

Shedding Light on Energy & Cost-effective Lighting



Electricity consumption for lighting is typically 30 percent of total electricity consumption. Consequently, a reduction in lighting electrical consumption can be significant if applied on a large scale.

Lighting in building facilities can frequently be more energy efficient and cost effective, as well as environmentally friendly, by evaluating areas where you can reduce or control lighting. Taking a number of the following actions can positively contribute to your environmental and economic bottom line with a minimal investment.

Reduced Lighting Operating Time

Reduced energy consumption can be accomplished through controlling light use. Obviously some common areas (lobby, hallways, etc.) require continual (24-hour) lighting, but others (meetings rooms, storage areas, some washrooms) only require illumination periodically. Lighting control systems, such as timers, light sensors, occupancy and motion sensors, can ensure lighting is off except when required, or cycle them to maintain appropriate illumination levels.

Timers may be set to turn lights on or off at pre-designated times, and modern systems provide for very sophisticated lighting schedules (in such areas as meeting rooms). Light sensors automatically trigger lights to come on when the ambient light level decreases to a certain point. Such systems are especially useful for exterior security lighting and common areas such as lobbies that receive plenty of natural lighting by way of large windows or skylights. As with sensor controls for HVAC usage, options include ultrasonic motion sensors and infrared occupancy sensors. The cost effectiveness of these devices depends upon the wattage controlled and the hours of “shut-off” mode; however, they can potentially save up to 75 percent in storage and washroom areas applications.

If capital costs to install such systems are too high, then regimented, manual monitoring and control of lighting systems is the next best option. If no one is assigned to this task, it may not be carried out (i.e., staff members assume ‘someone else’ will handle it). This is extra work for someone, but the savings make it quite worthwhile. Whether automatically or manually controlled and operated, staff must receive direction or instruction to ensure that optimal savings are achieved.

“Lights off” in Offices

In many accommodation operations, the front desk and some office areas will be in use 24-hours a day. On the other hand, other facilities have significant office areas (executive, accounting, marketing offices) that are rarely, if ever, occupied during evening and weekend hours. There are obvious opportunities for energy savings through a simple strategy of ensuring that all lights, computers, and other equipment is shut off, or at least set to stand-by modes, during these low-demand times.

Sodium and Metal Halide Light Fixtures

High-intensity discharge (HID) lamps (i.e., high-pressure sodium, metal halide, mercury vapor, and low-pressure sodium) are among the most energy-efficient light sources available. HID lamps offer very high lumens (lots of light), high efficacy, long life, economical operation, and rugged construction. Appropriate applications include high ceiling lobby areas, warehouse and outdoor areas, security, and in some office and recreational facilities CFLs are not effective where ceilings are greater than 20 feet.

These lamps are most economical where they operate for extended periods and in locations where replacement is difficult. Since they require a warm-up period and take time to re-light after a power interruption, they should only be used in areas where such potential 'down times' will not cause major problems. Nevertheless, their energy and cost savings can be dramatic. For example, assuming 4000 hours of operation per year and an electricity rate of 8-/kWh, replacing a 500-watt incandescent lamp with a 100-watt high-pressure sodium lamp and corresponding 35-watt ballast will result in energy savings of 73 percent and annual savings per fixture of \$116.80.



High-intensity discharge (HID) lamps are among the most energy efficient light



Exterior locations like parking lots or parking garages are also an appropriate place for installation for high-intensity discharge (HID) lamps.

Changing Light Bulbs

Group relamping can save approximately 20 percent annually over a "spot relamping" maintenance strategy since corresponding labor costs are typically four times the cost for spot relamping as compared to group relamping. This practice may seem counter-intuitive ("why fix it if it ain't broke?"), but there is an underlying logic – "spot" relamping is, by definition, a random and unplanned event, which ultimately creates a greater total labor need than a more preventative, planned relamping strategy. In addition, the lamps

efficacy and stability both decrease towards the end of lamp life, leading to poor illumination and potential problems for electronic controls. Not waiting for lights to burn out also avoids client and staff complaints and annoyances.

Lighting Ballast Maintenance

Lighting ballasts and controls should be checked periodically and adjusted to ensure continuing proper and efficient performance. Establishing a schedule for this periodic checkup will ensure that the task is regularly undertaken.

Exterior Lighting

Exterior lighting includes security/safety lighting, parking lot illumination, exterior signage and directional indicators. These are the most logical areas to install sensing equipment. Photosensors and/or timers ensure that lighting is on when required, but not on at unnecessary times (i.e., natural lighting during the day make eliminate the need for lights to be on at the same time in garden areas, on signs, etc.).

Exterior locations are also an appropriate place for application for high intensity discharge (HID) lamps like high-pressure sodium, metal halide, mercury vapor, and low-pressure sodium. As with indoors, these lamps offer a great deal of light (high lumens), long life, economical operation, and rugged construction.