

Silicon Valley startups, investors target \$100 billion lighting industry

dhull@mercurynews.com

Posted: 06/05/2011 03:40:49 AM PDT

Updated: 06/05/2011 10:29:46 AM PDT

Dave Leonard, founder and CEO of Redwood Systems, grew discouraged trying to raise money in early 2008. He wanted to create the first digital lighting network -- combining information technology with advanced lighting to drastically cut electricity costs -- and he needed venture capital to do it.

"VCs' eyes would glaze over," said Leonard, a former [Cisco Systems \(CSCO\)](#) executive. "It took a lot of hard work to convince people that this would save more energy than they'd ever generate from solar. Lighting is the last analog dinosaur."

Fast-forward three years. Leonard now fields at least a call a week from potential investors and has landed several high-profile clients. Among them is [Facebook](#), which uses Redwood Systems' technology to control more than 1,000 lights in its new 300,000-square-foot data center in Prineville, Ore.

The Fremont-based startup is far from alone in its quest to improve the way we light our homes and offices. Silicon Valley is home to at least a dozen startups working on LEDs, essentially high-tech light bulbs that use far less energy than conventional bulbs, or lighting control systems that monitor and adjust lighting for maximum efficiency. Even [Google](#)

([GOOG](#)) has gotten into the act, announcing last month that it has partnered with Florida-based Lighting Science Group to launch the first Android-controlled LED bulb.

Lighting may not seem a sexy frontier of disruptive innovation -- particularly when compared with the electric car. But after struggling for years as cleantech's overlooked stepchild, lighting has emerged as a robust and fast-growing cleantech

sector. Part of the reason is sheer size: The annual global lighting market is estimated to be worth more than \$100 billion. The market for LED "luminaires" -- a fixture with light source integrated in it -- exceeded \$3.9 billion in 2010 and will grow to \$9.2 billion by 2015, according to Strategies Unlimited of Mountain View.

"The market is taking off," said Jason Matloff, a partner at Battery Ventures who serves on Redwood Systems' board. "It's an enormous industry, and big markets going through big transitions attract a lot of interest."

Lighting consumes about 24 percent of the total electricity generated in the United States, according to the Department of Energy. As governments, businesses and consumers look for

ways to save money on energy bills and reduce carbon emissions, better lighting is a key part of the answer.

A light switch?

Wondering whether you should change your bulb? Here's a comparison of three light bulbs that emit the same amount of light.



	Incandescent light	Compact fluorescent lamp (CFL)	Light-emitting diode (LED)
Energy used	60 watts	13-14 watts	6-9 watts
Lifespan*	31-42 days	333-416 days	2.9 years
Price per bulb	25-50 cents	\$1.99-\$4.99	\$20-\$55
Annual cost**	\$4.80	\$1.20	\$1
Negatives	Gets hot, not energy-efficient	Contains traces of mercury, generally not dimmable	High price per bulb

* Continuous usage

** Based on Department of Energy's estimate of two hours of operation a day at 11-cents per kilowatt hour

Source: Department of Energy, Wall Street Journal, D&R International
PAI/MERCURY NEWS

joint venture. Now Philips Lumileds, which has 645 employees at its headquarters in San Jose, is one of the world's leading LED manufacturers.

HP veterans populate and lead many of the valley's current crop of lighting startups. Among them are Karen Oweung, CEO of Lunera Lighting, and Intematix CEO Mark Swoboda.

Investors are bullish on the sector's potential. The biggest venture player in lighting is Vantage Point Venture Partners, which has poured \$100 million into seven companies across the lighting ecosystem and is aggressively looking for other lighting deals.

"I wouldn't be surprised if we put another \$100 million in over the next couple of years," said Marc van den Berg, a managing director at the firm who says he's constantly thinking about the consumer and agricultural applications of advanced lighting. Adjusting the spectrum of light can improve student performance in school, make it easier to deal with jet lag and boost crop yields in greenhouses -- something that California's indoor marijuana growers have long known.

One of the seven lighting companies in Vantage Point's portfolio is San Jose-based Switch, which debuted a 100 watt-equivalent LED bulb last month at Lightfair, the industry's largest trade show. Switch's LED bulb, which should be available in stores this fall, is expected to cost \$20 to \$30 each. But it uses 85 percent less power than an incandescent bulb, so it should pay for itself in about a year.

The federal government is giving new lighting technologies a boost by raising energy standards for light bulbs, which means that Thomas Edison's incandescent bulb, which has dominated the market for more than a century, is effectively being phased out. CFL bulbs were promoted as an improvement but have yet to catch on with consumers: Many people don't like the quality of light they emit, they typically can't be dimmed, and they contain small amounts of mercury, a neurotoxin that can be particularly harmful to children and pregnant women.

That's created an opportunity for LEDs, or light-emitting diodes. LEDs are based on the constantly improving semiconductor technology found in microchips. They don't contain mercury, can be used with a dimmer and last much longer than either incandescent or CFL bulbs.

Silicon Valley has been a center of lighting innovation since the 1960s, when [Hewlett-Packard \(HPQ\)](#) housed a pioneering optoelectronics division that designed and manufactured LEDs to make displays for their products. In 1999, when HP split in two, the optoelectronics group became part of the new Agilent Technologies. Agilent joined forces with Dutch lighting giant Philips to form Lumileds, and in 2005 Philips acquired Agilent's stake in the

The Mercury News

MercuryNews.com

Luxim, a Sunnyvale startup, makes a Tic Tac-size light using its patented Light Emitting Plasma, or LEP, technology. The minuscule bulbs illuminate everything from tanks of kelp at the Monterey Bay Aquarium to streetlights in China. Sequoia Capital's Michael Moritz, one of Silicon Valley's most successful venture capitalists, chairs Luxim's board of directors.

In most commercial buildings, one switch controls an entire row of lights, leaving many spaces wastefully overlit. But Redwood Systems' controls can manage lights with astounding precision. Office workers can individually determine how much light shines on their cubicle, lights located near windows can be programmed to dim depending on how sunny it is outside, and sensors mounted on the lights can monitor everything from air pressure to temperature.

At Facebook's vast Oregon data center, one of the most popular features is a "follow me" mode.

"We can follow a technician through the data center with light," Leonard said. "As he walks around, we light the pathway, and then the lights fade down. The technicians love it."

Contact Dana Hull at 408-920-2706. Follow her at [Twitter.com/danahull](https://twitter.com/danahull).