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Integrated lighting control systems: An innovative "green" solution for reducing energy costs

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As monthly expenditures for building operations come under greater scrutiny - from major corporations and public venues to households across America - electrical lighting, heating and air conditioning costs are increasingly targeted for significant cost savings. The current economic climate also presents an opportunity to become more socially responsible by reducing the carbon footprint.

Excessive and wasteful energy use is inherent to virtually every commercial building. These centers of commerce and entertainment contribute more to global warming than cars, trucks, and buses combined. As a result, demand for sustainable, healthy buildings is on the rise and a leading priority for today's commercial building owners, managers and tenants. According to the Department of Energy's Energy Information Administration, lighting is one of the areas of highest energy use. On average, lighting accounts for approximately one-quarter of a building's overall electricity use, rivaled only by HVAC and office equipment.

As a result, more and more building owners and managers are considering intelligent lighting systems. These systems not only reduce costs and demonstrate an overall commitment to being environmentally friendly, but this smart technology also contributes toward enhanced building values, higher tenant retention rates and overall end-user satisfaction.

At the forefront of the intelligent lighting movement is Encelium Technologies' Energy Control System. Known as ECS, the system uses the collaborative power of addressable networking technology in conjunction with advanced control hardware and software. This automated system also has the capability to integrate with the HVAC, security and irrigation systems.

While stand-alone lighting components have been around for years, ECS utilizes a universal I/O (input/output) module to connect to standard lighting components such as low-voltage non-dimming ballasts, occupancy sensors or photo sensors for unmatched digital control capabilities. One component of the system enables each person in a commercial building to control his or her own workspace light levels from their desktop computer. In addition to this personal control, the integrated system allows facility managers to make full use of a number of other energy management strategies.

The most attractive benefit associated with the installation of an intelligent lighting system is a significant return on investment, for both new and existing buildings. Most appealing is how soon building owners and managers realize actual cost savings. For example, ECS installation costs range from \$3 and \$3.50 per s/f for existing space. Designed to reduce lighting-related energy costs by 50 to 75%, the projected savings of 75 cents to \$1.25 per s/f per year means that the installation cost is amortized in less than three years. Not only is the system designed to reduce energy costs

by more than half, it eases the way for buildings to earn LEED certification, contributing up to 18 of the points needed for certification, as well as facilitate a building's compliance with ASHRAE 90.1, EPA Act, Title 24 of the California Code of Regulations and various utility rebate programs.

At The Rogers Centre, home to Major League Baseball's Toronto Blue Jays and numerous other entertainment and sporting events, approximately 7,000 light fixtures are dispersed throughout the 1.4 million s/f facility. The complex's ECS installation realized savings of 77% related to energy consumption, a 39% reduction in energy demand and a saving of 76% for energy costs. In terms of dollars, this translates into approximately \$300,000 saved per year. With regard to the environment, the centre has reduced its energy use by 3,731,000 KWh annually, taking enough energy off of the grid to power over 400 homes in Toronto.

Designing and implementing a customizable system for optimal performance is key. The Encelium Technologies system integrates six energy management strategies that offer building owners and managers digital lighting system control. These range from daylight harvest to account for natural lighting and personal and occupancy controls, to smart-time scheduling to switch or dim lights where occupancy sensors are not appropriate, task tuning to eliminate excessive lighting and variable load shedding.

While today's systems are proven, reliable, solid, robust and durable, applications and programs are continually being enhanced to provide more hands-on customer control and flexibility.

One example is the integration of Encelium's ECS with Tridium's Niagara AX Driver, which allows facility owners and managers to integrate HVAC and other imbedded energy-using devices into the lighting system. This synergy yields even greater cost savings due to the reduction of overall energy consumption building-wide.

There is no doubt the benefits associated with green building practices is without bounds. From the potential to save energy and reduce costs, to promoting a more productive work environment and occupant comfort, the value-add is far-reaching. While the initial motivation to implement an Energy Control System is driven by savings, many generations to come will reap the rewards of a better, greener tomorrow.

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