

Building Analytics Success Story

Commonwealth of Massachusetts



In 2016, the Commonwealth of Massachusetts state facilities agency, the Division of Capital Asset Management and Maintenance (DCAMM), began an effort to utilize existing and new metering at state-owned facilities to save energy and reduce peak demand. Partnering with the Massachusetts Division of Energy Resources' Leading by Example program and the extensive metering they installed through a prior project, the Commonwealth tracks 5-minute interval data for electricity, natural gas, steam, hot and chilled water, and oil usage. Their 953 meters cover 420 buildings including state hospitals, prisons, universities, community colleges, courts, and office buildings. With hundreds of facilities to track, a portfolio-level energy information system (EIS) has been essential to staying on top of energy use.



The data itself is what has become most valuable. We can share what actual loads are, so we aren't oversizing equipment. Looking data on how facilities are run helps our investment decisions.
- Krista Lillis, Energy Program Manager

What is an EIS?

An EIS is a combination of software, data acquisition, and communication systems used to store, analyze, and display building energy meter data on an hourly or more frequent basis. EIS is one type of energy management and information system (EMIS).

To turn all this data into useful information, DCAMM's EIS automatically identifies and reports opportunities for operational savings such as delayed start, earlier shutdown, reduced holiday/weekend operation, and baseload reductions. Their in-house MBCx team tests meters and compares the meter data to billing data for accuracy and provides analytic support such as tracking performance of peak demand reduction and operations efforts. The team identifies facilities with the highest EUI and highest demand charges to inform long term plans for facility improvements.

Quick Facts

Location: Massachusetts

Building type: Various state-owned buildings

Floor area with EMIS: 25 million sq ft

Total buildings with EMIS: 420 buildings

Energy savings: 23 buildings with 14% average energy savings

MBCx Service provider: In-house MBCx with 3rd party assistance from Banks 2 Quan (B2Q)

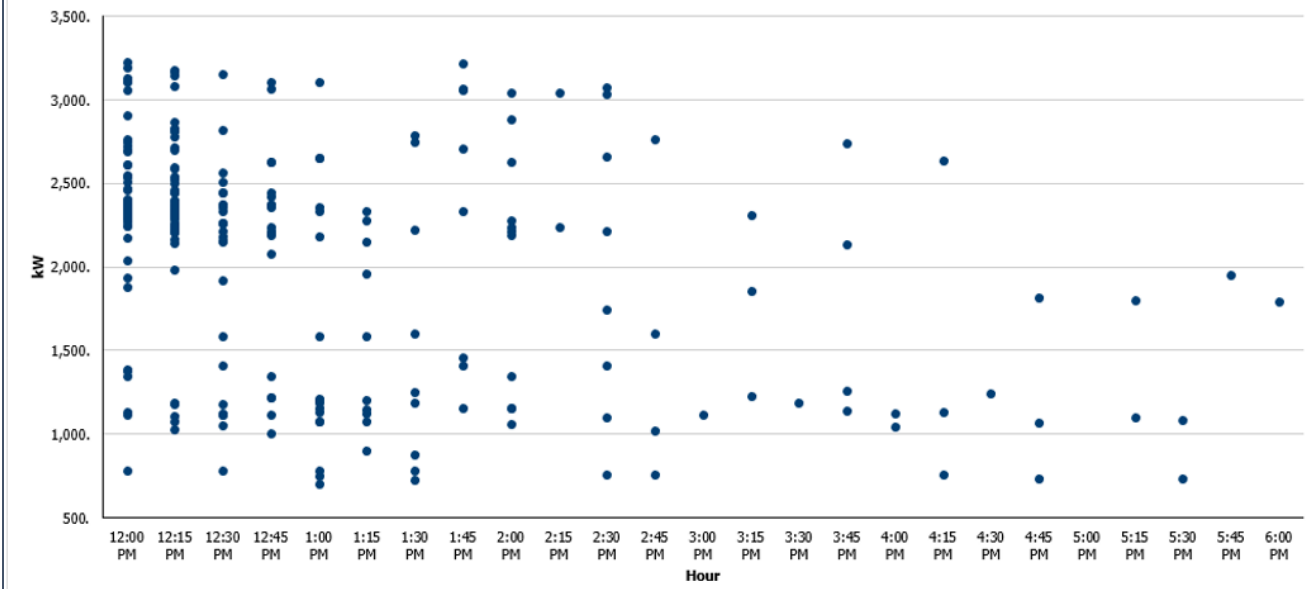
EIS Software: Enel X (formerly EnerNOC)

Smart Energy Analytics Campaign: Recognition for Largest Portfolio Using an EMIS

The Commonwealth of Massachusetts was recognized by Lawrence Berkeley National Laboratory and the U.S. Dept. of Energy in May 2019 for their exemplary work to save energy using an energy information system.

If peak demand were reduced to the average peak demand of **2,113.3 kW**, potential cost savings would be: **\$12,214.4**

BSB01 - McCormack Building



DCAMM reviews the 15-min interval in which peak demand occurs to identify demand reduction opportunities

Becoming a Data-Driven Organization

DCAMM is working to implement a process that systematically utilizes the wealth of data available. DCAMM's Energy and Sustainability Group currently uses the following process:

- **Weekly:** The team reviews the opportunities that are automatically reported by the EIS. They reach out to facilities to understand the issues and work with them to resolve. The team also uses the EIS to identify peak load shaving opportunities. They run reports in the EIS to determine when the buildings will hit their peak and share this information with facilities.
- **Quarterly:** The team reviews facilities with high energy use intensity and identifies possible projects using the EIS reports and the opportunities identified at the weekly meetings.
- **Projects:** If an energy project, major retrofit, or deferred maintenance project is being planned, the team uses billing and interval data to help fully understand the loads to right size equipment. Several sites have one utility account for many buildings, and the EIS enables DCAMM to look at the load for individual buildings.

We are doing a lot with demand response now that we can easily review our load. Our demand response cost savings is right up there with our energy cost savings.

- Krista Lillis, Energy Program Manager

Evolving the M&V Program

DCAMM's in-house team is responsible for implementing many energy and water conservation projects. Utilizing an innovative loan fund, the team felt the acute need to ensure M&V was being performed on energy projects after construction for a minimum of 5 years to verify the savings were realized and the loan payments could be made. Utilizing interval data, the team produces a whole building energy model. The interval data allows for the most accurate baseline and helps the team identify deviations from the original savings predictions. If opportunities for correction of building operations are found, the team brings these to the attention of facility managers and the project team.

The Smart Energy Analytics Campaign is a public-private sector partnership program focused on commercially available Energy Management and Information Systems (EMIS) and monitoring-based commissioning practices.

The campaign couples technical assistance with qualitative and quantitative data collection to inform research, development, and field study priorities. Partnering participants are encouraged to share their progress and may receive national recognition for implementations that demonstrate exemplary practices.