



**MAKE YOUR  
LIGHTING  
PROJECT MORE  
PROFITABLE**

# ILLUMINATE YOUR SAVINGS

## WITH LIGHTING INCENTIVES FROM FOCUS ON ENERGY

Lighting upgrades provide one of the quickest, most cost-effective energy improvements in a facility. Rapid changes in lighting technology mean new products that provide brighter, longer-lasting light are becoming more affordable and available for a variety of applications. Upgrading to a well-designed lighting system can provide ample light levels while lowering energy costs.

**AGRICULTURE,  
SCHOOLS AND  
GOVERNMENT  
PROGRAM**

### WHY DO A LIGHTING PROJECT?

When considering a lighting upgrade, it's important to take into account all parts of the facility including both interior and exterior lighting. Facilities require varying amounts of light for the tasks at hand. For example, classrooms require more light than a computer lab, while milking parlors need a brighter space than livestock housing. The Illumination Engineering Society (IES) provides standard lighting levels based on room types and their function. The chart on the right indicates recommended footcandle levels for several common areas. If your current lighting levels exceed these levels, the area may be a good candidate for de-lamping, re-lamping or lighting redesign.

| ROOM TYPE                                | RECOMMENDED FOOTCANDLES |
|--|-------------------------|
| <b>Schools and Government Facilities</b> |                         |
| Cafeteria                                | 20-30                   |
| Classroom                                | 30-50                   |
| Corridor                                 | 5-10                    |
| Gymnasium                                | 30-50                   |
| Kitchen                                  | 30-75                   |
| Library                                  | 30-50                   |
| Lounge/Break Room                        | 10-30                   |
| Office                                   | 30-50                   |
| Restroom                                 | 10-30                   |
| Storage area                             | 5-20                    |
| <b>Agricultural Facilities</b>           |                         |
| Free Stall Barn                          | 20-30                   |
| Milking Parlor                           | 20                      |
| Poultry Barns                            | 0.5-5                   |
| Swine Nursery                            | 5                       |

Source: IESNA and IECC (2015), Midwest Plan Service (2006, 2009)

### CONSIDER THE ENTIRE PROJECT

- *New fixtures*
- *Effective lighting layout*
- *Controls to match space needs*

Information included in this document is historical and based on data available at the time it was created. Source: IESNA Lighting Handbook and LPD levels from the IECC 2015. Adapted from "Agricultural Wiring Handbook". 15th Edition, 2009. Rural Electricity Resource Council and "Wiring Handbook for Rural Facilities". 3rd Edition, 2006. Midwest Plan Service.

## UPGRADE YOUR FIXTURES

Upgrading to energy efficient fixtures, especially on lights that operate the most hours, can save a large amount of energy. There are many different lighting technologies available, such as fluorescents and LEDs, and each has a direct impact on energy savings. For example, overhead lighting in an office or classroom may still be utilizing old technology, such as T12 fluorescent lamps or incandescent task lighting. Replacing this with high performance T8 lamps or LED fixtures will see a significant decrease in energy usage.

Consider retrofitting high bay/low bay lighting with new, efficient technology. High bay/low bay lighting is where a fixture is mounted at a height above 12 feet indoors. Common examples of this type of lighting can be found in gyms, industrial shop classes, jails, maintenance shops, garages and loafing barns. Inefficient fixtures can be high intensity discharge (HID) or inefficient fluorescents (T12 fixtures). Consider upgrading to higher efficiency HID's like pulse start metal halides or ceramic metal halides, high efficiency linear fluorescents (T5HO or T8), induction lighting, or light emitting diode (LED).



## TRY THIS

Consider **Long-Day Lighting** in barns with efficient fixtures to improve milk production.

## IMPROVED FIXTURE LAYOUT

It is highly recommended to work with a lighting professional who has experience designing lighting systems for your type of facility. The lighting professional will take light level measurements at various locations throughout your facility and explore the most appropriate layouts to reach maximum energy efficiency.

## MATCH THE NEEDS OF YOUR SPACE

### RE-LAMPING

Re-lamping refers to removing less efficient lamps and replacing them with lower-wattage lamps. For example, you can replace 32-watt T8 fluorescent lamps with more efficient 28-watt fluorescent lamps or LED replacement lamps. Reducing wattage doesn't significantly impact light output, but it does make a big difference in curbing energy use. Switching from 32-watt to 28-watt lamps will reduce your lighting costs by more than 20 percent! Work with a lighting designer to design an appropriately lit space that meets the IES lighting recommendations and provides an energy efficient layout of exactly what the space needs.

Replacing outdated equipment with new qualified lighting systems can be a fast and extremely efficient way to save energy and money. LED lights offer an economic solution to reduce electric lighting costs by up to 70 percent when compared to traditional lights. Coupling LED upgrades with integrated lighting controls can add an estimated 40 percent in additional energy savings.

### DE-LAMPING

De-lamping involves removing unnecessary light fixtures or lamps. With de-lamping, individual lamps are removed from a fixture, or an entire light fixture is removed in areas that are over lit. Follow these helpful tips to determine where it is appropriate to de-lamp:

- Use a light meter to take footcandle readings on your current lights.
- Determine the areas that are over lit by comparing actual footcandle levels with the recommended level indicated on the chart on the first page.
- Remove lamps and retest the lighting level.
- Verify the ballast(s) function properly after removing lamp(s).

De-lamping or re-lamping your facility is an easy, inexpensive way to cut energy costs. Not only can it reduce lighting costs by up to 50 percent, it also requires minimal time and investment to start seeing energy savings.



## TAKE CONTROL OF YOUR SPACE

Lighting any space costs money, yet money is unnecessarily lost every day by paying to operate lights in unoccupied rooms. A better solution is to install sensors that switch lights on and off based on occupancy, the room's ambient light level, or time of day.



### OCCUPANCY SENSORS

Turn off the lights in your space when no one is present in the room. They typically consist of a motion detector that either senses heat or detects motion. Consider setting these up so they are vacancy sensors that will turn off after a predetermined amount of time with no movement. Direct mounted sensors toward the center of the space to minimize hallway traffic turning lights on.



### DAYLIGHTING SENSORS

Turn lights off along walls with windows when a certain light level is reached from exterior sources. Placement of these is important for maximum efficiency. Install photocell sensors to control exterior lights that automatically turn on at dusk and off at dawn.



### TIMERS/DIMMING

Advanced control strategies can effectively save energy by turning lights off at certain times or dimming fixtures. For example, hallway lights only need to be at full light levels between class periods. Dimming or shutting lights off during classes can reduce energy usage substantially.

**Note:** Gymnasiums have different footcandle requirements for general activities like class periods and athletic events. Having multi-level switching can help save money in this case.



### GET ILLUMINATED

Focus on Energy is your source for information on energy efficient lighting. Contact your Focus on Energy Advisor today for questions on:

- Qualifications for Lighting Incentives
- Daylighting Controls
- Occupancy Sensors

To learn about incentive opportunities and program requirements, call **888.947.7828** to speak with an AgSG Representative or visit **[focusonenergy.com/efficientequipment](http://focusonenergy.com/efficientequipment)**.

# MAINTENANCE TIPS FOR ENERGY EFFICIENCY

A simple step to decrease energy costs is to perform ongoing (or preventative) maintenance on lamps and fixtures. This will help extend the usable life and reduce the need to replace lamps as frequently. Poorly maintained lighting systems cost far more in lost productivity than in energy wasted. Basic maintenance steps include:



## Keep light fixtures clean

Clean fixtures, lamps, and lenses by wiping off the dirt with a moist cloth. Repeat every six months to two years, depending on how much dust and debris is in the surrounding environment. **Note:** Never clean an incandescent bulb while it is turned on – the water's cooling effect can cause the bulb to shatter.



## Implement a schedule

Implement a schedule for re-lamping fixtures during unoccupied times. Allow for some lights to burn out, then re-lamp all the fixtures at once to save on labor from on-demand lamp replacements.



## Review timers and sensors

Review timers and sensors on an ongoing basis to ensure they are operational and all seasonal and event schedules are up to date.

## SAMPLE LIGHTING CALCULATION

### HOW MUCH ENERGY WILL YOU SAVE FROM UPGRADING YOUR LIGHTING?

| DESCRIPTION                             | EXISTING SYSTEM    |                            |                 |                      |                       | PROPOSED SYSTEM    |   |                 |                                      |                       | SAVINGS                 |                                      |
|---|--------------------|----------------------------|-----------------|----------------------|-----------------------|--------------------|---|-----------------|--------------------------------------|-----------------------|-------------------------|--------------------------------------|
|   | Number of Fixtures | Type of Fixture            | Fixture Wattage | Operating Hours/Year | Energy Used Per Year* | Number of Fixtures | Type of Fixture                         | Fixture Wattage | Operating Hours/Year                 | Energy Used Per Year* | Energy Saved Per Year** | Dollars Per Year (assume \$0.11/kWh) |
| Upgrade fixtures in a barn or gymnasium | 20                 | High Bay 400W Metal Halide | 455 watts       | 2,500                | 22,750 kWh            | 20                 | LED High Bay (DLC Listed)               | 190 watts       | 2,500 hours                          | 9,500 kWh             | 13,250 kWh              | \$1,458                              |
| Add an occupancy sensor to a classroom  | 12                 | 4L HPT8 Fixtures           | 95 watts        | 2,000                | 2,280                 | 12                 | 4L HPT8 Fixtures with occupancy sensors | 95 watts        | 1,400 hours (reduce on hours by 30%) | 1,596 kWh             | 684 kWh                 | \$75                                 |
| Your example here!                      |                    |                            |                 |                      |                       |                    |   |                 |                                      |                       |                         |                                      |

\*calculated # fixtures\*wattage\*hours per year/1000  
 \*\*(existing - proposed)

## CUSTOM VS. PRESCRIPTIVE

Focus on Energy is your source for information on energy efficient lighting. The chart below provides incentive criteria for custom and prescriptive lighting requirements. Contact your Energy Advisor to determine if you qualify for custom or prescriptive lighting incentives that can help reduce the cost of your project.

| CUSTOM                                    | PRESCRIPTIVE  |
|---|---|
| Changing number of fixtures in a room     | One-for-one replacement   |
| Requires preapproval                      | Preapproval available to lock in incentives over \$10,000 – otherwise submit within 60 days of installation |
| Incentive based on energy saved in a year | Incentive based on a dollar amount per fixture or lamp installed  |

**LED products and high performance fluorescent fixtures and lamps must be on a qualified products list**

**LEARN MORE AT [FOCUSONENERGY.COM/EFFICIENTEQUIPMENT](http://FOCUSONENERGY.COM/EFFICIENTEQUIPMENT)  
 OR CALL 888.947.7828 TO SPEAK WITH AN AgSG REPRESENTATIVE**

## SAVING ENERGY AND MONEY FOR WISCONSIN

Focus on Energy, Wisconsin utilities' statewide program for energy efficiency and renewable energy, helps eligible residents and businesses save energy and money while protecting the environment. Focus on Energy information, resources and financial incentives help to implement energy efficiency and renewable energy projects that otherwise would not be completed.

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Partnering with Wisconsin utilities