Energy Management for Businesses Case Study

Energy costs are some of the highest expenses for businesses of all sizes. To understand their energy usage and lower their costs, businesses need to first understand their current usage. They need to know when and how much energy is used in their facilities. They also need a way to measure the quality of the power in their system, since poor power quality negatively affects energy efficiency. Power quality problems can also lead to equipment damage, loss of data, and costly power outages. In addition to information, businesses need a means to control their electrical usage. They need to be notified in advance when their usage may generate a peak demand charge or a power factor penalty. They also need a way to learn when a power quality problem has occurred and to be able to analyze the cause and attribute it to either their system or the utility. An energy management system with usage, power quality, predictions. and alarms is therefore necessary to lower businesses' energy usage and costs.

Many commercial businesses, educational institutions, hospitals, and other industries also have sustainability targets, either generated in-house or determined by governmental regulations. To meet their goals in reducing their carbon footprint, they need to be able to track their sustainability efforts and report on their progress. The ability to monitor the enterprise's carbon footprint is another important requirement for a business's energy management system.

Being able to consolidate other commodity usage, e.g., water or gas, into the energy management system adds another important layer of usefulness. Companies that can manage all their commodity usage in one system have an advantage when it comes to reporting on usage, comparing usage between facilities, or building areas, and being alerted of potential problems, such as water leaks. An energy management system that can incorporate W.A.G.E.S. (water, air, gas, electric, and steam) meters as well as energy meters is of great benefit to a business.

The EnergyPQA.com® AI driven energy management system meets all the needs previously discussed. It provides detailed usage and demand, power quality analysis, custom reporting on metered data, C-Suite reporting on cost management and power quality risk, and alarming on multiple conditions, including predicted peak demand up to three days in advance. It provides carbon footprint analysis for facilities, PUE for data centers, and W.A.G.E.S. usage and predictions. It enables comparisons between facilities and between metered areas within a facility. It gives businesses the tools they need to successfully manage their energy usage and costs.

Let's look at a few examples of how customers use the EnergyPQA.com® system and benefit from the information it provides.

<u>New Balance</u>

The New Balance company has its main headquarters in Boston but has multiple facilities around the United States. They have been using the EnergyPQA.com® energy management system for over a year and are very happy with the results. The company currently has 14 meters in ten facilities registered in the system and is planning to increase both monitored meters and facilities. The meters consist of Nexus® 1500/1500+ advanced power quality meter and Shark® 250 Cyber secure energy and power meters. The system has 18 users, including its Admin, Wayne R. Hynes, who is the project manager for retail maintenance and energy procurement in the Facilities Engineering department.

Wayne uses the EnergyPQA® system meter dashboards daily to view meter data, looking at usage and demand as well as all other energy parameters, such as power factor. He uses the system to generate daily, weekly, and monthly energy reports for facilities managers and further examines usage details in response to any questions from them. He studies waveform captures on power quality events to determine what occurred. Wayne shared two times when the PQ direction information provided by the EnergyPQA.com® system's waveform viewer helped to identify the cause of problems. One time it uncovered the fact that electricians had installed CTs backwards after an electrical system overhaul. Another time, a facility in California was experiencing high voltages. The data provided by the EnergyPQA® system showed that the voltage surges at the facility were due to the utility, Southern California Edison. After the utility was shown the EnergyPQA® system report, they corrected the problem.

Wayne and his team also make use of alerts, such as voltage and demand limits exceeded, and waveform captures. When a facility manager reports a voltage fluctuation in one of the buildings, Wayne uses the system to analyze the event and discover what occurred to cause it. Wayne's department is not currently using the predicted demand feature of the EnergyPQA.com® system, but he does investigate demand readings when he receives a demand exceeded alert from New Balance's energy consultant. He reports that the EnergyPQA® system is very useful and is a quality product and he is looking forward to more opportunities to reduce costs using the system.

Peak Mining

Peak Mining, with six locations throughout both North and South America and Europe, has been using the EnergyPQA.com® system in four of their modular data centers since late 2021. Accurate metering is critically important to them in shaping their response strategy as they participate as a controllable load resource or load modifying resource. Peak Mining had considered other systems but decided upon EnergyPQA.com® and are very happy with the flexibility and helpfulness of the support they have received from EIG. Matt Hensley, the Head of Operations for North America, reports he has experienced outstanding collaboration and support while working with the EIG system integration services team.

There are 52 active meters in the system, consisting mainly of Shark® 200 revenue-grade power and energy meters. The meters are generally connected to the switchgear and are used to monitor the independent, modular data centers. There is a main Admin for the system and there are eight site managers and five other users from accounting and related departments, all accessing the system from around the globe.

Interestingly, data centers' energy concerns are different from that of most other industries. Data centers provide the grid or utility with a very desirable high load factor. As Matt points out, seeing less consumption in a facility can be a cause for concern, not celebration! But being aware of unexpected, unplanned, or unscheduled power consumption reduction (or outage) is essential to the data center as it indicates there may be a problem that needs looking into. Matt and the other users of the EnergyPQA.com® system view the meter dashboards to be alerted to any indicators of problems. They view usage in the data centers to ensure on cycles and curtailment are being implemented properly. They print reports on power quality and interim power usage for energy audits. They also use the system to validate utility billing and power curtailments, relying on the high-accuracy Shark® 200 meters they are using and the consumption data from the EnergyPQA.com® system.

Matt reports that Peak Mining plans to expand their use of the system, especially the power usage effectiveness (PUE) feature, which shows how much of the energy consumed by a data center is used to generate income. Another feature he thinks may be useful is identifying the source of power quality events – upstream or downstream, using the EnergyPQA.com® system's single cycle waveform dashboard.

Founder's Brewing

Founders Brewing, located in Grand Rapids, Michigan, has been using the EnergyPQA.com® system since the beginning of 2023. They currently have six physical meters consisting of three Nexus® 1500+ power quality meters and three Shark® 250 cyber secure power and energy meters installed in two facilities. The meters are located on the main power feed coming from the utility and are used to measure consumption. They also have five "virtual" meters that allow them to break out the usage for specific areas of the facilities, such as the warehouse. This enables them to understand the energy used by specific areas of the facilities.

Patrick Zambon, the Controls Engineer for Founders Brewing is the EnergyPQA.com system's Admin. He determines which users can see information from the system. There are currently several additional users of the system. They download meter logs to view usage details when there is a problem, such as a power outage or a machine having problems, to diagnose the issue. Patrick looks at the waveforms of power quality events to perform post-event analysis. He also uses the system to understand the utility's billing and to determine what the energy costs are for the production, warehouse, and storage areas of the facilities.

The electrical contractors that work with Founders Brewing initially recommended the EnergyPQA.com® system to them. Patrick reports that they are happy with the system and plan to expand their use of its capabilities as personnel requirements are met.

In conclusion, the challenge of reducing energy usage and subsequent costs, attaining sustainability goals, ensuring power quality, and managing energy usage most efficiently is of paramount importance to businesses of all types. The EnergyPQA.com AI driven energy management system provides businesses with the tools they need to accomplish their energy goals. For more information on the EnergyPQA.com® system and to schedule a Demo, visit:

https://www.electroind.com/products/energypqa-com-energy-management-system/