

GOLD RUSH

FOR COMPANIES SELLING “GREEN” TECHNOLOGIES, THESE ARE THE BEST OF TIMES. DEMAND IS RISING, THE POLITICS ARE RIGHT, AND SUBSIDIES ABOUND.



SOLAR PLANT, ALMEIRA, SPAIN

> At a former military base near Leipzig in eastern Germany, developers recently switched-on the world's fourth largest photovoltaic plant—an installation the size of 200 soccer fields. The 40-megawatt plant uses over half a million thin-film modules to convert solar energy into electricity, and feeds it directly into the power grid.

The Waldpolenz solar park, developed by the EUR 400 million juwi group, is part of a wave of such projects across Germany. Germany installed 100,000 solar systems in 2006, representing 750 MW of solar-electric generation, according to the German Solar Association. The trade group expects the total for new solar installations in 2008 will be at least 35% higher than in 2007.

German solar technology turnover has grown from EUR 450 million to EUR 4.9 billion in the last six years, according to

the Ministry of Economics. Much of that growth has been led by mid-sized companies such as the juwi group of Woerrstadt and Q-Cells SE, based in Bitterfeld-Wolfen near Dessau, which claims to be the world's biggest solar-cell manufacturer.

The reason for the proliferation of solar installations in Germany—not one of the world's sun-washed countries—is easy to find. Investors have been attracted to solar plants—as well as to wind farms, biogas plants and other renewable energy production—by the country's electricity feed-in law, which sets above-market prices for electricity produced with renewable fuels and requires utilities to buy it.

Germany has plenty of company around Europe for such policies. Spain, Portugal, the Netherlands, France, Greece and Denmark, among others, also set “feed-in tariffs” favouring energy from renewable sources. Others, such as Belgium and



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Italy, set requirements for utilities to buy a certain amount of electricity from renewable sources—which amounts to the same thing as setting an above-market price. Still others, such as Finland and the UK, provide various fiscal incentives (eg, tax breaks and R&D grants) to renewable energy developers. These policies ensure that technologies which might not be able to compete against fossil fuels on their own are able to gain market share. And with the recent EU agreement setting a goal of 20% of energy from renewable sources by 2020, such measures will likely increase.

Hot pursuit

Europe’s renewables industry has done well in this system, in part because Europe has taken the global lead in environmental regulation. A recent report from consultancy Roland Berger for the German Environment Agency found that European companies have more than 30% of the global market for environmental technologies. The consultancy is clear about the policy foundations for this success. “Our interview partners stated that traditional regulatory measures—threshold values, quotas and such—are the most effective tools for promoting environmental innovation,” it says. “Instruments for stimulating demand are also helpful. ... Environmental technologies are an economic motor of the future—but only if Europe does not lie back and wait for the rest of the world to match its environmental targets.”

The rest of the world is indeed in hot pursuit. US President Barack Obama said during the presidential campaign that he wants to spend \$150 billion over 10 years on developing the US alternative energy technologies industry. He also has proposed a national emissions cap-and-trade system similar to the one in the EU. About 50 countries, including India, China and Brazil, have already set renewable energy targets. China, until now a net

‘WE KNOW WHERE WE HAVE TO GO’

Dr Claudia Kemfert is head of the department of energy, transportation and environment at the German Institute for Economic Research and professor of economics at Humboldt University in Berlin. She spoke with GlobalTrade about the economics of climate protection.

GlobalTrade: From the point of view of individual companies, does it make sense to invest in emissions reduction even if the company is not currently required by law to do so?

Kemfert: Yes, it does. Fossil fuels are scarce and finite, and will become more expensive in the future. Using less energy in general, and less fossil-fuel energy in particular, will save money for companies of all sizes, and reduce dependence on oil imports.

GlobalTrade: Where do you see some of the most promising markets for developers of low-carbon technologies?

Kemfert: The renewable energy sector is an obvious one, but there are also interesting developments in other industries. The chemical industry, for example, is developing low-emissions substitutes for oil. There are energy-efficiency technologies being introduced in nearly all sectors.

GlobalTrade: Much of the investment in green technologies has been driven by government rather than market forces. Governments subsidise renewable energy, set up emissions trading schemes to favour investments in renewables, and influence the price of carbon by the way they set up the emissions trading schemes. Does any of this bother you as an economist?

Kemfert: We would not need to have subsidies for renewable energies if we had stringent emissions reduction requirements, but that is not politically feasible. The current emissions trading model may not be the ideal one according to economic theory. But the best alternative is to start doing something even if it is not the lowest-cost approach. A second-best solution is better than doing nothing at all. We know where we have to go, and we know it is a long and difficult road.

“EUROPEAN COMPANIES HAVE MORE THAN 30% OF THE GLOBAL MARKET FOR ENVIRONMENTAL TECHNOLOGIES.”

German Environment Agency

importer of energy efficiency technologies, is developing an industry of its own. (Please see box, “Race To Riches”, page 8).

There is more at stake than domestic environmental protection. Since green technologies are a worldwide growth industry, governments hope to help position their own companies to compete in it. The UN Environment Programme (UNEP)

says renewable energy investments worldwide reached \$160 billion in 2007, up from \$100 billion in 2006, and are continuing an exponential rise.

No 'invisible hand'

The industry's backers see no problem with the fact that much of the growth is fuelled by government measures, such as feed-in tariffs, minimum-purchase requirements for

renewable energy, mandates to cut emissions, and R&D grants and tax breaks for green-technology industries. The main rationale is that fossil-fuel emissions damage the environment, thus creating a public interest in paying for clean alternatives. The more one believes that climate damage is imminent, the more one is willing to pay to contain the threat. (See box, "Debating Doomsday", page 4) A separate argument is that renewable energy and fuel-efficiency tech-

RACE TO RICHES

> The EU, which has supported renewable energies longer than other countries and regions, is currently the lead player in the global market. In its 2008 report "EU Action Against Climate Change," the European Commission identified eco-industries in general as one of the most dynamic sectors of the European economy, growing at around 5% a year in response to global demand for green technologies, products and services. In all, co-industries employ 3.4 million people in Europe, the commission said. It added, "Renewable energy technologies have already created 300,000 jobs, and it is estimated that a 20% share for renewables will take this to almost 1 million new jobs by 2020—and possibly more if Europe exploits its world leadership."

Success brings imitators, however. "Germany heavily promoted renewable technologies in the past, so German companies in this industry have an advantage at the moment," says Dr. Claudia Kemfert of the German Institute for Economic Research. "But many other countries are copying that strategy, giving rise to competition from other regions."

Measures proposed by U.S. President Obama to support renewable energies would create a giant domestic market for power from those sources, and boost US demand for energy-efficiency technologies. "A lot has been done already to improve fuel efficiency in Europe," says Thorsten Herdan, managing director and director of energy policy for the German Engineering Federation. "In the US, it is not only the automotive industry that has a problem with energy efficiency. A lot of US industries consume too much energy, and will look to improve efficiency in the near future."

China is also emerging as a major player. "Chinese producers see the potential for developing major domestic clean

READY FOR TAKE-OFF

Under EU rules agreed in December, all flights to and from EU airports will require emissions permits beginning in 2012. Some airports are already taking pre-emptive action to cut emissions. Aéroports de Paris (ADP), Europe's second largest airports group, is an example, investing EUR 11 million in a geothermal plant at Orly in Paris. Engineers will drive two long shafts down to a hot-water aquifer 1,700 metres underground, use one of them to draw hot water up, run the water through an existing power station, and then use the other shaft to send cooled water back down. The heat from below will supply one-third of the airport's heating needs, reduce CO2 emissions by 7,000 tonnes a year, and save fuel costs, says Chairman Pierre Graff.

technology industries and have already started to do so," says Herdan. "The head of China's national development and reform commission told me some years ago that, 'just because we spent the last thousand years sleeping doesn't mean we will spend the next thousand years sleeping too.'"

For European players, the best opportunities for maintaining market dominance probably lie in these two markets. "The best growth markets are in the US and China," says Steve Sawyer, secretary-general of the Global Wind Energy Council. "The US is the world's largest wind-energy market, and China is the fastest growing. In 2008, about 7,500 megawatts of wind energy capacity will be installed in the US and 5,000 megawatts in China."

With governments worldwide committed to supporting green technologies, and growing markets in most parts of the world, it seems a fair bet that the industry's wild ride will continue. But some in the industry caution against over-confidence: Political support can be as fickle as the wind. <