TACKLING ANALYTICAL CHALLENGES WITH STRATEGIC ENERGY MANAGEMENT AND OTHER PROGRAMS THAT RELY ON SAVINGS AT THE UTILITY METER

Moderator: Maureen McNamara, U.S. Environmental Protection Agency

PAPERS:

Estimating Energy Savings Resulting from Strategic Energy Management Programs: Methodology Comparison
Andrew Bernath, The Cadmus Group
Maggie Buffum, The Cadmus Group
Strategic Energy Management Modeling: What's Good Enough?
Philipp Degens, Energy Trust of Oregon
Anna Kelly, The Cadmus Group
A Comparison of Approaches to Estimating the Time-Aggregated Uncertainty of Savings Estimated from Meter Data
Bill Koran, SBW Consulting
Erik Boyer, Bonneville Power Administration
M. Sami Khawaja, Ph.D., The Cadmus Group
Josh Rushton, Ph.D., Rushton Analytics
Jim Stewart, Ph.D., the Cadmus Group

SESSION SUMMARY:

Strategic Energy Management (SEM) programs targeting commercial and industrial customers have become increasingly popular throughout the United States. These programs seek to implement comprehensive changes in energy management and sustain them over time. In addition, other program types including pay-for-performance and behavior-based programs rely on changes in energy use at the meter. These programs share in common reliance on regression models to demonstrate energy savings.

Both program managers and evaluators of these programs grapple with a host of valid questions in developing and testing models. How do you select the right regression framework? What level of model development is good enough? Is there a way to simplify methods for programs and their customers to reduce costs and burden? How do you quantify aggregate uncertainty?

In the first paper, the authors use a simulation approach to test different frameworks (i.e., forecast, simple pre/post, and fully specified pre/post) and model specifications to determine which produce accurate and robust results and under what conditions.

The second paper explores the characteristics of monitoring, targeting and reporting models developed for SEM programs based on a sample of facilities from the Energy Trust of Oregon programs in the 2009-2013 timeframe. Developing and maintaining these models accounts for a significant portion of the cost of delivering SEM programs. The authors explore the feasibility of streamlining the model process with reduced form models (i.e., with fewer and a more consistent set of variables) in order to deliver comparable results and reduce program costs.

The final paper explores and contrasts multiple methods for assessing the aggregate uncertainty for multiple data points—e.g. the uncertainty for a full year of savings. Calculations from ASHRAE, classical statistics, and resampling methods are compared to show the challenges in estimating uncertainty. Four data sets were used for the comparisons, and the paper shows which methods performed best for those data sets.