AEI

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Case Study

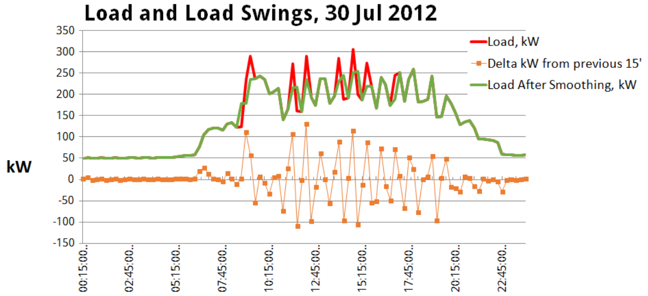
Proper Sequencing of Loads at a Large MA High School Reduces Summer Peak Demand Charges

The Problem

AEI was engaged by the prime contractor to study the sequence of operations and discover opportunities for peak demand mitigation at two separate campuses of a large high school system in Massachusetts, with a combined total of 783,000ft^2 and 3,300 students. Peak demands during the summer cooling season—normally expected to be an unoccupied time of the year—showed the largest variability in electric demand. The unpredictability of the demands made it difficult to consider any demand response initiatives until the nature of the swings could be determined.

Solution

Using the utility main meter interval data we applied our AEI SoftStart™ analytics to profile the school's energy use. We first disaggregated the main meter data into three separate seasonal 24-hour average profiles for heating, cooling and shoulder seasons to compare average loads and the variability within sample periods. The Summer cooling profile for one meter quickly stood out with significantly more volatility than any other account or season. The load for this single meter starts the day at 50kW and then rises as expected to an average of about 200kW.



We determined that three 55kW chillers were being operated on identical schedules rather than sequenced to avoid coincident demand. In any given 15 minute period during the day, the demand could swing as much as 165kW as the three chillers would turn on and off together.

By sequencing the chillers and deferring the start for the third stage at a few critical points during the day, we showed the peak demand for an average hot day could be reduced by 46kW without affecting cooling capacity or comfort. The resulting savings on demand charges alone amounts to over $1,200 per month during the summer cooling season, and reduces the school's risk by as much as $4,800 per month when utility demand charges increase as expected over the next two years.

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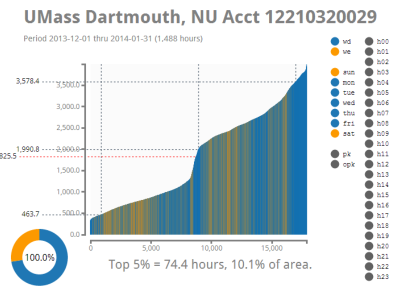
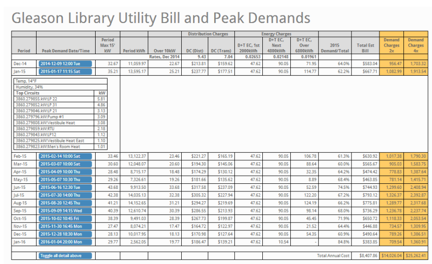
Building Energy Efficiency with AEI

Take Back Control with AEI SoftStart™



AEI energy data analytics help you take back control of your facility's energy use. The first step is an inexpensive main meter AEI SoftStart™ review using the EPO data collected by your time-of-use (TOU) facility meters. Even with just the main meter, we can:

- Profile your facility's energy use by time of day, day of week, season/season, year/year, including weather normalization,
- Show dynamic demand visualizations that quickly identify your peak demands during the year,
- Calculate the Energy Use Intensity (EUI) of your buildings and compare them to each other and to the DOE national database.

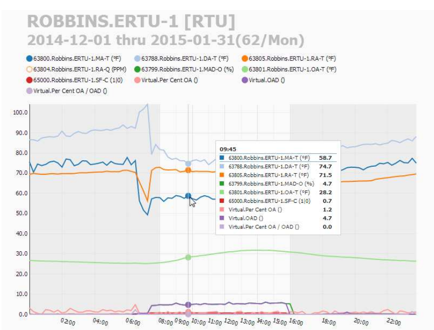


From these analytics, we can start to understand how your buildings operate:

- Do your buildings set back appropriately during unoccupied hours?
- What are the base, heating and cooling loads of the buildings?
- What are the top peak demand moments in the billing period? How does your peak demand compare to the average load?
- How do your buildings perform relative to each other per square foot, and to the national averages for similar building types?

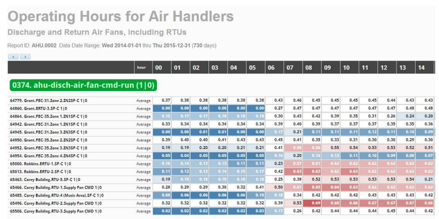
An AEI SoftStart review is the inexpensive way to answer these questions and others, pointing you in the right direction to choose the next best steps toward energy efficiency.

With BAS Data, Deeper Insights and Savings



With the Building Automation System (BAS) data from your facility, AEI kicks into high gear and goes well past what the main meter has told us. We'll dig deep into the air handlers, chillers, boilers and other assets to see that they are operating efficiently and to plan. We'll discover the typical inefficiencies such as simultaneous heating and cooling, excessive or insufficient ventilation, VFD efficiencies, and hundreds of other performance indicators. We'll identify the simple and quick ROI O&M savings opportunities, but also give you the reference data for making capital improvement decisions. How well do your current assets perform against an ideal cost-to-operate model? We'll tell you all this and more, and in plain English. Commissioning a new BAS? We can qualify the installation to be sure it's been properly configured.

Lower Costs and Maintained Savings over Time



AEI is with you through the entire process, from early main meter insight, through your retro-Cx, recommissioning and BAS commissioning projects, all the way to steady-state continuous commissioning to maintain the savings that were achieved. As your partner, AEI continues to monitor the main meter and the BAS under the watchful eye of our CEMs, delivering reporting and insight to your secure and private web portal. Your engineers and ours share a low-cost reference desk where your data is presented in logical and meaningful ways that are tuned to your staff's needs.