



Can Chain Retailers Help Save the Utility Grid - and the Environment - and Get Paid for Doing It?

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With nearly 900,000 locations, U.S. chain retail stores are among the largest commercial consumers of electrical power. They're in for a shock, too, as they open their utility bills in the months ahead: Electricity rates, already high, are rising fast and poised to soar even higher.

While spiraling electricity costs are driven in part by increasing prices of resources, such as coal and natural gas, lack of new generation capacity is also a major culprit. The June 30 issue of Forbes reported, "By as early as next year our demand for electricity will exceed reliable supply in New England, Texas and the West, and, by 2011, in New York and the mid-Atlantic region." As a result, the article cautioned, "get ready for spiking electricity rates, brownouts and even blackouts."

Instead of simply putting up with higher bills and periodic service disruptions, some proactive retailers are becoming part of the solution—and profiting from it at the same time. Leveraging Internet-enabled electricity load-management technologies, these chains are helping to save the grid by automatically reducing peak demand during critical periods. This enables utilities to assure reliable service (and perhaps avoid building additional power plants), while providing an opportunity for savvy retailers to:

- **Make money**—by participating in utility-sponsored demand-response programs, which offer generous financial incentives for companies that agree to reduce their electrical consumption during times of peak demand;
- **Save money**—by implementing energy-management systems (EMS) that reduce electrical consumption 365 days a year; and
- **Improve the environment**—through lowering energy consumption, which dramatically reduces chain retailers' carbon footprint.

Demand response—Saving the Grid and Profiting From It

The premise behind demand response is simple: Utilities desperately need their customers to cut back on energy consumption during critical periods, and they're willing to pay them to do it. Demand-response programs kick in when the electrical grid reaches a crisis point: For example, when too many air conditioners are churning on a hot summer day. These "grid emergencies" or "peak-demand" days will occur far more frequently as the demand for electricity goes up faster than new power plants can be put online.

Electricity Generation Gap	
Increase in U.S. Generation Required during the next 10 years (1)	18%
Increase in U.S. Generation Scheduled for the next 10 years (1)	8%
U.S. & Canadian Capacity required to serve less than 80 hours per year (2)	10%

Sources: (1) National Electricity Reliability Council (NERC)
 (2) The Center for Smart Energy

Retailers hold especially tantalizing possibilities for reducing demand when the grid reaches the breaking point. What's even more exciting is that the entire process—from announcing a demand-response event to adjusting set points and in-store lighting across an entire chain—can be completely automated, as demonstrated in a test last fall by California's Lawrence Berkeley National Laboratory. The test involved chain retail stores in San Diego equipped with Site Controls' EMS systems to automatically control the stores' thermostats and lighting. It simulated a demand-response event, and the stores determined in advance how much power they would be willing to shed during the event. During the test, a computer system at the San Diego Gas & Electric Co. sent an automated demand-response signal to a centralized system at Site Controls, which in turn automatically turned off a pre-determined number of overhead lights and raised the thermostat settings at the stores.

The results: With only six retail stores participating in the 37-minute test, the locations were able to reduce their electrical loads by 28%—returning 66kW of power to the grid without interfering with their customers' shopping experience. Multiply the load reductions by thousands of chain retail stores that can participate in demand-response events, and that number begins to have a real impact by reducing electrical loads during times of peak usage.

The best news? Retailers can get paid for participating in demand-response programs by receiving rebates from their utility companies, while pre-set business rules ensure that customer comfort is not impacted.

Energy Management—Saving Money 24/7

In addition to periodic peak load management, EMS solutions also deliver compelling energy savings 365 days a year. At Site Controls, our customers have seen energy savings that range from 15% to 25%. For a typical 12,000 sq. ft. chain drug store with monthly energy costs of \$3,900 per location, the annual energy savings per store exceeds \$7,000 annually (figured conservatively). Multiply that by 300 stores, and the savings add up to \$2.1 million.

For a larger “mid-box” chain retailer with 300 locations (each averaging 25,000 sq. ft.), the numbers are truly eye-popping: average annual energy savings per location of \$16,453—or \$4,935,938 for the entire chain.

With results such as these, Site Controls customers are seeing a complete payback on energy-management systems in 18 months or less, based on energy savings alone. And by participating in demand-response programs, retailers generate top-line revenue with no incremental costs. Other benefits include reduced maintenance expenses, improved asset performance and increased operational visibility.

Improving the Environment: Reducing the Carbon Footprint

Retailers can find the silver lining in the pending energy crisis by implementing EMS systems and engaging in demand-response programs. There's an additional benefit as well: In addition to helping “save the grid” while improving the bottom line, retailers can dramatically reduce their carbon footprint.

Consider the earlier example of the mid-box retailer with 300 stores averaging 25,000 sq. ft. each. The same reductions in energy usage that save \$5 million per year have an environmental impact of:

- 58,471,875 lbs. of carbon emissions reduced each year;
- 5,085 cars off the road each year;
- 3,562 households powered for one year; and
- 87,708 trees planted each year

This isn't greenwashing, either—these are real numbers that can be easily achieved by the EMS and demand-response measures described in this article.

Taken together, chain retailers can be a major part of the solution for reducing peak demand for electricity and protecting the environment—and they can boost their bottom line at the same time. That's a welcome development for retailers, who can turn the looming electrical crisis to their advantage.