



Why *Europe* looks *greener* than the U.S.

A court ruling that environmental benefits justify the breaking of the EU's competition rules is good news for industry executives seeking a business climate favorable to renewables

While much progress has been made on reducing the cost of green energy since the 1970s, renewables will require policy support for perhaps a decade more to establish them as mainstream—read price-competitive—energy options.

Policy support, including subsidies, for renewable energy in the U.S. remains patchy at best and is waning under the Bush Administration. However, the European Union has made green-supportive policies a priority, though the emphasis varies across its 15 member nations. The results are there for all to see:

- More than two-thirds of the world's total windpower capacity,

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which topped 23 GW by the end of 2001, is in Europe. Germany, Spain, and Denmark are leading the way.

- Germany alone will account for about 20% of the total world solar power market in 2001.

- Sweden gets more than 16% of its total primary energy from biomass, and Austria isn't far behind.

The list goes on, and with the recent passing of the EU renewable electricity directive, will grow further. The directive stems from a 1997 European white paper on renewables which calls for the proportion of the Union's primary energy supply derived from renewable sources to double by 2010. The majority of the EU's existing renewable supply is from large hydro-

Energy policy

The overall goal of the directive's provisions is to raise renewables' share of total energy supply from about 11% now (mostly large hydro) to 22% in 2010

electric and biomass.

Since the opportunities to expand large hydro have largely been exploited in Europe, this new production would have to come from the *new* renewables—wind, solar, geothermal, and nontraditional biomass. The white paper set targets for each of these sources (see table). Alongside the renewable power directive, the European Commission is proposing a directive on biomass-derived fuels for transport, which would have ethanol and biodiesel take 5.75% of that market by 2010. Other energy-related measures include directives on energy efficiency, combined heat and power, and carbon trading.

The main impetus for the white paper and the resulting policy measures has been the perceived need to mitigate climate change. Unlike in the U.S., the growing consensus in European political circles is that global warming is real and its causes must be addressed now. As a result, after the U.S. withdrew its support for the Kyoto Protocol a year ago, the EU took the lead in moving the pact along toward ratification by its members and Japan. Having invested political capital in the treaty, the onus is now on the EU to get its members to deliver on their promises. Investors are getting the message that the EU means business on climate change, and that investments in renewables will be underpinned by government support. Europe will consequently be the leading market for renewable technologies for at least the next decade.

Lessons from a five-year history

The genesis of the renewable electricity directive sheds light on

Europe's contentious policy debate about the best way to support renewable energy. The original draft from the Commission laid out a harmonized system of support, based on a then untried system of renewable obligations. Hoping to copy the success of SO₂ emissions trading in the U.S., tradable green certificates were to be used as the means of tracking compliance. With certificate trade, renewable power could be generated wherever it was cheapest. Its "greenness" then could be sold to electricity suppliers or customers obliged to buy it by law. The result, in theory, should be the availability of the desired amount of green power at the lowest cost.

However, these early drafts of the directive provoked a furious reaction from, in particular, the German, Danish, and Spanish governments. They are the countries that have led the way on renewable energy in Europe, through fixed tariffs for the production of electricity from renewable sources, particularly wind. By assur-

ing investors a guaranteed return, such policies have been spectacularly successful in actually getting renewable capacity built.

Proponents of fixed-tariff policies point to the lack of success that the old British non-fossil-fuel obligation (NFFO) system and the French Eole 2005 program—under which developers bid competitively for long-term power purchase contracts—had in getting projects off the drawing board. Fixed tariffs are also simple, which encourages local participation; this has been another major factor behind the success of the German and Danish wind industries. Having built up industries with thousands of employees making renewable energy equipment, and a constituency of facility owners whose income was threatened by a move away from fixed tariffs, some governments resisted the imposition of a new and untried system by Brussels.

In the end, a typical European "fudge" was negotiated. Member states are free to use whichever policy they think is best for their circumstances. Some will continue with fixed tariffs, while others are experimenting with obligation-type policies. In four years, the European Commission will review progress, and if it concludes that a harmonized system is both necessary and desirable, it will propose creating one. There would then be a seven-year transition period to the new system, once its details are agreed upon.

Other provisions in the directive include a list of *indicative* targets for the proportion of power from renewable sources that each country should achieve by 2010. The overall goal is to raise renewables' share of total energy supply from about 11% now (mostly large hydro) to 22% in 2010. Different countries' different energy circumstances are taken into account; the targets are mostly based on existing national goals—for instance, Great Britain's indicative target is to become 10% green by 2010, from about 2.8% now. Signifi-

From green to greener

Type of energy	Capacity in EU	
	1995 (actual)	2020
Wind	2.5 GW ¹	40 GW
Hydro	92 GW	105 GW
Photovoltaics	0.03 GW	3 GW
Biomass	44.8 Mtoe ²	135 Mtoe
Geothermal		
Electric	0.5 GW	1 GW
Heating	1.3 GWth ³	5 GWth
Passive solar (mainly for heating)		35 Mtoe
Unconventional renewables (tidal power, ocean currents, wave power, hot dry rock, ocean thermal energy conversion)		1 GW

¹ Electrical gigawatts (equals 1,000 MW)

² Million tonnes of oil equivalent

³ Thermal gigawatts

Source: EU white paper, November 1997 (http://europa.eu.int/comm/energy/library/599fi_en.pdf)

Creating demand for green energy, by the numbers

Ever since 1993, when the Sacramento (Calif.) Municipal Utility District kicked off its PV Pioneers program, skepticism and optimism have dueled over the market viability of green energy. Skeptics find it inconceivable that more than a handful of people would be willing to pay a premium for electricity generated from renewable sources. Yet willingness-to-pay (WTP) studies conducted throughout the 1990s repeatedly painted a rosy picture of large numbers of residential end users eager to do just that.

As is so often the case, the reality is somewhere between the extremes. A decade of market experience has shown that there is indeed a non-negligible group of people who will pay more for green energy, but also that their numbers are not as large as some thought. Surveys also indicate that of those who are willing to pay more, very few actively seek the opportunity to do so. Indeed, the market reality of selling green energy is much like selling any other new product: Customers need to be made aware of the product, educated about it, and then motivated to buy it.

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Who are these people?

The first decade of selling green energy has not, however, provided answers to some key questions about the markets for and marketing of renewables. Two are, "Is today's 5% market penetration the highest we'll see?" and "How can we reduce the cost of reaching potential buyers?" These questions have remained difficult to answer in part because, until now, we have collectively had a fuzzy image of who exactly will "put their money where their mouth is" and buy green energy.

A recent, 43-page report by E Source, "Understanding Residential Green Energy Buyers: A Market Research Survey," yielded a wealth of useful information. It details the demographics of residential users who signed up for green energy programs, reveals what beliefs and opinions motivated them, and—as a result—suggests the most effective marketing channels for reaching them at low cost.

Following are some of the report's key findings:

- Likely green energy buyers can be found across the U.S., although they are more prevalent in the Northwest

and Northeast.

- About 22-million U.S. households—about 23% of the American total—are more than twice as likely than the average household to purchase green energy. This does not mean they will buy it when offered, only that they are far better than average prospects. The survey identified 13 clusters of these prospects, down to the zip +4 level.

- Some 85% of households currently purchasing green energy say they are *very likely* to continue doing so. And 71% say they will do so even if the price increases by \$1 per month, or about 15% more than their current green energy premium.

- Green energy programs are unknown to most of the population. Only 35% of the general population in the surveyed areas knew about their local utility's green energy program, even where the program had been marketed for a year or more.

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cantly, the EU did not make the targets legally binding on member states. However, if at the time of the four-year review the European Commission rules that progress has been inadequate, it can make the targets mandatory.

Technical issues tackled in the directive include the definition of what is a renewable technology; in such grey areas as waste-to-energy and hydro, some—but not all—types of projects are considered green. This has been one of the major points of disagreement in the negotiation process. The directive also makes provisions for providing grid access to suppliers of renewable electricity.

Protection, not protectionism

Despite the passing of the directive, elements within the European Com-

mission continue to agitate against fixed-price tariffs and for a harmonized, certificate-based system of support across the EU. For example, Competition Commissioner Mario Monti regularly makes noises about the German tariffs, claiming they violate the EU's market principles of free cross-border trade because they are available only to generators in Germany. His claims run counter to a ruling by the European Court of Justice (ECJ) on an earlier version of the German tariffs, which made two important points. First, the ruling said that the tariffs did not constitute state aid, because the subsidy is paid by consumers rather than by the government. The ruling's second point was even more significant: It said that although the German tariffs violated the EU's internal market rules, that violation was justified by the

resulting environmental benefit.

It is clear that the EU has made a political commitment to make environmental protection in general—and climate change mitigation in particular—a key aspect of its development policy. The ECJ ruling shows that this priority may also override competition policy, one of the other pillars of EU economic development. With this lead from the top, European energy executives can feel confident that they will be supported in their efforts to innovate and begin the transition to a low-carbon economy. Can there be any doubt that the EU—rather than the U.S.—will be the breeding ground for the energy technologies of the future? ■

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