



# SEDAC

SMART ENERGY DESIGN ASSISTANCE CENTER



## Lighting Best Practices A Resource for Building Owners and Operators

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### 5 Practices for Good and Efficient Lighting

#### Useful

Good lighting is **Useful** and is only used *if* it is needed.

##### **Keep continuous lighting to an absolute minimum:**

When no occupants are present, lighting should be kept to a minimum. To ensure this, lighting can be controlled by occupant sensors, when feasible, or be controlled by switches with other lighting in the space.

#### Targeted

Good lighting is **Targeted** and directed to fall *only* where it is needed.

##### **Avoid sending light where it is not desired, particularly outside:**

Providing light in locations where it is not useful or does not have value is light and energy that was paid for without benefit. Especially outdoors, lighting should be directed to a facade or logo or something that should be visible rather than uplighting the dark night sky.

##### **Space fixtures appropriately and avoid trying to throw light, causing glare.**

Often it is tempting to space light fixtures further apart to save on installation costs. This leads to either leaving dark spots between fixtures or often the fixtures being tilted to “stretch” the light, which can increase glare and decrease visibility.

#### Low-level

Good lighting is **Low-level** and is *not* brighter than necessary.

##### **Design for the appropriate light level:**

The Illuminating Engineering Society (IES) developed recommended lighting level ranges to provide enough lighting without eye strain. Over-lighting spaces leaves potential energy savings on the table and may lead to headaches or other health issues. In spaces with multiple functions, designing for the lower level throughout the space and supplementing with task lighting can help maximize energy savings and enable occupants to adjust the lighting to suit their needs.

## Controlled

Good lighting is **Controlled** and used only *when* it is needed.

### Include controls to limit the time of operation:

Lighting upgrade projects should include controls to reduce the amount of time that lights operate. LEDs are less susceptible to issues from switching. As such, occupant sensors can reduce the time that lighting operates and further extend the life of the fixture. Utilizing occupancy sensors can also enhance security by detecting occupants that should not be present.

Many LED fixtures are dimmable. Providing dimming capability in spaces allows users the ability to adjust lighting levels to their desired tastes and the tasks that they are working on. The dimmers can be marked to indicate the nominal position for the room.

## Warm-colored

**Warm-colored** lighting should be used where possible.

### Limit high-color temperature lighting to applications that require it:

There are certain applications, such as detailed tasks or instrumentation, that are calibrated to higher color temperature lights. High-color temperature (cooler color) lighting should be limited to these applications as it can be detrimental to sleep patterns in humans and animals.

## Retrofitting or Replacement?

One decision that many facilities managers face is to retrofit the existing fixtures with LEDs or to replace the fixtures. Good candidates for retrofit would be fixtures that are in good condition and the optics are compatible with the LED retrofit solution. Replacement fixtures may cost more, but can come with several benefits including better thermal management for a longer life span.



Linear LED retrofit lamps in existing fixture



LED replacement fixture

## Who We Are

The Smart Energy Design Assistance Center assists buildings and communities in achieving energy efficiency, saving money, improving indoor air quality, and becoming more sustainable. SEDAC is an applied research program at the University of Illinois at Urbana-Champaign.

SEDAC services to save energy and money include:

Quick Advice | Energy Assessments | New Construction Design Assistance | Long-term  
Climate Action Planning | Retro-Commissioning