

News

Thanks to improved technology, LEDs to have a bright future

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In the past few years, LEDs have made huge advances in energy efficiency. Industry sources and outside experts say LEDs are now the most energy-efficient lighting source available. They use far less energy than other bulbs, last a lot longer, and cost less to use over their lifetime.

For now, the lights still cost more than the average consumer is used to spending on a light bulb -- a lot more. Prices for LEDs on the market today can be more than five times what an incandescent bulb costs. However, the LEDs use about 85% less energy and last 30 times longer. They also use about half as much energy and last five times longer than compact fluorescent lights.

Manufacturers' game plan is to first target commercial and industrial customers, for whom the economics of LEDs are increasingly too compelling to ignore. Such customers leave their lights on most or all of the time and pay labor costs each time bulbs are changed. Longer-lasting lights that use less energy thus offer them significant savings over time.

Then, as sales increase, creating economies of scale and bringing down production costs and prices, the industry will expand its marketing to residential customers in a push that many observers expect will make LEDs the lighting of choice for years to come.

Jim Brodrick, Solid State Lighting program manager for the U.S. Department of Energy, predicts that LEDs will save Americans \$280 billion in energy costs over the next 20 years, and that the technology will make up 70% of the market by the end of that period. [Philips Lighting](#), part of Netherlands-based Royal Philips Electronics, sees LEDs as the future. It has spent \$4.2 billion in LED company acquisitions over the past two years.

Strategies Unlimited, a market-research firm specializing in advanced electronics, forecasts that sales of LEDs, which accounted for a minuscule \$330 million of the \$15 billion lighting market in 2007, will grow 40% this year and reach \$1.6 billion by 2012. "It's a small base" but "it's growing fast," says Robert Steele, a principal at the Mountain View, Calif., firm.

LEDs consist of a small semiconductor that emits photons when electricity is applied. For decades, they've been used as indicator lights for small applications like remote controls and stereos. A major hurdle to their broader use for industrial and residential lighting, however, was manufacturers' inability to boost brightness without increasing power consumption too much. Advances in materials used in LEDs have led to an explosion in technological improvements at the leading LED companies over the past two years. An LED light and fixture on the market from [Cree Inc.](#), a Durham N.C.-based LED maker, produces about 60 lumens per watt, a measure of lighting efficiency. That product is about as bright as a 65-watt incandescent bulb, while using only about one-sixth of the power. The LED lamp also has an estimated life of about 50,000 hours, about 33 times longer than that of an incandescent light.

Some companies and a growing number of cities have started adding LEDs incrementally. For such users, the savings LEDs provide on energy bills, bulb-replacement and labor costs can often cover the higher up-front cost in about a year, industry experts say.

Raleigh, N.C., recently installed LED lights in parking decks and other outdoor spaces. Dan Howe, assistant city manager, estimates that in one underground parking deck the change will save the city more than \$700,000 in energy and maintenance costs over the 15-year lifetime of the LED products.

Wal-Mart Stores Inc., after tests at two of its stores in Texas and Colorado, has decided to use LEDs in the freezers and refrigerators at all 4,200 of its stores in the U.S. A company spokesperson adds that tests are under way of LED lights in the parking lot of a Wal-Mart store in Arkansas.

For now, price remains the biggest obstacle, especially for residential use. But there are signs that this is changing as well. Consider "down lights," the kind of directional, recessed lighting that is common in many homes and offices. LEDs are well-suited for this kind of lighting because they typically provide directional light. But despite their suitability for this purpose, Sloan Ritchie, a sustainable-home builder in Seattle, says he isn't yet installing LED down lights because they're too expensive: about \$80 each, compared with \$15 for an incandescent and \$35 for a fluorescent. Even though LEDs offer savings in the long run -- and use less energy -- consumers still are reluctant to pay more up front. However, with LED prices falling about 25% a year, Mr. Ritchie says he may begin using them next year.

According to the Energy Department's Mr. Brodrick, some manufacturers already are test-marketing products in stores of Home Depot Inc., the big home-improvement retailer. Meanwhile, for the LED market itself to light up. For one, as often happens with new technology, the quality of LED products currently on the market is uneven. Of 140 LED products in stores and tested by the U.S. Energy Department, more than half were considered poor quality. People get kind of interested.

Leading LED manufacturers have responded by buying their own fixture makers. Earlier this year, Cree purchased LED Lighting Fixtures Inc., and Lighting Science Group Corp., a New York-based LED product company, purchased Netherlands-based Lighting Partner BV.
