New Building Automation Technology Means ROI for Retailers

by Gina Elliott, MBA

Executive summary

Retailers must compete with some of the thinnest profit margins of any commercial sector. At the same time, they are one of the largest users of energy. Now new technology has made building automation systems practical for most retail businesses, even those in leased facilities, enabling energy cost reductions by as much as 30% and a ROI measured in months, with additional benefits in operational savings. A single retail store can save thousands of dollars annually, while a large chain can achieve savings in the millions.

Introduction

There are many types and sizes of retail business, from single stores to international chains. But almost all retailers share a common challenge: profit margins are razor thin and every dollar counts, especially in this age of Internet competition. This fact makes retailers highly sensitive to operational costs. The typical retail owner or manager worries about payroll, rising cost of goods, building leases, and other fixed expenses.

Surprisingly, few retailers do very much to control energy costs. Usually located in leased properties and often in older buildings, retailers see little choice but to pay their rising energy bills. Even many national and international retail chains accept the energy systems in the properties they lease, costing millions of dollars in wasted energy.

Energy costs typically represent more than half of retailers' total facility operations and maintenance budgets.

This situation is changing rapidly, however, as new technologies utilizing wireless communications and the Cloud make building control systems affordable for any size retail operation, even in leased facilities. Just as importantly, these systems have become very user friendly for the general business person and are often accessible through smart phone apps. As a result, many businesses are able to use these systems to reduce energy costs by as much as 30%, adding directly to the bottom line and profit margins.

This paper provides an overview of building automation for retailers and the ROI that such systems can generate.

The cost of poor building management in retail

Whether an enclosed mall or hypermarket, mid-size store or small shop, restaurant chain or grocery store, retailers around the world face high energy costs.

In the United States, the retail industry accounts for the largest energy bills and second largest amount of GHG production in the entire commercial sector. The problem is not getting better, either: energy use is growing faster in retail than in any other sector.

For businesses that use ovens or refrigerators, energy waste is particularly high. These businesses typically must set the HVAC at levels to compensate for the heat or cold air being generated in the store. This inevitably leads to waste, especially when employees forget to turn off ovens overnight, adjust thermostats inappropriately, or leave the back door open to cool off the kitchen.

How energy problems can hurt your business

Direct energy costs are only part of the picture. Energy-related problems such as HVAC downtime, power disruption, or refrigeration failure are all too common and can result in:

- Lost revenue
- Slimmer margins
- Unhappy customers
- Lost business hours
- Food contamination and spoilage
- High repair costs

Cost of downtime =$1,000+ per employee*

A single failure event in critical equipment, such as heating systems or kitchen ovens, can put a retailer out of business for hours or worse—while still having to pay employees and protect stock. Many breakdowns could be predicted and avoided by using a basic building automation system.

*Based on 4 lost hours in a typical retail business.

What are the barriers to good building management?

Fifty-five percent (55%) of retailers operate stores in buildings that are 10 or more years old[1].

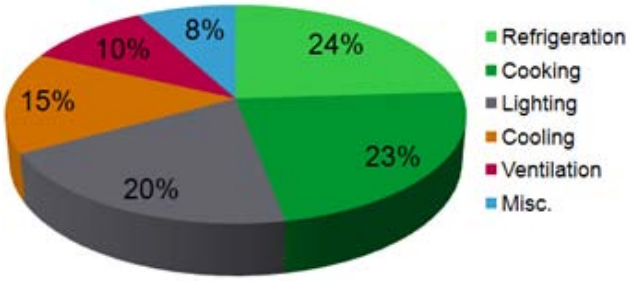
Given the importance and cost of energy, why haven't more retailers addressed the problem?

A major reason is that business owners usually do not own the space they occupy, making infrastructure investments less desirable. Why upgrade energy systems if you don't own the building? Since a high percentage of retail buildings are more than a decade old, the systems in place are usually inefficient and provide little visibility or control—often just simple thermostats. There's a good chance the buildings were improperly commissioned for the current space utilization.

Furthermore, until recently, building automation systems were relatively expensive and disruptive to install, requiring specialists to program room controllers and run new wiring in walls and ceilings.

Finally, for large retail chains that open and move hundreds of stores throughout a country or the world, a consolidated approach to building automation has seemed impractical.

Many retailers rely on "manual" solutions, such as instructing employees on setting thermostats, turning off lights, shutting down ovens, etc. But these measures provide no feedback or control over daily or long-term energy use, and they are notoriously hard to enforce because they leave daily building operation in the hands of people who may be inexperienced and unconcerned.



Biggest energy users in restaurants*

[1] "How To Become A Trusted Supplier In The Retail FM Industry," Professional Retail Store Maintenance Association, 2015

Table 1

Typical energy consumption by appliance.

Where does all the energy go?*

Equipment	Watts
Desktop computer	150
Monitor (15”)	75
Laser printer	350
Fridge	120
Coffee machine	800
Microwave	1,200
POS/Cash register	300
17” LCD display (signage)	75
Desktop laser printer	120
Commercial refrigerator	1,000
Commercial fryer	10,000

*Source: http://www.sdge.com/business/restaurants-and-food-service

Seizing the opportunity: What retailers can do

In recent years, new technologies have revolutionized building automation. It’s no longer necessary torun wires through the walls and ceiling. It’s now possible to install smart thermostats that communicate wirelessly with HVAC and lighting systems, as well as refrigerators and ovens, and even connect to the Cloud to allow owners and managers to remotely monitor and control their energy systems.

Thanks to wireless communications and the Cloud, building automation makeseconomic sense even for a single store or restaurant in a leased facility. Why run to your facility late at night or worry about employees following protocols, when you can just check your systems on a smart phone from home or vacation?

Often, a building automation system can be easier to install than a new light fixture! You can also take it with you if you change locations.

For larger retailers such as malls and chains, updating building automation systems can open up new possibilities for reducing costs. Any number of remote locations can be linked via the Cloud, and more can be easily added as growth occurs. Enterprises can benchmark, compare locations, apply best practices, and use analytics to uncover hidden problems and opportunities.

Typical controls to consider include:

- Smart AC and heating controls to allow advanced scheduling
- Cloud-based access from any smart device, to monitor and control
- Door and motion sensors that trigger lighting and AC when a room becomes occupied
- Window sensors that can detect when a window is open and trigger new HVAC settings or security alarms
- Power sensors on equipment such as boilers and ovens, allowing early identification of equipment problems
- Ventilation control for a healthier, more comfortable environment
- Building Management Systems that enable centralized control and reporting, remote access, and flexibility to grow with business

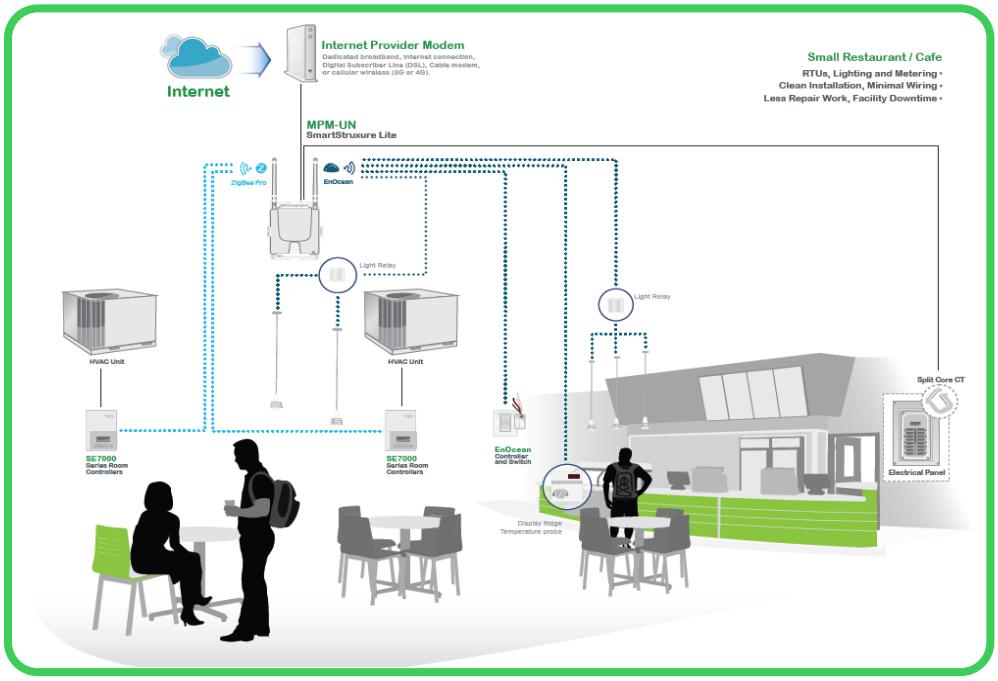


Figure 1

Example architecture for a small restaurant or a coffee shop.

Building automation links energy-using equipment into one manageable system. Modern scalable solutions allow multiple locations to be managed together via the Cloud.

Once you see it, you can manage it

One of the biggest advantages of building automation is the ability to add energy consuming system monitoring and control software, or a BMS (Building Management System). A modern, integrated BMS can provide access to all systems that impact a building's environment from anywhere and at anytime, making it easy to monitor, manage and respond quickly and efficiently to changes that impact comfort and cost.

The BMS integrates data from multiple systems and devices including thermostats, controllers, meters and sensors, and other connected devices. It then provides the user with an intuitive graphical interface for control, monitoring, and reporting. A BMS can be used for a single store or across an entire chain to see details on equipment and energy activity. In addition to remote real-time visibility, a BMS can provide historical reporting and trending analysis. By monitoring connected equipment such as HVAC and refrigeration, retailers can track energy consumption, and identify equipment problems early before a breakdown causes loss of business.

Mobile apps make a BMS easy to understand and operate even for non-technical retail managers.

The benefits of a BMS include the ability to:

- Validate performance and verify savings
- Implement future energy-saving measures and justify investments
- Display energy consumption, alarms, and trend comparisons
- Track system performance
- Provide data on temperature history, people, locations
- Receive alarms of equipment problems before they become critical
- Remotely manage connected systems such as HVAC, refrigeration, and lighting
- Set system schedules

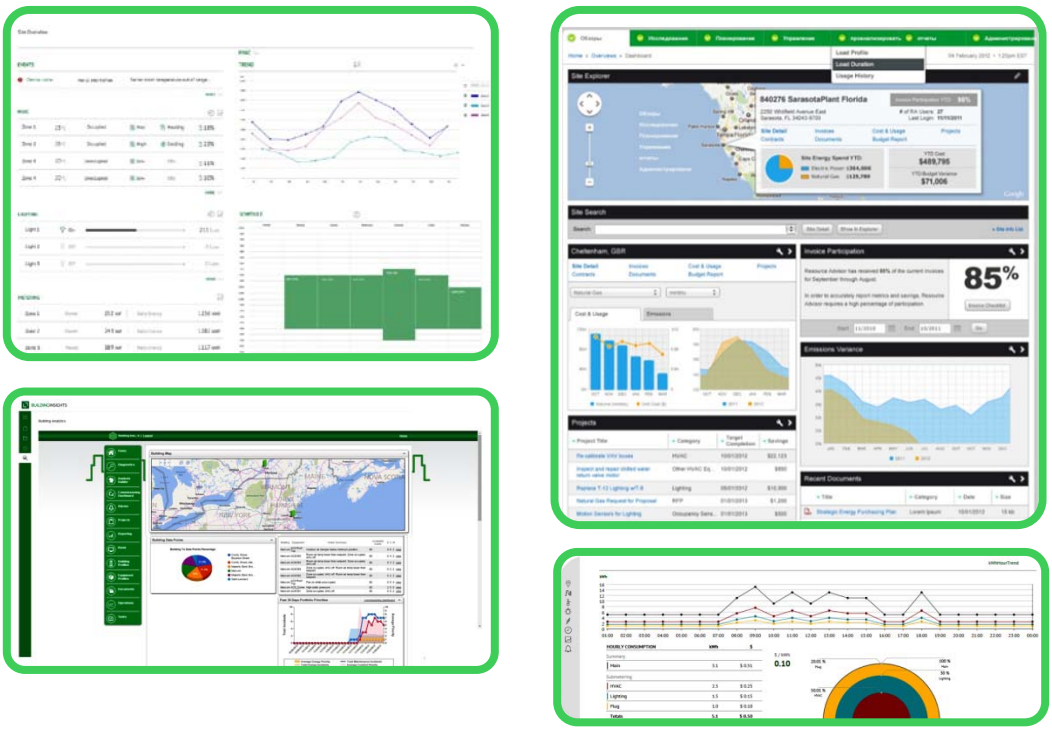


Figure 2

Examples of graphical reports available with a BMS.

Measuring the ROI

Achieving just a 20 percent reduction in energy costs will directly translate into an additional 1 percent in profit.

Keeping in mind that every retail business is different, asingle small store can expect to install a basic building automation system that controls HVAC and lights in the range of a few thousand dollars. Applications for remote access, centralized monitoring of multiple stores, and equipment analytics can be added. Use of open communication protocols allows owners the flexibility to add systems, features, and functionality as they grow without tying them to one vendor or manufacturer.

Obviously, heavy energy users like grocery stores, restaurants, malls and other larger structures need to invest more, but the payback is correspondingly greater. A retail chain with hundreds of stores can easily save in the millions of dollars annually.

In Schneider Electric's experience,overall energy savings of between 15 - 30% are achievable for most retail locations. Typically, this produces a complete Return on Investment (ROI) in only months. After that, the savings go directly to the bottom line.

Where the ROI comes from:

- More efficient HVAC use
- Lighting costs reduced up to 40 percent[3]
- Maintenance costs reduced by 2-3%[4]
- Fewer critical equipment failures
- Longer equipment life
- More comfortable customers
- More productive workers

Increase customer comfort and worker productivity

Building automation can enhance your customers' comfort by maintaining temperatures and lighting at optimum levels for a positive retail experience. Studies also show that worker productivity improves in a good indoor environment[2].

[2] "Research Note: Thermal Comfort," World Green Building Council, 2003

[3] EnergyStar (http://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/save-energy/stamp-out-energy-waste)

[4] "Best Practices: Smart Building Technologies for Grocery and Big-Box Retail Stores," IDC Energy Insights, 2014

Operational savings: Beyond dollars & cents

*Building automation can provide retailers with the most valuable commodity of all: **time**.*

Most retailers can justify investing in building automation from the cost-savings alone. As we've seen, these savings can be substantial.For many retailers, however, the savings in time and operational hassles can be just as important. This is true whether the business is a small operation with a few stores, or a large chain with outlets in multiple regions.

Consider the typical small retail owner, who probably does not have a facilities manager on staff. Every problem lands on his or her doorstep. If it's too cold or too hot in a store, the owner may have to drive to the location personally to assess the problem. When equipment breaks down—usually without warning—the owner has to scramble to find a solution, paying premium rates for repairs. These problems are minimized or eliminated with building automation systems.

Large chains with hundreds of stores can realize even greater operational savings, simply because the challenges are multiplied by so many locations. For example, the cost of running trucks to a store whenever an HVAC-related problem occurs is often taken for granted as a necessary business expense. But as we've seen, it isn't necessary at all. With a well-designed, cloud-enabled building automation system, a facilities manager can monitor and set HVAC systems remotely, identify problems early, and initiate repairs when needed in the most cost-effective way.

Operational benefits include:

- Fewer emergencies
- Ability to adjust HVAC settings remotely
- Remote diagnosis for optimized repair calls
- Trend monitoring for early problem identification
- Proactive management of equipment
- More efficient use of FM staff
- More consistent store environment at all locations

Examples of savings

The following examples are based on industry averages and Schneider Electric's experience. Each retail store is different, and actual figures should be calculated based on the specific conditions of each retail enterprise. A building automation specialist cansurvey your facilities and provide an accurate savings projection.

North American Fast Food Restaurant

Type of business: National fast-food chain with 1,000 stores

Current cost of energy: $30,000 annually per site

Problem: No comprehensive energy control system; ovens and HVAC equipment controlled locally, resulting in improper settings and wasted energy.

Solution: A building automation system with cloud-enabled monitoring, reporting, and control.

Result: With 15% energy savings (a conservative estimate), the chain can expect to save $4,500 annually per restaurant. Across 1,000 locations, the chain will save $4.5 million per year.

European Furniture Stores

Type of business: European chain of 3,000 furniture stores

Current cost of energy: 7,000 Euros per store

Problem: Legacy buildings with outdated thermostats provide no centralized control.

Solution: A building automation system with cloud-enabled monitoring, reporting, and control.

Result: 20% energy savings (a typical result) equals $1,400 Euros per store each year, and 4.2 million Euros annually across the enterprise.

Conclusion

Retail is one of the largest energy users of all commercial sectors, with some of the thinnest profit margins. Thanks to wireless communications and the Cloud, retailers of any size can now afford to install and use advanced energy control systems to reduce energy costs by up to 30%, in addition to realizing significant operational savings. Even leased facilities can be upgraded easily by the retail tenant. Most retailers achieve a complete return on investment in a year or less.

Interested readers can find more information at www.rila.org, the website of the Retail Industry Leadership Association, and www.prsm.com, the home of the Professional Retail Store Maintenance Association. Those who want a deeper dive into building automation products and technologies can download these free white papers, authored by the experts at Schneider Electric:

Integrated Application-Specific Controllers: A New Approach to Zone-Level Control

Leveraging Wireless Technology to Reduce Building Energy Costs

By learning about the new solutions that are available in building automation, retailers of all sizes will have an option that was not available before: the option to see and manage energy use, and reduce the cost of operations.

About the author

Gina Elliott has worked for more than a decade in emerging technologies for the built environment. Her experience ranges from the convergence of IT and Telecom, to multi-system interoperability and innovative engineering of high-maintenance buildings, to smart buildings. Her roles have included Marketing and Business Development, with a focus on working with clients and industries to understand their challenges in order to develop practical, effective solutions.