Prenova®

The Energy Management Balance Sheet**:**

Pros & Cons of Today's EMS Technology

What you will learn:

- The primary benefits of Energy Management Systems and how they can **significantly reduce** energy consumption
- Which **major pitfalls** around installing EMS technology you need to look out for
- How you can **overcome these limitations** — so you're sure to get the promised benefits

Executive Summary

Over the last several years, energy prices have become **increasingly dynamic**. Energy markets are deeply affected by changes in global politics and economies. Low one moment, **prices can rise significantly** in just a few months.

Effective energy sourcing helps mitigate costs, but companies eventually focus on the need to reduce consumption. Installing modern energy management technology is one way to **reduce energy spend**.

Energy Management Systems have **many advantages**, but they also have a few drawbacks – which may explain why **two-thirds of retailers have yet to implement an** EMS.

Read this paper to **learn the strengths** of today's Energy Management Systems – and how to **overcome their weaknesses**.

Introduction

Energy Management and Sustainability are on everyone's mind these days. In fact, in a research study conducted earlier this year by Prenova and Chain Store Age, almost 80% of retailers said these issues were of significant importance to their organization. There are several reasons for this concern . . .

Price Volatility

Energy prices have risen significantly over the last 20 years, including dramatic spikes like the one that occurred in 2008. Prices may have fallen temporarily due to current economic conditions, but the long term trend is obvious – when the global economy starts to recover energy prices will begin to climb.

Consumer Attitudes

Many consumers prefer to do business with companies they perceive to be environmentally responsible. Smart retailers recognize this and are taking action. While reducing operating costs is the primary driver for energy management initiatives, improving brand perception is the second most common motivation.

Government Regulations

Governments around the world are turning their attention to global climate change, and many retailers are cautious due to uncertainty over what will happen with proposed energy legislation. While some are taking a "wait and see" approach, others are moving aggressively to reduce their carbon footprint.

These trends are driving more retailers to consider implementing energy management systems, both to control carbon and reduce energy spend. While the technology has been around for a while, the Chain Store Age survey found that only a third of retailers had installed an EMS in any of their stores. This whitepaper is intended to help retailers decide if the time is right to invest in the technology by offering a valuable look at both the pros and cons of these systems.

The Pros of EMS Technology

Energy Efficiency

- **Ensure lighting and other systems are off when not required**
- **Optimize the performance of air conditioning / heating equipment**

When store personnel are responsible for turning the lights off or adjusting the thermostat, they frequently wind up using more energy than necessary. Someone working in a hot stockroom for instance may turn down the temperature, causing the air conditioning to run longer and potentially resulting in a cold sales floor. When finished putting out inventory, they may also leave the stockroom lights on. Unfortunately, scenarios like this are common and significantly increase energy consumption, resulting in higher utility bills. An Energy Management System avoids this by maintaining a comfortable temperature throughout the store and by ensuring that lighting and other equipment is turned off when not required.

An EMS also helps reduce energy consumption by optimizing the performance of HVAC, lighting, and refrigeration equipment. For example, a store with multiple rooftop units (RTUs) may only require two units to keep the building cool most of the time. The third and fourth may only be needed under certain conditions. If the operation of these RTUs isn't coordinated by an Energy Management System however, it's common for all four to run simultaneously, regardless of the actual cooling requirement. This is a big waste of energy.

Greater Control

- **Standardize HVAC set points and lighting schedules across the portfolio**
- **Ensure local settings remain compliant with corporate standards**

Comfort and convenience are important considerations in retail. Without corporate oversight however, individual stores operate according to the preferences of the employees. One location may always be cold, while another stays uncomfortably warm. There is no consistency. Establishing corporate standards helps retailers maintain a comfortable shopping environment, while also controlling costs. The best way to ensure compliance with these standards is to install an Energy Management System, program the appropriate temperature set points and schedules, and then watch for deviations.

Many EMS platforms allow manual overrides of temperature and schedule settings to give store personnel greater flexibility. As an example, a store manager may want to come in early to setup for a big weekend sale. This requires turning the sales floor lights on a half hour earlier than usual, so he overrides the system. In another example, several members of a large party may complain the restaurant is too hot. So they ask the manager to turn on the air conditioning. The system allows her to change the temperature setting by a couple of degrees.

While such adjustments are sometimes necessary, it's important to return the system to the appropriate standards. Since the store manager may not remember to do this, most modern systems automatically reset after a given time. In some cases it may also be possible for a store employee to reprogram or disable the EMS however. This obviously affects the potential energy savings, so it is important to monitor stores to ensure they comply with temperature, schedule, and other settings.

Increased Visibility

- **Track performance and receive alerts when assets aren't functioning properly**
- **Monitor energy consumption to spot excessive usage**

Beyond simply controlling energy consuming assets, an Energy Management System also records the performance of these assets. This information can be accessed remotely, either via a telephone line, cellular service, or via the internet. Facility management teams have access to a wealth of data, including system alarms, performance alerts, and fault detection, so they know how critical equipment is functioning at all times. This allows them to quickly diagnose problems when they occur and just as quickly respond to complaints. It also makes it possible to spot abnormal temperature readings that may indicate local settings have deviated from corporate standards.

By observing the performance of store assets over time, the facilities team can spot anomalies that may go unnoticed by store personnel. For instance, if they see an RTU cycling on and off frequently, they can take action to identify the cause of the problem. A rapidly cycling compressor not only consumes more energy, but can also burn out more quickly. Store employees would likely not be aware of the problem as long as the store remained comfortable. So the ability to monitor asset performance not only reduces energy consumption, it also extends asset life.

Advanced systems can record energy use, and almost all modern EMS can integrate with third-party devices that have this capability (e.g. Interval Data Recorders (IDR) and Smart Meters). Most of the time, a sudden increase in energy consumption isn't recognized right away. It can take a month or more for the problem to be noticed because utility bills usually don't arrive until several weeks after the end of a billing period. By that time, excess consumption has cost the company a lot of money. With access to consumption data, energy managers can spot the issue much sooner. Attempts to correct the situation can also be evaluated to determine if they were successful.

The Cons of EMS Technology

Capital Expense

Because margins in the retail industry can be extremely thin, successful companies are extremely cost conscious. Capital expenditures are investigated carefully, and both the costs and benefits must be clearly understood before an investment is approved. Today, retailers are reigning in capital budgets altogether due to the falloff in consumer spending. In some cases, projects only move forward if the payback is less than twelve months. Though an EMS typically reduces energy spend by 10% to 20% per year, the payback usually falls outside the one year window. Getting an energy management project off the ground under these circumstances can be very difficult.

Solution: To avoid a major capital expenditure, look for an energy services provider that offers bundled pricing. With this approach, equipment, installation, configuration, and warranty costs are rolled together. Rather than making an upfront investment, the retailer pays a set monthly fee for everything. In other words, the onetime capital expense is replaced by a recurring operating expense. Depending on the speed of implementation and the level of savings achieved, this approach can result in positive cash flow in a matter of months.

System Complexity

Simply installing an Energy Management System won't guarantee savings. An EMS has many working parts and requires careful engineering. To achieve the desired objectives, the system must be properly configured or "commissioned." Control sequences must be designed and rigorously tested or HVAC, lighting, refrigeration, and other equipment won't operate as it

should. Sensors must be placed in appropriate locations and calibrated to ensure accurate readings. It is a time consuming process that requires attention to detail. It's also a process that, all too often, isn't performed correctly. Failure to properly commission an EMS reduces or even eliminates energy savings potential. In working with other retailers, Prenova has found that EMS-equipped stores typically burn 6.6% more energy than stores in the same portfolio without an energy management system. This is due to improper commissioning and/or a lack of routine monitoring to ensure settings are maintained to standard.

Solution: To ensure that energy management projects run smoothly and achieve maximum benefits, choose an energy services provider with experience in the retail industry. The needs and objectives of retailers can differ from those in other industries. Retail environments often require increased cooling to compensate for heat generated by sales floor and display lighting. Sensor location is particularly important in retail stores. For example, the temperature in high traffic areas, such as the front of the store near the primary entrance, may fluctuate to a wider degree than elsewhere. Improperly placed sensors will trigger HVAC equipment to run longer than necessary, increasing energy consumption.

Information Overload

One of the advantages of Energy Management Systems is that they provide a wealth of data. Unfortunately, this is also one of their drawbacks. These systems are designed to alert facilities personnel when equipment may not be functioning properly by generating alarms. Depending on the number and types of sensors that have been deployed, and the parameters that have been set, dozens of different alarms can be created - from air temperature thresholds to humidity levels to dirty filters and more. The problem occurs when an EMS generates too many alarms. Most retail locations require multiple HVAC units. At any given time, at least one of them is likely to have some minor problem. For a large chain, this means the facilities team may receive hundreds of alarms each day. And though some may signal a critical failure, most of the time they don't require immediate action. Making sense of what matters and what doesn't isn't easy and as a result, many times alarms are simply ignored.

Solution: For retailers with a limited facility management staff, working with an energy services firm that provides remote monitoring may be the answer. A third-party is often better equipped to manage the stream of data because they have the tools and processes in place to do so on a large scale. An effective alarm management program categorizes alarms based on

severity and enables technicians to identify what action, if any, needs to be taken. The technician can then work to resolve problems before they become critical. And because energy management systems provide remote access to building assets, most alarms – over 60% in Prenova's experience – can be addressed without a service call. For a retailer with hundreds of locations, avoiding two or three unnecessary truck rolls per store delivers significant savings.

Conclusion

Energy used to be a relatively insignificant operating cost. That has changed. During the last several years, energy prices have not only increased (at times significantly), they've also become more dynamic. In addition to driving up overall costs, drastic price swings introduce greater financial risk. As a result, energy is now either a top concern for most companies – or is quickly becoming one.

The topic of energy has made it into the boardroom, with even C-level executives focused on cutting costs. Reducing energy consumption is one of the keys to controlling energy spend. And investing in EMS technology is an important component of an effective energy management strategy. The benefits of doing so are clear: improved energy efficiency, greater control, and increased visibility. And while the technology has some drawbacks, an experienced energy services provider can help overcome them.

Talk to an energy management specialist

You can find out more about any of Prenova's services by visiting our website, writing, or contacting us at the number below.

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