

THE SKINNY

Energy Efficient Lighting



Lighting accounts for about one fourth of all electricity consumed in the US and offers one of the simplest and most cost effective ways to capture efficiency savings. Incandescent lighting technology has remained essentially unchanged since it was invented by Thomas Edison in 1879, when electricity was cheap and nobody knew what global warming was. Today, Australia, the European Union and California are all looking to phase out incandescent lighting in favor of more efficient options.

Incandescent bulbs are little heaters in disguise; they convert about 90% of the electricity they use to heat and only about 10% to visible light. If every household in the US exchanged four 100-watt incandescent bulbs with compact fluorescent bulbs (CFLs) it would save the energy equivalent of seven million cars and lower annual carbon dioxide emissions by about 125 billion pounds.

WHAT TO KNOW ABOUT CFLS

Replacing incandescent bulbs with CFLs is one of the easiest and most effective ways to save energy. CFLs use about 75% energy than incandescent bulbs and last up to 10 years. Each CFL you install can save more than \$50 in electricity costs over the life of the bulb.

The cost of CFLs has come down substantially over the past decade, even as quality and selection have increased. Today's CFLs have better color rendering and lighting quality and are available in many different types, shapes and wattages. When purchasing CFLs, be sure to look for the appropriate bulb for your needs. For example, dimmable, 2-way, 3-way, or outdoor fixtures require CFLs specifically designed for these purposes. To maximize the bulb's energy savings, install CFLs where you keep the lights on the most.






Color Rendering Index (CRI): CRI expresses the impact of different light sources on the perceived color of objects and surfaces. The highest CRI rating is 100, the CRI rating of incandescent bulbs. Most CFLs have CRI ratings of above 80 -- which are considered high. Choose one with a higher CRI if showing true colors is important to you.

Color Temperature: Color temperature conveys the spectral properties of a light source. Lower color temperatures imply warmer light (more yellow/red) while higher color temperature implies a colder light (more blue). If you like warmer light, choose CFLs with 2600K-2800K. If you like a colder, office-like light, choose CFLs with 4000K -5000K.

Lumen: A lumen is a measure of the light produced by a lamp. The higher the lumen rating, the greater the light output. To get a CFL with the right amount of light, choose one that offers the same lumen rating as the light you are replacing.

Lamp Life: Some CFLs last longer than others. Choose one with a longer life rating.

Common CFL Bulb Shapes

Torpedo 	Often used for chandeliers. Usually available with a medium or candelabra base.
Spiral 	Most commonly known CFL shape. Available in almost the same sizes as incandescent bulbs.
A-Shape 	Designed to be as similar in shape to a traditional bulb as possible.
Globe 	Available in different sizes. Usually available with a medium or candelabra base.
Flood/PAR 	Often used for down light in recessed cans and track lighting. PAR works great in accent lighting.

Mercury Content: A CFL bulb contains about 3-5 milligrams of mercury. While this is far less than coal power plants emit to provide an equivalent amount of incandescent lighting, care should be taken in the disposal of CFLs. At the end of their useful life, CFLs should be disposed of at a household hazardous waste facility. If a bulb breaks, do not vacuum; sweep up all the glass and fine particles and place them in a sealed plastic bag. Open windows and doors for ventilation.

WHERE TO DISPOSE OF CFLs

If you're a Boulder County resident, drop off burnt out CFLs free at the household hazardous waste facility located in the southeast corner of Western Disposal Services Waste Transfer Station at 5880 Butte Mill Road, east of Boulder.

For information on hours of operation, items accepted, etc., call the HHW Hotline at 303.441.4800 or visit:
www.co.boulder.co.us/recycling/hhw/hhwhome.htm

THE SKINNY ON LEDs

Light Emitting Diodes or LEDs are the next big innovation on the horizon for household lighting. They are more efficient, contain no mercury and can last 10 times longer than CFLs. They are not appropriate for every application, however. Standard LEDs are not quite as bright as a traditional bulb, but the lighting quality is closer to daylight. Plus they work with dimmers. They give off a very direct field of light, which makes them most useful for task lighting or when aimed directly at what you want to light. LED bulbs are harder to find and more expensive than CFLs. But several different types are available on-line – an LED accent light goes for about \$15-\$23 and an outdoor floodlight about \$45 to \$60. Under cabinet light strips run about \$80-\$135.

	Incandescent Bulbs	CFL	LED
Life Span (in hours)	1,500	10,000	60,000
Watts	60	14	6
Cost per unit	\$1.345	\$2.98	\$54.95
KWh of electricity used over 60k hours	3,600	840	360
Electricity Cost @ \$.10/kWh	\$360.00	\$84.00	\$36.00
Bulbs needed for 60k hours of usage	40	6	1
Equivalent 60k hour bulb expense	\$53.80	\$17.88	\$54.95
Total 60,000 Hour Lighting Expense	\$413.80	\$101.88	\$90.95
<i>Estimated Household savings over 60,000 hours (energy + replacement)*</i>			
Household cost	\$12,414.00	\$3,056.40	\$2,728.50
Savings by switching from Incandescent	\$0.00	\$9,357.60	\$9,685.50
<i>Monthly household energy savings</i>			
KWh used per month	270	63	27
Electricity Cost (@ \$0.10 per KWh)	\$27.00	\$6.30	\$2.70
Savings by switching from Incandescent	\$0.00	\$20.70	\$24.30
<i>Annual household energy savings</i>			
KWh used per year	3,285	767	329
Electricity Cost (@ \$0.10 per KWh)	\$328.50	\$76.65	\$32.85
Savings by switching from Incandescent	\$0.00	\$251.85	\$295.65

* assumes 30 bulbs per home, 5 hours daily use, 30 days in month

LEARN MORE

Energy Star: www.energystar.org

Department of Energy: <http://www.eere.energy.gov/buildings/info/components/lighting/>