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## **19. INVESTING: Venture capitalists hunt energy opportunities beyond solar, ethanol**

**Arthur O'Donnell, special to *Greenwire***

SAN FRANCISCO -- As solar-power and ethanol companies move into the financial mainstream, venture capitalists, private funds and even nonprofit foundations are looking for some new "clean energy" opportunities.

Energy companies are luring up to 6 percent of total venture-capital investments, and experts are predicting that will rise to 10 percent with a total investment of \$8 billion in the next three years. Energy technology represents "a wave of opportunity ahead of us," Ira Ehrenpreis of Technology Partners said during the Strategic Research Institute Energy Tech Investors' conference here last week.

There are about 240 energy tech companies expected to emerge for initial public offerings (IPO) in 2007-09. "I'm encouraged by the large amount of companies coming to market," said Mark Townsend Cox, managing partner of New Energy Fund. "I have a list of 20 companies that have gone public" around the world in recent months, he said. "We haven't even scratched the surface in clean tech."

Solar is a particular bright spot for investors, driven by state policies favoring renewables and increasing regulation of traditional fossil fuels, Cox said. "Sixty percent of solar companies have net profits now," he said. "Every single product these companies produce gets sold. This isn't alternative energy anymore; it's mainstream. Its penetration in the market is small, but the upside is great."

In 2005, two of the hottest initial public offerings were for SunPower and Suntech Power Holdings, which realized share-price gains of between 30 percent and 50 percent above the IPO price, noted Frank Rahmani, a partner with Cooley Godward.

Following solar into the public markets this year have been companies that produce ethanol, which got a tremendous boost from being touted by President Bush during his State-of-the-Union speech in January. "Ethanol is the new solar," said Jarett Carson of Sound Energy Partners. "The market reacted quickly, and there is a critical mass of companies going public and late-stage private markets."

Pacific Ethanol has benefited from an \$84 million investment by Microsoft CEO Bill Gates, as part of two private placements that brought the firm over \$229 million this year. The cash will help fund its planned development of at least five ethanol production facilities in California.

Other ethanol companies have been having mixed results in public markets. VeraSun in June launched an IPO that raised over \$420 million, and its share price has since gone up more than 10 percent. Shares in Aventine Renewables, on the other hand, lost about 25 percent of value since the company entered the market in late June. Still, analysts are projecting increased revenues for ethanol for the foreseeable future as it gains market share as a transportation fuel additive.

Mathew Jones, partner in Nth Power an energy-oriented venture capital fund, pointed out that the U.S. market for fuels is 200 billion gallons per year -- 125 billion gallons of gasoline and 75 billion in diesel. Driven by regulations and "renewable fuel standards," ethanol is poised to reach 8 billion gallons by 2010, and over 130 ethanol-producing facilities are expected to be operating in 2007.

## Beyond corn

The ethanol rush is spurring interest in other alcohol fuels.

"Today ethanol means corn starch," said Glenn Nedwin, chief scientist at Dyadic International, which uses genetic engineering techniques to unlock sugars from cellulose. "At what point do you not have enough corn? The Corn Association says you can grow enough for 16 billion gallons, but if you want to go beyond that you have to go to cellulosic material."

Added Bill Reichert, managing director of Garage Technology Ventures: "It's not about the corn. It's about biomass globally. It's much more efficient to turn sugar into ethanol than to turn corn into sugar. Bagasse is a great feed stock, but we can use any crop waste or wood waste." In addition, he said, using waste products saves money on the production and collection, helping make waste-based fuels more cost effective.

Walt Copan, chief technology officer of Clean Diesel Technologies, said there eventually might need to be a choice between food production and fuels production. "The issues are about utilization of biomass resources in the most intelligent way possible," he said. Copan foresees "cracking" alternatives to fermentation as more effective by allowing for wider use of vegetables or oils from soy, palm or canola to provide new fuels.

The investment opportunities are not only on the fuel side, he said, but also advances in emission-control technologies. "Current emissions controls are not suited to deal with biofuels, and that creates opportunities," he said. There are other technical challenges, including corrosion of fuels lines and degradation of octane levels that currently limit biofuels, he said, but more investment allows companies to put resources into overcoming those challenges.

Nedwin said he is also intrigued by the wider markets for biofuels, such as in polymers that can be used to replace petroleum-based products and fibers. "Once you make cheap sugars," he said, "ethanol is just one product."

## Biology provides new ideas

New technology companies -- whether in energy, communications or pharmaceuticals -- are increasingly looking to understand basic biological processes as a source of new ideas, said Steve Jurvetson, managing director of Draper Fisher Jurvetson, which recently closed a \$284 million investment fund for early-stage venture opportunities. In particular, he said, the exponential growth of gene mapping and bioengineering is "driving the current revolution. It will have a business impact in energy long before it has a mainstream impact."

Jurvetson pointed to recent explorations of ocean life as providing a wealth of potential genetic material that is far more efficient in converting sunlight into energy than existing solar power technologies.

He also cited the work of Greenfuel Technologies Corp., which is employing "mutant algae" to consume carbon dioxide and other pollutants from power plant emissions. "Almost everything coming out of this has energy applications," Jurvetson said.

As if to underscore the point, Greenfuel was represented at the conference by Cary Bullock, who earlier in his career was an executive with Kennetech Corp./U.S. Windpower, one of California's pioneering wind energy firms.

"The model we're using for Greenfuel is a lot like what we had for U.S. Windpower," Bullock told *Greenwire*. "We knew we had to get the cost down to 5 cents per kilowatt-hour and be able to produce 100 MW."

In this venture, Bullock said, the challenge is to be able to grow algae fast enough to make the process commercially viable.

That same drive toward reaching a competitive cost and scale is essential to all new technologies.

"This industry needs scale," said Bryant Tong, a managing director with Nth Power. "For many companies, it's been a missionary sell, one product at a time, and unit prices are high."

What will differentiate successful new energy tech companies from the prior generation is a commitment to innovation and experienced management, Tong said. That in turn will attract more funding from risk-taking venture capitalists and funds.