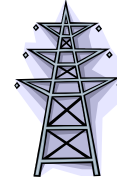


Energy Efficient Lighting



Watts vs. Lumens- an important distinction

One lumen is the equivalent of the light given off by one candle. A watt, on the other hand, is the amount of electricity a light bulb uses to produce light - it's not an indication of brightness.

This is how a new 13-watt compact fluorescent light bulb produces as much light - as many lumens - as a traditional 60-watt incandescent bulb. (As much light, using only one-quarter of the electrical energy!)

Incandescent Bulbs- the traditional lightbulb

The basic idea behind these bulbs is simple. Electricity runs through the filament. Because the filament is so thin, it offers a good bit of resistance to the electricity, and this resistance turns electrical energy into heat. The heat is enough to make the filament white hot, and the "white" part is light. **The filament glows because of the heat -- it incandesces.**

The problem with incandescent light bulbs is that the heat wastes a lot of electricity. Heat is not light, and the purpose of the light bulb is light, so all of the energy spent creating heat is a waste. Incandescent bulbs are therefore very inefficient. They produce perhaps **15 lumens per watt** of input power.

While regular incandescent bulbs last usually between **750 to 1,000 hours** before burning out, some long-life bulbs last up to 2,500 hours. The trade off is that long-life bulbs are less energy efficient and produce less light per watt.

Halogen Bulbs- an energy efficient alternative?

Standard halogens are more efficient, modern versions of the incandescent bulb, and they last longer - 2,250 to 3,500 hours. They give off a crisp, very bright, white light, and they maintain their light output over time without fading with age, as incandescents do.

While standard halogens are efficient, most people use much more wasteful high-wattage halogen tubes in their homes. Unfortunately, these cheap and convenient halogen tubes **waste energy by creating four times more heat than the average incandescent bulb**. A 500-watt halogen reaches temperatures of over 1,200 degrees - creating a serious fire hazard.

Halogen torchieres are an example of low-price technology that proves to be costly in the long run. Discount stores often sell 300-watt torchieres for around \$15 or less. Using that lamp for **two hours a day will consume nearly 220 kilowatt hours of electricity in a year, at an average cost of \$18**. You'll spend more for electricity each year than the lamp cost in the first place.

Fluorescent Lights- They've Come a Long Way Baby!

Fluorescents are not only one of the most efficient options around, offering the longest-life bulb, they come in a variety of colors, types and sizes. Best of all, with the new electronic ballasts, they are quiet and flicker free.

Fluorescent lights are phosphor-coated glass tubes filled with an inert gas and a small amount of mercury. Because different brands can have different mixes of gases inside, fluorescents produce a wide assortment of color light that match the warm glow of incandescents.

All fluorescent lights need a controlling ballast to operate. The ballast alters the electric current flowing through the fluorescent tube, activating the gas inside and causing it to glow. Newly developed electronic ballasts eliminate that

annoying flicker and buzz that used to occur with old magnetic ballasts, which were also heavier and less efficient. But there are now even more impressive improvements to the design of fluorescent lights.

To create the same amount of light as an incandescent bulb, a fluorescent tube uses **only one-quarter to one-third of the energy**. Plus, **fluorescents last 10 to 15 times longer - 10,000 hours or more**.

Compact Fluorescent Lights (CFLs)- A New 'Twist' on Fluorescents

A variation on the fluorescent tube, compact fluorescents work the same way, only the tube has been made smaller and folded over in a way to make them fit into spaces designed for incandescent bulbs. With a screw base that fits a normal light bulb socket, they operate on **a quarter of the energy used by incandescents**, and **last ten times longer**. In fact, **if every household in the U.S. replaced one light bulb with a compact fluorescent light bulb (CFL)**, it would **prevent enough pollution to equal removing one million cars from the road**.

A fluorescent bulb produces less heat, which is where the energy efficiency comes from. A fluorescent bulb can produce **between 50 and 100 lumens per watt**. This makes fluorescent bulbs **four to six times more efficient** than incandescent bulbs. That's why you can buy a 15-watt fluorescent bulb that produces the same amount of light as a 60-watt incandescent bulb.

A compact fluorescent lamp will initially cost more than an incandescent bulb, but because it lasts longer and costs so much less to run, it will prove to be **a better bargain over time**. Just keep in mind that light bulbs cost much more to run than to buy in the first place.

Important Considerations in Buying & Using CFLs

In the past some lower-cost compact fluorescent lights have been imported and sold in the U.S. Many of these have been of questionable quality and had a lifespan much shorter than predicted. As a result, many people who tried compact fluorescents have been unhappy with their performance. Encourage these individuals to try CFLs again.

Compact fluorescent bulbs now meet the stringent criteria for long-life, energy savings, start time, color, and brightness set by the federal government's **ENERGY STAR®** program. There are CFLs suitable for table lamps, recessed lighting fixtures, surface mounted fixtures, enclosed outdoor fixtures, or almost anywhere incandescent bulbs are used.

Also, consider where you will use your CFLs:

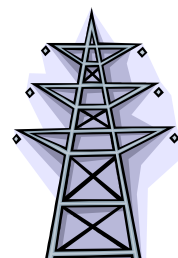
- **Place CFLs in the fixtures you use most frequently.** CFLs are most efficient when they operate for several hours at a time (2 hours or more).
- **Certain CFLs are designed to work in dimmable, 3-way fixtures, as well as torchieres.** Check the package to be sure you are buying the correct bulb. The ones that SRP is selling on behalf of the Green Building Group are not intended for this purpose.
- **Use CFLs in the fixtures that are hard to reach** such as ceiling fans, other ceiling fixtures, and enclosed outdoor fixtures. Because CFLs last longer, you enjoy the convenience changing these hard to reach bulbs less frequently.
- **CFLs come in a multitude of shapes and sizes.** Select the best shape and size to fit your needs

Resources

California Energy Commission- www.consumerenergycenter.org

Energy Star- www.energystar.gov

How Stuff Works- home.howstuffworks.com



High Country Conservation Center

PO Box 4506, Frisco, CO 80443 • www.highcountryconservation.org • recycle@colorado.net • 970-668-5703