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Better Leveraging Mechanical Systems Data is Key to Energy Savings and Revenue Growth for Building Operators

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Property owners and managers of facilities, whether manufacturing plants, commercial office buildings or healthcare facilities, are constantly seeking new ways to reduce energy consumption.

This should come as no surprise, as energy use accounts for between one-third and two-thirds of a typical facility operating budget, depending on the building and the industry. Given the uncertainty while buildings are temporarily empty or drastically reduced in usage/capacity during the COVID-19 pandemic, property owners can optimize buildings' operations to improve their bottom line.

While operators cannot simply "turn off" an entire commercial property, there are several ways to leverage energy efficiency to reduce utility costs during these times. What might surprise, however, is the fact that one of the most effective new tools to manage energy costs, data analytics, remains for many an untapped opportunity.

Recent progressions in big data have allowed building managers to achieve improvements in plant and equipment efficiency. By collecting and effectively analyzing building operating and mechanical systems data, operators can reduce equipment and energy costs dramatically, while improving tenant/employee comfort.

Building operating managers today can also look beyond their own building's performance to find useful data for making decisions. Benchmarking through the Environmental Protection Agency's no-cost ENERGY STAR® Portfolio Manager enables users to look at building performance data, including energy use intensity, from every metered building by size and geography. This gives building operators apples-to-apples data comparisons with peer building systems.

Interestingly, collecting data is not the biggest challenge when it comes to managing building systems information. Having the ability to interpret the data and properly use it to make decisions is a game-changer that can be elusive to operators for a variety of reasons.

For several years now, building operators have had the ability to view performance data and manually spot trends and patterns in energy usage. Building systems information can be viewed in several ways,

including hourly, daily, monthly, seasonally and year-to-year. This requires analyzing large volumes of data and turning it into actionable information to target underlying problems and identify opportunities for energy savings.

While data can be useful in understanding building behavior, the information being collected is often complex, especially for building managers with multiple responsibilities. These challenges are magnified when you consider that many building managers are also trying to keep up with changing technologies as well as tenant/employee needs. Most dashboards collect and present data; however, they rarely provide insights, and that's the catch.

Interpreting Data Should Be a Team Effort

To get the most return on this technology investment, interpreting the data should be a team effort that includes outside experts. This is where many buildings fall short—not having the expertise onsite to leverage the data. That's a tall order, as it requires a special skill set. You can acquire it through training, or you can hire people with the right qualifications to do it. It's also where external experts can help.

At National Grid, we often play the role of matchmaker for our larger customers, helping them connect with the right consultants to better manage their data. For mid-size customers, we have prequalified vendors called project expeditors, who can help analyze building data and make system performance recommendations.

Whichever path you choose, it is critical to have the right skill set available to read through the volumes of available information and parse out the key stats that will enable strategic decisions. Without it, available data can be underutilized, misused or overlooked altogether.

We had a case recently where a LEED-certified building was using significantly more energy than it was supposed to. We discovered that during a routine air balancing procedure, a contractor had disengaged an off-time setback but failed to reset it after completing the procedure.

The system change ran undetected for an extended period of time. This is a case where the system was collecting data, but either no one was looking at it or they didn't know what to look for. To make matters worse, the customer had recently eliminated the storing of historical data as a cost-saving measure. Consequently, the performance irregularities were not discovered until after valuable energy had been wasted and excessive costs had been incurred.

According to the U.S. Energy Information Administration, about 40 percent of total U.S. energy consumption was in residential and commercial buildings—about 39 quadrillion BTUs. Just imagine how that could be improved if we maximized building system performance through improved analytics. This issue is prevalent in both new buildings and older facilities, particularly when you consider that only one to two percent of the current building stock is new.

Data Can Optimize Energy Use

Whether from a comfort or energy-efficiency standpoint, data insights can help building owners:

- Improve overall energy efficiency and identify energy-saving opportunities.
- Break down data to better understand energy consumption based on building occupancy and time, thereby identifying peak demand reduction opportunities.
- Monitor the environment in buildings to improve tenant/employee comfort, which enables potentially higher rents and promotes tenant retention and employee productivity and health.
- Proactively identify conditions that might cause problems and correct the conditions before they become severe.

- Do preventative maintenance and optimization—before issues arise or escalate. You could receive data about when an energy-related component is about to fail and needs to be fixed immediately to avoid emergency maintenance.
- Prioritize maintenance work based on criticality.
- Improve budgeting estimates of how many components are failing or are near the end of their lifecycle while getting valuable data to help in planning and forecasting capital and maintenance costs.

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