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Recycling Household CFLs

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Since the 1940s, consumers have installed fluorescent lighting in their garages, kitchens, bathrooms, utility rooms, and recreation rooms. In the 1980s, lamp manufacturers developed a smaller, compact version of the fluorescent lamp as an alternative to incandescent bulbs for other areas of the home.

During the past ten years, technological advances in compact fluorescent lamp technology has greatly improved light quality, eliminated flickering, reduced size, reduced warm-up time, and reduced cost. As a result, the use of compact fluorescent light (CFL) in homes has skyrocketed during the past few years. Industry and government sources have heralded the CFL as a major solution to consumers' energy woes.

Growing market penetration of energy-efficient lighting products, however, has generated increased concern over their disposal. CFLs, like other fluorescent lamps, contain a small amount of mercury that is necessary to create light. To date, manufacturers have not been able to identify an energy-efficient substitute for the mercury. Because studies indicate that long-term exposure to large amounts of mercury vapor can pose health risks, questions arise about the small amount of mercury contained in fluorescent lamps.

HOW SMALL IS SMALL?

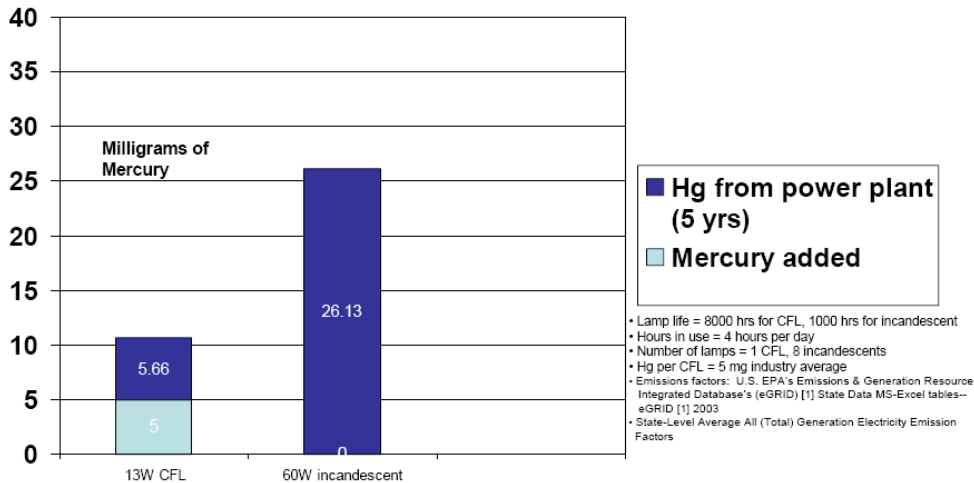
The amount of mercury in a compact fluorescent lamp is extremely small. So small, that all of the mercury contained in a CFL can fit into the tip of a pen. To insure that this amount stays small, in April 2007 NEMA members agreed to a maximum mercury content for CFLs of no more than 5 mg for standard wattages¹. This commitment represents a ceiling—the actual average is estimated to be about 3–4 mg. Assuming a mercury level of 3 mg, one pound of mercury would make 150,000 CFLs. According to the U.S. Environmental Protection Agency (EPA), CFLs account for about 0.01% of anthropogenic emissions of mercury. An oral mercury thermometer, in comparison, contains 500 mg to 1 gram of mercury—or 100 to 200 times more than a CFL.

NET MERCURY BENEFIT

Using CFLs has a net environmental benefit. In the U.S., more than half of our electricity is generated from coal-burning power plants. Burning coal releases many air pollutants, as well as airborne mercury. Four to five times as much mercury is emitted into the air to generate the electricity needed to run a standard light bulb than a CFL, since CFLs are much more energy efficient.

¹ This applies to CFLs with wattages up to 25W. A maximum of 6 mg applies to CFLs with higher wattages.

Mercury Total Over 5 Years Compact Fluorescent Lamp vs. Incandescent



Even with the mercury added to the CFL, there is less mercury vapor release associated with them than standard bulbs. Furthermore, unless the CFL breaks, the mercury is fully contained within the bulb. And even if the CFL lamp breaks, only a very small percentage of the mercury will be released as a vapor, the majority of the mercury will remain with the lamp fragments.

WHAT ABOUT DISPOSAL?

The incredible expansion in sales of CFLs has led to a concern about their disposal. While CFLs last about seven to ten years, they have been around for some time. Sales of CFLs are estimated to be about 200 million in 2007. This number is projected to increase and could more than double in the future if stringent energy-efficiency regulations are placed on standard incandescent bulbs, as some lawmakers have proposed.

This growth in sales, use, and ultimately disposal of CFLs has substantial cost implications, as EPA estimates the cost of properly recycling bulbs to be from \$0.50 to \$2.00 per unit. This makes recycling an extremely expensive disposal option that is difficult to implement cost-effectively, given the small amount of mercury contained in CFLs.

NEMA SUPPORTS LAMP RECYCLING

Bulb manufacturers support efforts to recycle lamps as a way to reduce mercury vapor in the environment. Since 2003, NEMA has maintained www.lamprecycle.org, which provides a one-stop source for lamp recycling information nationwide. The website contains a list of recyclers as well as links to all state websites with information about bulb management. Recyclers and others actively promote the use of this website. Manufacturers are also labeling bulb packages with information about recycling and a toll-free number, along with the industry website. And manufacturers label all mercury-containing lamps with an Hg

symbol enclosed in a circle to allow the user to easily identify lamps that contain mercury. Finally, individual companies also have their own bulb-recycling promotion efforts.

EXISTING RECYCLING OPTIONS

While consumer lamp recycling options are limited today, they continue to improve each year. Industry is working with numerous stakeholders to help increase consumer lamp-recycling options. Some lamp recycling options for consumers have developed independently in several areas. Examples include the following.

- Utility collection programs exist in Maine and Minnesota. Run by utilities or efficiency partnerships, these programs pay for the CFL recycling and recruit local retailers to offer collection.
- Retailers such as IKEA recycle CFLs at no cost at their store locations. Other retailers, such as Wal-Mart are running one-day events and testing different options.
- Pilot programs in Vermont and New Hampshire utilize various funding sources to offer free collection at hardware stores throughout the states.
- The U.S. Postal Service announced plans to conduct a recycling pilot project in October 2007 at local post offices.
- Dane County, Wisconsin, requires lamps to be recycled and has established a network of more than 50 retail establishments that take back lamps from consumers.
- Many household hazardous waste collection centers will accept fluorescent lamps from consumers for recycling. See www.epa.gov/bulbrecycling for a list of household hazardous waste collection centers by state.

State and local governments are also becoming more active in growing consumer awareness of the need to recycle mercury-added lamps. The state of Minnesota, for example, has passed a law requiring retailers who sell fluorescent lamps to post the following notice in 36-point type or larger: "Fluorescent bulbs save energy and reduce environmental pollution. Note: Fluorescent bulbs contain a small amount of mercury and must be recycled at the end of their use. Contact your county or utility for recycling options."

EPA CFL RECYCLING STUDY

The EPA has initiated an effort to study all of the legal, technical, financial, and communication issues involved in any CFL-recycling effort. The intended outcome of the study is a recommendation of a cost-effective and reasonable approach to recycling CFLs.

PRODUCER RESPONSIBILITY

Some have argued that manufacturers should be responsible for financing and arranging the collection and recycling of CFLs. This is also called "Manufacturer Take-Back" or "Extended Producer Responsibility."

As discussed in detail in the NEMA White Paper entitled “Manufacturer Take-Back of Lamps,” manufacturer take-back systems are an ineffective and impractical approach for mercury containing lamps. The difficulties associated with such systems are magnified in the case of CFLs, which are a commodity product largely consumed and disposed by households. Manufacturer take-back requirements could actually result in greater emissions of mercury to the environment – exactly opposite of the goal it seeks to achieve.

Problems with manufacturer take-back of CFLs include the following.

- 1) **It would be very expensive for the consumer.** To cover the costs of both collection and recycling, manufacturers would need to add recycling costs, collection costs, and administrative overhead into the purchase price of a CFL.
- 2) **Manufacturers are not set up to collect CFLs.** Unlike retailers, manufacturers do not have multiple locations designed for direct interaction with consumers and thus cannot readily and cost-effectively arrange for collection of used products.
- 3) **Consumers would not benefit from efficiencies in the recycling system.** There is no way to determine today what the cost of recycling a CFL will be in seven to ten years, when it is ready for disposal. This makes it impossible for manufacturers to estimate recycling costs and build them into the price of their product.
- 4) **It will increase the cost of energy-efficient lighting.** Light bulbs are very price-sensitive and recycling costs can add as much as 150 percent to the price of a single bulb. This could dissuade consumers from buying them and thus slow the transition to more energy efficient lighting.
- 5) **Many stakeholders are designing recycling solutions.** Recycling programs are being designed and tested in several states through the efforts of local governments, retailers and utility programs to assist consumers in recycling their CFLs. Optimal solutions have not yet appeared, but it is clear that the most effective, cost-efficient approaches are those in which many or all stakeholders play a role.
- 6) **Lamp manufacturer take-back systems would be inefficient and duplicative.** As discussed in “Manufacturer Take-Back of Lamps,” manufacturer collection would cause many duplicative and non-competitive recycling systems to appear, which will raise recycling costs significantly.

CONCLUSION

CFLs benefit consumers and the environment. They save energy and produce cost-savings for the user. They also reduce air pollution and airborne mercury emissions from power plants. CFLs last six to twelve times longer than traditional incandescent lamps, which means fewer resources are consumed by their use and fewer lamps need to be disposed at end of life.

NEMA manufacturers are committed to work with lawmakers and other stakeholders to advance the market for CFLs and other energy efficient lighting technologies, and to find optimal solutions to the problem of disposing CFLs at end of life. We therefore support public policies designed to:

- Keep the cost of CFLs affordable to consumers,
- Develop sensible, cost-effective solutions for bulb collection and disposal that fit the widely variable circumstances of consumers nationwide,
- Provide a variety of consumer lamp recycling options,
- Involve multiple stakeholders in the effort to design recycling solutions and establish programs,
- Build upon the existing recycling infrastructure, and
- Enable recyclers to pass the true cost of recycling to consumers and other stakeholders, allowing for price reductions as volumes increase and recycling technology improves.

In addition, because inconsistent, state-specific approaches create an unworkable framework for effective recycling programs, NEMA encourages the development of a national, federally mandated system for recycling CFLs that adheres to the aforementioned principles.