

ENERGY EFFICIENCY STANDARDS FOR LIGHTING

FREQUENTLY ASKED QUESTIONS

Why have lighting standards?

Light bulbs can use a lot of energy. The adopted standards will ensure that the next bulb you purchase will be energy efficient, meet quality standards, and last for years. As LED demand grows, standards will help California achieve its long-term energy goals and reduce greenhouse gas emissions.

The Energy Commission's lighting standards are prompted by legislation that calls for energy reduction in home lighting by 50 percent and at businesses by 25 percent from the 2007 levels by 2018.

Why will standards make a difference?

Lighting consumed 22 percent of home electricity, according to the 2009 Residential Appliance Saturation Survey (RASS).

In 2010, there were more than 600 million general-purpose bulbs in California homes. At that time, LEDs made up less than 1 percent of the total stock, but was predicted to increase over 10 years.

Small-diameter directional lamps are often used in retail, hospitality, residential, and museum applications. In California, about 16 million of these bulbs are installed in existing buildings, and the stock is expected to grow to 18 million by 2029.

What do the standards cover?

The standards cover screw-in LED light bulbs that a consumer would purchase for almost any household use. They also cover more specialized bulbs, called small-diameter directional lamps, used in commercial applications, such as track lighting. The standards focus on efficiency while maintaining performance. The standards also reinforce product labeling to help find energy efficient replacement LED bulbs.

When will standards go into effect?

The standards for small-diameter directional lamps and Tier I general purpose LEDs will take effect January 1, 2018. The general service LED Tier II standard will take effect July 1, 2019.

How much energy can be saved?

The standards could save Californians more than \$4 billion in energy costs over 13 years. In 2029, the total estimated savings is more than 3,000 gigawatt hours (GWh) per year, equivalent to the amount of electricity required to power all the households in Santa Barbara and Ventura Counties (about 400,000 average homes) indefinitely. The savings is equivalent to displacing one 500 megawatt power plant.

The regulations are estimated to avoid 10.3 million metric tons of carbon dioxide between 2017 and 2029. The greenhouse gas savings are roughly equivalent to the CO₂ emissions of 168,000 cars.

Are there already products on the market that comply?

Yes. All major manufacturers have bulbs that comply with the standards.

Will the cost of a light bulb go up?

While energy-efficient light bulbs may cost more than inefficient bulbs, they make up for those prices in lifetime savings.

LEDs last about 20 years with the savings, cost, and pay back varying by type. However, costs are declining as demand grows. Directional bulbs will potentially increase in cost by \$1.50 with an average lifetime savings of nearly \$12. Candelabra bulbs will potentially increase in cost by \$1 with an average lifetime savings of about \$4.50. Omnidirectional bulbs will potentially increase in cost by \$.50 with an average lifetime savings of nearly \$8.

The estimated increase in cost of a small-diameter directional lamp is roughly \$4 per bulb with an average 11-year lifetime savings of nearly \$250 in reduced energy and bulb replacement costs.

Why is the Energy Commission looking at the color content of a bulb?

The color of a light bulb is distinguished by the color rendering index (CRI), which is a score that rates a bulb's ability to make an object appear as it would under natural light. Daylight is the ideal for making colors look the way they should, so its CRI is a perfect score of 100. Unfortunately, colors can be distorted by removing them from the

light to make the bulb seem more efficient. The Energy Commission set minimum color requirements, yet allows for some tradeoffs between the efficiency and CRI.

Why is there standby mode in a light bulb?

There are a growing number of LED bulbs that are designed to be connected to power at all times, so they may be controlled via a network. This "standby mode" contributes to the constant consumption of power when the lamp is both on and off. Regulations include limits for standby mode because it makes up a significant percentage of the energy use of connected bulbs today and because of the large potential statewide energy impacts with market saturation.

Who supports the standards?

Supporters range from nonprofits to manufacturers to other stakeholders, including the California's investor-owned utilities, California Lighting Technology Center, Green Creative, CREE, the Sierra Club and the Natural Resources Defense Council.

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