

## Frequently Asked Questions Information on Compact Fluorescent Light Bulbs (CFLs) and Mercury June 2008

### **Why should people use CFLs?**

Switching from traditional light bulbs (called incandescent) to CFLs is an effective, simple change everyone in America can make right now. Making this change will help to use less electricity at home and prevent greenhouse gas emissions that lead to global climate change. Lighting accounts for close to 20 percent of the average home's electric bill. ENERGY STAR qualified CFLs use up to 75 percent less energy (electricity) than incandescent light bulbs, last up to 10 times longer, cost little up front, and provide a quick return on investment.

If every home in America replaced just one incandescent light bulb with an ENERGY STAR qualified CFL, in one year it would save enough energy to light more than 3 million homes. That would prevent the release of greenhouse gas emissions equal to that of about 800,000 cars.

### **Do CFLs contain mercury?**

CFLs contain a very small amount of mercury sealed within the glass tubing – an average of 4 milligrams – about the amount that would cover the tip of a ballpoint pen. By comparison, older thermometers contain about 500 milligrams of mercury – an amount equal to the mercury in 125 CFLs. Mercury is an essential part of CFLs; it allows the bulb to be an efficient light source. No mercury is released when the bulbs are intact (not broken) or in use.

Most makers of light bulbs have reduced mercury in their fluorescent lighting products. Thanks to technology advances and a commitment from members of the National Electrical Manufacturers Association, the average mercury content in CFLs has dropped at least 20 percent in the past year. Some manufacturers have even made further reductions, dropping mercury content to 1.4 – 2.5 milligrams per light bulb.

### **What are mercury emissions caused by humans?**

EPA estimates the U.S. is responsible for the release of 104 metric tons of mercury emissions each year. Most of these emissions come from coal-fired electrical power. Mercury released into the air is the main way that mercury gets into water and bio-accumulates in fish. (Eating fish contaminated with mercury is the main way for humans to be exposed.)

Most mercury vapor inside fluorescent light bulbs becomes bound to the inside of the light bulb as it is used. EPA estimates that the rest of the mercury within a CFL – about 11 percent – is released into air or water when it is sent to a landfill, assuming the light bulb is broken. Therefore, if all 290 million CFLs sold in 2007 were sent to a landfill (versus recycled, as a worst case) – they would add 0.13 metric tons, or 0.1 percent, to U.S. mercury emissions caused by humans.

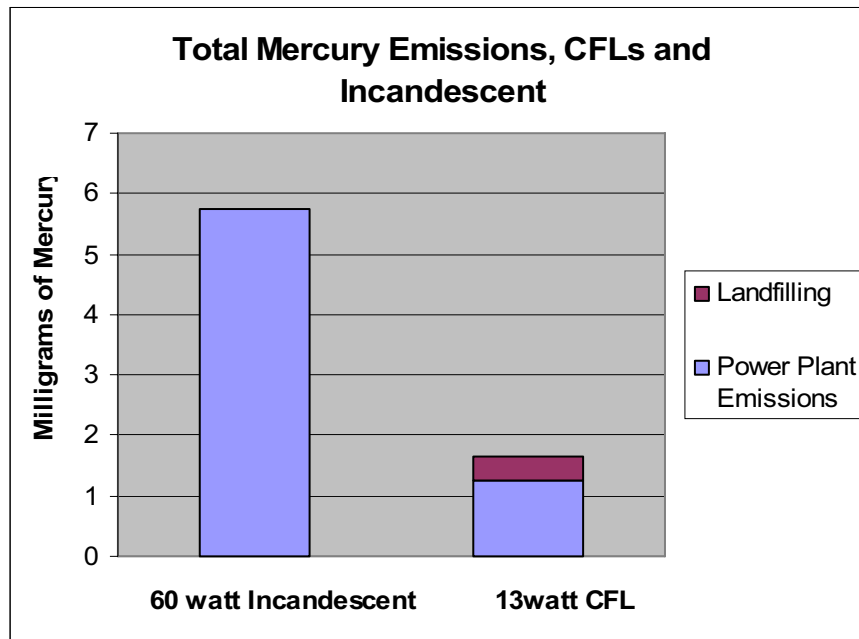
### **How do CFLs result in less mercury in the environment compared to traditional light bulbs?**

Electricity use is the main source of mercury emissions in the U.S. CFLs use less electricity than incandescent lights, meaning CFLs reduce the amount of mercury into the environment. As shown in the table below, a 13-watt, 8,000-rated-hour-life CFL (60-watt equivalent; a common light bulb type) will save 376 kWh over its lifetime, thus avoiding 4.5 mg of mercury. If the bulb goes to a landfill, overall emissions savings would drop a little, to 4.2 mg. EPA recommends that CFLs are recycled where possible, to maximize mercury savings.

Table 1

Light Bulb Type	Watts	Hours of Use	kWh Use	National Average Mercury Emissions (mg/kWh)	Mercury from Electricity Use (mg)	Mercury From Landfilling (mg)	Total Mercury (mg)
CFL	13	8,000	104	0.012	1.2	0.4	1.6
Incandescent	60	8,000	480	0.012	5.8	0	5.8

Figure 1



Because CFLs also help to reduce greenhouse gasses, other pollutants associated with electricity production, and landfill waste (because the bulbs last longer), they are clearly the environmental winner when compared to traditional incandescent light bulbs.

### **What precautions should I take when using CFLs in my home?**

CFLs are made of glass and can break if dropped or roughly handled. Be careful when removing the bulb from its packaging, installing it, or replacing it. Always screw and unscrew the light bulb by its base (not the glass), and never forcefully twist the CFL into a light socket. If a CFL breaks in your home, follow the clean-up recommendations below. Used CFLs should be disposed of properly (see below).

### **What should I do with a CFL when it burns out?**

EPA recommends that consumers take advantage of available local recycling options for compact fluorescent light bulbs. EPA is working with CFL manufacturers and major U.S. retailers to expand recycling and disposal options. Consumers can contact their local municipal solid waste agency directly, or go to [www.epa.gov/bulbrecycling](http://www.epa.gov/bulbrecycling) or [www.earth911.org](http://www.earth911.org) to identify local recycling options.

If your state or local environmental regulatory agency permits you to put used or broken CFLs in the garbage, seal the bulb in two plastic bags and put it into the outside trash, or other protected outside location, for the next normal trash collection. Never send a fluorescent light bulb or any other mercury-containing product to an incinerator.

If your ENERGY STAR qualified CFL product burns out before it should, look at the CFL base to find the manufacturer's name. Visit the manufacturer's web site to find the customer service contact information to inquire about a refund or replacement. Manufacturers producing ENERGY STAR qualified CFLs are required to offer at least a two-year limited warranty (covering manufacturer defects) for CFLs used at home. In the future, save your receipts to document the date of purchase.

### **How should I clean up a broken fluorescent bulb?**

Because CFLs contain a small amount of mercury, EPA recommends the following clean-up and disposal guidelines:

#### **1. Before Clean-up: Air Out the Room**

- Have people and pets leave the room, and don't let anyone walk through the breakage area on their way out.
- Open a window and leave the room for 15 minutes or more.
- Shut off the central forced-air heating/air conditioning system, if you have one.

## **2. Clean-Up Steps for Hard Surfaces**

- Carefully scoop up glass fragments and powder using stiff paper or cardboard and place them in a glass jar with metal lid (such as a canning jar) or in a sealed plastic bag.
- Use sticky tape, such as duct tape, to pick up any remaining small glass pieces and powder.
- Wipe the area clean with damp paper towels or disposable wet wipes. Place towels in the glass jar or plastic bag.
- Do not use a vacuum or broom to clean up the broken bulb on hard surfaces.

## **3. Clean-up Steps for Carpeting or Rug:**

- Carefully pick up glass fragments and place them in a glass jar with metal lid (such as a canning jar) or in a sealed plastic bag.
- Use sticky tape, such as duct tape, to pick up any remaining small glass fragments and powder.
- If vacuuming is needed after all visible materials are removed, vacuum the area where the bulb was broken.
- Remove the vacuum bag (or empty and wipe the canister), and put the bag or vacuum debris in a sealed plastic bag.

## **4. Clean-up Steps for Clothing, Bedding, etc.:**

- If clothing or bedding materials come in direct contact with broken glass or mercury-containing powder from inside the bulb that may stick to the fabric, the clothing or bedding should be thrown away. Do not wash such clothing or bedding because mercury fragments in the clothing may contaminate the machine and/or pollute sewage.
- You can, however, wash clothing or other materials that have been exposed to the mercury vapor from a broken CFL, such as the clothing you are wearing when you cleaned up the broken CFL, as long as that clothing has not come into direct contact with the materials from the broken bulb.
- If shoes come into direct contact with broken glass or mercury-containing powder from the bulb, wipe them off with damp paper towels or disposable wet wipes. Place the towels or wipes in a glass jar or plastic bag for disposal.

## **5. Disposal of Clean-up Materials**

- Immediately place all clean-up materials outdoors in a trash container or protected area for the next normal trash pickup.
- Wash your hands after disposing of the jars or plastic bags containing clean-up materials.
- Check with your local or state government about disposal requirements in your specific area. Some states do not allow such trash disposal. Instead, they require that broken and unbroken mercury-containing bulbs be taken to a local recycling center.

## **6. Future Cleaning of Carpeting or Rug: Air Out the Room During and After Vacuuming**

- The next several times you vacuum, shut off the central forced-air heating/air conditioning system and open a window before vacuuming.
- Keep the central heating/air conditioning system shut off and the window open for at least 15 minutes after vacuuming is completed.

### **What is mercury?**

Mercury is an element (Hg on the periodic table) found naturally in the environment. Mercury emissions in the air can come from both natural and man-made sources. Coal-fired power plants are the largest man-made source because mercury that naturally exists in coal is released into the air when coal is burned to make electricity. Coal-fired power generation accounts for roughly 40 percent of the mercury emissions in the U.S.

The use of CFLs reduces power demand, which helps reduce mercury emissions from power plants.

For more information on all sources of mercury, visit <http://www.epa.gov/mercury>

For more information about compact fluorescent bulbs, visit <http://www.energystar.gov/cfls>

EPA is continually reviewing its clean-up and disposal recommendations for CFLs to ensure that the Agency presents the most up-to-date information for consumers and businesses.
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