Guide to Energy-Efficient Lighting

Lighting accounts for about 15% of an average home's electricity use, so it pays to make energy-efficient choices.

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Compact fluorescent lights (CFLs) and light emitting diodes (LEDs) embody new lighting technologies that can reduce your electricity usage without sacrificing your indoor lighting aesthetics.

Principles for Minimizing Energy Use

Follow the principles outlined below to help you light your home in a pleasant and attractive way while minimizing your energy use.

Use ENERGY STAR® qualified CFLs or LEDs. Replace bulbs that are lit three or more hours a day with ENERGY STAR qualified compact fluorescent light bulbs (CFLs) or light emitting diodes (LEDs). Incandescent bulbs are based on old technology and waste 90% of their energy as heat. By purchasing ENERGY STAR qualified light bulbs, you can be sure that they meet strict energy-efficiency criteria established by the U.S. Environmental Protection Agency.

Phase out other light bulbs. As less frequently used bulbs burn out, replace them with ENERGY STAR qualified CFLs or LEDs. Even modest improvements in lighting efficiency around the home add up over time.

If your home has dimmer switches, use them. Get in the habit of dimming incandescent lights whenever full lighting is not required. Specialty dimmer-compatible CFLs and LEDs are now available for use in light fixtures with dimmable switches.

Today's CFLs

Although CFLs have been available for residential use since the 1980s, they have made significant strides in quality and popularity in recent years. Today, CFLs are the most cost-effective, energy-efficient choice readily available on the market. A CFL produces the same amount of light as a comparable incandescent, but uses 75% less energy, produces 75% less heat, and lasts up to 10 times longer than an incandescent bulb.

CFLs come in many sizes and shapes. Three-way CFL bulbs and dimmer-compatible CFLs are available, as well as candelabra CFLs for night lights and decorative light fixtures. Screw-in CFLs fit into almost any lamp that accepts standard bulbs, while pin-based CFLs plug directly into a dedicated energy-efficient fixture. All indoor and most outdoor ENERGY STAR qualified light fixtures are designed to accept only pin-based CFLs.

Because CFLs contain a small amount of mercury, always recycle them at the end of their lifespan. Many retailers recycle CFLs for free. See *Further Reading* at the end of this fact sheet for information on how to recycle old light bulbs.

Today's LEDs

LED lighting is gaining in popularity and availability. LEDs are more efficient and provide higher quality than even CFLs. LEDs use at least 75 percent less energy than incandescent bulbs, emit virtually no heat, and last 25 times longer. LEDs are also dimmable. LED lighting products use light emitting diodes to produce light very efficiently. An LED can last up to four times longer than a CFL, and unlike CFLs or incandescents, they are cool to the touch.

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Rapid adoption of LED lighting in the United States over the next 20 years could:

- Deliver energy savings of about $265 billion.
- Avoid the need to build 40 new power plants.
- Reduce electricity demand for lighting by 33% in 2027.

As with other types of lighting, not all LED lighting is created equal, so look for the ENERGY STAR symbol. See *Further Reading* at the end of this fact sheet to learn more. Keep an eye out as technology improves and prices drop for this new lighting option.

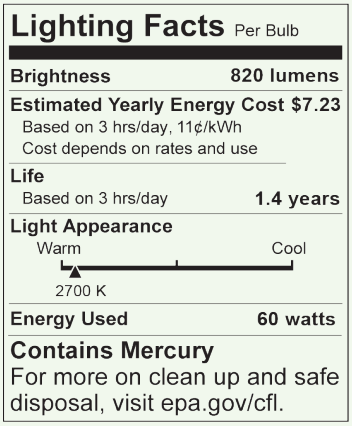
What About Color?

Early CFLs gave off a cooler (slightly bluer) light than most people prefer. Today CFLs and LEDs come in a variety of colors to satisfy most consumers. These colors are denoted by the K-value.

The higher the K-value, the cooler (bluer) the light. And the lower the K-value, the warmer (yellower) the light.

Choosing the Right Color (K-Value)

Label for Energy-Efficient Bulbs (Containing Mercury)



Lumens or Watts?

You are probably used to buying light bulbs based on wattage numbers such as 60, 75, or even 100 watts. When incandescent light bulbs were the only choice, wattage was the only number that mattered. To make the right choice when buying CFLs and LEDs, you need to check the lumens. While a watt is a measure of electrical power, a lumen is a measure of light (brightness). If you are looking for an energy-efficient alternative to a 75-watt light bulb, you should look for a 1,100 lumen CFL or LED light. You can find this in a CFL that uses as little as 18 watts or in the case of LEDs for recessed lighting, just 16.5 watts.

Daylighting

Daylighting entails using natural daytime light to brighten interiors. Installing tubular daylights, or modern skylights, can provide more daylight to spaces with little natural light. See the *DOE Energy Savers: Passive Solar Home Design* under *Further Reading* for more information.

Lighting Facts Labels

In 2010 the Federal Trade Commission decided to add new labels to light bulb packaging that will help people select the most efficient bulb for their lighting needs. The labels, placed on light bulb packaging in 2011, show "Lighting Facts," modeled after the "Nutrition Facts" labels on food packages. They provide information about brightness (or lumens), energy cost, the bulb's life expectancy, light appearance ("warm" or "cool" light), wattage, and whether the bulb contains mercury.

Further Reading

DOE Energy Savers: Lighting and Daylighting
www.energysavers.gov/lighting

DOE Energy Savers: Passive Solar Home Design
www.energysavers.gov/publications

Recycle a Bulb
www.recycleabulb.com

Financial Incentives

Tax credits, incentives, and rebates may be available in your area. Please visit **www.energysavers.gov/taxcredits** for more information.

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Energy Efficiency & Renewable Energy

EERE Information Center
1-877-EERE INFO (1-877-337-3463)
www.energysavers.gov

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DOE/EE-0344 • October 2010