

REPORT SUMMARY:

Energy Savings Forecast of SSL in General Illumination

The U.S. Department of Energy (DOE) models adoption of light-emitting diodes (LEDs) in the U.S. general lighting market, along with associated energy savings, based on the full potential DOE has determined to be technically feasible over time. DOE's Solid-State Lighting Program is designed to achieve these technically feasible targets. The latest projections were released in September 2016, in the seventh edition of the biennial report, *Energy Savings Forecast of Solid-State Lighting in General Illumination Applications*.

Key Takeaways

Here are highlights from the report, which uses an updated 2016 U.S. lighting market model and extends the forecast period to 2035 versus the 2030 limit used in past reports.

Energy savings from LED lighting will top 5 quads annually by 2035.

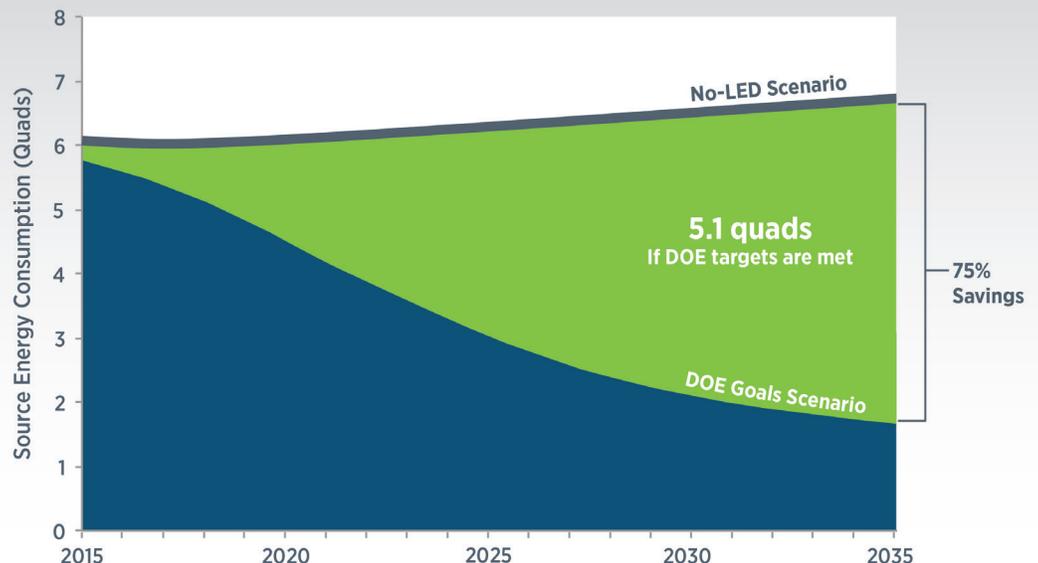
SSL does not simply slow the rate of growth in energy consumption for lighting, it turns the consumption curve *down*; and that curve keeps going down through the extended forecast period. Annual savings by 2030 had been estimated at 4.5 quadrillion Btus (quads) in previous forecasts, essentially cutting U.S. lighting energy use in half compared to where it would have been if LED lighting had not entered the market. The newest projection steps up that estimated savings to 5.1 quads by 2035, representing a **75 percent** reduction in energy consumption versus a no-LED scenario. This savings of 5.1 quads is

equivalent to nearly the total annual energy consumed by 45 million U.S. homes today. Cumulative savings will amount to 62 quads between 2015 and 2035—equivalent to nearly \$630 billion in avoided energy costs.

Energy savings in the near term also will be impressive. Various forecasts conclude that LED lighting will have tremendous growth over the remainder of this decade, reaching anywhere from a quarter to upwards of 80 percent of lighting sales by 2020. DOE estimates that LEDs will constitute about 30 percent of U.S. lighting installations by 2020, which is on the conservative side compared to other forecasts. Regardless, the annual energy savings in 2020 estimated by DOE is substantial, topping 1.5 quads if DOE targets are met.

TURNING DOWN LIGHTING ENERGY USE

U.S. energy savings attributable to LED lighting will reach 5.1 quads by 2035. Energy use for lighting in 2035 will be **75% lower** than it would have been if LEDs had not entered the market.



LED products will dominate every general lighting niche. By 2035, LED lamps and luminaires are anticipated to hold the majority of lighting installations in each of the niches examined, comprising 86 percent of installed stock across all categories. In 2015, LEDs represented only 6 percent of installed stock.

By far the biggest energy savings will come from four product categories plus connected lighting technology. As shown below, most of the 5.1 quads of projected energy savings by 2035 will be attributable to two

commercial lighting applications (linear and low/high-bay), one residential application (A-type), and one that crosses both residential and commercial (directional). Connected lighting and other control technologies will be essential in achieving these savings, accounting for almost 2.3 quads of the total.

it incorporates additional years of historical LED market share data. The enhanced model will be used not only in future Forecast reports, but also in DOE's biennial market-snapshot report, *Adoption of Light-Emitting Diodes in Common Lighting Applications*.

Read the full *Forecast* report at energy.gov/eere/ssl/ssl-forecast-report.

Benefits of the Updated Model

The lighting market model used in this year's report is more finely calibrated and granular than previous models, since

