Guidehouse

Using AMI Data for the ComEd Evaluation

August 27, 2020 SAG Meeting

How Evaluation Uses AMI Data

- Econometric Analysis
  - Residential Thermostat
  - Virtual Commissioning (VCx)
  - Small Business Thermostat
- Site-Specific Analysis
- Smart Tool

Residential Advanced Thermostats

- Estimate electric cooling savings attributable to smart thermostats to support updates to the TRM
- The AMI data enabled our daily regression model, where we have observations of actual daily usage for each customer. Previously, we would only be able to resolve average daily usage by month. This resolution allows us to better capture customer response of energy use to weather (for example), day to day.
- The hourly resolution of the AMI data allows us to investigate hourly loadshapes for customers, segmented in a number of different ways (for specific types of customers, or by weekend/weekday). This allows us to, for example, look at how a smart thermostat might change customer behavior throughout the day. We did observe savings during the day, but an increase overnight.

Virtual Commissioning (VCx)

- Guidehouse used customer AMI energy usage data, matching hourly weather data, and information on the nature and timing of the specific changes each VCx participant made through the program, to measure the energy impact of the program for each customer.
- We used regression analysis to develop and calibrate an hourly, weather-adjusted energy usage model for each customer.
- Then we used the calibrated model to simulate each customer's hourly usage with and without the VCx-induced changes to measure their annualized energy savings.

Citation: Guidehouse, "ComEd Virtual Commissioning Impact Evaluation Report (Final)," April 17, 2020.

Small Business Thermostat

- Guidehouse used cooling-season AMI usage data from ComEd small business customers that had installed programmable thermostats through the Air Care Plus program to update the cooling energy savings parameter of the TRM.
- We aggregated the interval data to daily totals for the purpose of measuring the average cooling energy savings from installing the measure.
- We selected matched controls using a minimum-distance algorithm during the cooling-season months of each participant's pre-install year.
- Then we measured their average cooling energy savings using a lagged-dependent variable regression model.

Citation: Guidehouse, "Small Commercial Thermostats TRM Research" (memorandum dated May 26, 2020)

Site-Specific Analysis

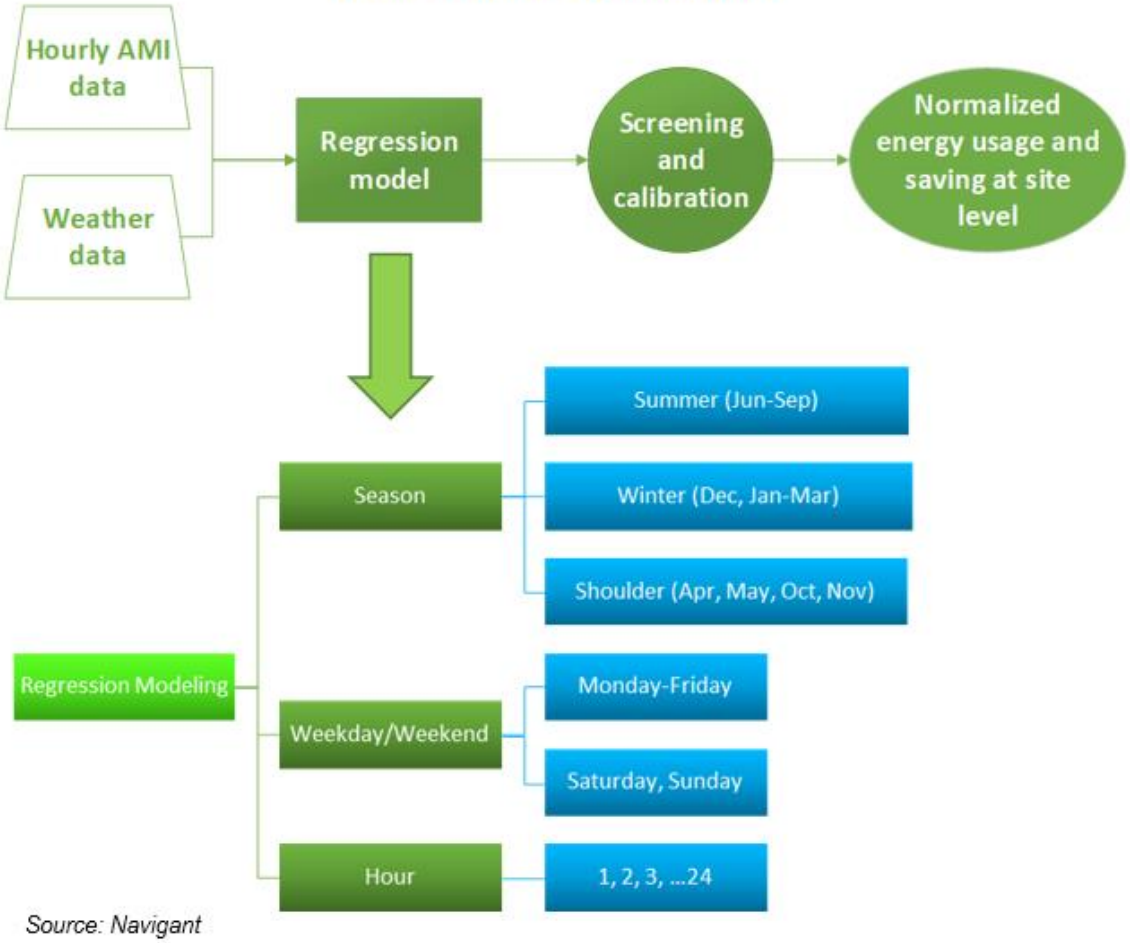
Calibrate engineering models to site-specific consumption patterns

Sector	Activity
Business	Custom
Business	Data Centers
Business	Industrial Systems Optimization
Business	Energy Advisor Monitoring-Based Commissioning
Business	Retrocommissioning

Smart Tool Pilot

- **What is it:** C&I weather-normalized site-level pre-minus-post custom hourly impact analysis using revenue-grade utility hourly or sub-hourly electric meter data (Scheduled Meter Analytics Regression Tool - SMART)
- **How can it be used:** energy impacts screening for entire participant population, demand performance period coincident savings analysis, TRM research
- **ComEd use case:**
  - Piloting the SMART tool in parallel with traditional evaluation methods for the C&I Custom program
  - Screening for sites that could receive a desk review instead of an on site evaluation without loss of accuracy, reducing the on site sample size

Figure 1. SMART Tool Data Flow



Source: Navigant

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Smart Tool Pilot

Program-participant impact surveys using the Guidehouse SMART tool can reveal apparent trends that warrant further investigation.

Such trends may not be readily apparent from a traditional random sample.

- The 2019 AMI survey for the ComEd C&I Custom program suggest the following apparent trends could be investigated and resolved:
  - program may systematically underclaim savings for Compressed Air measures
  - program may systematically overclaim savings for Refrigeration measures

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