

Venture Capital Flood

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Absolute dollar figures can be hard to come by, but there's no doubt that renewables and clean tech are growing exponentially as a percentage of venture capitalists' portfolios.

Mark Heesen, president of the National Venture Capital Association (NVCA), puts the figure north of 4 percent, up from less than 0.5 percent seven or eight years ago. That's an 800 percent increase. And the pace is accelerating. Raj Atluru, a managing director of Draper Fisher Jurvetson, one of the largest venture firms, estimates that clean tech is the fourth largest venture category among all categories, up from seventh largest just three years ago. In 2006, he says, it accounted for 10 percent of all venture capital investments. **Ira Ehrenpreis, general partner in the venture firm Technology Partners, puts the number even higher, at about 14 percent of all venture dollars in the fourth quarter of 2006.**

Much of that interest is in alternative fuels, but a significant percent of the dollars and interest are going into solar, energy efficiency, storage, and smart-grid technology. As might be expected, no single reason can account for the surge; rather, it's driven by a confluence of factors - economic, political and social - some specific to the power industry, and some of broad, even global concern.

There are the obvious: the carbon-emission crisis, the realization that grid constraints require demand-side changes, the enormous inflation in the price of new plant construction, and public pressure to address the issue of global warming. And there's the nature of the beast itself. Venture capitalists are by definition in search of the next big thing, the nexus between economic demand and technological innovation.

"Venture capitalists created the biotechnology space, by and large, and the IT space and the communications space dramatically changed because of venture dollars," says NVCA's Heesen. "I think that same type of dramatic change can happen in the energy sector. It's a huge market. There is an absolute need and want for change."

Right now, the most intense venture interest is in solar technologies. From a venture perspective, wind is already a mature industry, dominated by a few large manufacturers,

capital intensive and already beginning to feel manufacturing constraints.

It's also been a singular success financially. In 2005, a number of venture-funded solar firms, including Suntech Power and SunPower Corp. had successful IPOs, and success breeds success. Suntech opened at just under \$21 a share when it went public in December 2005, and hit \$43.125 in July, up about 106 percent, while SunPower opened at \$27 in November 2005 and hit just over \$68 in July, up just over 150 percent. And IPOs in the energy management sector have done just as well. EnerNOC, Inc. went public at about \$26 in May and traded as high as \$38 in July, and Converge, Inc. opened at \$21 in April and closed above \$35 in July.

According to Ehrenpreis, "for people who were wondering how you could make money in this space historically, there's been some visible successes to show just how much money one can make."

Powerful Drivers

Another powerful driver is the fact that solar has suddenly moved front and center for a number of major corporations that include Wal-Mart, Google and GE. For a company like Wal-Mart, energy costs are second only to personnel costs, and financial fiduciary responsibility demands those costs be addressed. This kind of corporate commitment breeds an ecosystem that's very hospitable to venture capitalists.

Most of the interest in solar has been on the technology side, where advances in materials and thin-film technologies are particularly exciting. But there are areas that haven't yet been touched. On the residential side, for instance, solar is still a luxury, one that only those with a high green blood-cell count will undertake, because the payback period is typically longer than the seven years the average American owns his home.

Also receiving intense venture interest is energy management, a broad category that includes demand response, smart-grid technologies, storage, and energy efficiency programs. Deeya Energy, for instance, is a startup in which Draper Fisher Jurvetson, among other VC companies, has an interest. They're developing a new battery technology that, they claim, will for the first time commercialize load shifting and that will better enable storage of renewable sources, such as wind and solar. A primary initial market is India, where power availability plagues virtually every major city.

Jeff Sterba, president of the Edison Electric Institute and chairman and CEO of PNM Resources, sees nanotechnology as central to new developments in the critical area of energy storage: "The one thing that would revolutionize our industry is the development of a cost-effective mass storage device or set of devices or system. One of the applications we're seeing now is the application of nanotechnology for batteries, where nanotubes increase the area of lithium ion batteries that are actually utilized by an order of ten thousand times. That would unlock the potential for solar, wind and tidal while fundamentally changing the way in which we utilize the grid."

Not every enterprise reflects the kind of high-tech innovation usually associated with venture capitalists. ICE-Energy closed a \$25 million round of financing led by Goldman Sachs and Good Energies this past May. ICE, which is already in the revenue-generating stage, uses a device to generate and store cold air during the night. That air is then used to cool the building during the day, essentially shifting the load from peak to off-peak hours.

Meantime, John White, CEO of the Center for Energy Efficiency and Renewable Technologies, sees smaller-scale, distributed generation technologies as most suitable for venture investments. He includes everything from fuel cells to photovoltaics, micro turbines, demand response and smart-grid technologies.

"The green sector generally is getting very lively, but the barriers to entry in the electric utility sector are pretty high," White says.

Venture capitalists are willing, for now, to take the risks. Their interests will undoubtedly signal a monumental shift in how the energy sector conducts business.

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