Turning down the cost of utilities in retail

A holistic approach is helping retailers overcome barriers, prioritize activities and accelerate payback of energy-saving measures in stores

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Energy is the fourth largest in-store operating cost for US retailers (after labor, rent and marketing). A typical hypermarket may have energy bills of $500,000 per year, for example. While overall energy costs differ by type of retail format—between about 4 and 9 percent of in-store operating costs—they also vary widely between stores of the same age, type and size. That suggests a significant opportunity for cost reduction. When we looked at energy consumption across the network of one large retail chain, for example, we found differences of up to 40 percent between otherwise similar stores (Exhibit 1). Indeed, when retailers conduct energy audits on their stores, they typically identify opportunities to reduce energy consumption by 20 to 30 percent, and sometimes by up to 50 percent.

Savings aren't the only reason retailers should be interested in cutting energy consumption. Many organizations now accept that to do their fair share in the fight against climate change, they should be reducing carbon emissions by at least 3 percent a year[1]. Most retailers have energy savings targets in place as part of their overall operating and sustainability policies, but these goals aren't always as aggressive as those that climate scientists suggest are required.

Elusive savings

In practice, however, even the savings currently targeted by retailers have proven frustratingly hard to capture. The difficulty stems from three root causes; one is common to energy efficiency improvement in any industry, the other two are more specific to retail networks.

First, there's the universal fact that there are no silver bullets in energy efficiency. Cutting energy consumption is an incremental process, which relies on the accumulation of dozens of small changes in equipment, operating parameters and policies. Identifying, implementing and enforcing all these changes requires technical expertise, stamina and discipline.

Second, there's the need to balance energy efficiency improvements with their potential impact on store operations and customer perceptions. In a typical grocery store, about 60 percent of the energy consumed is used to run refrigeration and heating, ventilation and air-conditioning (HVAC) equipment; 30 percent is used in lighting; and the remaining 10 percent to run other equipment like cash registers or closed circuit TV. That means that the vast

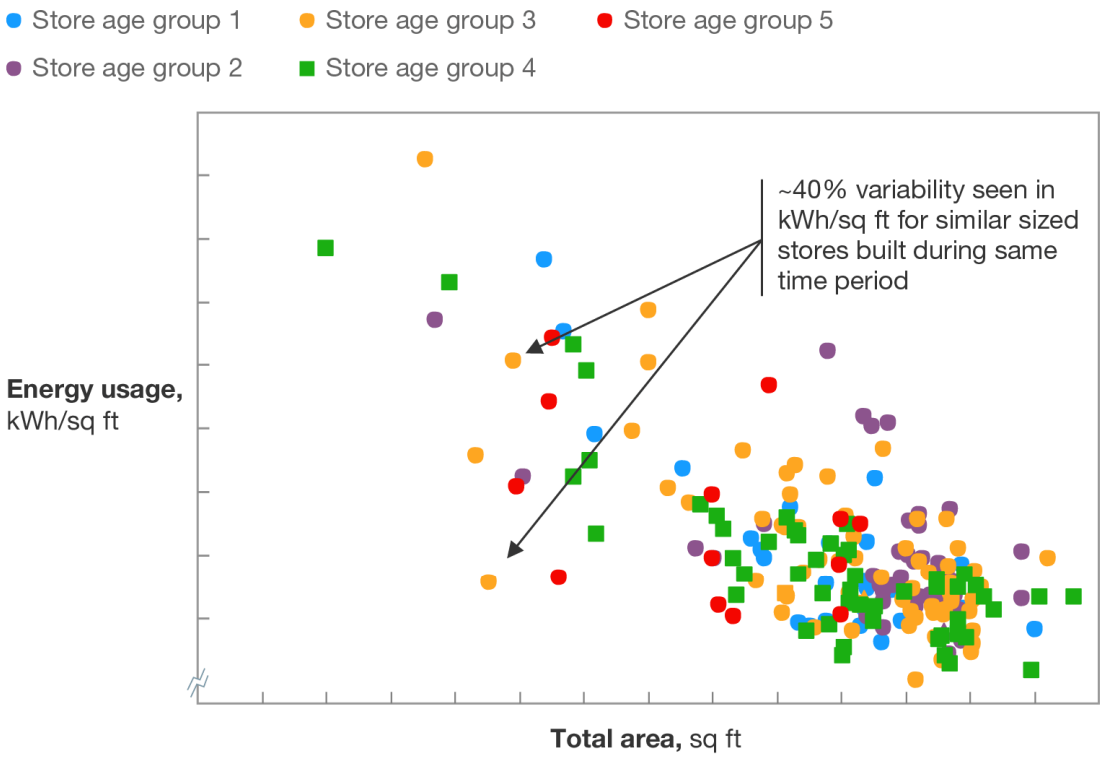
[1] http://www.worldwildlife.org/projects/the-3-solution

majority of changes—altering lighting levels or in-store temperatures, for example, or adding doors to refrigerated cabinets—will have a direct impact on customers and staff. That can make managers nervous about introducing energy saving measures, or can leave them struggling with unintended consequences once changes are made.

Exhibit 1

Energy usage varies significantly, even between stores of a similar age and type, indicating significant opportunities for demand reduction.

DISGUISED CLIENT EXAMPLE



- Variability is a result of different assets or different maintenance of similar assets
- Range of starting points often necessitates unique solutions for each retail location across the network

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Finally, there's the challenge of rolling out efficiency measures across hundreds of stores. In a large market like the US, retailers will often have stores of many different shapes, sizes and ages. They will be located in regions with different climates, and use different refrigeration, lighting and HVAC equipment. They will buy their energy from different energy suppliers with different tariff structures. The other costs at these stores, from rents to labor, will vary too. All that makes it hard for managers to decide which improvement initiatives they should focus on in which stores. It also makes it tough to

compare the likely return on investment (ROI) of energy savings measures with other potential investments.

The light bulb moment

Overcoming these challenges requires a deliberate and systematic approach. As with the challenges themselves, some elements of that approach are common to good practice in other industries or other spend categories. Others are specific to the retail environment. In this article, we will focus most of our attention on the tools and approaches retailers can use to assess the impact of demand reduction ideas and plan their rollout across the network. But we'll also look at the overall requirements of a utility spend reduction program, and the resources needed to deliver one.

Supply and demand

Like any other purchased product or service, retailers have access to three main levers to control their utility expenditures. First, they can tackle **supply** costs, by selecting the optimum supplier, or combination of suppliers, and by negotiating favorable deals with those suppliers. Second, they can tackle **demand** by specifying energy-efficient equipment, and by operating and maintaining that equipment in the optimal way. Finally, they can make **organization and process** changes to ensure that savings are sustained, and that new opportunities are systematically identified and captured as they arise.

All these levers matter in utilities spend reduction, but in the retail store environment we have found the largest opportunities for savings by far are in demand reduction. In particular, the biggest savings potential typically comes from investment in energy-saving technologies. Supply-side negotiations can often reduce energy costs by 3 to 5 percent, for example, but technical changes can reduce energy consumption by 20 to 30 percent in the case of HVAC equipment and as much as 50 percent for lighting. Similarly, the opportunity for retailers to reduce energy consumption through operational changes can be relatively small. In lighting, for example, reducing daytime light levels or delaying the switch over to nighttime lighting can cut energy use by 2 to 3 percent. Such changes require little investment, but they are very visible to customers relative to the small savings achieved.

One area of considerable interest to some retailers is the introduction of on-site energy generation or storage technologies, like roof-mounted solar photovoltaic arrays, wind turbines or battery banks. Today, the payback on these investments is highly dependent on the site-specific resource quality, policy incentives, and the local energy costs. Increasing volumes, technology improvements, installation effectiveness, and, very importantly, financing innovations, are driving costs down rapidly. We believe it is likely that the economics of these technologies will continue to improve significantly, but would almost always recommend that an aggressive energy efficiency program to reduce demand should be done before (or at least in parallel to) moving to alternative energy.

Making the right demand reduction choices

There is no shortage of options for retailers looking to reduce demand for energy in their stores. Lighting, refrigeration and HVAC manufacturers are continually developing new, more efficient versions of their equipment. Control systems are becoming smarter too, allowing equipment to react more

intelligently to changes in the external environment or to be controlled more precisely to match real demand.

When one retailer brought in outside experts to evaluate energy consumption at one of its stores, they were able to produce an initial list of more than 100 ideas, ranging from the installation of LED lighting on the sales floor to improved maintenance of the self-closure springs used on freezer cabinet doors. An initial filtering exercise—to weed out ideas that were already being widely implemented, were applicable to few stores in the network or would only yield small savings—left several dozen possibilities on the table.

The next challenge for the company was to decide which of those ideas it could introduce that met three criteria: they would not adversely affect customer experience or other store operations; they could be rolled out across the entire network; and they would deliver the best return on investment.

To get those choices right, retailers need facts to support their decision-making processes. Leading organizations are using three particular tools to help them here: **consumer insights** testing, to check that proposed changes don't have a negative effect on customer experience; the creation of a holistic **business case** to balance the savings potential of each idea with its costs and impact elsewhere; and a network-wide **ROI analysis** to plan and sequence the rollout of demand reduction measures.

Customer insights

Retailers can test the effect of energy saving measures on customer experience in two main ways. First, they can survey consumers about their experiences in competitor stores that have adopted similar measures. Second, they can conduct tests in their own stores to see how changes are perceived. To evaluate the opportunity to reduce light levels in its stores, for example, one retailer first surveyed customers on their overall feelings about lighting in retail stores. This research revealed that customers were more likely to find low light levels off-putting than excessive brightness. The company then asked a group of mystery shoppers to comment on their experience of light levels in a number of competitor stores. This showed that the majority of customers found lighting in these stores acceptable, despite quite large differences in brightness. Finally the company changed the lighting in a pilot store, surveying customers before and after the change. In this test, the retailer found statistically significant changes in customer opinion in only two out of seven departments, and even here less than 2 percent of customers thought the change was unacceptable. Armed with this evidence, the retailer's energy savings team was able to convince managers to consider a reduction in lighting brightness network-wide.

The way changes are presented to customers can also make a difference in how they are perceived. Research has shown that in-store energy efficiency is one of the top three criteria customers use to judge a retailer's sustainability policy. Those green-oriented consumers matter because they spend more than average and tend to be more loyal to their chosen retailer. Therefore, it can be useful to accompany new policies or equipment with signage that informs customers about the reason for the change.

A holistic business case

The savings achieved by energy efficiency measures depend on multiple factors, including the capital cost of any new equipment required, other energy saving solutions planned or already in place, and changes to labor costs as a result of new activities or processes. For example, the introduction of doors or

night covers for refrigerated cases can cut refrigeration costs significantly. However, in addition to the cost of the additional doors, retailers need to consider the labor required to close and open night covers, or to clean handprints from the doors that are repeatedly opened for access to cabinets for restocking.

Companies can do this by preparing a simple one- or two-page business case for each idea, summarizing its impact on capital and operating costs per store, the necessary investment and the expected payback period (Exhibit 2).

Preparing a business case for all energy savings ideas in the same format helps retailers ensure they have fully considered the implications of each change, and allows them to make like-for-like comparisons when deciding which ideas they should implement, and in what order they should be rolled out. The sequence in which changes are made is also critical, since solutions are not necessarily cumulative. Switching off LED lighting saves less energy than doing the same with conventional lighting, for example.

Exhibit 2

Holistic business case calculations for the introduction of an energy-saving technology.

ILLUSTRATIVE

Financial summary—Install curtains on refrigerated cases

Net annual operational savings: ~$1.6–2.5M
ROI[1]: 4–7x
Total capex: ~$3.6–4.0M
Payback (years): 1.5–2.5

Annual savings per store

Electricity savings	Estimated average kWh reduction per store		50,000
	Cost per kWh	x	$0.10
	Total average savings		**$5,000**
Additional labor costs	Additional labor hours per day to close and open night curtains[2]		0.33
	Labor cost per hour	x	$15
	Number of days per year	x	365
Electricity savings	**Total additional labor costs**		**$1,806**
	Total operational savings		**$3,194**

Net annual operational savings across all applicable stores

Number of stores		500
Total net savings for all stores		**~$1.6M**

Capex

Actual average capex		$12,000
Actual average rebate	–	$4,000
Net capex		**$8,000**
Number of stores	x	$500
Total capex		**~$4.0M**

- **Additional labor costs could be eliminated** if an employee could pull down the night curtains during their normal closing procedures or during down time
- **Negotiate with vendor for bulk discount of 10% for 250 sites or more**
- **No customer impact**—solution will only be used after closing hours

Excluding labor costs and getting a 10% reduction for bulk prices would result in ~$2.5M in annual operational savings and a payback of ~1.5 years

[1]Assumes 10 year useful life.
[2]Assumes 5 minutes in morning and 15 minutes at night.

McKinsey&Company | Source: Supermarket Energy Technologies 2012 price quotes and business care

Optimizing ROI

The third key tool for retailers planning a utility spend reduction program is a robust mechanism for estimating the impact of proposed changes across the network, one that takes into account differences in the size and type of stores, local energy costs and the equipment currently installed in each.

Rather than relying on estimates obtained by scaling pilot results, leading retailers build models of their store networks and use these to obtain more

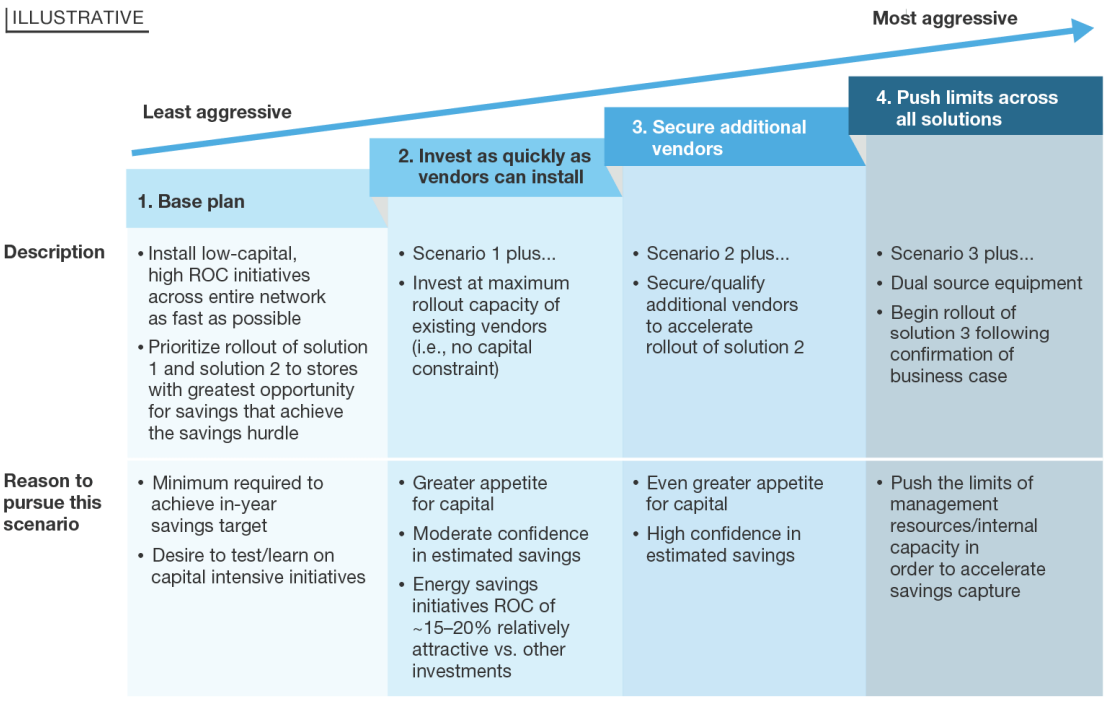
accurate savings estimates. These models contain details of the exact assets in use at each store—usually collected by store maintenance personnel—as well as the energy and labor costs at the site, together with any other relevant factors, like local rebates or tax incentives that might affect the viability of an idea.

Using these models, retailers don't just get better savings predictions; they can also see exactly how those savings are likely to vary site by site. This allows them to limit implementation only to the specific sites where doing so makes most sense, and to plan the sequence of idea implementation that will give them the fastest return on their investment.

Companies can also use ROI modeling to plan different rollout scenarios. This enables them to be more or less aggressive with their plans depending upon the availability of capital and the organization's appetite for change (Exhibit 3). Planned rollouts should also take into account existing store remodel and upgrade cycles, with efforts combined wherever possible to reduce labor and equipment costs, minimize disruption, and account for any potential write-offs associated with equipment that could be replaced before being fully depreciated.

Exhibit 3

Retailers can roll out demand reduction technologies in different scenarios based on the availability of capital and appetite for change.



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Organization and process management

To capture and sustain utilities spend reduction over the long term, retailers need to embed processes like those described above into their operations and

purchasing organizations. Doing that will often require them to obtain new skills, new processes and new tools.

It's important that retailers track energy consumption accurately, and at a sufficiently granular level. This provides the ability to check the effectiveness of demand reduction activities and to identify occasions where equipment or operational problems mean savings aren't being achieved. Retailers may also need to modify the key performance indicators they use to track store operational performance in order to make store managers more accountable for the energy consumption on their sites.

Changes will be required at headquarters too. Companies may need different criteria when planning new stores or selecting new equipment to ensure that their energy efficiency is fully considered. The ability to accurately estimate lifetime total cost of ownership becomes a critical skill in supporting energy transformations, given that energy consumption, maintenance, and the parts required over a unit's lifetime can often be many times the initial purchase cost. They may also find they need more staff with the technical know-how to assist such purchasing decisions, and to identify and evaluate new savings opportunities.

* * *

Retailers shouldn't shy away from utility spend reduction measures. Energy is a high and rising part of store operational costs, and the opportunity to reduce that cost through technical and operational changes is significant. The challenge for companies is to go about capturing these savings in a structured and sustainable way. Using the methods described in this article, some are now showing that it is possible to overcome the barriers to improvement and transform the energy performance of their networks■

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Sidebar: The tip of the iceberg

While excellence in the energy management of its stores is a powerful way to drive value, energy purchased for a retailer's direct operations is usually only about 10 percent of the total energy they buy. Where is the other 90 percent? It is embedded in the products they sell. Take a bag of frozen vegetables for example: the food producer uses fuel in the tractor, the processor uses electricity to run their plant and freeze the product, the plastic packaging requires energy to make, and the logistics require fuel as well – you get the picture. Given the significant amount of "embedded energy" every retailer buys, leaders are increasingly requesting energy efficiency improvements in their supply chains, driving both economic and environmental benefits.

For more detail on this topic, see "Driving energy, water, and material efficiency in your global supply chain" (https://operations-extranet.mckinsey.com/content/focus/Webcasts/view/20141211_wr_driving_energy_water_and_material_efficiency), and "Tools for sustainability," by Nick Bennette, Markus Hammer, and Steve Swartz (see http://www.mckinsey.com/Client_Service/Sustainability)