

# BUSINESS

## Burst of energy

More and more venture capitalists are backing clean technology in the United States, but will it take off? Virginia Gewin reports.

For years, venture capitalists spurned Lee Lynd's plans to make lucrative ethanol out of agricultural waste. But in March, that suddenly changed. Lynd, an engineer at Dartmouth College in New Hampshire, got US\$4 million from venture capitalist Vinod Khosla to expand his company, Mascoma, into one of the leading US ethanol producers.

Lynd's idea has been buoyed by the tide of money flowing into clean energy as US investors wise up to its potential, in the light of high oil prices and rising public concern over energy security.

From venture capital to regular investments by staid financial institutions and pension funds, money is now pouring into technologies such as solar, wind and biofuel. The amount of venture capital has risen from very low levels a decade ago to almost a billion dollars last year (see graph). That's just over 4% of all such capital in the United States, according to Clean Edge, a market-analysis firm based in San Francisco. Last year, some 160 new US companies started in the sector. And three of the largest initial public offerings of technology stocks in 2005 were for solar energy companies: Q-Cells, SunPower and Suntech Power raised some \$800 million in total.

### Boom time?

But the upsurge in interest from the money men is not without its pitfalls. Some analysts are already asking whether the splurge has the makings of a bubble. They wonder if the United States, where public demand for alternative energy sources lags behind that in Europe and elsewhere, can support so many new companies. And with little public investment in energy-related scientific research over the past 20 years, they want to know where the fresh ideas are coming from that will support successful ventures.

So far, many of the clean-energy companies are being built on technology derived from other high-tech sectors, such as electronics or biotechnology. The photovoltaic cells made by solar-power companies, for example, use silicon wafers developed over many years by the electronic industry. And biotechnology has produced the enzymes that can efficiently convert cellulose material from plants into ethanol.

After years of neglect, the Bush administration is now trying to push this technology along by doing more energy-related research in government laboratories. President George W. Bush's Advanced Energy Initiative, which was announced earlier this year, would increase the Department of Energy's budget for this kind of work by 22%, to \$771 million, next year.

But Bill Green of Vantage Point Venture Partners, a Silicon Valley investment firm that backs small companies in the sector, says a lack of research dollars is not what is holding them back. He says the main problem is the ability to scale ideas up and launch them into the energy market.

Indeed, companies such as Mascoma are mainly focused on increasing the efficiency of existing production abilities. The cost of enzymes for biomass-based ethanol production has decreased 30-fold since 2001, but high processing prices remain the biggest challenge in taking bioethanol to market. Mascoma has addressed this by developing an efficient pretreatment process that reduces waste and produces saleable by-products.

The government is aware of the problems small energy companies face in scaling up. Floyd Kvamme, co-chairman of the President's Council of Advisors on Science and Technology, is currently drawing up a set of policy recommendations for nurturing such companies. He says the government should do more to promote demand for renewable energy.

Market watchers agree that it is demand for renewable energy, more than the supply of new ideas, that will determine the fate of the young companies. Michael Liebreich, chief executive of New Energy Finance based in London, says he doubts that vastly innovative technologies

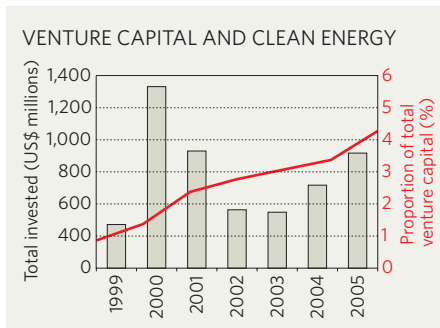


will be needed. He says there are some areas, such as advanced materials for solar panels, enzymes for biofuel processing, software for grid management and battery development, in which new ideas could yield the high returns sought by venture capitalists. But he thinks they should tread carefully. "You don't want a situation where too many venture capitalists are chasing too few good deals," he says, noting that this could produce a boom-bust cycle, in which too much hype encourages low-quality investments that yield disappointing returns.

### Dumb money

One reason for caution is the shortage of entrepreneurs or investors who understand the nuances and complexities of the sector. "People want to see a lot happen," says Lynd, "but there are not that many competent people to make it happen." And some analysts think that the venture capitalists are already overfunding projects. "There is a lot of dumb money out there," contends Peter Fusaro, founder of Global Change Associates, an energy investment consultancy in New York.

The National Renewable Energy Laboratory (NREL) is the principal research institute for developing alternative-energy technology in the United States. Many advances in photovoltaic cells, for example, have sprung from the laboratory at Golden, Colorado. Although the lab's primary focus is on research, it has also actively sought to connect investors with technology. But its efforts are hampered, lab officials say, by government red tape. "If you are on a research and development contract with NREL, you can't spend money on market





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These bioreactors produce ethanol from cellulose, but will they be built on an industrial scale?

analysis or validation,” says Lawrence Murphy, the lab’s manager of enterprise development programmes.

Critics say that such rules are an immense impediment to technology transfer. Dan Reicher was assistant energy secretary in the Clinton administration and now runs New Energy Capital, a firm in New England that backs renewable energy projects. He says that there is far too little coordination between government and the private sector.

“The Department of Energy has got to shift from research to deployment issues,” says Mark Sinclair, deputy director of the Clean Energy States Alliance, a non-profit collaboration of 17 state funds to promote markets for clean energy, headquartered in Vermont. Sinclair would like to see federal action that would encourage, for example, the adoption of photovoltaics by home builders.

“We are in policy wasteland,” agrees Green. He points out that even though 22 states require electricity firms to generate a minimum percentage of power from renewable sources, they each have different rules and targets, which makes life hard for companies.

Others are more sanguine, arguing that good ideas will work their way through to the market in the end. Despite the lack of a national energy policy, business will see plenty of opportunities for high returns as long as the price of oil and gas remains high. “The capital markets are driving this train,” says Fusaro. ■

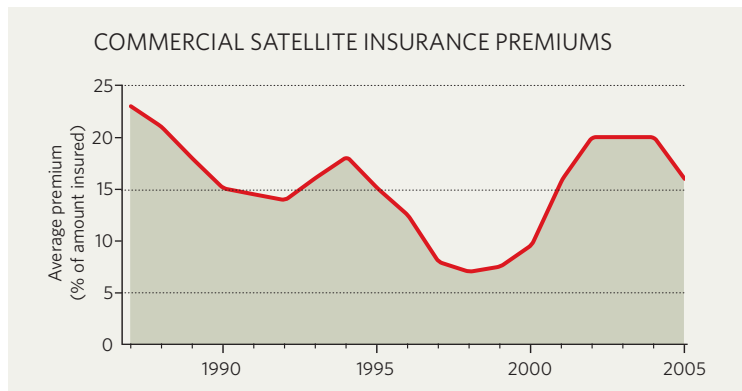
## IN BRIEF

**INDIAN OVERDRIVE** IBM has announced a huge push of people and resources into India, saying that it will invest US\$6 billion there over the next three years. Its plans were unveiled by IBM chairman Sam Palmisano and Indian president Avul Kalam to a crowd of 11,000 cheering employees in Bangalore on 6 June. They include the expansion of existing computer laboratories in that city, as well as the establishment of a global telecommunications laboratory in New Delhi. The computer firm, headquartered in Armonk, New York, already employs some 43,000 people in India — more than it does in any other country outside the United States.

**BACK ON SALE** The US Food and Drug Administration (FDA) says it will allow the multiple sclerosis drug Tysabri to return to the market — under strictly monitored conditions. Tysabri (natalizumab) was approved in 2004 but pulled from sale in February last year after its manufacturers, Biogen Idec of Massachusetts and Irish biotechnology company Elan, said that two patients had died in clinical trials of the drug. Shares in the two companies dipped on the 5 June decision, however, owing to the harshness of the proposed restrictions: Biogen Idec dropped \$2.32 to \$45.39, and Elan fell \$2.46 to \$16.52.

**GENERIC GO-AHEAD** The FDA, under pressure from the courts (see *Nature* 441, 23; 2006), has approved a copycat version of a biologic — a drug made from living cells — for the first time. Omnitrope, which won European approval in April, is a generic version of Pfizer’s Genotropin (a human growth hormone) and has been approved for the treatment of growth disorders. Sandoz, the German Novartis unit that makes Omnitrope, labelled the decision a “breakthrough” for makers of generics. But the FDA says its decision does not set a precedent for approval of generic biotech drugs, because most of them are regulated by a different statute from that applying to growth hormones.

## MARKET WATCH



If you’re an insurance company that finds house fires and fender-benders a little bit mundane, there’s always the space business.

With premiums of, say, US\$40 million a shot and payouts that can be ten times that, insuring commercial satellite launches is not for the faint-hearted.

Yet after a series of accidents that took these premiums to highs of as much as one-fifth of entire project costs, premiums slipped back last year (see graph).

“Insurers are in business to make a profit, so if you have a period when the business is profitable, others will come into the market,” explains Rick Hauck, former chief executive of AXA Space, a satellite insurer based in Bethesda, Maryland.

Premiums rose sharply after the solar panels failed on six Boeing 702 communications satellites in 2000 and 2001 — costing insurers some \$1.5 billion. High premiums subsequently put a damper on commercial satellite launches, which were already suffering from the collapsing fortunes of the telecommunications industry.

But an assessment by the US Federal Aviation Administration, published last month, suggests that premiums are finally starting to dip again.

No one knows whether the fall will be sustained. “It is in the hands of events,” says Hauck. “If there are profits, others come in to compete and that puts pressure on the rates.” ■

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