

# ENERGY EFFICIENT LIGHTING

A Public Service of the Churchill Area Environmental Council  
2300 Wm. Penn Highway, Pittsburgh, PA 15235 1994

Lighting is intended to make our lives more productive, secure and pleasant. And yet, every time we flick on a light, some pollution is created and global warming may be affected. Moreover, it costs us money.

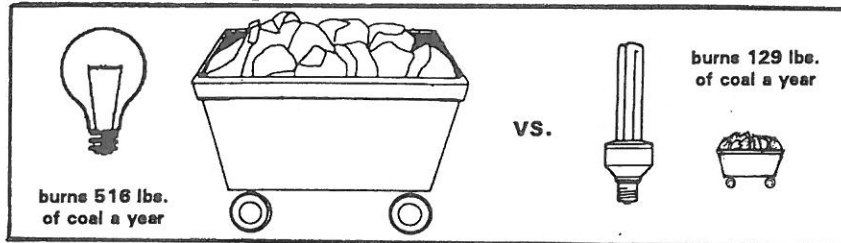
All of us are looking to cut costs. At home, it's to make ends meet. In business, it's to be more competitive, especially in a global market. Lighting consumes one fifth of all electrical power in the United States and has become a major expense. Part of the expense surfaces in the form of our monthly electric bill. The other part is unseen in the form of pollution clean-up costs. Electricity is clean at the light switch, but producing the electricity at the power plant is extraordinarily polluting because 75% of it comes from burning fossil fuels like coal.

The time has come to tread more lightly, to conserve more and to save dollars in the process. We can rethink how we light our homes and our commercial and industrial sites. With state-of-the-art lighting technology the potential exists to provide for our lighting needs with 75% less energy. Such a decisive difference can be accomplished by

using fluorescent light bulbs, especially the new **COMPACT FLUORESCENT LIGHT BULBS**. For instance, by replacing a single 100 watt incandescent lamp with one 25 - 27 watt compact fluorescent one, you will end up with the same quantity and quality of light with a bulb that will last about ten times longer.

In addition, over the lifetime of one compact fluorescent lamp (CFL,) you will have cut the emissions from a typical coal-burning power plant of about a ton of carbon dioxide and 20 pounds of sulfur dioxide. You will have saved the cost of buying and installing up to ten ordinary incandescent bulbs, and most of all, you will have saved the cost of generating about 570 kilowatt hours (KWH) of extra electricity (\$25 worth of fuel plus investment in generating capacity.)

Replacing incandescent lamps with fluorescents is a smart move, both for our pockets and for our planet.



Yes, there is a downside. Attractive as CFL's are in terms of thrifty energy use, they are expensive. On average they cost about \$20 each, but you can watch for occasional promotions or sales. Utility companies sometimes offer "good buys" on CFL's. However, to help you recover from the "sticker shock" let's compare costs over the bulb's lifetime.

## COMPARATIVE COSTS AND SAVINGS

### Incandescent Bulbs

100 watts  
1,000 hours  
10 bulbs  
900 KWH  
\$0.1275 /KWH\*  
(12.75 cents)  
\$114.75  
\$ 5.00 /10  
\$119.75

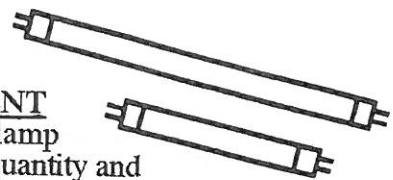
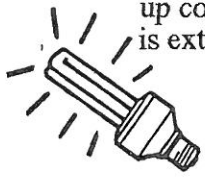
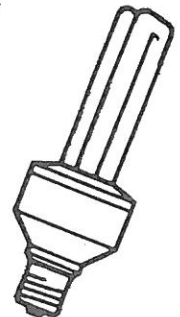
Wattage of lamp  
Rated life of the lamp  
Number of bulbs needed for 10,000 hours of operation  
Amount of electricity consumed per 10,000 hours of operation in kilowatt hours (KWH)  
Local cost per KWH - residential  
Cost of electricity for 10,000 hours of operation  
Cost of bulb(s) per 10,000 hours  
Total Cost per 10,000 hours  
Money saved by burning a single compact fluorescent bulb for 10,000 hours

### Compact Fluorescent Lamps

25-27 watts  
10,000 hours  
1 bulb  
225 KWH  
\$0.1275  
\$28.68  
\$20.00 /1  
\$48.68  
\$71.07\*\*

\* Commercial electricity rates may be slightly lower.

\*\* The figures above are based on the cost of residential electricity and light bulbs in our area.



## QUESTIONS AND ANSWERS

### - What are the best uses for COMPACT FLUORESCENT lights?

Juggling the cost of the bulbs against their 10,000 hour lamp life, the fastest rate of return would be where lamps are burned continuously, or nearly so, or where high wattage is used or in hard to reach places. Large scale lighting, as in an office building or industrial facility offers the added advantage of reduced labor costs involved in the frequent replacement of conventional bulbs, a significant business expense.

In weighing lamp life against lamp price and operating cost, follow the guidelines below:

	Type of Lamp	Minutes
If you will be out of a room for MORE THAN the times listed, TURN OFF the room lights.	Incandescent	5
	Standard Fluorescent	15
	Compact Fluorescent	30

### - Are COMPACTS suitable for outdoor use?

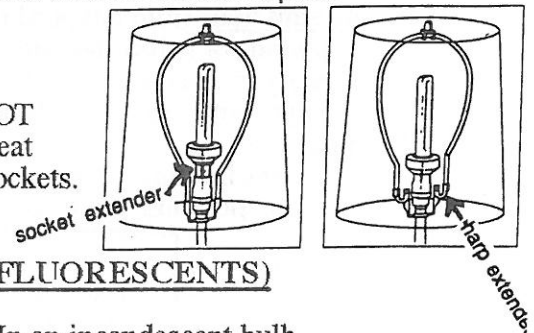
Most of them need to be protected from rain and snow by being installed in a waterproof light fixture or under an overhang.

### - Will COMPACT FLUORESCENTS fit my fixtures?

Fluorescent lamps come in many shapes and sizes to accommodate almost any use, from floodlights to elegant table lamps. Socket and harp extenders are available from lighting stores for fixtures that are difficult to fit. All compact fluorescent bulbs are coated with an advanced phosphor blend that lights in a warm color tone.

### - Can I use dimmers, 3-way switches or photo sensors?

At present there are no dimmable fluorescents on the market. (Do NOT install these bulbs on a circuit controlled by a dimmer; it could overheat and become a fire hazard.) Compacts may be screwed into 3-way sockets. However, they will operate only at full light output.



### - Why are FLUORESCENT bulbs (including COMPACT FLUORESCENTS) more energy efficient than incandescent ones?

Light is produced in lamps by means of two different processes. In an incandescent bulb electricity passes through a metal filament inside the sealed glass bulb, heating it up and making it glow "white hot." Fluorescents produce light by exciting "phosphors" - the white powder coating on the inside of the lamp - to "fluoresce."

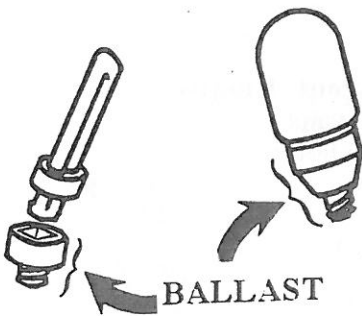
Only ten percent of the electricity used by a typical incandescent bulb is converted into light. The rest becomes heat. Essentially, the bulb is a little space heater that produces some light. In contrast, about thirty percent of the electricity used by fluorescents is converted into light.

### - What is a ballast? Do all fluorescents need one?

A ballast regulates the electricity delivered to the bulb; otherwise it would not start. Compact fluorescents come in one-piece units with the ballast concealed in the base of the bulb or in two-piece units where the ballast is screwed into the light socket, allowing you to replace the bulb but reuse the ballast.

The one-piece type is a little cheaper to buy initially, but it costs less to replace a two-piece bulb (when it becomes necessary.) On the other hand, one-piece lamps offer more electronically advanced ballasts that start instantly, run silently and do not flicker.

A ballast does require a small amount of electricity to run. The ratings of power consumption should state how many watts the entire unit uses.



### - Where can I get more information?

Details to help in making the switch to and the investment in CFL's can be obtained from an electrical supply business.

### - Credits

Consumer Reports, October 1992.

Rising Sun Sampler, 158 1/2 Midland Avenue, Basalt, CO 81621, 1990.