

Sophisticated monitoring systems and equipment upgrades keep supermarkets humming without running up the energy bill.

Energy boosters

BY NORA CALEY

Monitoring energy costs at home means lowering the thermostat or shutting the light when leaving the room. While the same principals apply, saving energy is complicated in the grocery channel, and advances in refrigeration, lighting and other systems have been at the forefront as energy costs continue to rise.

"The environment is second only to hospitals and health care in complexity," says Andrew Cook, president of A. Cook Associates, a Theford Center, Vt.-based provider of facilities management software. "The sheer volume of equipment in stores has become increasingly complex and expensive, and the cost of maintaining equipment has increased over time."

The tight operating margins of supermarkets make these systems particularly attractive, according to industry experts. "Supermarkets' margins are being squeezed because they are opting not to pass energy cost increases to consumers," says Matt Lauck, director, marketing for St. Louis-based Emerson Climate Technologies' retail solutions division. "By being able to take advantage of systems they have in stores, and building new stores to be more efficient, they can get some of those margin dollars back."

Cook says if a retailer has a profit margin of 1.5% and energy costs of three-quarters of a percent, the company can increase its profit by 5% if it reduces energy costs by 10%. "There is no sale, no event that will permit you to increase profit by 5% quickly," he says. "Hence maintenance is an important factor in expense control."



Alan Amaron, president of temperature equipment manufacturer Rasco, L.L.C., based in Hempstead, N.Y., says grocery retailers want to their locations to be environmentally sound, even though some new equipment or systems could be costly. "Nowadays they are willing to spend more because long term they will make it up," he says.

CALCULATING THE PAYOFF

Doug Bishop, director of marketing for Tyler Refrigeration in Niles, Mich., says when grocers install energy efficient lighting or refrigeration, the decision-makers want to know how

long the new equipment will take to pay for itself. "They have done their programs that pay back quickly, in one to two years, and now customers are willing to look at longer term pay-back periods of five to ten years."

Bishop says some of the one- to two-year pay-backs are in refrigeration. A grocer can save money by increasing the size of the heat transfer coils in the display cases. Another tactic is to use more efficient compressors, and variable speed motor drives.

Paul Tollar, an engineering consultant with Syracuse, N.Y.-based Carlyle Compressor, says retailers have been modifying and replacing their commercial compressors to accommo-



date the newer refrigerants that are less harmful to the environment. About 80% to 90% of the newer compressors are semi hermetic reciprocating compressors, which run more efficiently than older compressors.

"Semi hermetic compressors have been the most popular," he says. "They are more efficient, more durable, and are serviceable. Most of these compressors last for 15 or more years.

Tracy Love, marketing programs manager for Stone Mountain, Ga.-based Heatcraft Refrigeration Products, says she has seen interest from supermarkets that are opening smaller stores that focus more on fresh produce and natural and organic foods. Those companies are also interested in compressors that make less noise. "They are concerned about sustainability, and they're not only looking at energy efficiency but sound as well."

The company offers the Bohn Monarch Series Air Cooled Condenser with EC (electronically commutated) Motors, which offers approximately 75% reduction in condenser power usage and has the QuietEdge fan. "The EC motors came out last year, and they're really picking up steam this year," she says. The newer compressors also use R410 refrigerants, the more environmentally friendly refrigerants which, by order of the U.S. Environmental Protection Agency, will replace R22 in new equipment starting in 2010.

Another way to save energy in refrigeration is to put products in reach-in refrigerators with triple- or double-pane glass doors. The store would even be able to display more items than in coffin or island cases. Bishop says payback takes about seven to 10 years for the glass door refrigerators, and some stores are considering them for meat and produce.

David Morrow, president and chief executive officer of Zero Zone, based in North Prairie, Wis., notes that some supermarkets are switching to reach-in units for medium temperature items such as dairy, deli and beverages. "One of the largest food retailers has done their own study of open cases versus door cases and has found the old paradigm that doors are an impediment to sales simply doesn't hold water under actual shopping conditions," he says.

SEEING THE LIGHT

From a merchandising perspective, getting customers to linger is important and lighting can be used to direct shopper focus. "In specialty areas such as produce, organics and bakery, every minute the customer spends there, they spend a dollar on impulse," says Daryl Sullivan, president and CEO of Las Vegas-based Celebrity Lighting.

He recommends accent lighting at a three-to-one ratio. For example, if ambient lights shine 100-foot candles of light, the accent lights should shine 300-foot candles of light on organic produce.

For every \$100 in revenue, \$1 goes to energy costs, and out of every \$1 in energy costs, with almost one-quarter of that going towards lighting,



according to Julia Dolsen, marketing manager for Salon, Ohio-based Energy Focus. "So anything they save there has an impact," she says.

Another cost is food spoilage, so supermarkets want to make sure the lights don't contribute to produce over-ripening. Energy Focus' lights don't have ultraviolet (UV) or infrared (IR) rays, which generate heat as well as light.

Orion Energy Systems, based in Manitowoc, Wis., recently launched its commercial grade light pipes, a much larger version of residential skylights. "The light pipe doesn't use any elec-

tricity, and it doesn't bring in heat," says Linda Diedrich, director of corporate communications. "Some facilities, in their warehouse area, go 10 hours a day with their lights off, and they save \$50,000 a year."

Supermarkets are also paying attention to lighting inside the refrigerators. Matt Rose, product manager for the refrigeration equipment company Hussmann Corp., says the Bridgeton, Mo.-based company recently launched its Always*Bright brand of LED

lights for medium temperature multi-deck display cases. He says retailers can save up to 50% in light-related energy compared to fluores-



cent bulbs. The LED lights last up to 50,000 hours versus 18,000 hours for fluorescent.

"From an environmental standpoint, in addition to the reduction of energy consumption, LEDs generate less landfill waste due to their extended life. LED's longer life also reduces overall labor costs associated with replacing burnt-out lamps," he says. "Also, many utilities are offering rebates for retailers utilizing LED light systems."

Energy Focus offers a freezer light called EFO Ice, a fiber optic light that illuminates displays without generating heat. "So there's no wasted heat in the freezer, no added freezer load," Dolsen says.

David McShane, president and CEO of U.S. operations for Chicago-based Wellington Drive Technologies, says 55% of the energy

load in a supermarket is refrigeration. "People have looked at lighting, but really one of the bigger consumers of energy is display case motors," he says. "At night you can turn the lights off, but once you have product in display cases you cannot turn off the motors."

Some supermarket companies are retrofitting their display cases with new, more efficient motors. "Our motors are three to four times more efficient," he says.

TAKING CONTROL

Another way to make sure the store runs efficiently is to computerize the temperature and light controls. Retailers are more open to trying the technology now. "All supermarket owners and their children know how to use computers now," says Amaron. Rascoe's thermal imaging monitoring system measures every square inch of the refrigerated cases. A computer alerts a manager that a freezer is overstocked, a reach-in door has been left open, or there is a hot or cold leak somewhere.

The system is wireless, which saves the supermarket from putting more wires in the ceiling.

Emerson offers Intelligent Store, which allows supermarkets to monitor and control refrigeration, lighting, HVAC and other systems. By controlling these items in a central location, the company can decrease human error. Sometimes technicians or other workers change certain set points incorrectly. "That can cost the retailer money. For example, you don't want to keep a product at minus 40 degrees when you only need it to be minus 10," Lauck says. The system also provides energy reports, showing the stores with the best energy efficiency.

Smart Defrost from Heatercraft controls the refrigeration unit's defrost cycle. "You are burning a lot of energy to go through that defrost," Love says.

Paul Wickberg, president and chief operating officer of Verisae, a Minneapolis-based supplier of clean technology software and services, says supermarkets today are focused on the total cost of energy. "They say, 'I don't care

how site 125 is doing. I want to identify the 10 worst performing sites so I can manage my enterprise energy and carbon costs to their 'minimum.' They also want to identify sites with the best opportunities for energy savings and associated utility rebates, programs and incentives. Verisae offers a comprehensive facilities database that ties the programs to the locations and the assets within them.

He adds that food retailers want to know not only whether the temperature is correct in their display cases, but whether each fixture delivers that temperature for the lowest cost, and be alerted when an asset is not operating efficiently. "That's what the more sophisticated control and monitoring systems are delivering now, which just wasn't happening even a year ago," he says. "Retailers are not necessarily looking for the lowest first cost solution to operate buildings. They are looking at the total cost of operating a building over time and the impact not just of energy, but the impact to the environment." □