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Retrofits That Deliver

Careful planning ensures successful lighting upgrades, say experts with NEMA's enLIGHTen America program

By Dan Hounsell, Editor

Many obstacles can get in the way of projects designed to improve a facility's energy efficiency. Topping this list of challenges are such issues as finances, product specification and calculating the return on investment (ROI).

These issues might create legitimate concerns for maintenance and engineering managers and others involved in project planning, but they need not be deal breakers. In fact, they might not even be real obstacles. Organizations often make decisions based on uncertain or incomplete data, and diminish potential ROI by not completing due diligence.

Lighting retrofits typify this scenario. These projects can help institutional and commercial facilities curtail energy use and create more efficient and aesthetically pleasing indoor environments, but only if planners base their decisions on accurate information. Too often, managers and other team members approach retrofits with misconceptions that lead to faulty decisions.

"Companies often view lighting-upgrade projects as a revenue drain, when in fact they represent a positive cash flow that renews itself year after year," says Paul Hafner with Philips Lighting Application Center. Success, then, often starts with debunking misconceptions.

Common myths

The misconceptions surrounding lighting retrofits are numerous. Many managers lock onto a particular project scope or technology, which can create problems.

"They tend to get focused on one solution, like a lamp and ballast retrofit," which limits the options and opportunities, says Andy Davis, channel manager for OEM and ESCO with WattStopper. "They need to look at it with a wholistic-type approach."

ROI also can present challenges. Managers might have trouble quantifying it or might be mistaken about when the financial payback begins.

"Lighting renovations typically pay back in two years or less, " says Cheryl English, vice president of market and industry development with Acuity Brands Lighting. "With the energy-efficient-lighting tax deduction, the payback is often in the range of 9 to 18 months."

The benefits often go right to the bottom line.

"Organizations often do not understand they are already paying the money for energy-saving technologies to their local utility and could use the same money much more productively," Hafner says. "For every $100 they pay to their utility for the electricity to power outdated lighting technology, an investment in more energy-efficient technology could reduce that payment to $60 and allow them to use the remaining $40 to pay for the energy-saving improvements."

Other misconceptions involve the effect of retrofits on interior spaces and lighting quality. For example, many managers believe current lighting levels are appropriate for the circumstances, says Randy Dollar, vice president of business development with Universal Lighting.

In fact, he says, "Many existing lighting systems were based on the ceiling grid, more so than the actual lighting needs for the application. As a result, most applications have too much light. In these cases, light levels can be reduced without any impact to productivity."

The performance of previous lighting retrofits also might have created lingering problems.

In the past, retrofit systems created lighting distribution that caused shadows, English says, adding, "New systems are designed to not only improve the distribution of light but replace the reflector and lens to improve the overall aesthetics of the space. Many lease spaces find that the improvements in lighting quality result in increased lease rates."

Planning matters

Debunking these misconceptions and the circumstances that create them requires careful planning and product specification by managers and other team members. One common source of frustration involves savings and performance that do not meet expectations.

"This reflects shortfalls in the planning process, such as over-promising and under-delivering on the upgrade's performance and energy savings and making faulty assumptions about burn hours," says Doug Stoneman, senior manager for channel marketing with Philips Lighting Electronics.

Involving building occupants is one of the first steps in preventing these problems, says Mark Lien, director of the Lighting Solutions Center with Hubbell Lighting.

"It is critical to get occupant buy-in on the changes being made, especially if they'll be conspicuous," Lien says. "Survey them prior to the audit for lighting concerns," he says. "Emphasize and quantify advantages to the new system, such as color rendering improvements."

Stoneman says an audit can give managers and organizations a fuller picture of the application parameters, as well as of the occupant's lighting requirements, adding, "Users should

Spotlight: enLIGHTen America

The lighting manufacturers of the National Electrical Manufacturers Association (NEMA), representing more than 45 of the largest lighting companies in the United States, have teamed to launch a broad-based, awareness-building marketing campaign aimed at saving energy and cutting energy costs in existing buildings in the United States. Called enLIGHTen America, the campaign targets building owners, operators, executives, contractors and anyone else interested in upgrading lighting products in unrenovated buildings.

"We are providing valuable information and tools to all types of customers," says Jeanette Strainic, marketing manager for GE Lighting. "In turn, they are conducting energy audits and then relighting with NEMA members' products. Everyone wins."

The enLIGHTen America Web site offers energy-saving solutions through case studies, tax incentives, recycling fluorescent lamps, and energy-efficient lighting products, such as high-intensity-discharge and compact fluorescent lamps, luminaires, lighting controls, NEMA Premium ballasts, light-emitting diodes (LEDs), and exit signs.

For more information, visit **www.nemasavesenergy.org**.

be asking broad questions, such as 'What are the ongoing maintenance concerns for the newly installed lighting system?' and 'Are there skill sets required, such as with controls, that the facility is not able to provide?'"

Because retrofits often aim to lower an organization's overall energy use, managers should consider an energy audit.

"It is important that your lighting-management provider extends the time and effort to perform a full-scale energy audit, including before-and-after readings on the lighting circuits and the lighting levels," says Edward Satterwhite, eastern regional operations manager with Osram Sylvania.

Specifying considerations

Careful planning enables managers and the project team to match lighting technology to the space and facility more effectively, but organizations also make planning mistakes.

"Not fully understanding the application or its context is a common misstep," Stoneman says. "For example, if you are upgrading a high-bay application, is the space climate controlled? A technology that gets installed and tested in August may provide plenty of light at that time, but in an unregulated space, it may not prove to deliver enough light in February."

So it is essential managers understand the environment in which they install the new system.

"For example, if the space is difficult to access, then managers will want to make sure that the lamps and ballasts they choose are rated for long life to reduce maintenance costs," Stoneman says. "In other scenarios, the application might require lamps and ballasts rated for high temperatures. Perhaps the space is currently overlit or underlit. The right solution can't be implemented unless the specific conditions of the application are fully evaluated."

Lien encourages managers to pay close attention to lamp voltages.

"The specification sheets for fixtures generally provide enough information to order the correct lamps," he says. "With some metal-halide products now, there are tricky qualifiers by brand. Ask for the lamp recommendation in writing from your distributor or manufacturer to limit your liability." One proven strategy for success is keeping an open mind when it comes to technology.

"I see a lot of one-size-fits-all attitude, especially when it comes to controls," Davis says. Considering additional options, such as time control or a mechanical-system interface "might be in the better interest of the owner," he says.

Beyond installation

Lighting retrofits also can underperform because planners did not look far enough ahead. They often fail to consider proper system maintenance, such as relamping, that can extend the project's performance life.

"It's counterintuitive to replace a lamp that is burning, but when about 80 percent — some say 70 percent — of the lamps have burned out, the others are close behind," Lien says. "That's the time to change them all at once. This can be done assembly-line style and completed in a fraction of the time, compared to spot relamping." In other cases, planners forget that facility activities constantly evolve, meaning upgraded lighting systems have to be as flexible as they are functional.

"Many organizations choose a system that does not give them any flexibility for the future," Dollar says. "Office environments may be rearranged, and warehouse racks may be relocated. Installing a system that doesn't provide some flexibility can result in a lighting system that is unusable or counterproductive."

Also, too many organizations fail to monitor savings generated by a retrofit.

"I don't see it being planned for a lot," Davis says. "(Organizations are) not assigning it to a building engineer or facility manager. It just tends to be off their radar." The solution, he says, is conducting an annual review of the new lighting-management system.

Finally, Satterwhite says managers must understand "the warranty programs that come with your typical retrofit and the means by which to take advantage of them. Make sure you have all warranties in writing and that the lighting-management company has the processes in place and the resources to enforce them."

The future of retrofits

For managers still on the fence regarding the need to undertake a lighting retrofit, several trends are worth noting. Consider the likely impact of rising electricity rates and demand charges.

"We'll have rising electricity costs for the foreseeable future, and this will drive the need for retrofits, both as a necessary budgetary consideration and as a reliable and profitable investment," Lien says. Finally, managers need to be aware of the impact of solid-state lighting, which uses light-emitting diode (LED) technology.

"Solid-state lighting will certainly become more popular in the future, offering the benefits of reduced energy, and their long life will have a positive impact on maintenance costs," English says. "Facility managers need to be prudent about this new technology and do their homework about applying it correctly." ●

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