

Beyond Swirly Bulbs

Federal Regulations Spur New Lighting Options

On hot summer evenings children love chasing fireflies, often catching them in jars. Then the real magic begins, as the intermittent glow captivates the captors.

That same sense of wonder can be found in labs as scientists refine the process of making light-emitting diodes (LEDs)—highly efficient lightbulbs comparable to a fireflies' glow. LEDs have been commonly used as solitary sensor lights in electronics; now manufacturers are searching for economical ways to contain a colony of LEDs in a single lighting shell that would create enough light output (lumens) to match that of traditional incandescent bulbs.

This research is part of national effort aimed at redefining household lighting. Starting in January 2012, 100-watt (W) incandescent bulbs—a technology developed in the United States by Thomas Edison in 1878 and largely untouched since—must become more energy efficient.

Federal Mandate

Why the government push? The U.S. Energy Information Administration (EIA) estimates we use 13.6 percent of our nation's energy supply to keep the lights on, and a lot of that power is wasted. If you've ever touched a traditional lightbulb when it's on, you realized much of the energy (90 percent) is released as heat. This leaves a lot of room for improvement.

Addressing the issue of wasted energy, Congress passed the Energy Information and Security Act of 2007 (EISA). By 2014 household lightbulbs using between 40W and 100W will need to consume at least 28 percent less energy than traditional incandescents, which bill authors say will save Americans an estimated \$6 billion to \$10 billion in lighting costs annually. The law also mandates lightbulbs become 70 percent more efficient than classic bulbs by 2020 (LEDs already exceed this goal).

Look for Labels

Such a massive product change means consumers must switch from thinking about lightbulbs in terms of watts (amount of energy used) to lumens (amount of light produced.) Lumens, not watts, tell you how bright a light bulb is, no matter the type of bulb. The more lumens, the brighter the light.

Beginning in 2012, labels on the front and back of lightbulb packages will emphasize a bulb's brightness in

lumens, annual energy cost, and expected lifespan.

A Bulb Ban?

Contrary to popular belief, the federal law does not ban incandescent bulb technology; it requires bulbs use less energy.

“It’s equivalent to standards passed in the 1980s to make refrigerators more energy efficient, and we’re reaping those benefits,” remarks Brian Sloboda with the Cooperative Research Network (CRN), a division of the National Rural Electric Cooperative Association, the national trade arm of local electric co-ops. “Refrigerators use less than one-third of the electricity today than they did in the mid-1970s, but consumers can’t tell a difference in how their food is cooled. The premise is, why not do the same for lightbulbs?”

EISA halts the manufacture of inefficient lightbulbs, but stores will not remove tried-and true incandescent bulbs from shelves come New Year’s Day. Current inventory will still be available for sale until exhausted. And the improved efficiency requirements only apply to screw-based lightbulbs; specialty bulbs for appliances, heavy-duty bulbs, colored lights, and three-way bulbs are exempt.

Explore Your Options

Once traditional incandescents go the way of the passenger pigeon, residential bulbs will largely fit in three categories, each stacking up a bit differently:

- Halogen Incandescents: Use 25 percent less energy, last three times longer than regular incandescent bulbs
- Compact Fluorescent Lamps (CFLs): Use 75 percent less energy, can last up to 10 times longer
- LEDs: Use between 75 percent and 80 percent less energy, last up to 25 times longer

For consumers comfortable with their old incandescent bulbs, halogen incandescents will be an easy first step. Featuring a capsule of halogen gas around the bulb’s filament, they’re available in a variety of colors and can be dimmed.

The most familiar options on the market today—and most economical—are CFLs. The technology operates the same as fluorescent lighting in offices or the kitchen. The bulbs are now available in a wide array of colors and some can be dimmed. CFLs are generally best used anywhere where lighting is left on for extended periods and full brightness is not immediately necessary, such as family rooms, bedrooms, and common areas.

The final choice is LEDs. Although still developing, you can find LED lights, recessed fixtures, and some lower wattage replacement bulbs on store shelves. Currently, most residential LEDs are used for outdoor lighting where

fixtures are left on for extended periods and changing bulbs is not easily done.

LEDs are more expensive than other options: a replacement for a 60W incandescent bulb costs between \$30 and \$60. But costs should fall as manufacturers respond to growing consumer demand.

LEDs are not without their problems: They need to stay cool to operate efficiently, and when several bulbs are placed together for a brighter, more consumer-friendly light, lifespan decreases. However, many manufacturers are accounting for this by adding cooling elements to LED bulbs. Some bulbs feature a spine design to allow air to flow around the base; other models have fans built into the ballast.

Can You See a Difference?

The difference will be found on your monthly electric bill—more efficient bulbs use between 25 and 80 percent less energy than traditional incandescents, and last much longer. The U.S. Department of Energy claims each household can save \$50 a year by replacing 15 traditional incandescent bulbs.

To learn about lighting options, visit energysavers.gov/lighting. For details on the change and shopping tips visit ftc.gov/lightbulbs.— Megan McKoy-Noe, National Rural Electric Cooperative Association

Measuring Light in Lumens

New federal efficiency standards require lightbulbs to consume less electricity (measured in watts) for the amount of light produced (measured in lumens). Traditional 100W bulbs—typically incandescent bulbs—will give way to choices that use 72W or less to provide you a comparable amount of light. If you are replacing a 100W bulb, a good rule of thumb is to look for one that delivers about 1,600 lumens. As a result, a new bulb should provide that level of brightness for no more than 72W, cutting your energy bill.

As of January 1, 2012, traditional 100W incandescent lightbulbs will no longer meet efficiency standards and will no longer be available at most stores.* However, you will have other cost-saving options. Many of these choices are already on store shelves.

Efficiency standards will kick in for other types of lightbulbs over the next three years. Traditional 75W incandescent lightbulbs will no longer be available as of January 1, 2013; 40W and 60W versions will no longer be available as of January 1, 2014.* —U.S. Department of Energy

*The act specifically limits the import or manufacture of inefficient bulbs. Stores will be able to sell remaining inventory.