

Private Equity Week

April 21, 2008

Investors see the light of LED startups;

GENERAL NEWS

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SECTION: Pg. 1(2) Vol. 15 No. 14 ISSN: 1099-341X

LENGTH: 916 words

In a world where tech innovation moves at quantum speed, the incandescent bulb has long been a conspicuous anachronism, virtually unchanged since Thomas Edison propagated it in 1879.

Energy-efficient replacements, such as fluorescents, have made inroads. But in startup circles, the lighting sector hasn't historically attracted many venture-backed entrepreneurs with visions of truly disruptive technologies.

That's changing. In the past three months, at least 11 companies developing lighting and display technologies have raised more than \$185 million combined in venture funding.

Most pitch themselves as clean-tech companies and are drawing from the growing pool of venture that's earmarked for energy-efficient investments.

"Anyone focused on energy is also focused on lighting," says Sean Dalton, general partner at Highland Capital Partners, who points to estimates that one-quarter of power consumption today is for lighting and displays. The funding pace has been particularly torrid for later stage rounds.

QD Vision closed a \$9 million Series C round with backing from Highland, along with North Bridge Venture Partners, In-Q-Tel and OSI Ventures. The Watertown, Mass.-based company is developing power-efficient, brightly colored displays and lighting products using nanoscale quantum dot technology.

The largest round went to Bridgelux, a Sunnyvale, Calif.-based company developing light emitting diode (LED) technology for use in displays and camera flashes. The company raised a \$40 million Series D round, which included a \$10 million line of credit, led by VentureTech Alliance.

Luxim, another Sunnyvale, Calif.-based company, came close to Bridgelux's total, raising \$39 million in January from Sequoia Capital, Worldview Technology Partners, Duff Ackerman & Goodrich and Crosslink Capital. The company has developed a high intensity plasma light source it calls LIFI, or Light Fidelity.

"On energy investments, we like technologies that help you reduce energy consumption rather than ones that help you produce energy more efficiently," says James Wei, a Worldview general partner and Luxim board member.

Wei estimates that as much of 50% of electrical energy that's produced can be used up in transmission and distribution. So reducing consumption--through devices such as Luxim's lamps--has more impact on energy cost than finding new ways to generate power.

Upbeat market growth forecasts are also augmenting investor interest in lighting technologies, in particular LEDs. Research firm Strategies Unlimited estimates that the market for high-brightness LED products grew by 9.5% to \$4.6 billion in 2007. The firm predicts the market will grow at an annual rate of 20% over the next four years, reaching \$11.4 billion in 2012.

VCs appear to be turning on to that vision. About half of the lighting-related companies funded in the last three months specialize in LEDs. These light-emitting electronic semiconductor devices are used in flat-screen video displays, and increasingly as lighting sources.

BridgeLux CEO Mark Swoboda says recent advances also have made LED lighting more cost-competitive with compact fluorescent systems, which in turn is more appealing to investors.

Additionally, Swoboda notes, "LEDs are much more rugged and can survive longer and in operate in cold and other harsh environments." Plus, they don't contain mercury, like fluorescents, or lead, like incandescent bulbs.

Efforts to ban energy-sucking incandescent bulbs are also fueling interest in alternatives. Research firm Frost & Sullivan noted in a recent report that a European Union proposal to ban incandescent lamps is having visible impact, and that "there has been a marked switch in preferences in domestic and commercial lighting from incandescent lighting to energy efficient lighting."

Legislators have introduced similar proposals in other locales, including one California assemblyman whose bill would ban sales of general service incandescent bulbs in the state.

While the market for energy-efficient lighting is certainly large enough to generate big venture returns, VCs say there's been a shortage of companies that meet their specifications.

"It's been a bit frustrating," says Dalton, who estimates that he's looked at 30 or 40 lighting-related business plans over the last four years. Inadequate intellectual property protection is a common deal killer. Another problem is many promising technologies don't lend themselves to standalone products.

Still, investors are encouraged that a few venture-backed companies in the lighting and display sectors have made it to exit.

Color Kinetics, a maker of digital lighting products using LEDs, went public in 2004 and was acquired by Philips Electronics in June 2007 for \$815 million. During the six years leading up to its IPO, the company raised \$61 million from S.A.C. Capital, Needham Asset Management and ThinkVentures, among others.

U.K.-based Cambridge Display Technologies, another LED company, also went public in 2004. The company, which raised more than \$150 million between 1992 and 2003, was acquired in July by Sumitomo Chemical Co. for \$285 million.

Ewing, N.J.-based Universal Display Corp., a developer of organic LED technology, raised \$8 million in the late 1980s and went public in 1992. Today, it's valued at about \$530 million, a multiple that Dalton says should give investors some encouragement.

"Public investors see a really important emerging technology," he says. "And at a \$500 million market cap, we VCs can make solid returns."