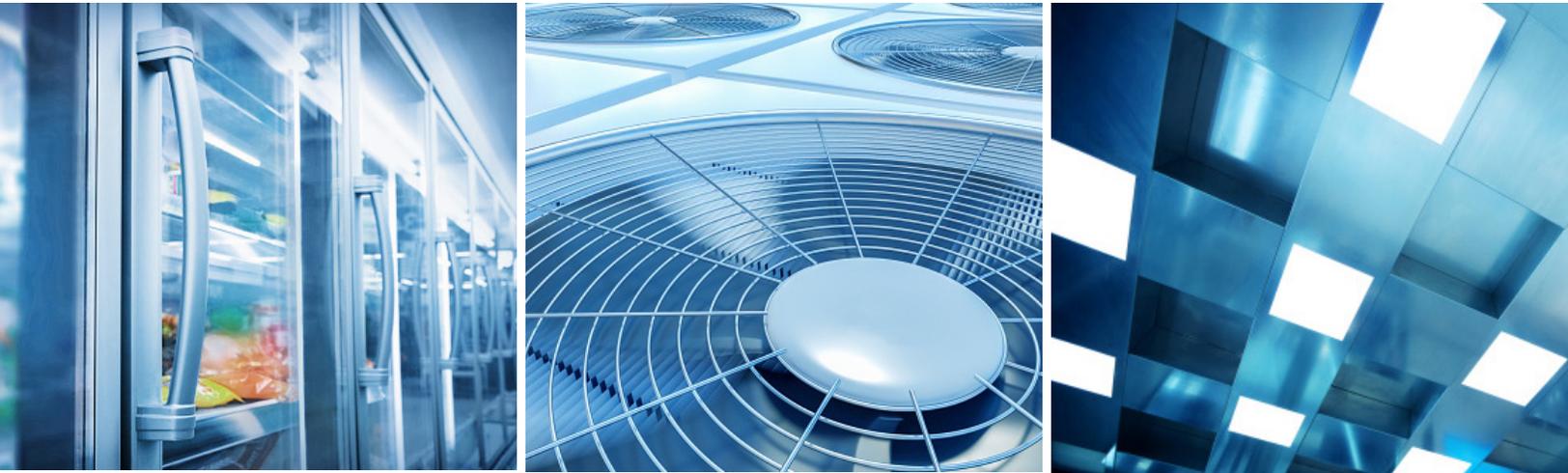


As C-Stores Evolve, Their Energy Strategies Must Evolve With Them



Convenience store evolution comes with new challenges, i.e., how to efficiently manage energy consumption while still meeting food safety and customer comfort demands.

The answer lies in building management systems: central systems that control and monitor a building's mechanical and electrical equipment.



Step inside a convenience store today and you'll notice they aren't what they used to be. Once merely destinations to buy gas, cigarettes and lottery tickets, these stores have evolved to offer new products, including frozen and fresh foods.

Why the change? Aside from offering more customer choice and convenience, it's also a strategy to keep customers in the store longer — because the longer they're browsing the aisles, the more likely they are to buy.

To that end, customers must also be seeking a return to the smaller "corner store" experience, because large supermarket food retailers are getting into the game. This explains the introduction of small 5,000 to 20,000 square-foot "neighborhood" stores that look more like convenience stores.

But, with this convenience store evolution comes new challenges, i.e., how to efficiently manage energy consumption while still meeting food safety and customer comfort demands.

The answer lies in building management systems: central systems that control and monitor a building's mechanical and electrical equipment, such as refrigeration, lighting and HVAC. The technology isn't new; supermarkets have been using it for two decades to coordinate store equipment and minimize costs. And, they've seen dramatic results, with some operations reducing energy costs by tens of thousands of dollars every year.

This potential for significant savings is one reason why building

management systems are garnering more attention from convenience store operators today.

Going beyond energy-efficient equipment

Years ago, reducing energy use meant installing energy-efficient equipment. While equipment is still a big part of the puzzle, business management systems take this concept further, by replacing manual equipment controls and thermostats with digital "smart" controls for more efficient operations.

Since these systems manage and control energy-intensive equipment based on a variety of store conditions, operators can avoid excessive energy use and costs while still managing store environments.

Take refrigeration, for example. Refrigeration accounts for the lion's share of any foodservice operation, and manually controlled refrigerated systems waste energy by inefficiently maintaining case temperatures and ineffectively operating the refrigeration cycle. Building management systems with digital refrigeration controls enable the ability to monitor refrigeration cases and product temperatures to cycle compressors accurately within a tighter control range. Case controllers prevent excessive compressor cycling and can automatically adjust case temperatures overnight to save energy while still maintaining food safety standards.

Advanced lighting controls remove the human and mechanical elements, and instead manage interior store lighting using a variety of more dependable inputs, including ambient lighting levels, light sensors, motion detection, occupancy schedules and occupancy triggers such as security systems. By managing these inputs, convenience store operators can tailor a retail location's interior and exterior lighting to meet their specific needs.

HVAC strategies hinge on accurately controlling temperatures and establishing schedules that reduce unnecessary use. Contrary to refrigeration and lighting, HVAC use varies by season and regional weather patterns, but still accounts for up to 20 percent of a convenience store's total energy use. Building management system HVAC controllers can cycle rooftop fans according to discharge and return air temperatures, helping reduce compressor runtime and strike a better optimized balance between customer comfort and energy efficiency.

Integrating equipment controls

Using building management systems to control individual equipment is one thing, but benefits can grow exponentially when systems are linked together. By scheduling and operating equipment with the full knowledge of other systems in the store, building management systems can attain an entirely new level of operational efficiency.

One benefit of managing integrated equipment is a lower per-kWh charge. Utility companies charge convenience stores on a sliding scale. The more electricity they use, the higher the rate and ultimately, the total cost. Building management systems can help convenient stores stay below a specific demand threshold, avoiding higher per-kWh costs.

The systems accomplish this by cycling lighting, refrigeration and HVAC equipment in the most efficient manner, based on the store's needs at any given moment. For example, as energy use reaches peak demand threshold, the building management system can help reduce the load on HVAC units to remain in a lower-demand kW rate tier without affecting the store environment.

Similarly, equipment uses the most energy during the start-up phase, and the building management system can stagger multiple systems so they are not starting at the same time, thereby reducing the store's energy demands.

Gaining more visibility into store operations

In addition to operating equipment more efficiently, building management systems also collect a wide range of data that convenience store operators can use to gain more visibility into store operations. Using these insights, operators can identify their low-performing stores and target improvement initiatives, including:

- Locations that deviate from corporate equipment settings
- Stores with unusually high energy consumption
- Stores with recurring maintenance expenses

Having enterprise-level insights enables convenience store operators to make more informed decisions — backed by clear data — about their operation.

The ability to retrieve data remotely from equipment enables maintenance teams to diagnose equipment problems without even entering the store, helping reduce equipment downtime and costs. When facility managers are alerted to an equipment maintenance request, they can triage the issue remotely to determine the scale of the problem, what tools or parts are needed to repair it, and if it requires immediate attention or if it can wait for routinely scheduled maintenance. Having all of this information at the touch of a button helps eliminate wasted maintenance trips and allows maintenance teams to prioritize their efforts.

Building management systems also allow facility managers to proactively monitor equipment performance to potentially identify issues before they become significant problems, which could result in expensive repairs, product losses and equipment downtime.

Convenience for customers and operators

As convenience stores evolve, it's vital that their systems and energy strategies evolve too. Building management systems help facilitate enterprise management; optimize, standardize and monitor store efficiency; and generate a wealth of valuable data that can be used to drive down operating costs.

These systems also increase visibility into actual store conditions and can provide convenience store operators with an effective and scalable means of combating cost inflation while still meeting food safety and customer comfort demands.