Being Green for Less Green

REI retrofits its data centers for energy efficiency

by D. GAIL FLEENOR

Sometimes an opportunity can hit you squarely in the face like a blast of cold air — much like the air found in a typical data center. Data centers cannot go down, ever, or business will grind to a screeching halt, especially if there is no backup. But with computers running 24/7, the equipment in a data center gives off its own heat — and that equipment must be kept cool to prevent heat-related failures, which usually requires heavy-duty air conditioners running constantly. All this means companies bleed energy dollars to keep servers operating.

REI, headquartered in Kent, Wash., is well-known for its dedication to environmental causes, and energy conservation is not new to the outdoor clothing and equipment retailer. Since 2008, REI has grown without using more energy by improving its store footprint, says Kirk Myers, REI corporate social responsibility manager. In 2012, the retailer was approached by its utility provider to partner in an energy savings program for its data center.

It seemed like a no-brainer, but for one concern: How would the effort affect the data center? With more than 130 stores in 33 states, and a consumer base of 5 million who purchase online and in stores, REI is a major retailer with annual sales close to $2 billion. There is no room for data center downtime.

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TARGETING 'ENERGY HOGS'

Enter CLEAResult, a provider of technical guidance in saving energy. Since 2003, the consulting company has designed and helped implement energy efficiency programs for utilities, schools and businesses. CLEAResult recently announced that several other energy saving companies have joined its venture, expanding the company's reach to more than 40 locations in North America.

Much of the company's efforts are concentrated on data centers, and with good reason: According to CLEAResult, data centers consume 2-3 percent of electricity used in the United States, making these "energy hogs" an obvious target for conservation.

The process begins with an audit to determine current energy usage. The firm then offers what it feels is the best solution for the company. A cookie-cutter approach for increasing energy efficiency is not used, says Michael Stachowiak, senior energy engineer for CLEAResult. "For example, some data centers are not standalone like REI's," Stachowiak says. "The center may be located in the middle of a building, which would demand a different approach."

First and foremost, the proposed reduction could not reduce efficiency, Myers says. "Downtime for the data center was a non-starter." Any changes and installation of energy economizers had to be done while the data center was running.

While the technology installed was standard, the change demanded a lot of "handholding," Myers says. CLEAResult had to reassure staff that

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ice-cold conditions in the data center were not necessary. Previously, everything in the data center had to be cold, because there was no way to direct the cooling where it was needed. "Our data center used to be a great place to test a parka," he says.

During Phase I of the energy saving plan, air curtains were installed to keep cold air in areas critical to data center performance. Hot air was directed back to the outside as exhaust. "This was a big shift for us," Myers says. "We were able to turn up the room temperature to a normal setting."

Phase II brought an evaporative cooling tower to chill water and bring coolness into racks where computers sit, replacing several large air conditioner units that ran nearly year-round.

The process does not involve installing expensive equipment, notes Stachowiak, or contracting with a design firm. One of the main goals, he says, is achieving more redundancies to protect the data center. "We put the economizer in and leave the current cooling units in place in case they are needed."

Once the primary cooling system was in place, Phase II meant that REI had redundancy. The new system provides free cooling more than 97 percent of the time; air conditioners are needed only a few hours each year. What's more, the company was able to consolidate equipment and there was no longer a need for equipment to be spaced

out from walls and other computers, which enabled REI to shrink its data center footprint. Maintenance costs also decreased with the changes.

UTILITY INCENTIVES

Incentives from REI's utility provider Puget Sound Energy, together with energy savings, made for a short turnaround time for return on investment, says Myers. "The payback for the data center changes took less than one year."

The incentives provided by local utility companies are an essential part of the quick ROI, as well as helping with the resources to undertake such a project. CLEAResult works with local utility companies on behalf of the business for this vital incentive money. Stachowiak says it doesn't matter how large or small a company is, there are savings available and CLEAResult is tasked with finding them. While energy savings for data centers depends upon the climate, he says the process always yields 70 to 90 percent savings.

The completed data center energy upgrade for REI, resulting in a 93 percent reduction in the amount of energy required for cooling, was named a regional "Project of the Year" in 2013 by the Association of Energy Engineers. This savings translates to enough money to power six REI stores or purchase 2.2 million kilowatt hours each year, according to Myers.

Phase III for REI is underway, as

stores are looked at as a total system for energy savings, not just separate buildings. "It's unbelievable what we're finding," Stachowiak says. An analysis of an REI store in Denver found that the unit was using two-and-a-half times the area energy average. Heat, air conditioning and lighting in the store were the culprits. "We showed REI that they can save about 67 percent of their total energy bill in the store by making our suggested changes," he says.

"It's not the business of the store staff to know how to save energy — retail is their primary function," Stachowiak says. CLEAResult presents its findings to companies regarding retrofits and also teaches store managers what they should be looking for, how to monitor energy costs going forward and how to make facility staff comfortable with the changes.

"We don't just present an analysis of the situation," Stachowiak says. "We help with the contractor used, we check the design for accuracy, we make sure the plan is achieving the savings we said it would and we help the business apply for and get the incentives offered by their local utility."
STORES

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