Billing Analysis: It's Complicated!

Moderator: Philipp Degens, Energy Trust of Oregon

PAPERS:

The Dynamics and Advantages of Using Billing Analysis to Evaluate New Residential Construction Programs
Michael Li, BC Hydro

The Devil's in the Details: What is the Effect of Methodological Decisions on Estimated Savings?
Pace Goodman, Navigant
Jes Rivas, Navigant
Marilla Yaggie, Navigant
Lauren Gage, Apex Analytics

Cleaning Up the Mess of Energy Billing Data: An Investigation of Differences in Billing Analysis Results Caused by Data Cleaning Methodologies?
Eric Ziemba, Opinion Dynamics
Stefanie Wayland, Opinion Dynamics
Olivia Patterson, Opinion Dynamics

SESSION SUMMARY:

Billing analysis has been in constant use by evaluators of energy efficiency programs to estimate residential program impacts since the early 1980s. Methods have evolved over time, starting with PRISM and PRISM-like approaches, which weather normalize and analyze the energy consumption of individual customers. Other approaches use large panel data sets to analyze energy consumption data from many customers in one fell swoop. Some billing analysis relies on quasi-experimental design, while in recent times more evaluators have strived to use randomized control and treatment groups. One would think that over all this time procedures and processes associated with billing analysis would have been reduced to a few well known steps and procedures that can easily be wrapped into a set of algorithms—an aspirational end goal of many M&V2.0 proponents.

This session will look at different research methodologies used in residential billing analysis, and how specific differences in methods can affect results. The three papers presented here indicate that there is still more to be learned about billing analysis, and how it can be used.

The first paper analyzes the impact of a residential new construction program. A quasi-experimental design is used, with a comparison group of non-participants selected based on home size, space heating source, location and year built. Such a non-participant group represents the counter-factual energy consumption, which is compared with the participant group's energy consumption to determine savings.

The second paper provides an overview of methodologies employed in billing analysis. It investigates the level of variation in savings estimates, when savings from a single data set are calculated by different model types, using different comparison groups and using different exclusion criteria. This work informs evaluators, researchers, policy makers and program administrators as to the relative importance of certain analysis decisions, such as model selection, comparison group development and data filtering.

The final paper investigates a variety of standard data cleaning procedures that are used in billing analysis to turn the "raw" data into the "final analysis" data set. The paper investigates how each phase of the data cleaning procedure affects the results.