



# Facts of Light

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About one-third of the electricity used by schools is for lighting. In homes, up to five percent of our total energy use is for lighting. In many homes, much of this light is still produced by **incandescent light bulbs**, using the same technology developed in 1879 by Thomas Edison. These bulbs are surprisingly inefficient, converting up to 90 percent of the electricity they consume into heat.

The Energy Independence and Security Act of 2007 changed the standards for the efficiency of light bulbs used most often. By 2014, most general use bulbs needed to be 30 percent more efficient than traditional, inefficient incandescent bulbs.

What do the standards mean for consumers? The purpose of the newer efficiency standards is to give people the same amount of light using less energy. Most incandescent light bulbs have been phased out and are no longer for sale. There are several lighting choices on the market that meet the new efficiency standards.

Energy-saving incandescent, or **halogen**, bulbs are different than traditional, inefficient incandescent bulbs because they have a

capsule around the **filament** filled with halogen gas. This allows the bulbs to last three times longer and use 25 percent less energy.

**Compact fluorescent light bulbs (CFLs)** use 75% less energy than incandescent bulbs and last up to ten times longer. These new bulbs fit almost any socket, produce a warm glow and, unlike the earlier models, no longer flicker and dim. Over the life of the bulbs, CFLs cost the average consumer about a quarter of the cost of traditional incandescent bulbs for the same amount of light. CFLs have a small amount of mercury inside and should always be recycled rather than thrown away. Many retailers recycle CFLs for free.

Once used mainly for exit signs and power on/off indicators, technology and lower prices are enabling **light emitting diodes (LEDs)** to be used in place of incandescents and CFLs.

LEDs are one of the most energy-efficient lighting choices available today. They use even less energy than a CFL and last 25 times longer than traditional incandescent bulbs. LEDs are currently the more expensive choice, but as demand continues to increase, their prices are expected to decrease accordingly.

## Cost of 25,000 Hours of Light

All bulbs provide about 850 **lumens** of light.



COST OF BULB	INCANDESCENT BULB	HALOGEN	COMPACT FLUORESCENT (CFL)	LIGHT EMITTING DIODE (LED)
Life of bulb (how long it will light)	1,000 hours	3,000 hours	10,000 hours	25,000 hours
Number of bulbs to get 25,000 hours	25 bulbs	8.3 bulbs	2.5 bulbs	1 bulb
<b>x</b> Price per bulb	\$0.50	\$3.00	\$3.00	\$15.00
<b>= Cost of bulbs for 25,000 hours of light</b>	<b>\$12.50</b>	<b>\$24.90</b>	<b>\$7.50</b>	<b>\$15.00</b>
COST OF ELECTRICITY	INCANDESCENT BULB	HALOGEN	COMPACT FLUORESCENT (CFL)	LIGHT EMITTING DIODE (LED)
Total Hours	25,000 hours	25,000 hours	25,000 hours	25,000 hours
<b>x</b> Wattage	60 watts = 0.060 kW	43 watts = 0.043 kW	13 watts = 0.013 kW	12 watts = 0.012 kW
<b>= Total kWh consumption</b>	<b>1,500 kWh</b>	<b>1075 kWh</b>	<b>325 kWh</b>	<b>300 kWh</b>
<b>x</b> Price of electricity per kWh	\$0.12	\$0.12	\$0.12	\$0.12
<b>= Cost of Electricity</b>	<b>\$180.00</b>	<b>\$129.00</b>	<b>\$39.00</b>	<b>\$36.00</b>
LIFE CYCLE COST	INCANDESCENT BULB	HALOGEN	COMPACT FLUORESCENT (CFL)	LIGHT EMITTING DIODE (LED)
Cost of bulbs	\$12.50	\$24.90	\$7.50	\$15.00
<b>+</b> Cost of electricity	\$180.00	\$129.00	\$39.00	\$36.00
<b>= Life cycle cost</b>	<b>\$192.50</b>	<b>\$153.90</b>	<b>\$46.50</b>	<b>\$51.00</b>
ENVIRONMENTAL IMPACT	INCANDESCENT BULB	HALOGEN	COMPACT FLUORESCENT (CFL)	LIGHT EMITTING DIODE (LED)
Total kWh consumption	1500 kWh	1075 kWh	325 kWh	300 kWh
<b>x</b> Pounds (lbs) of carbon dioxide per kWh	1.23 lb/kWh	1.23 lb/kWh	1.23 lb/kWh	1.23 lb/kWh
<b>= Pounds of carbon dioxide produced</b>	<b>1,845.0 lbs carbon dioxide</b>	<b>1,322.3 lbs carbon dioxide</b>	<b>399.8 lbs carbon dioxide</b>	<b>369.0 lbs carbon dioxide</b>