



Montana Pollution Prevention Program
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Compact Fluorescent Lights (CFLs) Make \$ense



Did you know Compact Fluorescent Light Bulbs (CFLs) can improve the lighting in your home and save you money? The standard incandescent bulbs currently lighting your home have changed very little from Thomas Edison's first light bulb in 1879. Only 10% of the energy used by these standard bulbs contributes to light; the other 90% is wasted as heat. In fact, incandescent lights burn hot enough to fry an egg!

And what about halogen lights? A typical halogen bulb burns at 1,000 degrees F. These old-fashioned light bulbs waste energy and can potentially cause burns or fires.

CFLs provide the same high-quality light as incandescent bulbs, but generally operate at temperatures of less than 100 degrees F. Why spend money heating rooms in your home with lighting?

A new generation of CFLs now meets the EPA ENERGY STAR program's stringent criteria for long-life, energy savings, start time, color and brightness. Available from a variety of manufacturers, ENERGY STAR labeled CFLs are bright, warm and cozy, featuring designs that distribute light symmetrically, providing high-quality, inviting light without the flickering and humming of older fluorescent bulbs. CFLs now come with a wide range of styles and features, including dimmable bulbs and outdoor bulbs.



Switching to compact fluorescents can add up to big savings. CFLs cost more up-front, but not over the long term. An incandescent light bulb costs 75 cents or less at the store, but it will typically cost six to ten times that for electricity over its relatively short (750-hour) life. This is because incandescent lights put out more heat than light.

Advanced technology enables CFLs to use 75% less energy than a standard incandescent bulb and last up to 10 times longer. This means that over the life of one CFL, you can avoid replacing up to 13 incandescent bulbs! The super efficient performance of CFLs also means you can save at least \$25.00 in energy costs over the life of each CFL that replaces an incandescent bulb.

*** Based on a minimum life of 6,000 hours at \$0.10 kWh.*

ENERGY STAR CFLs emit the same amount of light as standard bulbs, but have lower wattage ratings because they use less energy. Use the light output comparison guide at the below when replacing standard incandescent bulbs.

The cost comparison below shows the savings you can achieve by switching from incandescents to CFLs. If you know what your local costs are for CFLs, incandescents, and electricity rates you can calculate your expected savings using the savings calculator on the "Products" page of the ENERGY STAR website:

<http://www.energystar.gov>



A Tale of Two Light Bulbs

EQUAL LIGHT OUTPUT

Incandescent (watts)	CFL (watts)
40	14
60	20
75	25
100	32
150	50

COST COMPARISON

BULB:	Incandescent	Compact Fluorescent
Watts consumed	75W	18W
Rated lamp life	750 hours	10,000 hours
No. lamps used over 10,000 hours	13	1
kWh used over 10,000 hours	750 kWh	180 kWh
Cost per kWh (average)	\$0.083	\$0.083
Electricity cost per 10,000 hours	\$62.25	\$14.94
Cost per bulb	\$0.75	\$14.00
Bulb cost per 10,000 hours	\$9.75	\$14.00
Total life-cycle cost	\$72.00	\$28.94

Compact Fluorescent Lights Are Good for the Environment

According to the Rocky Mountain Institute (RMI), residential, commercial, industrial, and municipal lighting uses about 22 percent of all the electricity generated in the United States, and accounts for 39 million tons of carbon dioxide emissions.

RMI estimates that the technology already exists to cost-effectively save 50–90 percent of the power now consumed by lights in the United States.

That would save \$30 billion a year—enough electricity to retire 70 to 120 large power plants—and reduce carbon-dioxide emissions by 20 to 35 million tons per year.

Your Local Hardware Store Only Stocks One Style of CFL?
Try the Following Websites:

EPA's Energy Star Program

<http://www.energystar.gov/products/cfls/>

Real Goods

<http://www.realgoods.com/shop/shop3.cfm?dp=301>

Planetary Systems – Energy Efficient Lighting

http://www.planetarysystems.com/cat_efficient_lighting.html

Energy Conserving Lights

<http://energyconservinglights.com/CompactFluorescentBulbs.htm>

EcoMall

<http://www.ecomall.com/>

Positive Energy Green Builders Catalogue

<http://www.positive-energy.com/pages/LightingFlourescent2.html>

ABC Lights

<http://www.abclights.com/allbulbs2/globebulbs2.html>

Top Bulb

http://www.topbulb.com/find/prod_list.asp?intSubCategory=433

Bulbman

<http://www.bulbman.com/>

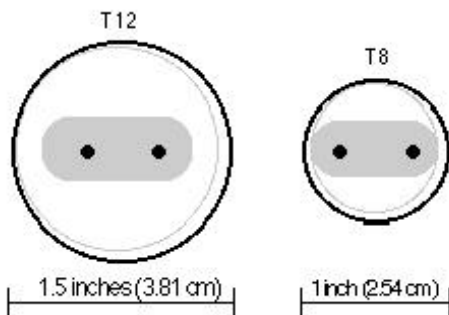


SOURCE: Rocky Mountain Institute
<http://www.rmi.org/sitepages/pid352.php>

Don't Forget to Upgrade Fluorescent Tubes

Replacing four T12 lamps and two standard magnetic ballasts with four T8 lamps and one electronic ballast can yield energy savings of as much as 40 percent with little or no reduction in light output.

Throughout the 1970s, manufacturers of fluorescent lamps introduced new products that were intended to use less electricity than common 40-watt fluorescent tubes with magnetic ballasts. In 1981, the 32-watt T8 lamp was



introduced in the United States, and today, the T8 lamp is becoming the standard for new construction and is increasingly popular as a retrofit replacement for 40-watt T12 lamps.

The name "T8" refers to the diameter of the tube in eighths of an inch. A standard T12 lamp is therefore one-and-one-half inches (3.81 cm), in diameter. A T8 lamp is one inch in diameter.

All major lamp manufacturers market T8 lamps, and they are readily available in the common 4-foot length, as well as 2-, 3-, 5-, and 8-foot lengths and in several U-shaped sizes. Both T12 and T8 lamps use the medium bi-pin base, which allows T8 lamps to fit into the same fixtures as T12 lamps of the same length.

T8 lamps require electronic ballasts which offer many advantages, such as reduced flicker, less heat, less noise,

and the ability to operate as many as four lamps on a single ballast; some offer dimming and better power quality characteristics.

T8 lamps also exhibit a slower decline in light output over time, relative to T12 lamps. At 40 percent of their rated life, standard T12 lamps only produce about 88 percent of their initial rated light output, compared to about 90 percent for T8 lamps. T8 lamps have the same 20,000-hour rated lamp life as standard T12 lamps.

T8 lamps have improved color characteristics compared to those of standard T12 lamps.

For applications where high light output is necessary, T8 lamps are also available in 4-foot, 36-watt versions that produce about 20 percent more light. These higher-wattage lamps require different ballasts than other T8 lamps.

ADVANTAGES of T-8 TUBES with ELECTRONIC BALLASTS

- Up to 40% more energy efficient
- Improved color characteristics
- Reduced flicker
- Less heat
- Less noise
- Slower decline in light output over time
- Up to 4 tubes can be operated on a single ballast

SOURCE: National Lighting Product Information Program NLPIP - 2001 NLPIP sponsors include: Energy Center of Wisconsin; Iowa Energy Center; Lighting Research Center; Northwest Energy Efficiency Alliance; New York State Energy Research and Development Authority; United States Department of Energy; United States Environmental Protection Agency; United States General Services Administration <http://www.lrc.rpi.edu/NLPIP/Online/>