California scheming

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A new Silicon Valley is being born. The northern Californian region that brought the world microprocessors, personal computers and Google now has its sights set on another technological revolution: one founded on photovoltaic solar cells, sources of biofuel such as algae and the application of information technology to improve energy efficiency.

Yet this new green technology industry needs help. As Barack Obama prepares to take office as US president next week, Silicon Valley has sensed that a turning point is at hand. It has been working overtime to convince the incoming administration of the strategic importance of these developments – and their need for financial backing.

To hear Valley notables describe it, the answers to some of the biggest issues facing the US can be found there. These range from climate change and America's lack of energy independence to the need to create jobs and ensure long-term competitiveness in the next big strategic industry, the one geared to weaning the world from its reliance on fossil fuels.

According to this view, as the US looks to move beyond its carbon-based economy, the Valley's start-up culture – with its risk-taking mentality, strong technology leaning and record in fostering new business approaches – will play a central part. "It's the only place innovation can come from," says Vinod Khosla, a leading venture capitalist from the early internet years who has more recently become the Valley's most prominent exponent of what is being called "cleantech" investing.

Despite the self-confidence, however, many green technologies are not yet able to stand on their own feet. Alternative sources of electricity, from solar to biofuels, are still far from competitive with coal. To make matters worse, just as many of these technologies prepare to scale up – expanding production to bring down unit costs to competitive levels – the credit crisis has starved them of funds needed to grow.

In some industries, the US has fallen behind. The country's relatively low petrol prices have stunted demand for high-mileage vehicles, while the relocation of the consumer electronics and computing manufacturing base to Asia has robbed the US of a big local market for advanced batteries.

Below: Electric dreams and harsh realities in the automotive industry

It is not surprising, then, that the coming change in Washington has raised hopes in Silicon Valley, or that the pleas for help have been growing louder. "There are a lot of companies, like [in] solar and wind, which are trying to get their programmes through here," says Jeff Depew, chief executive of Imara, an advanced battery technology start-up that has its own request in for Department of Energy support.

While it prides itself on a brand of hypercapitalism defined by the self-reliance of its entrepreneurs and the almost constant state of creative destruction in which they work, the Valley has long been a big beneficiary of government largesse. From the defence build-up that helped to create the semiconductor industry to the birth of the internet (itself initially a project of the Pentagon), much of the research and early

contracts for new technologies have been funded by the taxpayer.

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A SMARTER GRID

Barack Obama has expressed support for a 'smart grid' to optimise electricity transmission and save power. It should also be capable of carrying power from the places where it can be created – the windy centre of the US, the sunny south-west and the geothermal hot spots in the Rockies – to the coastal cities where it is most needed

WIND AND SOLAR ENERGY

Renewable sources of energy have become more cost-effective but with full competitiveness some way off, financial incentives are still needed to create demand. The credit crisis has also left the alternative energy industry starved of capital

ELECTRIC VEHICLES

Cars are responsible for 20 per cent of global CO2 emissions. Much of the extra cost in cleaner electric vehicles, and the focus of new technology development, lies in the batteries, with Asian

ENERGY EFFICIENCY

Insulation, the use of LED light bulbs and a switch away from carbon-based materials for building and other purposes could lessen demand and reduce emissions

Yet the Valley has also nurtured an aloofness from Washington that has not always served it well and could hamper its efforts to be heard during a downturn, when more entrenched lobbies are making much noise. Also, the very newness of the cleantech industry means it lacks the necessary political ties, says Jeff Anderson, co-chair of Cleantech for Obama, an industry group that was formed to help the president-elect's campaign and may now evolve into a lobbying machine.

As a result, the green business movement has had to ride on the coat tails of the better-established environmental lobby. The interests of the two converge on many points but the reliance has taken the focus away from the long-term economic arguments that the cleantech industry believes it needs to rely on. The environmentalists "tend to get romantic about specific solutions that aren't practical from a business point of view", says Mr Khosla.

Yet there is still considerable optimism in Silicon Valley that the Obama inauguration will represent a turning point. That rests both on campaign promises to tackle environmental issues as well as a belief that key members of the administration, from Mr Obama down, will bring a technocratic approach to policy that should favour the new green business movement.

Putting "incredible scientists" in charge at the energy department, for example, "gives me great hope . . . that the energy problem will be approached with logic, based on science and factual observations", says Andy Grove, former chief executive of **Intel** who has been seeking

companies leading the way

Illustration based on 'The Electric Home of the Future', Popular Mechanics, Aug 1939

FT Graphic

support for an advanced battery industry in the US.

Much of the immediate hope rests on the promised economic stimulus package. The buzz in the Valley is that as much as $100bn (£69bn, €76bn) could be used to support green technologies. High on the wish list is a piece of infrastructure that would boost the competitiveness of many producers of alternative energy: a new electricity transmission network across the country. That backbone would be the sort of grand project seen as a focus of the Obama stimulus plan. However, the planning and approval process could delay it for 18 months or more, making its value during the current economic slump questionable.

Beyond this, the Valley has been pushing for two broad forms of support: low-cost loans for businesses and longer-term research and development subsidies. It is a simple process to look at the range of new green technologies and back the ones that have moved furthest down the "cost curve" towards full competitiveness, says Mr Khosla. He advocates support for a wide range of solar, wind and biofuel technologies and argues that money should go only to technologies that can stand on their own feet within five to seven years.

The vulnerability of subsidies to changes in the political winds has long made Silicon Valley wary about counting on them as a way to make technologies viable, says Steve Milunovich, a cleantech analyst at Merrill Lynch. He points to the big swings in investment in wind farms in the past, as government subsidies have come and gone, but adds that there is little choice.

Even if the Valley gets much of what it wants from the Obama White House, however, there is a paradox at the heart of the green technology movement. Asked why taxpayers should support cleantech companies when those in many other industries are also suffering, venture capitalists such as Mr Khosla rest their case on the need to tackle climate change and the desirability of energy security.

The sort of things being proposed, however, will not on their own achieve either of these goals. There may be a feelgood effect from backing green technologies and they may create jobs and wealth, but when it comes to tackling the big problems they are likely to fall short. Mr Grove dismisses much of the effort as "tinkering". The model on which Silicon Valley has thrived will not produce answers fast enough to the environmental crisis, the former Intel chief argues. "The technologies are all practical [and] do-able," he says. "But in terms of the overall problem, they are very marginal."

What would it take to make a real difference? Mr Grove says Mr Obama's most important job will be to prepare Americans for a historic period of self-sacrifice comparable to Franklin D. Roosevelt's preparation of the US for the second world war.

Others specify that this must include a big levy on petroleum. Valley luminaries including Bill Joy, a founder of **Sun Microsystems** and now a partner at Kleiner Perkins, and Michael Moritz, an early backer of **Google** and a partner at Sequoia Capital, argue that a floor price for petrol is needed to change consumer habits and sustain a market for new technologies.

The sliding economy has not helped their case. "The idea of a tax in this environment is not very likely," says Merrill's Mr Milunovich. Yet a senior executive in one of the biggest Valley companies, who is one of those to have submitted proposals to Mr Obama's transition team, argues that the gradual introduction of a carbon tax need not be economically harmful. That is particularly if it is part of a "carrot and stick" approach in which the money from higher taxes is given back to consumers in the form of incentives to switch to greener products.

Will the Obama administration be prepared to consider such drastic steps? Silicon

Valley, which prides itself on taking the big, radical bet, would like to think that the incoming president will mark a break from the past. It is about to find out.

THE AUTOMOTIVE INDUSTRY: ELECTRIC DREAMS AND HARSH REALITIES

Silicon Valley's entrepreneurs like to think big – and few are thinking bigger than Shai Agassi (pictured below).

The former SAP executive, who was once in line to become joint chief of the German software company, has turned into one of the most outspoken proponents of all-electric vehicles in the US. "There won't be a car industry in 10 years" if a Detroit bail-out is not accompanied by a policy shift to encourage electric vehicles, he warns.

The Israeli engineer envisages a new business model for the automotive industry. To cover the high cost of batteries, customers would pay a monthly lease fee that gave them unlimited miles, while the electricity to recharge these vehicles would come from renewable sources.

Mr Agassi's start-up, called Better Place, has already agreed to invest in a network of recharging and battery-exchange stations in Israel, Denmark and Australia and has taken its first steps in the US in Hawaii and the San Francisco bay area.

The biggest problem that Washington must address, according to Mr Agassi, is how to foster a domestic battery industry. This will require investment in a supply chain that brings together chemicals companies, makers of battery packs and experts in power electronics. Also on Mr Agassi's wish list is research and development support to help Detroit get an electric car on the road by 2011 and financial incentives for the first buyers of the new vehicles.

Yet some are sceptical. A switch to electric cars "won't happen unless the gas price is in the $5 [a gallon] range", says Andy Grove, the former Intel boss. With the current price below $2, he now dismisses his own attempts, through his philanthropic foundation, to promote electric vehicles. "I realise I was mucking around in the dirt," he says.

"Electric vehicles are way too expensive to be global," adds Vinod Khosla, a venture capitalist. While applauding Mr Agassi's experiments, he says: "I equally believe that capitalism has to be cost-effective."

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