



ENERGY

The German Experiment

THE GOVERNMENT SETS A PREMIUM PRICE ON SOLAR AND OTHER ALTERNATIVE POWER SOURCES. THE POLICY OFFERS LESSONS IN WAYS TO ENCOURAGE THE USE OF RENEWABLE ENERGY.

By EVAN I. SCHWARTZ

A decade ago, Germany launched a renewable-energy plan on an unprecedented scale. Its parliament, the Bundestag, enacted a law obligating the nation's electric utilities to purchase green power at sky-high rates—as much as 60 cents per kilowatt-hour for solar—under fixed contracts lasting up to 20 years. (German market prices for electricity, largely produced by coal and nuclear plants, were about 12 cents per kilowatt-hour.) The idea behind this “feed-in tariff” was that anyone would be able to build a renewable-power plant—or install rooftop solar panels—and be guaranteed predictable profits by feeding energy into the grid, where utilities would buy it at premium prices. The higher costs would be passed on as monthly surcharges to ratepayers, spread out among all homes and businesses in a country of about 80 million people. Fossil and nuclear fuels amount to “global pyromania,” said Hermann Scheer, the German politician who championed the policy. “Renewable energy is the fire extinguisher.”

Now, as the United States and other nations look toward creating their own

policies for dealing with climate change, the effectiveness of the German experiment is a subject of debate. From one perspective, the Renewable Energy Sources Act of 2000 has exceeded its aims. Germany's first target was to get at least 10 percent of its electric power from renewable sources by 2010. The German grid now gets more than 16 percent of its electricity from these sources, and the government has raised its target for 2020 from 20 percent to 30 percent.

The country avoided pumping about 74 million metric tons of carbon dioxide into the atmosphere in 2009. The German environment ministry also touts a side benefit: nearly 300,000 new jobs in clean power. As a result, the feed-in tariff has the support not only of the left-leaning politicians who originally backed it but also of most of the skeptics in the right-leaning parties that fought against it, says Claudia Kemfert, who heads the energy department at the German Institute for Economic Research in Berlin. “The skepticism is over,” she says. “We’re celebrating the success.”

But from another perspective, the German policy is a government boondoggle.

THE RENEWABLE ENERGY SOURCES ACT
Passed by the German Bundestag February 25, 2000
Amended in 2004, 2008
www.bmu.de/english

“It’s not surprising that if you throw enough money at a certain technology, people will use it,” says Severin Borenstein, codirector of the Energy Institute at UC Berkeley’s Haas School of Business. Yes, the incentives triggered a frenzy of renewable-power installations, but at “very high prices,” says Henry Lee, director of the Environment and Natural Resources Program at Harvard’s John F. Kennedy School of Government. The spending on photovoltaics has been especially cost-inefficient in terms of producing power, Lee adds, because “Germany is the cloudiest country in Europe.” Despite the weather, Germany now accounts for half the world’s 20 gigawatts of installed solar capacity. “What that gets you,” says Lee, “is high prices for electricity, locked in for 20 years, from technology that will be out of date within three years.” Concludes Borenstein: “That’s a failure of public policy.”

As for the job-creation benefit, it may turn out to be ephemeral. Solar panels and wind turbines can be manufactured nearly anywhere in the world. Now, partly because of competition from low-cost manufacturing in China (see “Solar’s Great Leap Forward,” p.52), many German manufacturers of this technology are struggling. Q-Cells, Conergy, and Solarworld have seen their stock lose much of its value since the start of 2008. Anton Milner, the founding CEO of Q-Cells, resigned in March after the company reported an annual loss of 1.36 billion euros (\$1.67 billion). In May, to keep pace with the plunging cost of solar panels, the Bundestag cut the rates it set for selling solar power to the grid by 11 to 16 percent on top of a scheduled annual decrease of 10 percent. To try to compete with imports, solar companies have fired hundreds of workers, and the nation’s solar trade association has warned of even more layoffs.

Meanwhile, some of the countries that copied key features of the German policy have also seen their booms start to fizzle. In 2008, Spain set an all-time record for photovoltaics, installing 2.46 gigawatts’ worth of solar panels in a single year—41 percent of

all new installation worldwide, according to Solarbuzz, a research and consulting firm. But in Spain, buying all that high-priced power became a burden to the utilities. That, along with a longer contract term and aggressive pricing, caused the tariffs to be drastically cut. Without the high incentives, in 2009 Spain installed only 6 percent of the world's new solar-power capacity.

Nevertheless, interest in feed-in tariffs is growing in the United States. At least two cities—Sacramento, CA, and Gainesville, FL—have enacted local plans. California, Hawaii, and Vermont have passed laws that would create their own feed-in tariffs, and at least 15 other states have considered it.

What might these policies cost? In Germany, electricity prices have soared more than 60 percent over the past decade. But Germany's environmental ministry says the tariff system is responsible for less than a 10th of that increase, or about \$3 per month for a typical household. Since German households consume about half as much electricity as U.S. homes, the extra cost for renewable energy has not been a deal-breaker for the public, says Kemfert, who contends that a majority of Germans support it. Overall, the tariff cost Germany an estimated \$11 billion in 2008 alone, about a third of 1 percent of its GDP.

But why even bother with feed-in tariffs? Many economists favor either a carbon tax or a cap-and-trade system in which electricity plants buy permits to burn fossil fuel. "It would be better to tax brown power than subsidize green power," says Borenstein. Coal is the biggest carbon emitter among all energy sources, and it currently accounts for about half the electricity produced in the United States as well as in Germany. Phasing out coal should be the main goal, and pursuing that goal by putting a price on carbon, he says, allows the market to decide which renewable sources are most cost-effective. That's more efficient than letting the government set prices.

However, neither cap-and-trade nor a direct tax may be politically feasible in the

United States. So would a national feed-in tariff be an acceptable alternative? Or would it also be politically doomed, since it, too, would raise electricity prices? To make a case for it, politicians would need to convince the American public that renewable power is worth it, pointing to Germany as the example. Indeed, the German experiment does show that a large industrial society can reach ambitious goals for scaling up new sources of clean electricity, with users paying the way. Germany expects to produce most of its electricity from renewable sources by 2030. Meanwhile, the United States produces only about 7 percent of its electricity from such sources, most of that from long-standing hydroelectric plants.

The real significance of the German plan, though, may not be as a model for other countries but as a source of permanent change in the world's energy economy. In this sense, Germany can be compared to early adopters of new gadgets, who often pay outrageous prices even though they know that others will get improved technology for much less a few years later.

Consider the changes in the market for wind power. By 2006, Germany had by far the largest wind-power base in the world, with 20.6 gigawatts of capacity. The massive scale brought the cost down, and wind began approaching grid parity in many parts of the world. In 2009, the United States and China were able to surpass Germany in capacity, but at far more attractive prices.

Thanks in part to the Germans, the same thing now appears to be happening in solar, with prices of photovoltaic panels plunging 40 percent last year alone. Yes, the critics are right that Germany's spending was wildly inefficient. But what Germany did was prime the global markets, showing that renewable technologies can be a big business worthy of investment. As a result, the United States may not need to copy Germany's experiment to reap the rewards. **TR**

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