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For more energy information, go to <http://energy.tennessee.edu>.

Energy Efficient Lighting

Here's an amazing energy fact: Only about 10 percent of the energy used by an incandescent light bulb goes toward producing light. The rest of the energy is wasted as heat! Energy-efficient light bulbs, on the other hand, produce more light than heat with the electricity they use. As a result, they provide the same amount of light as incandescent bulbs while using much less energy. And since lighting can account for up to 20 percent of a home's electricity use, making it more efficient provides a big opportunity for saving money.

"Reduced wattage" and "long-life" incandescents are widely available. They may last longer than a standard incandescent bulb, but they typically produce less light and are not always more energy efficient.

Halogen bulbs are a type of incandescent bulb that contains an inert gas. They are more energy efficient than incandescent bulbs and provide a brighter white light that is constant (does not dim with age). They operate at a higher temperature than incandescent bulbs and the tubular type (often used in torchiere lamps) can cause fires if it makes contact with combustible materials. These bulbs last 2,000 to 4,000 hours.

High-Intensity Discharge (HID) bulbs include metal halide, mercury vapor, and high- and low-pressure sodium. They are more energy efficient than halogen bulbs and can last up to 20,000 hours. They are mainly used in commercial and industrial buildings with high ceilings and for outdoor lighting.

Compact Fluorescent Light Bulbs (CFLs)

CFLs use the same technology as the long, fluorescent white tube lights you're used to seeing in offices and schools. Manufacturers developed ways to place the energy benefits of fluorescent lighting into products that fit into conventional light sockets – hence, the name compact fluorescents.

CFLs use 75 percent less energy than incandescent bulbs to produce the same amount of light. That means you can select a bulb with a much smaller wattage requirement to get the light you need.

CFLs also last up to ten times longer than incandescent bulbs (10,000 hours compared to 1,000 hours). Compact fluorescents need a few minutes to reach full power after they're turned on. CFLs are available in warm, cool, and natural daylight colors. Most of today's CFLs (and tubular fluorescents) use electronic ballasts that eliminate the humming noise and flicker associated with older fluorescent lights.

A 13-16 watt compact fluorescent =
a 60 watt incandescent in terms of light output
(around 900 lumens)

A 20 watt compact fluorescent =
a 75 watt incandescent (about 1,100 lumens)

A 23-28 watt compact fluorescent =
a 100 watt incandescent (about 1,750 lumens)

A 39 watt compact fluorescent =
a 150 watt incandescent (about 2,800 lumens)

CFL “Do’s and Don’ts”

Compact fluorescents may not be appropriate for all home lighting needs. For example, a CFL works most efficiently when it is left on for at least 15 minutes. Look at the CFL packaging to find those compatible with 3-way fixtures and dimmer switches. There are also CFLs made for outdoor light fixtures. Simple rules of thumb for their selection and maximum energy efficiency:

DO use compact fluorescents in light fixtures and lamps that remain on for more than 15 minutes.

DO use them in hard-to-reach fixtures to save yourself some precarious trips up a ladder.

Do use CFLs developed specifically for outdoors or cold spaces.

Do use CFLs developed to be used with three way light fixtures.

Do use CFLs developed to be used with dimmer light switches.

DON'T use them in fixtures and lamps that are turned on and off frequently (and left on for only several minutes).

Compact fluorescents are commonly available for \$2.00 to \$5.00 each, and often less per bulb in bulk packaging. Specialty CFLs typically cost more. Although their purchase price is more than incandescence bulbs, CFLs cost less over their lifetime because of the significantly reduced energy use.

CFL Purchase and Disposal

Most hardware and home improvement stores carry them. Also check the Yellow Pages under “lighting” or call your electric utility. CFLs are designed to screw into standard sockets and they come in a variety of shapes and sizes. Be sure to select models that will work with your light fixtures.

These lights will last for years, but when they do finally wear out, don’t throw them away with your regular garbage because they contain small amounts of mercury. Some communities sponsor household hazardous waste collection days to ensure the proper recycling or disposal of items like these. Contact your city’s public works department to find out about options in your area. Home improvement stores that carry them often provide drop-off recycling bins.

If you accidentally break a fluorescent bulb, follow these EPA approved steps.

Before Cleanup

- Have people and pets leave the room.
- Air out the room for 5-10 minutes by opening a window or door to the outdoor environment.
- Do not touch/handle mercury drops with bare hands.
- Shut off the central forced air heating/air-conditioning system, if you have one.

- Collect materials needed to clean up broken bulb:
 - stiff paper or cardboard;
 - sticky tape to pick up visible mercury particles;
 - damp paper towels or disposable wet wipes (for hard surfaces); and
 - a glass jar with a metal lid or a sealable plastic bag.

During Cleanup

- Be thorough in collecting broken glass and visible powder and mercury.
- Do not vacuum mercury particles.
- Place cleanup materials in a sealable container.

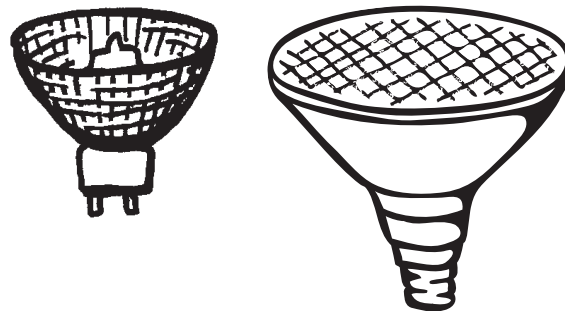
After Cleanup

- Promptly place all bulb debris and cleanup materials outdoors in a trash container or protected area until materials can be disposed of properly. Avoid leaving any bulb fragments or cleanup materials indoors.
- If practical, continue to air out the room where the bulb was broken and leave the heating/air conditioning system shut off for several hours.
- Avoid inhaling the mercury during the clean-up process.

Light Emitting Diodes (LEDs)

You have seen them in EXIT signs, traffic signals, holiday lights, and as the colored power button on your television or computer. They are now available for use in your home’s lighting fixtures. This solid-state technology is even more energy efficient than CFLs. They produce very little heat and maintain their light intensity for up to 25,000 hours (afterward dimming to about 70 percent of their capacity). LEDs can be used as regular fixture bulbs, floodlights, and dimmable globes. They provide “directional” light and are ideal for recessed downlights and task lighting. LED bulbs

Halogen bulbs are a type of incandescent bulb that contains inert gas.



are relatively new on the lighting front, so are currently fairly expensive. If you decide to try one, look for the EPA Energy Star label to ensure quality and performance.

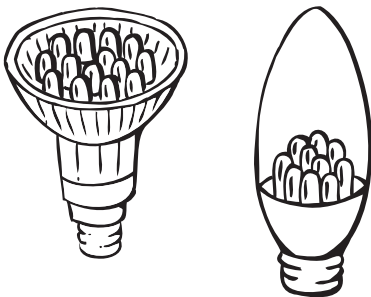
Lighting Labels

To help make your light bulb purchasing decisions easier, new labels are now required on all products. Manufacturers must clearly show a bulb's light output (measured in lumens), how much energy it requires (measured in watts), and how many hours it's expected to last.

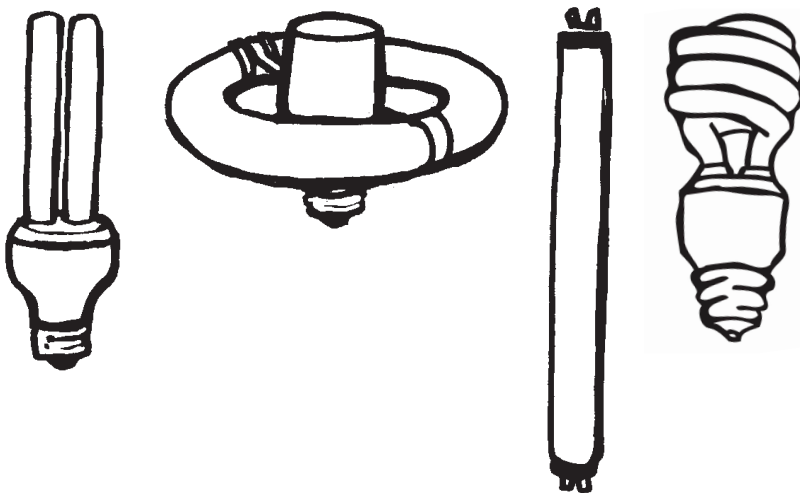
Note: bulb light output per wattage varies somewhat from brand to brand.

When shopping for an energy-saving fluorescent bulb, don't choose it by wattage, but instead look for bulbs with a high lumens/watts ratio. For example, a 75W incandescent bulb produces about 1,200 lumens, for a lumens/watts ratio of 16:1. You get nearly the same light output with an energy-saving 18W fluorescent bulb that has a lumens/watt ratio of 61:1. To calculate the ratio, divide the number of lumens, printed on the package, by the bulb's wattage.

Light Emitting Diodes (LEDs) are the newest lighting technology.



Compact fluorescent bulbs come in many shapes and sizes. They cost a little more at the store, but they'll reduce your utility bill.



Lighting Tips

No matter what type of light bulbs you choose, you'll be guaranteed to save energy if you put into practice these common-sense tips:

- Turn lights off when you're not using them.
- Take advantage of natural light from windows whenever possible (day lighting).
- Don't use more light than you need.
- Focus the light on where it is needed most.
- Regularly dust your light bulbs and fixtures to prevent dirt build-up.
- If you normally leave outdoor lights on all night, install a motion sensor or a daylight sensor/photocell
- "De-lamp" (remove bulbs/tubes) from fixtures if not needed.

Energy Independence and Security Act (EISA) of 2007

The EISA is an energy policy that addresses energy efficiency standards for light bulbs. The first phase requires any screw-based bulb that uses between 40 and 100 watts use at least 27 percent less energy by 2014. The second phase requires that most light bulbs be 60 to 70 percent more energy efficient than today's standard incandescent by the year 2020.

