

Lights Out for Thomas Edison

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The Energy Independence and Security Act of 2007 will soon ban the most common light bulbs in the United States. New efficiency standards will require manufacturers to produce incandescent bulbs that use less energy per unit of light produced, starting with 100-watt incandescent bulbs in 2012, down to 40-watt bulbs in 2014.



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Under the new standards:

- 100-watt light bulbs are banned entirely.
- 70-watt light bulbs will have to be 36 percent to 136 percent more efficient.
- 50-watt bulbs must be 50 percent to 112 percent more efficient.
- 40-watt bulbs will have to improve 50 percent to 110 percent.

Incandescent bulbs cannot meet these new standards absent a significant technological breakthrough. Thus, the common light bulb will soon be extinct.

Illuminating Efficiency. The alternative for most household uses will be compact fluorescent lights (CFLs) designed to fit standard incandescent bulb bases. CFLs currently make up only 5 percent of the light bulb market. They have been touted for years as the smart choice for consumers interested in reducing their energy bills, due to their extended lifespan and low energy use vis-à-vis the equivalent light output from an incandescent. For example, a 60-watt incandescent bulb produces 850 lumens — the same light output as a 13-watt to 18-watt CFL. Unfortunately, except under a fairly narrow range of circumstances, CFLs are less efficient than advertised. Manufacturers claim the average life span of a CFL bulb is 10,000 hours. However, in many applications the life and energy savings of a CFL are significantly lower:

- CFLs must be left on for at least 15 minutes or used for several hours per day to achieve their full energy saving benefits, according to the Environmental Protection Agency (EPA).
- Applications in which lighting is used only briefly (such as closets, bathrooms, motion detectors and so forth) will cause CFL bulbs to burn out as quickly as regular incandescent bulbs.
- CFLs often become dimmer over time — a study of U.S. Department of Energy “Energy Star” products found that after 40 percent of their rated service life, one-fourth of tested CFLs no longer produced the full amount of light.

At about \$3 per bulb, CFLs are expensive, whereas incandescent bulbs cost only 20 cents per bulb, on average. And there are other drawbacks. For instance:

- When initially switched on, CFLs may provide as little as 50 percent to 80 percent of their rated light output and can take up to three minutes to reach full brightness.
- CFLs often don’t fit existing light fixtures, such as small-base lamps and candlelabras, so these will have to be replaced.
- Standard CFLs will not operate at low temperatures, making them unsuitable for outdoor lighting.
- CFLs can emit an annoying buzz.
- CFLs emit infrared light that can interfere with remote-controlled devices, such as televisions, video games and stereo equipment.

CFLs are simply unsuited for many common uses. The new law therefore excludes whole classes of light bulbs from the standards, including appliance light bulbs (ovens and

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refrigerators), flashing and colored lights, traffic signals, shatter-resistant bulbs, three-way adjustable bulbs and so forth.

Hidden Dangers of CFLs. CFLs contain potentially toxic mercury. Thus, there are health and environmental concerns regarding their proper disposal. Shattered CFLs in municipal landfills have the potential to leach mercury into the soil. Over time this mercury could seep into the groundwater or nearby streams. For this reason, a number of states and localities have outlawed disposing CFLs with normal trash — instead, consumers must take their used CFLs to authorized hazardous waste disposal sites.

The EPA recommends recycling CFLs. However, curbside recycling is not available everywhere and often doesn't include CFLs. Recycling fa-

cilities that accept CFLs are not common within major metropolitan areas, much less in rural areas where on-site incineration or trenches are often used — both of which release mercury into the atmosphere.

Perhaps even more important is the danger of broken CFLs in the home. The EPA has provided detailed guidelines to avoid unsafe indoor mercury levels [see the sidebar].

Cleaning up mercury from a shattered CFL can be costly. For example, when a CFL broke in her daughter's bedroom, Brandy Bridges of Prospect, Maine, called on the state's Department of Environmental Protection to make sure she cleaned up the broken glass and mercury powder safely. A specialist found unsafe levels of mercury in the air and recommended an environmental cleanup

firm, who estimated the clean up cost of at \$2,000. Because her mother was unable to pay the exorbitant cleaning bill, the girl's room remained sealed off in plastic for more than a month.

Conclusion. Consumers consider many factors in addition to energy efficiency when they purchase light bulbs. The ban on incandescent bulbs will be costly and potentially dangerous. The public has not yet embraced CFLs, and the government should not impose on consumers its preferences regarding the types of lights used in the home. As the deficiencies of CFLs become more apparent with widespread use, perhaps Congress will let consumers decide.

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WHEN A COMPACT FLUORESCENT BREAKS

Before cleanup: Vent the room

1. Open a window and leave the room for 15 minutes or more.
2. Shut off the central forced-air heating/air conditioning system.

Cleanup steps for hard surfaces

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

Cleanup steps for carpeting or rug

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

Disposal of cleanup materials

7. Immediately place all cleanup materials outside the building in a trash container or outdoor protected area for normal trash pickup.
8. Wash your hands after disposing of the jars or plastic bags containing cleanup materials.
9. Check with your local or state government about disposal requirements in your specific area. Some states prohibit such trash disposal and require that broken and unbroken lamps be taken to a recycling center.

Future cleaning of carpeting or rug

10. For at least the next few times you vacuum, shut off the central forced-air heating/air conditioning system and open a window prior to vacuuming.
11. Keep the central heating/air conditioning system shut off and the window open for at least 15 minutes after vacuuming.

Source: U.S. Environmental Protection Agency.

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