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Frequently Asked Questions
Information on Compact Fluorescent Light Bulbs (CFLs) and Mercury
November 2010

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 (mg). 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 or more in the past several years. Some manufacturers have even made further reductions, dropping mercury content to 1 mg per light bulb.

What are mercury emissions caused by humans?

EPA estimates the U.S. is responsible for the release of 103 metric tons[1] of mercury emissions each year. More than half 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[2] – is released into air or water when it is sent to a landfill, assuming the light bulb is broken. Therefore, if all 272 million CFLs[3] sold in 2009 were sent to a landfill (versus recycled, as a worst case) – they would add 0.12 metric tons, or 0.12 percent, to U.S. mercury emissions caused by humans.

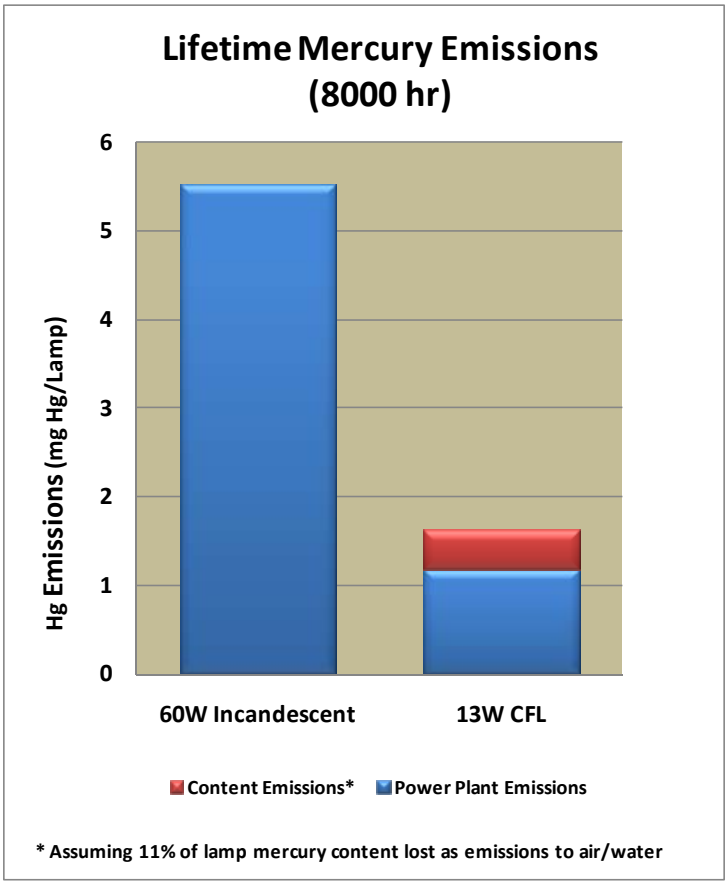
How do CFLs result in less mercury in the environment compared to traditional light bulbs?

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 4.3 mg of mercury. If the bulb goes to a landfill, overall emissions savings would drop a little, to 3.9 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	0.44	1.6
Incandescent	60	8,000	480	0.012	5.5[4]	0	5.5

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 cleanup 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 epa.gov/cfl/cflrecycling.html or 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 scheduled 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? [5]

Fluorescent light bulbs contain a small amount of mercury sealed within the glass tubing. When a fluorescent bulb breaks in your home, some of this mercury is released as mercury vapor. To minimize exposure to mercury vapor, EPA recommends that residents follow cleanup and disposal steps. A cleanup overview is described below; please visit epa.gov/cfl/cflcleanup.html for more information.

CLEANUP AND DISPOSAL OVERVIEW

The most important steps to reduce exposure to mercury vapor from a broken bulb are:

1. Before cleanup
   a. Have people and pets leave the room.
   b. Air out the room for 5-10 minutes by opening a window or door to the outdoor environment.
   c. Shut off the central forced air heating/air conditioning (H&AC) system, if you have one.
   d. Collect materials needed to clean up broken bulb.

2. During cleanup
   a. Be thorough in collecting broken glass and visible powder.
   b. Place cleanup materials in a sealable container.

3. After cleanup
   a. 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.
   b. For several hours, continue to air out the room where the bulb was broken and leave the H&AC system shut off.

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 51 percent[6] 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 cleanup 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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[1] Source: U.S. EPA 2005 National Emissions Inventory.
[2] Source: Cain, A., S. Disch, C. Twaroski, J. Reindl, C. R. Case. Substance Flow Analysis of Mercury Intentionally Used in Products in the United States. *Journal of Industrial Ecology*. Volume 11, Issue 3, pages 61–75, July 2007.
[3] Source: U.S. Federal Trade Commission – USA Trade Online /Stat USA.
[4] Energy Information Administration data averaged over a five-year period.
[5] This document contains information designed to be useful to the general public. This document does not impose legally binding requirements, nor does it confer legal rights, impose legal obligations, or implement any statutory or regulatory provisions. This document does not change or substitute for any statutory or regulatory provisions. This document presents technical information based on EPA's current understanding of the potential hazards posed by breakage of mercury-containing fluorescent lamps (light bulbs) in a typical household setting. Finally, this is a living document and may be revised periodically without public notice. EPA welcomes comments on this document at any time and will consider those comments in any future revisions of this document.
[6] Source: U.S. EPA 2005 National Emissions Inventory.