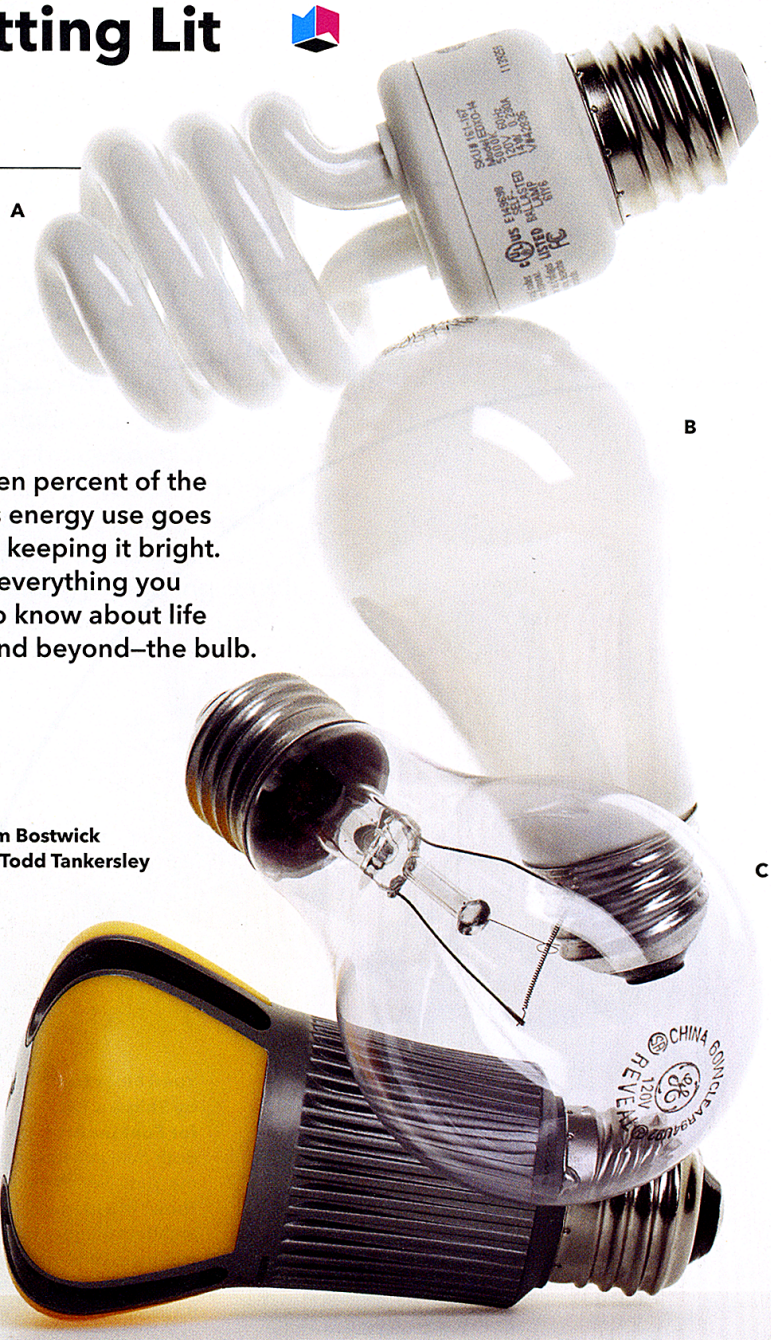
Getting Lit



Nineteen percent of the world's energy use goes toward keeping it bright. Here's everything you need to know about life with—and beyond—the bulb.

By William Bostwick
Photo by Todd Tankersley

1880 Thomas Edison patents the lightbulb.

1909 Edison patents his E27 lightbulb thread, first used on Shelby Electric Co.'s Mazda lamp.

1910 Tungsten becomes standard filament material.

1920s The lightbulb is first used as an icon for a "bright idea" in *Felix the Cat* cartoons.

1939 The fluorescent bulb is introduced at the New York World's Fair.

1962 GE gives the first practical demonstration of LEDs.

1975 GE makes and scraps physicist Ed Hammer's first CFL blub. The prototype is now in the Smithsonian.

1980 Philips releases a CFL.

1990s Ellis Yan starts mass-producing CFLs in China. GE brings back Hammer's bulb.

2007 Energy Independence and Security Act starts phasing out incandescents in the United Sates.

2008 Philips introduces the Ledino LED bulb in Europe. It costs $107.

2010 GE closes its last American incandescent bulb factory.

2011 Philips debuts the $40 AmbientLED, a 12-watt bulb that burns like a 60.

2012–14 100-, 75-, 60-, and 40-watt incandescent bulbs are banned in the USA.

Bulb Report

Each of the following four lightbulbs burns about as bright as a standard 60-watt incandescent, with the same 2,700 Kelvin "soft white" color temperature. Efficacy, the term used by lighting manufacturers for a bulb's overall efficiency, measures the lumens produced per watt of power used.

A. CFL

Compact fluorescent lamps glow when electricity passes through mercury vapor. Hazardous when broken, they're cheap, bright, and efficient when intact.

EcoSmart 14-Watt Household CFL
Price: $8
Energy consumption: 14 watts
Light output: 850 lumens
Life span: 10,000 hours
Efficacy: 61

B. HALOGEN

Technically incandescents souped up with halogen vapor, these bulbs burn hotter and brighter without wearing out.

Sylvania SuperSaver Soft White
Price: $3
Energy consumption: 43 watts
Light output: 745 lumens
Life span: 1,000 hours
Efficacy: 18

C. INCANDESCENT

These bulbs burn with a pleasingly full spectrum thanks to a resistive tungsten filament that flares when electricity courses through it.

GE Reveal 60-Watt
Price: $2
Energy consumption: 60 watts
Light output: 630 lumens
Life span: 1,000 hours
Efficacy: 11

D. LED

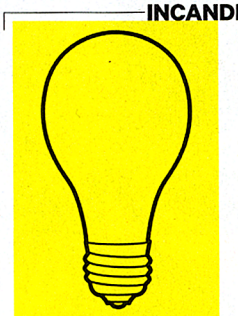
As solid-state lights—no gas here—LEDs have just a piece of semiconductor crystal in which electrons bounce and glow.

Philips AmbientLED 12-Watt
Price: $25
Energy consumption: 12 watts
Light output: 800 lumens
Life span: 25,000 hours
Efficacy: 67

BATTLE OF THE BULBS

Our panel of testers assessed two LEDs, two CFLs, and two incandescents—all 60 watts or equivalent—to separate the light from the hype. —*D.K.*

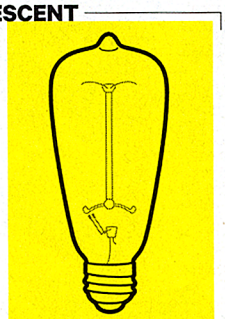
INCANDESCENT



PHILIPS SOFT WHITE 57 WATT

This is part of a new wave of incandescents that come in at slightly lower wattages than their claimed equivalents (to comply with California law requiring greater—but not great—efficiency). Light quality was best in test, with the classic softness that has made it so hard for us to quit incandescents. But it did seem dimmer than a full 60. And it's rated for only 11 months at three hours per day. **WIRED**: Price is right. Natural light color. **TIRED:** Inefficient. A bit dim.

$2 for four 6/10

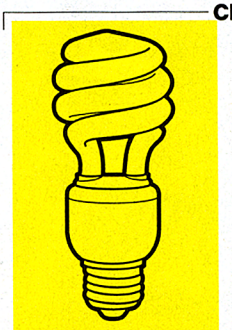


FEIT ELECTRIC VINTAGE STYLE CARBON FILAMENT BULB

This replica of an early Edison product wins points for aesthetics, with its elongated shape and ribbonlike loops of carbon filament. It's perfect if you've got lots of antiques or live in a restored Victorian—or if you're a retro-grouch /hipster. It casts a beautiful, warm light, just not very much of it; we rated it dimmest in our test. **WIRED:** Awesome throwback chic and natural hue. **TIRED:** Generally sells for three times suggested retail.

$6 6/10

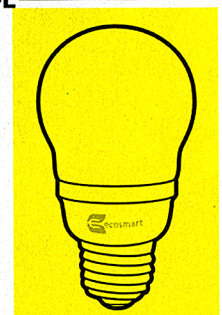
CFL



GE ENERGY SMART 13 WATT

One of the most popular CFLs on the market, this twister from GE is Energy Star rated, meaning that its claims of lifetime (8,000 hours), brightness (825 lumens), and color temperature (an incandescent-like 2,700 Kelvin) have been independently tested. We rated it the second-dimmest bulb in our roundup, but the excellent soft-white light was the best we've ever experienced from a CFL. **WIRED:** Outstanding light color. Long lasting. **TIRED:** Undimmable. Like all CFLs, it contains mercury.

$4 6/10

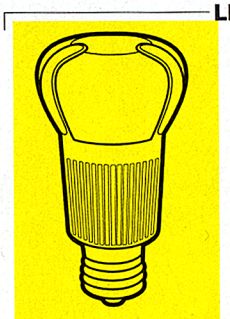


ECOSMART DAYLIGHT A19 60-WATT EQUIVALENT

Despite a worst-in-test 700 lumens (claimed) on a 14-watt draw, the EcoSmart didn't seem particularly dim. And the globelike casing around the coil gave this CFL a nice, even glow. Too bad the light was such a disagreeable blue-gray that we couldn't wait for the test to be over. It felt like being stuck in a Darren Aronofsky movie. **WIRED:** The rare bulb that appears brighter than advertised. **TIRED:** Daylight in name only. Undimmable. Contains mercury.

$9 for two 2/10

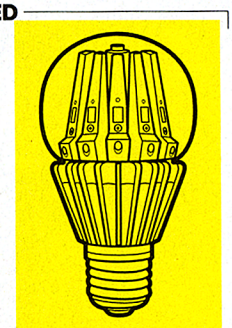
LED



PHILIPS AMBIENT

The first commercially available 60-watt-equivalent LED, this striking bulb has double the life (a claimed 15 years) of a comparable CFL. Our panel ranked it at or near the top for brightness and color of light (a nearly incandescent soft white), though opinions were mixed on its yellow color when the 8-ounce bulb is turned off. **WIRED:** First-to-market bragging rights. Dimmable. Superb light and longevity. Conversation piece. **TIRED:** Expensive. Slightly odd shape means it may not fit in certain light fixtures.

$40 8/10



SWITCH60 WARM WHITE

The clear winner in terms of aesthetics, the Switch was also the brightest bulb in our test. The warm light it cast was comparable to any incandescents we've seen, but it was hotter to the touch than any of the others—a function of the liquid cooling that transfers the heat up through the glass—and, at 10 ounces, the heaviest. **WIRED:** 20,000-hour lifetime (claimed). The choice for design nerds. Surprisingly bright. **TIRED:** Hot and relatively heavy. Ten times heavier than an incandescent.

$30 8/10

HOW TO BUY A LIGHTBULB IN 2011

These days, a browse through the lighting aisle at Home Depot is likely to leave you baffled. Here are the terms you need to know. —*D.K.*

LUMENS
The amount of light a bulb produces. Depending on which government agency you ask, this is "brightness" or "light output." Your reference point: A standard 100-watt incandescent produces about 1,700 lumens.

WATTS
Not a measure of brightness; instead, it's a measure of how much energy a bulb consumes to reach its claimed brightness.

WATT-EQUIVALENT
Since we've conflated watts and brightness, it's easier to talk about bulbs in terms of watts. So if a 100-watt incandescent produces 1,700 lumens, and a 20-watt LED does the same, the LED will be sold as a 100-watt equivalent.

EFFICACY
The number of lumens a bulb produces for each watt it consumes. The higher the number, the more efficient the bulb. A good number for incandescents is around 18, CFLs around 60, and LEDs around 54.

BULB LIFE
LEDs dim over time. They're considered effectively dead when they produce no more than 70 percent of their original brightness. For LEDs, this lifespan is given in hours or years, the latter an estimate based on three hours of daily use.

ENERGY COST
Based on an assumption of three hours of use per day at 11 cents per kilowatt-hour. For a 60-watt incandescent, it's just over $7 per year. CFLs and LEDs both come in at about $1.50 per year.

COLOR TEMPERATURE
Expressed in degrees Kelvin, this is how we measure things like soft white or daylight. A pleasant soft white will have a color temperature of 3,000 K. White light ranges from 4,100 to 6,000 K, roughly equal to midday sun. Higher numbers get increasingly blue.