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Small Box Retail: Think Outside the Energy Box

April 16, 2014 By [Martin Flusberg](#)



Martin Flusberg

CEO, Powerhouse Dynamics

Energy Management Systems (EMS's) are ubiquitous in the big box retail environment, and even in medium box stores, but have been less so in small box retail (defined for our purposes as facilities under 10,000 sq. ft.), although that appears to be changing. What has been unique about the small box world, and why are we seeing it change?

First, let's examine some of the reasons that small box and specialty retailers have been slower to adopt energy management systems. For one, these smaller footprint stores spend a lot less on energy than their larger box cousins, so the magnitude of potential savings is smaller. Second, many small box retail stores are located in malls or strip malls where HVAC and other systems are owned and controlled by the property owners, not by the retailers – and energy billing may be based solely on square footage, rather than actual

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usage. Third, it is just a small box, isn't it? Not much complexity in a small box, therefore not much savings to be had. Right?

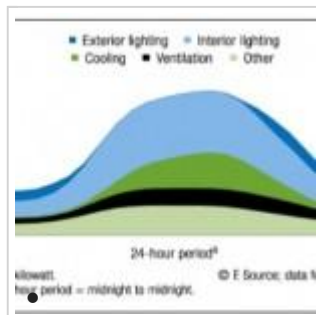
Combine all of this with the fact that, initially at least, the EMS being offered to small box retailers was a slightly scaled down version of the same expensive and complex system sold to the large box world. With low energy expenditures and high EMS costs, it is no wonder that the return on investment was often not there for small box retailers.

But, in the past few years, several technology developments have changed the nature of an EMS in a way that has created more cost-effective options for smaller facilities – creating what we have been calling EMS 2.0. Internet connected thermostats and cloud-based software have changed the face of HVAC control. Low cost sensors and wireless communications have significantly decreased deployment costs. The introduction of big data analytics and equipment performance diagnostics has created a range of new value opportunities for an EMS to deliver. And, enterprise level data and functionality provides visibility and value that did not exist before.

So, how can EMS 2.0 deliver savings for a small box retail chain?

Energy Management Systems in a Small Box Retail Environment

How much energy is used in smaller footprint stores will vary some with the type of store, but the biggest factor is geography – or more specifically weather. Regardless, the primary energy cost drivers in this type of facility are almost always HVAC (generally cooling) and lighting, so there is a degree of consistency.



This interesting graphic (courtesy of E-Source) shows energy use in a typical retail environment in California over the course of a summer day. Lighting clearly dominates, followed by cooling, but there are other contributors to energy use as well. How can an EMS play a role – at least in those locations where the retailer is paying for their energy use?

Lighting can be as much as 40% of the energy load, so an EMS that includes lighting controls may very well make sense. If a store is

open 12 hours a day and all lights are consistently being left on when the store is closed (or outdoor lights are left on during the daytime), the savings can be significant.

- HVAC control in the form of remotely controlled thermostats – which are much less expensive than traditional Building Management System controls – will also yield savings. This can be true even in situations where the retailer does not actually own the HVAC equipment itself, if they are paying for the power used. Moreover, remote HVAC controls allow for the proper balancing of cost and customer comfort and for centralized management of all locations.
- Where the HVAC systems are owned by the retailer, remote monitoring of system performance (energy usage and duct temperatures in particular) can help identify equipment problems early and may avoid catastrophic failure with its attendant impacts

on both cost *and* revenue. Moreover, real-time performance monitoring that catches small problems before they become big ones will reduce maintenance costs over time.

- The very simplicity of the small box helps to enable demand limiting, where rooftop units can be cycled to keep demand and therefore demand charges low. This can work with as few as 3 rooftop units – and is in sharp contrast to facilities such as restaurants where separate spaces (such as a kitchen and dining area) make demand limiting more difficult.
- Monitoring of other equipment, including office equipment and refrigeration if present, can have an impact as well. While such equipment may be responsible for a small percentage of the overall energy spend, identifying equipment that is left on when the facility is closed, or equipment that is not operating properly can increase the savings potential from an EMS.
- Finally, the addition of Enterprise functionality to an EMS provides the opportunity to benchmark facilities to make it easier to spot the best and worst performers – and learn from both. It may also allow the resource-constrained facilities team to be able to quickly identify poorly performing equipment, even across a large portfolio of facilities.

Times Are Changing

Interestingly, energy does appear to be a greater focus for retailers now, and retailers as a group seem to be doing more than other industries to reduce energy costs. For example, [a recent report from Ecova highlighted in Green Retail Decisions](#) indicates that retailers have reduced their energy use by 12% since 2008, more than any other vertical market.

At the same time, the very nature of the industry is changing, as bigger boxes are becoming smaller. For example, [this article on Bloomberg News](#) is one in a long line pointing to big box retailers, such as Best Buy and even Walmart, looking to make more efficient use of space by opening stores with dramatically smaller footprints. While most of these new stores do not even begin to approach small box proportions, nevertheless these retailers may discover that the EMS they have become accustomed to is too expensive for the new footprint. Even these giants may begin migrating toward the EMS 2.0 systems now beginning to be seen in smaller facilities, which can only lead to more EMS options and opportunities for retailers across the board.

Martin Flusberg is CEO of Powerhouse Dynamics.

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