LED Lights

Save Money with New Technology

LED lights use far less energy, contain no mercury, are more durable and last much longer than other types of bulbs.

What are LEDs?

Light-emitting diodes (LEDs) are semiconductor diodes that emit light when conducting current. LEDs contain no filament like an incandescent bulb and no gaseous mix like fluorescent bulbs. Technology is moving toward LEDs as production costs decrease and efficiency increases. LEDs are extremely efficient. As shown in the approximate cost table on page two, switching to LEDs can save 80 percent of the electricity cost of operating an incandescent bulb. Incandescent bulbs transform 90 percent of input energy to heat and only 10 percent to light. Incandescents are like using a toaster to light a room, because the technology is the same. LEDs produce light much more efficiently and are not hot to the touch, unlike traditional bulbs.

Why Choose LEDs?

Switching to LED lighting has many advantages.

- The average residential customer spends about $16 each month on lighting. This would decrease to just more than $3 per month by switching from incandescent to LED, adding up to more than $150 in yearly savings.
- ENERGY STAR® certified LEDs will last 25 to 50 times longer than traditional incandescents. If used for four hours each day, some LED lights claim to last about 50,000 hours, or 35 years.
- Each actual light-emitting diode (LED) is about the size of a fleck of pepper and gives off very little heat, so the lights are cool to the touch.
- When using dimming technology, the average human eye cannot detect any change until the LED is at about 40 percent power, so dimmable LEDs are an additional way to save electricity.
- For holiday lighting, it costs about $122 to buy and operate incandescent C-9 string lights for 10 seasons, compared to $18 with LED.
- Customers could cut lighting electricity costs by 80 percent from switching just 15 bulbs from traditional incandescent to ENERGY STAR LED, as shown in the table on page two.

Switching to LED lights can save 80 percent of the electricity cost of operating an incandescent bulb.

LEDs in Centennial Park

BPW and the City of Holland created a joint project to install a state-of-the-art system of 48 dimmable LED lights, which replaced the 175-watt metal halide lights along the pathways in Centennial Park. The project is estimated to save $2,800 in yearly electricity costs. The new programmable lights will use 70 percent less energy and last four to five times longer than old halide lights. Holland's traffic signals and downtown pedestrian lights have also been converted to LED for energy savings.

How Much Can the U.S. Save with LEDs?

With widespread use of LED lighting, the United States could make huge energy efficiency gains over the next 20 years. With rapid adoption, the U.S. would:

- Avoid the need to build 40 power plants
- Reduce electricity demand for lighting by 33 percent
- Save 348 million megawatt hours of electricity (compared to no LED use)
- Deliver energy savings of approximately $265 billion

How to Choose the Right Bulb

LED bulbs can replace nearly any type of traditional incandescent bulb. There are many options are available for color and type and it is important to choose bulbs that are ENERGY STAR certified. The quality of uncertified LEDs may diminish over time.

- **Estimate the desired level of brightness.** Wattage differs by bulb type—a 60W incandescent bulb is equal in brightness (measured in lumens) to a 10W LED bulb. Bulb packaging will denote the wattage and lumens. Please see the table below for more information.
- **Decide where the light should be projected.** LED lights are directional, so if the lights are being used for a general area, light bulbs that diffuse light will do so to a broader area. For directional light, for example under cabinet lighting, bulbs that have no reflectors or diffusers would be best.
- **Look for certifications,** otherwise the bulbs may flicker, dim or die prematurely. Quality bulbs tend to be more expensive, but will last much longer and will pay off in the long run. (Data from eartheasy.com)

Comparing Wattage and Lumens By Bulb Type

Lumens Watts

All Bulbs	Incandescent	CFL	LED
400-500	40	8-12	6-9
650-900	60	13-18	9-12.5
1100-1750	75-100	13-18	9-12.5
1800-2780	100	23-30	16-20
2780	150	30-55	25-28

While wattage describes the operating power of the light bulb, lumens show the brightness of the bulb. It requires more power for an incandescent bulb to reach the same brightness as a CFL or LED bulb (data from eartheasy.com).

Because of these great savings, there are many incentives for switching to LED and other energy efficient lighting, including this give-away program for residents and rebate programs for businesses. Please visit www.mienergysmart.com for more ways to save. (Data from energy.gov).

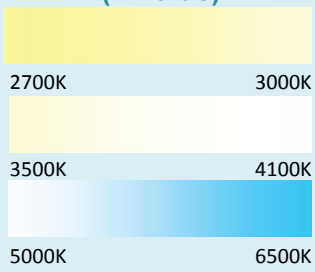
Approximate Cost for Operating 15 Bulbs Per Year

The chart below assumes replacing fifteen 60 watt bulbs and is based on four hours per day of usage. It shows users of ENERGY STAR LED lights may pay 80 percent less than people using incandescent bulbs.

Traditional Incandescent: $144
Halogen Incandescent: $105
ENERGY STAR CFL: $36
ENERGY STAR LED: $30

1. LEDs are extremely efficient. Switching to LEDs can save 80 percent on electricity costs, almost $10 per bulb, per year, for lights used four hours each day.
2. The life span of an LED light is significantly longer than other types of bulbs and LEDs are more durable.
3. LEDs are available in many colors and types. Choosing which LED to use should be based on the desired level of brightness, where the light should be projected, and its certification.

Choosing the Right Color (K-value)



LED lights come in a variety of colors, denoted by the bulb's K-value. As the K-value increases the shade of light becomes cooler (blue); as the K-value decreases the color is closer to yellow (data from energy.gov).

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(Data from energy.gov)

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