

Long Day's Journey Into Light

During these tough economic times, electrical retrofits and redesigns can increase efficiency and improve the bottom line.

BY DAN RAFTER

This isn't the best of times for business owners. The national unemployment rate has hovered above 9% for more than a year. Housing foreclosures have hit record levels. And more people are on pace to declare bankruptcy than in any year since 2005.

Consumers are struggling. They don't have nearly as much disposable income as they had just three years ago. And when this happens, they don't

spend nearly as much at their local department, grocery, and clothing stores.

John Boyer knows this. He's vice president of real estate at Reading, PA-based Boyer's Food Markets, a regional chain of supermarkets with locations dotting northeastern Pennsylvania. He knows exactly how badly consumers are struggling.

That's why Boyer and the entire management team at Boyer's Food Markets are doing everything they can to save money during these difficult

economic times. It's also why Boyer has green-lighted the efforts of Atlantic Energy Concepts to replace the lighting at eight of his company's food markets with more efficient lamps.

The move has not only saved Boyer's Food Markets a significant amount of money, it's also helped improve the shopping experience at the retrofitted locations. The new lights consume less energy, but they also throw a higher quality of lighting. The retrofit even allowed Boyer to reposition some of the stores' lighting so that it better highlighted the markets' selection of fresh fruits, vegetables, and dairy products.

"Obviously in our business, utility costs are a large part of our operating expense," says Boyer. "We are spending a lot of money on utility costs these days. But one thing I looked at when



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doing these lighting projects was the aesthetic value of the replacement lighting. That way, even if I didn't save a nickel, the stores would still look better after the projects were done. I figured that the cost savings were a leap of faith. Fortunately, we got both—the cost savings and the aesthetic value.”

It's testimony like this that the manufacturers of today's more energy-efficient lighting systems, both indoors and outdoors, want to hear.

In a challenging economy, building owners are taking a closer look at all of their expenses. It's not easy to convince them to invest upfront dollars in a lighting retrofit. But when building owners, such as Boyer, spread the news that a lighting retrofit can both save money and leave a building with an even higher quality of light, it makes

selling such projects an easier task.

“In a lot of parts of the country, the utility rates are still relatively affordable,” says Paul Olive, senior account executive at Atlantic Energy Concepts, a provider of lighting efficiency and retrofitting services that is also based in Reading. “To sell lighting efficiency projects to building owners in these parts of the country, you have to prove that there are real tangible financial benefits. Our utility rates are a third of what they are in New York City, [NY]. Here you need more incentives to encourage building owners to invest in new lighting technology.”

The good news is that many building owners are doing just that. Like most industries, the efficient lighting business is struggling with the impact of the weak economy. But thanks to a relatively quick payback, the manufacturers working in this field are steadily adding new converts who are committed to the benefits of more efficient lighting systems.

“A lot of building owners want a payback period of two to three years when it comes to new lighting systems,” says Olive, referring to the amount of time that the cost savings from lower utility bills equal the upfront expense of a new lighting system. “That can be hard when utility rates are lower. But thanks to improving technology, and to falling prices on these lighting systems, it's getting easier to reach this goal.”

Dealing With the Slowdown

The owners of commercial, municipal, and school buildings are all dealing with the negative effects of the down economy. The profits of most businesses are down, and this, of course, does impact how willing owners are to take on capital projects, even those, such as ones that improve a building's lighting efficiency, designed to save them money on utility costs in the long run.

Jean Diener, an analyst with Rockville, MD-based SBI Energy, a company that compiles research reports studying various energy-related issues, recently completed an August, 2010, report on the state of light-emitting diode (LED) and energy-efficient lighting worldwide markets.

She found that the economy is hav-

ing a two-fold impact on the willingness of building owners to invest in energy-efficient lighting systems. Many owners simply don't have the upfront money to commit to such projects. But there has been some positive impact from federal stimulus dollars. These extra dollars have encouraged municipalities and school districts to upgrade their lighting systems.

“No industrial segment has been free of the economic downturn,” says Diener. “Buildings owners, like everyone, have suffered from a lack of credit, lack of cash, and lack of the right timing for capital projects in general. It may seem inappropriate for an office building to initiate a major capital project while its tenants can't handle the rent.”

It doesn't help that a lighting upgrade is rarely done in isolation, says Diener. When building owners agree to upgrade their interior or outdoor lighting systems, they often take on plumbing, heating, and cooling system upgrades, too.

It's one thing to shell out the money for a lighting upgrade. It's another to add the costs of a cooling and heating system upgrade into the mix. For many building owners, though, it only makes financial sense to tackle all upgrades at once. Because of this, they'll put off the lighting upgrade until they have enough free dollars to tackle all their upgrades at the same time.

And that might not happen until the economy finally shows some positive momentum.

That's the situation in the private sector. In the public sector, though, it's a different story, Diener says. Thanks to government stimulus dollars, municipalities, school districts, and other public entities are finding the cash necessary to tackle lighting efficiency projects.

“They have access both financially and perceptually to all the latest technologies and engineering,” says Diener. “These projects have become showcases for technologies such as daylighting and advanced ‘smart’ building controls that not only result in energy savings, but in enhanced human environments, too.”

It may not seem like it today, but the national economy will eventually regain its strength. And when it does,

Diener expects to see a greater number of building owners look toward improving the lighting efficiency at their buildings.

If the economics are right, this makes sense: The right lighting project can not only save building owners money, it can improve the quality of light in their buildings' offices, hallways, and parking lots.

"This situation will most likely reverse itself in the next decade, and the private sector will embrace energy-efficient lighting extensively as projects that were delayed or postponed are begun again," says Diener. "In that time, technology will have increased efficiencies even more so, and the incentives will be higher and the obstacles lower."

Affordable Efficiency

The good news for building owners is that high-efficiency lighting equipment is now falling in price. This makes upgrading to lighting systems that consume less energy a more cost-effective move.

At the same time, several states are offering economic incentives to building owners who take steps to boost the energy efficiency of their facilities. These tax credits can go a long way toward making a lighting upgrade more affordable to building owners.

When building owners spread the news that a lighting retrofit can both save money and leave a building with an even higher quality of light, it makes selling such projects an easier task.



The efficient lighting eliminates glare and creates a more soothing ambience.

John Martin, principal with Branchburg, NJ-based Pro-Tech Energy Solutions, a company that provides energy audits, energy monitoring, and lighting upgrade products to building owners, says that officials with his company make sure to sell building owners on the long-term cost savings of lighting projects.

"Someone who gets what we are doing, who understands that we'll be saving them money in utility bills every month, embraces these lighting upgrades all day long," says Martin. "They get it. They understand the value."

Martin admits that the economy has made it more challenging to sell lighting upgrades to some building owners. But others are inspired to increase the efficiency of their building's lighting because the economy is in such dire straits, he says.

"We tell people that the quickest bang for their buck is often lighting upgrades and retrofits," says Martin. "We tell them that they can save 40% to 70% on their lighting bills after an upgrade without sacrificing light levels or quality of light."

As an example of a typical project, Pro-Tech might replace office fixtures that have four 32-W lamps with fixtures that have just two higher efficiency lights. This not only saves office building owners money each month, it also results in a better light source.

Then there are the savings that Pro-Tech can bring by tweaking the lighting that illuminates a building's outside areas. LED and induction lighting are both highly efficient, and the price of each type of lighting is coming down, Martin says, making it a top choice for parking lots and other outdoor spaces.

Building owners can actually save more money by replacing outdated outdoor halogen lamps than they can by upgrading their interior lighting, Martin says. Most building parking lots are lit by metal halide lamps. The average bulb in these lamps has anywhere from 16,000 to 20,000 hours of life in it before it burns out. Induction lighting, though, typically provides about 100,000 hours of lighting.

Not only will switching from halide lighting to induction lighting save building owners money in replacement bulbs, it will also help them cut down on the money they spend on maintenance. Every time a building owner has to hire an electrician to climb a ladder to replace a burnt out halide bulb, that owner is wasting important dollars, Martin says.

"It costs a lot to have electricians come out," says Martin. "If building owners don't have to do



Columbia lighting

The Mount Sinai Medical Center uses Columbia's ZPT fixture to direct light in a controlled manner.

that year after year, they'll see a nice return on their bottom line."

The combination of improved lighting technology, more affordable equipment, and increased state incentives are making this an exciting time to work in the business of efficient lighting, Martin says.

Martin points to Pro-Tech's own home state of New Jersey. The Garden State is rich with incentives designed to encourage building owners to invest in energy efficiency, Martin says.

"The more the federal and state governments get behind the efficient lighting movement with incentives, the more you'll see building owners embracing lighting upgrades," says Martin. "Anything that helps shorten the pay-back period helps. The United States is finally embracing energy efficiency. We are getting smarter about energy use. The big manufacturers in the past had just one intent: to sell product. In doing that, though, they were a little shortsighted when it came to efficiency. But now that the pricing of new lighting equipment is going down, it finally makes sense to bring these products to market."

Keeping Quality High

Building owners have multiple responsibilities when it comes to the exterior and interior lighting systems of their facilities. Yes, one of their priorities, especially in today's weak economy, is to reduce their costs as much as possible.

But their second priority is equally as important: They must make sure



Columbia lighting

Long & Foster's lighting system consumes 21% less energy than a standard three-lamp parabolic light.

that their buildings' lighting systems give their employees the chance to do their work as efficiently as possible.

A lighting upgrade isn't effective if it makes it hard for data specialists to see their computer screens. It doesn't work if the parking lot is too dark for those employees who arrive to the office early or leave later in the evening. And it's a failure if overhead lights are so bright that they cause workers to squint half the day.

Officials at Columbia Lighting in Greenville, SC, recognize this. It's why in 2007 the company launched its createchange initiative. Martin Werr, manager of brand development with the company, says that the goal of the initiative is to provide customers with

higher-efficiency lighting that comes with no drop-off in quality.

This, of course, is the goal of building managers and owners, too. They want to spend less on their lighting bills, but they want lighting systems that are every bit as effective even as they consume less energy.

At Columbia, the goal is a specific one: to provide light levels and lighting quality that is equal to conventional lighting systems, but that consume at least 20% less energy. The company offers a dozen products that help meet this goal.

These products can be broken into two main categories: recessed illumination that can be used in offices, schools, and hospitals; and higher-efficiency



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light products that are designed for gymnasiums, big box retail stores, and warehouses.

So far, Columbia has achieved its goals, Werr says. Customers who turn to the company for lighting upgrades for their warehouses, gymnasiums, and other large spaces have frequently been left with new lighting equipment that consumes 50% less energy than did their old lighting systems.

Office building owners have seen savings in the 22 to 34% range, all without seeing the quality of their interior lighting fall.

"We are trying to squeeze every last lumen out of a lighting fixture," says Werr. "There are a variety of drivers in this industry. The most obvious one is the cost of energy. Everyone's energy costs are continuing to rise. By providing this and not requiring owners to sacrifice light levels, we are helping their bottom lines. Building owners can appreciate that."

An example of this can be found at the corporate headquarters of real estate giant Long & Foster in Chantilly, VA. Columbia installed its 32-W EnergyMax 2-T8 lamps throughout the company's newly built corporate building. Each of these lamps consume 21% less energy than does a standard three-lamp parabolic light.

This provides Long & Foster a saving of more than 35,000 W every year.

Columbia also provided significant savings to Mount Sinai Medical Center in New York when the hospital in 2008 opened its Center for Advanced Medicine. A former eight-story parking garage

converted into a treatment center, offices, and client spaces, the center is illuminated by Columbia's ZPT fixture, designed to direct light in a controlled manner. This eliminates glare and creates a more soothing ambience, important for a medical facility.

The lights also brought savings. Because they consume less energy, Mount Sinai qualified for lucrative tax credits, something that reduced the project's expenses.

Cost isn't the only factor driving building owners to embrace more efficient lighting. Werr also pointed to green building. A growing number of building owners want their facilities to earn Leadership in Energy & Environmental Design (LEED) Certification from the US Green Building Council. Buildings that earn this are more attractive to tenants, something that makes renting out space in them an easier task.

Installing a more efficient lighting system can go a long way toward helping building owners reach their LEED goals, Werr says.

"Since lighting accounts for 30% to 40% of the power that a building uses, this is a very low-hanging fruit for building owners in their efforts to earn LEED Certification," says Werr.

Making a Difference in the Outdoors

Indoor lighting systems are important. But building owners can save a significant amount of money each year by improving the efficiency of their outdoor lighting systems, too.

Tim Hill, director of marketing and product management for outdoor products for Cooper Lighting in Peachtree City, GA, says that building owners have awakened to this fact. And many are turning to the latest trend to boost its efficiency, solid-state LED lighting.

LED lighting gives building owners better control of their lighting, Hill says. Instead of sending light into the air, LED lights allow owners to shine that light directly onto their parking lot surfaces.

At the same time, building owners can save a significant amount of money each year in lighting costs by replacing their metal halide parking-lot lamps with LED lights. Hill says that building owners typically reduce the amount of energy needed to light their outdoor spaces by 30% to 70% when they switch to LED lighting.

"The cost of energy is skyrocketing," says Hill. "There are areas of the country where they are capacity-strained in terms of producing more energy. Just think of what they're going through in California. Today, no one is taking any cost for granted, and that includes the cost of lighting their outdoor spaces."

This wasn't always the case. Outdoor lighting has typically accounted for a smaller percentage of a building's lighting expense. This makes sense: A typical office building might have 10 or 12 light poles in their parking lots. But just think of how many fluorescent lights they might have inside their buildings.



Columbia lighting

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As Hill says, it was easy for building owners to get lazy and stick 400-W metal halide lights in their parking lots.

Now that energy costs have risen so high in many parts of the country, though, building owners are looking for cost savings wherever they can find them. And they've discovered that they can make a big impact on their bottom line by boosting the efficiency of their outdoor lighting systems.

For Hill, that makes this an exciting time in the industry.

"There's not been a time since Thomas Edison and Nikola Tesla duked it out that there have been so many changes in the lighting industry," says Hill. "We are going from a fairly stodgy commoditized industry to an industry that is bringing out new advancements every single month. There hasn't been anything like this in the lighting industry for 75 years."

Making an Impact in Pennsylvania

Boyer, from Boyer's Food Markets in Pennsylvania, can vouch for the effectiveness of a lighting upgrade. Not only have the upgrades done by Atlantic Energy Concepts paid off in lower utility bills, they've also made the shopping experience of Boyer's customers a more pleasant one.

"Some studies will tell you that if you retrofit your store's lighting, you'll get 'X' amount of increased sales," says Boyer. "I have no proof of that. But I will tell you that the stores that we had retrofitted look better. And that does make a big difference."

And Boyer has nothing bad to say about the upfront costs of the retrofits, either. That's because the energy savings means a quick payback period.

"The payback period is two years, two-and-a-half years with these. I can't find a whole lot to complain about with that," says Boyer.



Columbia lighting

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For building owners, making lighting improvements does come down to their bottom lines. If it's cost-effective, owners will invest in this technology. If it's not, they won't.

Research analyst Diener says that this has always been the case.

And Diener also predicts that change will continue to come to the lighting industry when it comes to increasing efficiency. "Governments got on the greenhouse gases bandwagon and tossed out incandescent bulbs in favor of the CFL [Compact Fluorescent Light]. I predict in my report that the CFL will be replaced by LEDs, which represent a larger step toward the holy grail of energy efficiency." DE

Dan Rafter is a technical writer and frequent contributor to Distributed Energy.

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