

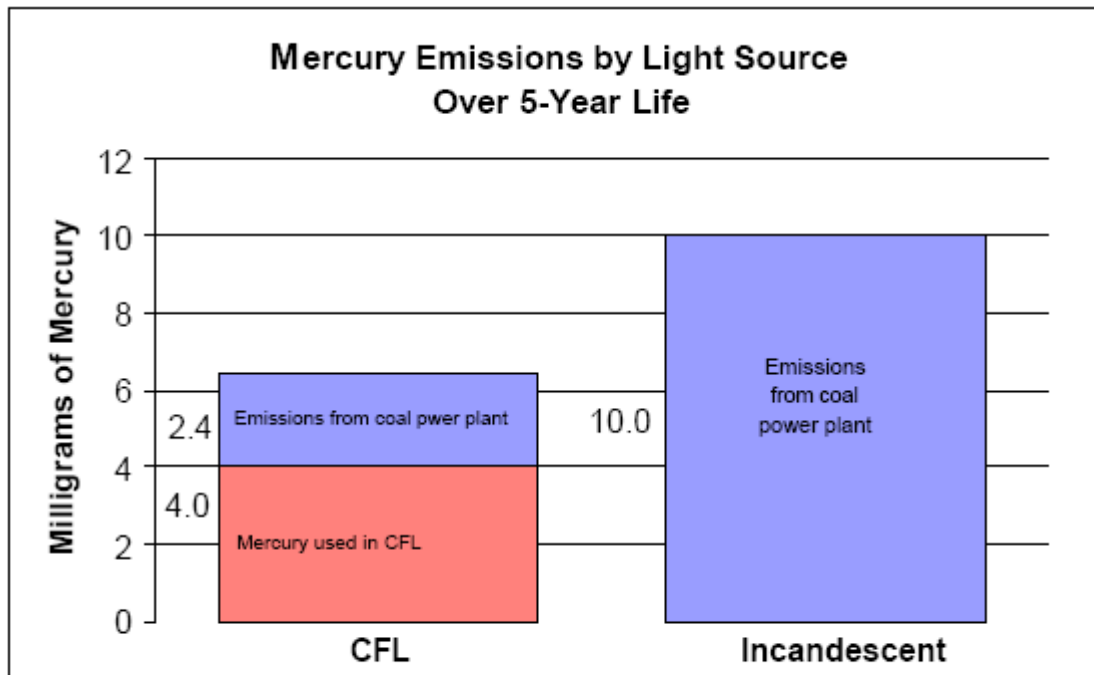
Compact Fluorescent Lightbulbs

By Jill Hahn

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Compact fluorescent lightbulbs (CFLs) are all over the news these days. Al Gore exhorts you to use them, Wal-Mart announces its determination to sell 100 million of them. But you've heard that CFLs contain mercury, which you know (since you've traded your mercury-containing thermometer for a mercury-free model at Newton City Hall) is toxic. And you don't want your home bathed in that life-draining blue glow that you have to tolerate at the office. So what would convince you to scrap the trusty incandescent bulbs that Thomas Edison invented over 100 years ago?

Money might. CFLs use at least 2/3 less energy than incandescent bulbs to provide the same amount of light and last up to 10 times longer, saving you \$30 or more in energy costs over their lifetime, as well as the cost of all those extra incandescent bulbs you would have had to buy.



Source: US EPA, June 2002

Environmental considerations should. Households in the U.S. use over 100 billion kilowatt hours of electricity per year for lighting. Reducing that by 2/3 would take a significant bite out of the greenhouse gas emissions that contribute to global warming.

A But doesn't mercury have environmental consequences? Why is there mercury in a CFL anyway?

CFL is glass tube containing a mix of argon gas, mercury vapor, and liquid mercury, and coated on the inside with three different phosphors. Electrons flowing between the two electrodes in the end cap bombard the mercury atoms, which release ultraviolet radiation that excites the phosphors so that they give off light. It's not a lot of mercury – about 5 milligrams (Philips has come out with a low-mercury CFL that contains half that). By comparison, your watch battery contains 25 mg of mercury, and that mercury-containing thermometer that you should have turned in to City Hall by now contains 500 milligrams. Actually, CFLs are responsible for releasing less mercury into the atmosphere than are incandescent bulbs. The biggest source of atmospheric mercury pollution in the U.S. is coal. A coal-fired power plant emits 10mg of mercury to produce the electricity to run an incandescent bulb compared to only 2.4mg of mercury to run a CFL for the same time.

But what about bringing a mercury-containing object into your house? The EPA reports that there is no health concern from a CFL while in use, or even if one breaks. You can minimize any risks from a broken bulb by following a few rules:

- Sweep up—don't vacuum—all of the glass fragments and fine particles.
- Place broken pieces in a sealed plastic bag and wipe the area with a damp paper towel. Put the used towel in the plastic bag as well.
- If weather permits, open windows to allow the room to ventilate.

Airborne mercury poses a very low risk of exposure. It becomes much more of a threat when it escapes into the environment and gets into the water. That's because bacteria can then metabolize it to its most dangerous form, methyl mercury (this is the form of mercury that moves through the food chain, and why pregnant women are warned not to eat too much fish). So when your CFL dies, don't throw it in the trash, where it might end up in a landfill and leach into the groundwater, or in an incinerator and get vaporized. Instead, Newton's Department of Public Works requests that you drop your bulbs off at the Recycling Depot on Rumsford Avenue.

Which leaves aesthetics. The advent of the three-phosphor system means that manufacturers can make CFLs that run the gamut from warm (resembling incandescent light) to cool white, so you don't need to worry about that sickly blue glow. What you do need to worry about, however, is the quality of the bulb. Some CFLs have a brief delay when you flip the switch. Some have to "ramp up", meaning it takes long seconds for their light to reach full brightness. Most of the "swirl" models available at local stores work well. If you come upon a style that doesn't, don't give up on CFLs. Return it, and buy a different brand. And bask in the glow of a virtuous light.

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