COVER STORY

SPECIAL REPORT
GLOBAL WARMING

The alternative-energy sector has suffered along with the broader economy of late, but patient money managers see profits on the horizon as the quest for environmentally friendly sources of power generation intensifies.

From Smoke-stacks to Green-backs

By Katie Gilbert

Last summer, as the price of oil was peaking at more than $145 a barrel, legendary oilman T. Boone Pickens Jr. emerged as an unlikely clean-energy pitchman. The 81-year-old investor was trumpeting a novel plan to build a wind farm in his home state of Texas that would produce 4,000 megawatts of electricity, enough to power 1.3 million homes, which he figured would free up natural gas to run cars more cleanly and help slake Americans' seemingly unquenchable thirst for foreign oil. Just a few months earlier, Pickens had put his money where his mouth was: His Dallas-based company, Mesa Power, paid $1.5 billion for 667 General Electric Co. wind turbines, slated for delivery in 2011 and expected to generate 1,000 megawatts of clean energy. By 2014, Pickens reckoned, the additional turbines he needed would be in place and the initiative, dubbed the Pampa Wind Project, would be fully operational.

Unfortunately for Pickens, gale-force economic winds began blowing in the wrong direction. Credit markets, the lifeblood of large-scale alternative-energy projects, all but locked up. Difficulties in finding a grid to distribute the farm's electricity and the plunge in oil prices, which sapped investor interest in the project, also created unexpected problems. Pickens was soon compelled to declare his timetable unrealistic.

The feisty Texas billionaire isn't the only alternative-energy investor whose plans have been disrupted by market turbulence. Although the sector attracted $155 billion in capital in 2008, up fourfold from 2004, investment flows fizzled in the second half of last year as the credit crisis intensified, according to data from London-based research

ILLUSTRATIONS BY **BRIAN STAUFFER**

firm New Energy Finance. From the second quarter of 2008 to the first quarter of 2009, asset financing dropped by nearly 60 percent, to $11.5 billion. Venture capital and private equity investments fell by more than half, to $1.8 billion. And public market investment fell off a cliff as valuations collapsed: The WilderHill New Energy Global Innovation index, which tracks 85 clean-energy companies with market caps north of $100 million, fell 61 percent last year, far outpacing the 38.5 percent drop in the Standard & Poor's 500 index.

"There are going to be good companies with promising technologies that can't get financing," says Brian Fan, senior director of research for Cleantech Group, a research firm in San Francisco.

Even so, the economic shakeout may ultimately prove to be healthy. "The downturn has felt terrible — in the long run it's likely essential," says Russell Read, former chief investment officer of California Public Employees' Retirement System, who left the pension fund in 2008 to co-found C Change Investments, a private equity firm based in Cambridge, Massachusetts, that invests in clean-energy companies. The current economic environment reminds him of the early 1980s, which marked a major turning point for several emerging industries and ushered in roughly two decades of sustained growth. "I believe we're at such an inflection point today," explains Read, who expects the alternative-energy sector to be among the biggest beneficiaries.

The fundamentals underlying investor interest are hardly a passing fad. Global warming, once the province of obscure scientific debate, has become a mainstream concern, driven by a growing consensus that the world's dependence on fossil fuels isn't ecologically — or economically — sustainable. This consensus has sparked new entrepreneurial ferment in the energy sector and attracted a variety of name-brand investors, including venture capital powerhouse Kleiner Perkins Caufield & Byers, which in late 2007 teamed up with Generation Investment Management, a money management firm co-founded by former vice president Al Gore, to "find, fund and accelerate green business," and Khosla Ventures, a venture capital fund run by Sun Microsystems co-founder and Kleiner Perkins alum Vinod Khosla. Many other investors in the venture capital, private equity and hedge fund arenas have followed their lead in search of profit.

Now a wave of government stimulus money is poised to wash over the alternative-energy industry. Of the $2.6 trillion in funds pledged by the Group of 20 nations to revive their faltering economies, roughly $400 billion is earmarked for alternative-energy projects, according to Cleantech.

The $787 billion U.S. stimulus package, which will funnel more than $70 billion into alternative energy, is the largest national outlay in absolute terms, slightly outpacing China's $67.2 billion in "green stimulus." Signed into law by President Barack Obama on February 17, the spending package allocates $11 billion for modernizing the electricity grid, $6.3 billion in grants to help local governments increase energy efficiency, $2.5 billion for energy-efficiency and renewable-energy research and $500 million for training workers in renewable-energy-related fields. The stimulus package also offers a 30 percent investment tax credit to alternative-energy manufacturers and homeowners who install energy-efficient technology.

Observers expect renewable-energy mandates to also spur growth in the sector. Late last year the European Union finalized a binding commitment to generate 20 percent of its power from renewable sources by 2020. In the U.S. the American Clean Energy and Security Act was passed by the House of Representatives in June. The legislation mandates an 80 percent cut in U.S. greenhouse gas emissions by 2050 and requires electricity providers supplying more than 4 million megawatts of power to produce at least one fifth of it from renewable sources by 2020. It also establishes a cap-and-trade system that grants emissions allowances to companies, which can then trade them. The legislation now faces a contentious battle in the Senate, where several other climate bills are also being crafted.

"Environmental regulation is the new alpha," asserts Peter Fusaro, chairman and founder of energy consulting firm Global Change Associates, based in New York City, and founder of the Energy Hedge Fund Center, a Web site that maintains a directory of hedge funds investing in the alternative-energy sector. "The regulatory certainty provides the financial certainty, and then a lot more people deploy capital in the sector."

There are some promising signs that the worst of the downturn may be over. Even though investment has slowed dramatically, 2008 marked a tipping point: For the first time power capacity projects sourced from clean energy attracted more capital than did fossil fuel technologies ($140 billion versus $110 billion). In addition, investment flows may have bottomed out. In early June, New Energy Finance reported that second-quarter global clean-energy investments had already outpaced those in the previous quarter. The jump in activity was fueled in part by successful secondary stock offerings worth $2 billion from a number of leading companies, including Denmark's Vestas, the world's largest maker of wind turbines, and SunPower Corp., based in San Jose, California, which develops solar energy technology.

Pickens, for one, is ready to get back to work on his wind project, although the plan has been "scaled back and put into phases," says Ray Harris, Mesa Power's president and CEO. General Electric has agreed to delay delivery of the wind turbines, but Harris won't say

when he expects them to be up and running. Still, he is working with GE to look for other, smaller wind projects around the U.S. to support together. Notes Harris, "We're seeing lots of projects out there in need of turbines and in need of capital."

Alternative energy first burst into the U.S. consciousness in the wake of the OPEC oil embargo in 1973. The sector got a boost a few years later when the journal Foreign Affairs published an influential essay by a young physicist and environmentalist named Amory Lovins, who articulated a vision of what he called a "soft energy path" — a future where renewable resources would replace the U.S.'s "hard energy path," defined by its reliance on foreign fossil fuels and nuclear power.

Jimmy Carter, elected president a year after Lovins's essay appeared, embraced these ideas. In a televised speech on the energy crisis, wherein he laid out his plan to create the U.S. Strategic Petroleum Reserve and the U.S. Department of Energy, Carter famously called for shared sacrifice and conservation, but he also vowed to harness "permanent renewable-energy sources, like solar power." Two years later he installed solar panels on the roof of the White House and unveiled a plan to power 20 percent of the U.S.'s electricity needs using renewable sources by the year 2000. But as the oil shocks receded and Ronald Reagan entered the White House, Carter's clean-energy policies — along with the White House solar panels — were dismantled.

Over the next couple of decades, the nascent solar and wind power industries went through a series of booms and busts as tax incentives came and went. At the same time, according to researchers at Resources for the Future, a Washington think tank, the deregulation of natural gas and oil, the falling costs of conventional energy production and the competitiveness of the world petroleum market all contributed to a decline and stabilization in oil prices, which hindered the adoption of alternative-energy technologies.

Even so, a consensus was building among scientists and policymakers that global warming posed a threat to the environment, culminating in the creation of the Kyoto Protocol, which was adopted in 1997 and became legally binding in 2005. The climate pact imposed limits on emissions of carbon dioxide and other harmful gases, marking a watershed moment even though the U.S. was notably absent from the list of signatories, with the Bush administration arguing that the agreement was flawed. (The U.S. will be at the table this December, however, when signatories are supposed to agree on a successor plan to the Kyoto Protocol at a United Nations confab in Copenhagen.)

Large corporations also led the charge. A few months after the Kyoto Protocol took effect, GE rolled out its "ecomagination" initiative, vowing to decrease pollution generated by its products and increase spending on clean-technology research and development. That same year retailing giant Wal-Mart Stores unveiled an ambitious plan to "green up" its operations, promising to spend $500 million a year to reduce greenhouse gases by 20 percent within seven years, shrink energy use in its stores by nearly a third and double the fuel efficiency of its truck fleet in ten years, among other goals.

With eco-conscious governments and corporations eager for new technologies, investors leapt into action. In 2005, $60 billion in new capital was dedicated to the alternative-energy sector, a 73 percent jump from 2004 and nearly three times the average increase over the previous two years. "There was a recognition by entrepreneurs and investors that we had a couple of big problems to solve," says Cleantech's Fan. "How do we wean ourselves off coal for power generation? And how do we reduce our dependence on oil for transportation?"

The still-fledgling solar sector was among the biggest beneficiaries of this newfound interest. In several European countries, most notably Germany, solar power got a lift from the adoption of "feed-in tariffs," which require an electric utility to spread the higher cost of renewable energy across its entire customer base, making switching to clean-energy sources cost-effective for end users. Germany's Q-Cells, today the largest producer of photovoltaic cells, went public in 2005 with backing from New York–based Good Energies, a private equity firm focused on renewable energy that oversees $2.4 billion.

Over the next two years, growing political and environmental awareness and plentiful investment capital yielded a veritable clean-energy boom. In 2007 investment in the sector jumped to $148 billion, more than double the total just two years earlier. That same year 19 percent of all new power capacity added globally came from renewable sources, nearly twice the level in 2005.

Even though investment in alternative energy began slowing in the second half of last year as the financial crisis heated up, 2008 was still a banner year. Wind energy, the most mature alternative-energy source, attracted $51.8 billion, including nearly half of all the asset finance capital deployed in the sector last year. Solar energy, which is slightly less mature, attracted $33.5 billion in venture capital and private and public equity. Through last summer capital was plentiful: William James, co-founder and co–managing director of RockPort Capital Partners, a clean-tech venture capital firm in Boston, says that when his firm set out in mid-2008 to raise a new fund to invest in alternative-energy technologies, it intended to shut the door at $400 million but instead took in $453 million. "We could have raised $700 million or $800 million, we were so oversubscribed," he says.

Capital may be a lot scarcer these days, but investors are undeterred. James, for one, has seen tough times before: When he and his five co-founders launched RockPort in 2000, the term "clean tech" hadn't yet been coined. All of the partners had backgrounds in energy, renewable power or commodities finance and were inspired to invest in the sector by the growing environmental consciousness sweeping Europe at the time. They decided to focus their capital and know-how on three areas: energy and power, advanced materials, and process and prevention technologies — and branded their niche "anchor technology." Not only did the name not stick, it also failed to inspire interest from institutional investors.

"If we went to any endowments or big investors, they would say, 'No, this is never going to work; we're not believers in the green movement,'" recalls James. But the partners stayed with it, ultimately growing their firm to $850 million in capital as their enthusiasm caught on in the investment community. Today the firm ranks with Kleiner Perkins and Khosla Ventures as one of the most active clean-energy investors, with the bulk of its money in solar and wind power. In 2008, for instance, the firm invested in Fremont, California–based Solyndra, which has developed photovoltaic systems that are cheaper and more powerful than rival solar technologies.

Specialty firms aren't the only big players that have been attracted

to the sector. Bryan Martin, co-head of the U.S. private equity unit at D.E. Shaw & Co., a global hedge fund firm that oversees $30 billion across a variety of strategies, says that his group dedicates about one third of its time to alternative-energy investing and has been active in the sector for more than five years. Martin welcomes what he sees as a return to a more rational environment. "The fast money and the hype are not always helpful," he notes.

Although D.E. Shaw also invests in the public equities, debt and convertible bonds of alternative-energy companies, Martin believes that private financing offers the most attractive risk-adjusted returns. His team focuses on finding projects that offer a bigger payoff because they appear difficult to execute. "We try to do the work to understand whether the difficulties can be overcome," he explains.

A case in point is a wind farm project that D.E. Shaw recently agreed to finance on Maui in Hawaii, where energy must be shipped in and is thus relatively expensive, helping make wind power attractive. The project hadn't yet been financed because locals feared that the turbines would imperil Hawaii's state bird, the nene. But the firm studied the geese's flight patterns and determined that the species wasn't prevalent enough near the proposed site to be at risk.

D.E. Shaw is a big backer of wind power in both Hawaii and the lower 48. The firm is an investor in First Wind, a Newton, Massachusetts–based wind energy company. Among its 36 projects in ten states, First Wind recently completed $375 million in financing for a 200-megawatt wind venture in Utah that will supply electricity to Southern California. Another of D.E. Shaw's portfolio companies, Deepwater Wind, is focused on developing offshore wind farms in markets where it is difficult to construct new power plants.

"This is not a traditional leveraged buyout where one can work on a deal for six months, close and own a big company," points out Martin, reflecting on the challenges of financing large-scale wind energy projects. "It may take three to five years to develop."

Gaps in market prices and imbalances in supply and demand are what attracted Boston-based Denham Capital Management to the alternative-energy sector. Riaz Siddiqi, managing partner at the $4.3 billion private equity firm, says he was drawn to the profit that could be made from what he calls a "value-dislocation paradigm."

The South African energy market is a case in point. Last year the supply of coal energy in that country hit a wall and South Africa was forced to cut industrial energy consumption by as much as 15 percent. In late 2008, sensing an opening for renewable power, Denham Capital invested in BioTherm Energy, a South African company that builds and operates renewable- and clean-energy projects. BioTherm converts waste gases from industrial processes into electricity, which can be sold or fed back into the national power grid, and plans to build a number of small power plants in South Africa in the coming years.

Like Denham Capital, C Change is looking to profit by backing technologies that can shift consumption from traditional to renewable-energy sources. Co-founder Read first became interested in alternative energy during the Carter era, when he was in high school and studying photovoltaics, which focuses on converting sunlight into electricity, a cornerstone of the solar industry. Read ultimately pursued a career in finance but has returned full circle to his earlier passion. C Change is looking to invest from $20 million to $80 million in alternative-energy companies and hopes to take an active role in the engineering and development of the underlying technologies. The goal, Read says, is to help portfolio companies scale up and achieve critical mass.

Last November, C Change announced its first major investment, in a firm called NC12, which formed a joint venture with an as-yet-undisclosed utility company to convert coal and petroleum coke from oil refineries into natural gas using a proprietary process that is essentially free of harmful emissions. When the final phase of the project is completed in 2012, the facility will produce the equivalent of 7 percent of current U.S. natural-gas imports, according to C Change.

The firm is also positioning itself as an adviser to cities and on green projects worldwide. For example, it is in discussions with the South Korean Ministry of Knowledge Economy about partnering to create a private equity vehicle that will help internationalize the country's technologies and bring the most promising non-Korean technologies to the nation, whose heavy industries have an intense demand for energy and materials. Read says that C Change will likely invest several hundred million dollars in South Korea–related projects over the next few years. "We are looking at similar arrangements with local partners in other regions," he adds.

Smaller hedge funds have gotten into the clean-energy investing game too. The Energy Hedge Fund Center lists 97 pure-play funds that invest primarily in the space. Rob Romero, founder of Connective Capital Management, a hedge fund that oversees $108 million in assets, 40 percent of which are dedicated to alternative energy, says that the sector's volatility plays to hedge funds' strengths. In 2001 a voice mail company that he had co-founded, eVoice, was sold to America Online, and he began exploring venture capital opportunities in alternative-energy technologies such as solar power and advanced batteries.

"What I found was that with venture you can only go long," explains Romero, who founded Connective Capital in 2003. "Frankly, many of the things that I saw I would rather have shorted."

In October 2007 he launched the Connective Capital Emerging Energy fund, which focuses solely on alternative energy. The small fund, which manages just $7 million and is still being incubated internally, lost 21.4 percent last year, versus a 3.6 percent gain for the firm's flagship fund. Still, the new fund has rallied in 2009, climbing 10.3 percent in the first five months of the year. Romero says that Connective Capital's investments in wind turbines and solar technology have been the most fruitful. For example, his position in Nasdaq Stock Market–listed A-Power Energy Generation Systems, which supplies wind turbines to China, has more than tripled since he bought the stock in March, although the shares fell after worse-than-expected first-quarter results were released in June.

To the casual observer alternative energy may appear to exhibit all the foibles of a textbook boom-and-bust industry, taking off as investor excitement catches fire only to overextend itself and crash. But many longtime industry observers see the current downturn differently, as a mere blip on the road to wider acceptance of alternative-energy technologies — and bountiful profits for early backers. "Some thought the sector was going to blow up and go away," notes RockPort Capital's James. "But it's our guess that clean tech is going to eclipse other spaces like information technology and biotech." ••

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