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CUSTOMER SPOTLIGHT:

Massachusetts Dept. of Energy Resources Deploys Enel X's Energy Intelligence Software State-wide to Eliminate Waste, Drive Down Costs, and Lead by Example

The Big Picture

The Commonwealth of Massachusetts' government is the largest energy user in the state, spending over $250 million and consuming more than 1 billion kilowatt hours (kWh) of electricity each year. Prior to the deployment of a software-based enterprise solution, its energy management team relied exclusively on 30-day-old utility bill data. In many cases, these bills were at an aggregated campus level (versus individual building level), which created further roadblocks for strategic energy management.

With aggressive energy reduction targets in place, in 2010, the Massachusetts Department of Energy Resources (DOER) kicked off a program to deploy a first-in-the-nation Enterprise Energy Management System (EEMS) to monitor real-time energy consumption across more than 25 million square feet of property at buildings as diverse as courthouses, college campuses, prisons and hospitals, some of which are brand new construction while others are 100+ year old facilities. In 2010, DOER selected Enel X's Software-as-a-Service (SaaS)-based energy intelligence software platform as the foundation of its EEMS project. Today, Enel X collects and analyzes real-time data from more than 1,300 meters at 460 state buildings, providing visibility into energy consumption across multiple commodities, including electricity, natural gas, oil, propane, steam, condensate, and chilled and hot water.

Enel X monitors more than $60 million of energy spend and has helped state agencies identify $2.6 million in low and no cost operational savings. Enel X has also provided the visibility required to prioritize capital projects and staff time against the biggest problem areas.

Delivering Value through Better Visibility

Enel X's energy intelligence software gives state facility, project management, and finance personnel the software tools and analytics needed to identify cost-effective opportunities to make both short and long-term energy improvements. To date, the company has delivered value by focusing on five key areas:

1. Project planning

Effective energy management starts with visibility. Without it, it's difficult to determine where that next dollar of investment will have the greatest impact. By collecting data across entire groups of buildings, like a college campus, users can compare like-facilities to identify which ones are using energy most or least efficiently. For example, by monitoring more than two dozen buildings at Fitchburg State College, facility personnel soon realized that the Mazzaferro Center, which primarily houses different campus offices, was using significantly more energy per square foot than other buildings with similar operating hours and uses. Upon further investigation, facility staff

INDUSTRY

Government

LOCATION

Massachusetts

ANNUAL ADDRESSABLE ENERGY SPEND

$60,000,000

TARGETED ANNUAL SAVINGS

$3M — $9M

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—Joseph LoBuono, Director of Operations, Fitchburg State University

was able to pinpoint a conflict between the building's HVAC system and building controls system. As a result, the Capital Planning and Maintenance Office incorporated funds into the budget to upgrade the building HVAC to the campus-wide controls system.

"The technology Enel X provides, I use personally on a day-to-day basis," says Joseph LoBuono, Director of Operations and Maintenance, Fitchburg State University. "It allows us to proactively see where our problems are, as well as where we can improve. That's the first step in producing an energy efficient campus."

2. Operational Savings

Enel X's energy intelligence software analyzes thousands of data points — electricity data, heating data, water usages, weather, real-time energy prices, occupancy schedules, etc. — to identify opportunities for operational process adjustments to have a big impact. At the Soldiers' Home in Chelsea, for example, the facility was incurring hefty peak demand charges when the building's chillers were coming on all at the same time. Enel X's software pinpointed the demand spike and working with Enel X's professional services team, the staff implemented a new phased start-up sequence that eliminated the peaks in demand, saving more than $19,000 annually and over 173,000 kilowatt hours (kWh) of electricity usage.

Similarly, because many state buildings are closed during holidays, simply comparing energy consumption against occupancy data can reveal significant waste. In one courthouse, for example, the data showed that even when New Year's Day fell on a weekday, the building wasn't defaulting back to its holiday setback schedule. By identifying the waste, building managers could make the appropriate adjustments. In 2014, the Courthouse dropped 500 kilowatts (kW) over the holiday, netting $10,000 in savings.

Across the Commonwealth, looking at these opportunities for operational savings — flattening peak demand spikes, ensuring night and weekend setback schedules were optimized, delaying start-up times for HVAC and other high intensity equipment — yielded approximately $2.6 million in identified annual savings with very little upfront costs.

3. Persistent Savings

Operational savings can yield big results, but as quickly as they're implemented, they can be overridden, which is why continuous energy monitoring is so critical. At Framingham State University, for example, a night setback issue was identified and quickly corrected. The building management system in the impacted area was re-programmed to cut back 80 kilowatts during unoccupied hours. Two weeks later, however, the programming was overridden. This time, however, instead of running for weeks, months, or even years, the waste was spotted in a matter of days, protecting the more than $16,000 in savings the College realizes by diligently setting back at night.

4. Maintenance Cost Avoidance

Utility bills typically only offer a 30-day retrospective view of your energy data, once the money has already been spent, and without the granularity needed to spot behaviors that might indicate your equipment is performing out of spec. Enel X's energy intelligence software gives users access to their data in 5-minute, 15-minute, or hourly intervals, empowering users to take a close look at their load profile.

When UMass Lowell looked at the 15 minute data for one of its sites, it could see that a large piece of machinery was cycling on and off unnecessarily, putting additional wear and tear on the equipment. Spotting the anomaly enabled college staff to correct the problem, extending the expected lifetime of their equipment.

5. Measurement & Verification

Energy managers and facility staff know that often the most challenging part of getting energy efficiency efforts funded is proving the business case, but in this case, success begets more success. Enel X's energy intelligence software's "compare-to-past" functionality can show, in real time and normalized for production and weather data, whether or

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—Rick Pollara, Director of Facilities, Massachusetts Hospital School

not energy management projects are delivering the desired outcomes. In 2013, UMass Lowell installed new boilers and economizers, diligently tracking natural gas consumption after the installation. In January 2013, the campus used less natural gas than the same period the previous year, even though 2013 had colder temperatures and more Heating Degree Days.

The Benefits:

Dollars for Our Community

Savings are first and foremost on the list of benefits that Enel X has helped deliver. The $2.6 million identified annual savings can have a meaningful impact for the Commonwealth. "The biggest value of seeing reduction in expenditure is the ability to keep costs down for students," said Mary Beth McKenzie, Executive Director of Administrative Services at Fitchburg State University.

Prioritize Investments for Maximum Impact

"Watching your energy use in different buildings, you can really pinpoint where you're losing some energy and where you can go after some savings, that in turn will help your budget," notes Rick Pollara the Director of Facilities at the Massachusetts Hospitals School.

Use Staff Time More Wisely

Debra Dunn, an electrician for Massachusetts Hospital School, adds, "The Enel X software allows me to check readings quickly and accurately from my office. I don't need to spend additional time out of a busy day going to each building taking meter readings, recording them, and analyzing things in a spreadsheet."

Better Accountability

Enel X's software gives users the tools to understand how different buildings are using energy, even if individual buildings are all supplied by one meter. Westfield State University, for example, uses Enel X to allocate electricity charges back to individual departments, putting accountability in the hands of those who use energy directly.

Making it Part of the Curriculum State colleges and universities use close to 450 million kilowatt hours (kWh) of electricity annually, costing more than $65 million. As such, many were eager participants in the EEMS program. Bunker Hill Community College went a step further than just using the software to identify savings; they made it part of the curriculum, using the software as a valuable tool in courses related to sustainability. Bunker Hill also uses the data from Enel X's software to populate public-facing dashboards that promote energy efficiency awareness to drive even more behavior changes and savings.

The Future

In a speech in 2012 entitled, "Shaping our Energy Future," Governor Deval Patrick championed his focus on making energy efficiency Massachusetts' "first fuel," noting, "For the $2 billion in energy efficiency investments we are making over three years, we are generating $6 billion in benefits for consumers — industrial, commercial, and residential. That's a rate of return I will take any day — and it is just the beginning." DOER continues to develop and implement policies and programs aimed at ensuring the adequacy, security, diversity, and cost-effectiveness of the Commonwealth's energy supply within the context of creating a cleaner energy future.