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SCE Energy Conservation Series

Switch To a More Energy Efficient Business: With Smart Lighting Controls

Installing one of today's smart lighting control systems could cut your energy usage by up to half.[1]

A building's lights might go on in the morning. But they often do not need to stay on all day. At any given time, lights might be on in an unoccupied room. In fact, studies suggest workers are not in their offices 30 to 70% of the time during work hours.[2]

Depending on the type of business you operate, lighting can account for 20 to 50% of your electricity consumption.[3] So, whether lights are needlessly kept on overnight, or left to illuminate unoccupied rooms, wasteful use of lighting can have a huge impact on your energy bill.

To eliminate this waste, most energy codes require some way to automatically shut off lights when not in use, either based on a schedule or occupancy. Lighting controls do this effectively and can reduce your energy costs significantly.

We have compiled this handy guide to help you save energy by understanding the many benefits lighting controls can offer your business.

Benefits Of Installing Lighting Controls

✓ **Energy savings**

Depending on your type of business, installing lighting controls could provide energy savings up to 50%[4]

✓ **Improved productivity**

Providing employees with ideal lighting conditions contributes to a work atmosphere more conducive to productivity

✓ **Reduced maintenance**

Lighting controls can extend bulb lifespan, thereby reducing maintenance time and costs by lengthening lamp replacement intervals

Lighting Controls Can Accomplish Alot

Fortunately, various lighting controls are available that can help reduce your energy bill, improve productivity and potentially reduce your maintenance costs, too.

The purpose of a lighting control system is to eliminate energy waste while providing a productive visual environment. To accomplish this, controls can provide the right amount of light where it's needed and when it's needed—automatically or at the discretion of users.

According to the Washington-based New Buildings Institute, lighting controls can reduce lighting energy consumption by 50% in existing buildings, and by at least 35% in new construction.[5]

Automatic shut-off strategies (either time-based switching using an intelligent control panel for scheduling on/off, or threshold-based switching using occupancy sensors) have become standard in commercial construction due to the proliferation of energy codes.

According to the California Energy Commission, scheduling can produce 5 to 10% energy savings, and up to 15% savings when using bi-level switching, either manually, automatically or through a combination of both.[6]

Did You Know?

Lighting accounts for **20 to 50%** of **electricity consumption** depending on your type of business.[7]

1 U.S. Small Business Administration (SBA).

2 DiLouie, Craig. *Occupancy Sensors Eliminate Energy Waste. Facilities Maintenance Decisions,* September 2008. facilitiesnet.com/lighting/article/Occupancy-Sensors-Eliminate-Energy-Waste-Facility-Management-Lighting-Feature--9607#

3-4 U.S. Small Business Administration (SBA).

5-6 DiLouie, Craig. *Get the Most out of Fluorescent Dimming.* Buildings, November 2007. buildings.com/article-details/articleid/5378/title/get-the-most-out-of-fluorescent-dimming.aspx

7 U.S. Small Business Administration (SBA).

Types Of Lighting Controls

Occupancy Sensors

These devices detect the presence of people in a room and automatically turn off lights in unoccupied areas. They are ideal for food storage areas found in restaurants and grocery stores.

Occupancy sensors are best suited for projects that require granular control, which can be difficult to achieve economically using scheduling. They also are suited for areas that are intermittently occupied, meaning unoccupied for two hours or more per day, and where lights typically remain on when the space is unoccupied.

Examples of appropriate applications include offices, classrooms, copy rooms, restrooms, storage areas, conference rooms, warehouses, break rooms, corridors, and filing areas.

Dimmable Ballasts

Dimmable ballasts enable you to regulate the intensity of fluorescent lights to save energy.

Step dimming ballasts are compatible with occupancy sensors and let you switch light levels to a percentage you specify (100 to 50%) using standard wall switches or relays.

Analog and digital dimming gives you even more flexibility, allowing you to dim as low as 3%.[8] They work with a variety of controls, photocells and daylight harvesting systems.

The classic use of dimming is in a conference room, classroom, auditorium, training center or a similar space. Dimming the lights in these spaces can support a variety of visual presentations and save energy as well. In restaurants and bars, dimming can be used for setting a mood. In healthcare facilities, dimming enables nighttime patient care with lower illumination levels. In an open discount retail space with daylighting, dimming can reduce lighting use while still allowing the lights to be on, making the store appear "open for business."

Bi-Level Switches

These type of controls regulate lighting in groups of fixtures or lamps, allowing you to turn on a select number of them when full illumination is not required.

Daylight Sensors (Photocells)

Light-sensitive controls can turn lights on and off or reduce their intensity based on the amount of daylight in the room, which prevents wasteful "day burn" — needlessly leaving lights on during the day.

In applications with daylighting, photo–control dimming can provide a smooth and unnoticeable transition to lower electric light levels as daylight levels increase, while maintaining the desired light level to produce significant energy savings.

The New Buildings Institute states that daylight harvesting systems can generate a maximum potential savings of 35 to 60%, but can "easily save 10 to 50% of annual lighting energy" in suitable spaces.[9]

The Seattle-based Lighting Design Lab states that savings can reach 40 to 60%, but that some spaces — such as offices, classrooms, and gymnasiums — can save 60 to 80%.[10]

Coupled with skylights, daylight-response switching has demonstrated energy savings of 30 to 70% in warehouses according to the U.S. Department of Energy.[11]

Timers

Timers can be used to ensure lights are turned off when they absolutely will not be used or when certain areas of the business will likely not be occupied.

Illuminating Insights!

Businesses like yours can **save 30%** or more in energy consumption **with lighting controls** in storage rooms, back offices and restrooms. The payback period is typically one to three years.[12]

[8] *Design & Engineering Services.* Southern California Edison, May 2015.

[9-11] DiLouie, Craig. *Get the Most out of Fluorescent Dimming. Buildings,* November 2007. buildings.com/article-details/articleid/5378/title/get-the-most-out-of-fluorescent-dimming.aspx

[12] Iida, Yuki. E-Source. *Sector Snapshot. Restaurants,* MAS-S-22, June 22, 2009.

Let the Sun Shine In—and Conserve On

One of your best energy-saving allies is right outside your windows: daylight. Installing dimmable lamps triggered by photocell-based daylighting controls allows you to reduce energy demand when the sun is out, saving you money.

Important Steps You Can Take

Look for ways to install lighting controls in your business

First, develop a company-wide plan that suits your operation and budget. Then secure the services of a qualified contractor for installation as needed.

- Shorter time delays produce higher energy savings, but they also result in shorter lamp life due to more frequent switching. Longer time delays avoid continual on-off cycles because occupants might enter and leave a space frequently. They also help to overcome brief periods when an occupant is moving very little. Manufacturers often recommend time delays of no less than 15 minutes.
- If the sensitivity level is too high, the sensor might turn on the lights, even though the space is unoccupied. If it is too low, the sensor might turn off the lights, even though the space is occupied. Because sensitivity relates to coverage, changing the sensitivity changes the coverage area.
- The light-level setting is available with models that offer a daylight-switching feature. It allows the installer or in-house technician to delay turning on the lights if the room receives enough daylight.

Apply for Incentives

Talk to your Account Manager about our Express and Customized Solutions programs. Your local contractor may also have access to other incentive programs.

Single-Room Or Whole-Building: There's a Lighting Control System To Meet Your Needs

Many single-room and whole-building lighting control solutions are readily available. Installing them is not just a smart way to make your business more energy-efficient. It also helps us protect or reduce strain on the electrical grid.

Working together to conserve energy, we all win.

Additional Resources

Design Brief: Lighting Controls. **Energy Design Resources,** March 2006.
energydesignresources.com/resources/publications/design-briefs/design-brief-lighting-controls.aspx

Summary Paper on Lighting Controls. **New Buildings Institute.**
newbuildings.org/sites/default/files/Lighting%20Overview%20(2).pdf

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- Plug In To Greater Energy Savings— With Smart Plug Load Management
- Manufacturing Motors & Compressors: Start Your Energy-Efficient Engines
- On The Menu: Major Energy Savings With Restaurant Refrigeration
- Cold Hard Facts About Refrigeration and Energy Conservation for Grocery and Convenience Stores
- Energy Efficiency Is In the Air: Optimizing Your HVAC
- Agricultural Pumping: Pumped and Primed to Save Energy