



Demand Management Case Study

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Boston Convention & Exhibition Center Boston, MA

Background

Owned and operated by the Massachusetts Convention Center Authority, the Boston Convention & Exhibition Center (BCEC) is among the largest exhibition venues in the northeast. From international trade shows and high-tech industry gatherings to galas, university graduations and even serving as a temporary COVID-19 field hospital, this landmark destination requires reliable power to host events.

The Challenge

Depending on occupancy and weather conditions, BCEC can draw the same amount of electricity as a small city, and its onsite building management system (BMS) operators, engineering and maintenance staff, event managers and sales executives consider the sustainable management of energy used throughout the more than 516,000 square feet of flexible and contiguous space as a shared responsibility.

The team set out to reduce its peak demand because it was good for both the environment and their bottom line. Times of high demand often require use of electricity generated by the least efficient power plants, so reducing their peak would help cut carbon emissions. And lowering peak demand could also help lower capacity costs, which make up a significant portion of their overall energy costs. BCEC could also receive financial incentives for participating in demand response programs.

With several large-scale summer events on the horizon BCEC set out to quickly implement a solution

The Solution

After enrolling in the Eversource ConnectedSolutions demand response program, BCEC Energy & Sustainability Manager Deirdre Manning along with the facility and management teams and Voltus partnered with Eversource to establish a plan.

First, BCEC staff identified and prioritized the most dispensable equipment and activities throughout the BCEC while maintaining safety and building operations requirements.

In advance of events, building occupants are sent emails from the BCEC team suggesting ways to reduce energy use at workstations and requesting assistance identifying areas of waste. Any reduction in use that might negatively impact the client experience was not included in the demand reduction plan.

Results

- Reduced demand by an average of 978 kW per event in 2019
- Earned more than \$34,000 in incentives from Eversource
- Effectively lowered capacity tag obligation by more than \$320,000 cutting the capacity component of electricity price negotiated with ISO New England by more than 50%.
- Avoided more than 1,300 tons of CO2 emissions per event on average - equivalent to removing 229 cars from the road for a year.

About Mass Save:

Together, we make good happen for Massachusetts: Berkshire Gas, Cape Light Compact, Eversource, Liberty Utilities, National Grid and Unitil. As one, we form Mass Save®, with the common goal of helping residents and businesses across Massachusetts save money and energy, leading our state to a clean and energy efficient future.

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Knowing from experience how the extensive system of chillers and controls in place must keep pace with the fluctuating New England temperatures, the onsite BMS operators used their knowledge to identify additional incremental savings and activities that would bring the reduction plan closer to the goal.

Jack Fallon, a long time BCEC BMS operator, stresses the importance of not letting the “building get away from you” meaning that being too aggressive with shutting down chillers and other equipment might not allow time for the building temperatures and systems to recover from a demand response event. Jack identified spaces where he could precool, others where he could maintain ventilation without cooling as well as typical actions like adjusting setpoints and on/off settings.

The Eversource metering team also worked seamlessly with BCEC to help expedite the installation of real-time monitoring equipment, which is instrumental for post event evaluation. The BCEC staff uses this data to pinpoint drops in demand and follow up with BMS operators to discuss areas of potential performance improvement.

Kevin Driscoll, a 10-year veteran in BMS and a relatively new BCEC employee, worked with Evan Harwood, the BCEC's Building Superintendent, to review the data and identify ways to bring a chiller serving area with servers offline earlier in a demand response event. For the next event, the temperature in the chilled water loop was driven down lower in advance which allowed the chiller to remain offline for four hours without the servers overheating. This change resulted in an earlier drop of more than 250 kW.

The expertise and commitment of BMS operators brought improvements to the action plan with protocols for shedding load in response to ConnectedSolutions event requirements, allowing the BCEC team to improve its performance and manage response to summer peak demand events.

“The BCEC is a quarter of a mile long building and our energy requirements can change on a daily and sometimes even an hourly basis depending on the needs of our clients. Our work with Eversource and the demand response procedures support our sustainability mission and have delivered strong results and significant savings. We're proud of the work and grateful for the continued collaboration from our team in setting and meeting aggressive goals.”

– Deirdre Manning, Energy & Sustainability Manager, Massachusetts Convention Center Authority

Highlights

Daily Updates: The day before an anticipated event, an update is shared with BCEC via email with anticipated peak load contribution requests. Using this data, the onsite team reviews the event schedule and develops a daily plan and timeline in coordination with the onsite BMS team.

Flexibility: BCEC is able to customize its response to accommodate summer event requests and meet its pre-set goal. Commonly requested activities include turning off individual office light fixtures, powering down unneeded office equipment (monitors, printers etc.) or possibly using laptops on battery power during a specific time period. In the public areas, with the help of the public safety team, escalators may be shut off. The engineering and maintenance team may also shut down air handling units in unoccupied areas of the building and/or raise the temperature set point a few degrees, and the HVAC engineers may stage down to smaller chillers for efficiency or maintain a medium sized chiller running at a very low rate.

Planning: BCEC alerts its vendors to events when temperature setpoints will be increased and air handler shut downs are scheduled to ensure any impacts to move-in or tear down of catering, staging and equipment is limited.

Reporting: The BCEC team has access to real-time and daily metering reports to evaluate event summaries and progress against goals.

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