

What, Exactly, Is a Feed-In Tariff?

If you charge consumers a bit more for electricity but also pay them to produce it at home, they will start installing solar panels.

“Where renewable energy is taking place,” said Toby Couture, an analyst at the National Renewable Energy Laboratory in Golden, Colo., “it is the result of policy.”

Yet in the renewable-energy policy debate now blossoming on Capitol Hill, a “feed-in tariff” is not under serious consideration. This may prove to be a mistake, because countries such as Germany with feed-in tariffs currently have the greatest installed renewable-energy capacity.

A feed-in tariff is a rate structure that pays consumers to produce electricity, rather than simply charging them to use it. It guarantees access to the electrical grid for all producers, even tiny ones. It guarantees a purchase price for that energy for an extended time period. The payment is also pegged to the particular technology used, whether it be wind or solar or some other kind. And the price is set to cover the cost of production and to ensure a small profit.

Feed-in tariffs now exist in more than three dozen countries including Germany, where experience underscores the crucial importance of getting the price right: The initial compensation was too low to entice much investment. Spain recently had the opposite problem—Madrid set its tariff so high that it led to a surge of solar-power installations. This proved quite expensive for the government because tax revenues paid for some of the renewable-energy incentives. Madrid was forced to cap the amount of renewable power it would buy each year, and the market for solar technology subsequently collapsed.

“Where feed-in compensation is paid out of taxes,” warned Hans-Josef Fell, the energy spokesman for the Green Party in Germany’s Bundestag, “the market is dependent on decisions taken by the finance minister.”

Experience elsewhere also suggests that subsidizing the purchase and installation of renewable technologies through tax write-offs or cash grants lacks long-term accountability. There is no way to ensure that the windmills and solar panels that taxpayers help finance will remain operational over time.

Other incentives for renewable-energy production have proven similarly disappointing. The 1978 U.S. Public Utility Regulatory Policies Act, better known as PURPA, offered to pay producers for their energy an amount equivalent to what it would

cost utilities to generate that power from other sources, such as natural gas. California’s electricity rate structure uses a similar “avoided cost” approach. But this pricing scheme has had little success anywhere it has been tried, Couture said.

What has worked is the German pricing system: a cost-plus arrangement. Producers are paid enough to cover their cost of production plus a profit of 5 to 7 percent. “This is not some ‘foreign’ concept,” Couture said. “American utilities have been signing cost-plus contracts for decades for nuclear power.”

The fee paid to producers of renewable energy in Germany varies. The tariff for power generated by offshore windmills is higher than that paid for electricity coming from onshore wind turbines, which cost less to install and maintain. Decentralized projects earn higher tariffs than centralized ones, to encourage broad deployment of renewable-energy technologies. Small rooftop solar installations, for example, earn 43.01 eurocents per kilowatt hour, while large ground solar operations receive only 31.94 eurocents per kilowatt hour.

The German feed-in tariff declines over time. The Bundestag recently voted to cut the solar feed-in tariff by 10 percent this year, 7 percent in 2010, and 8 percent in 2011. This sliding rate is intended to encourage the early adoption of new technologies. Because energy producers earn less over time, the makers of windmills and solar panels will be motivated to lower the cost of their technologies to avoid losing customers. That incentive seems to be working: The cost of photovoltaic systems dropped 25 percent between 1999 and 2004.

“Policy is a magnet for investment,” Couture said. “And a feed-in tariff makes renewable energy a low-risk investment,” because the cost-plus payment rate is guaranteed for 20 years.

With feed-in tariff contracts, homeowners can go to banks and borrow the money needed to put a solar collector on their roofs. The banks know they will get repaid, and homeowners know they will earn a profit. “The feed-in tariff is a safer investment than putting your money in the stock market,” quipped

Burghard von Westerholt, managing director of the First Solar plant in Frankfurt (Oder).

Moreover, because windmill payments are based on the number of kilowatt hours of electricity produced, operators have a financial incentive to run their facilities efficiently and to maintain them with as little interruption as possible.



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CEO of First Solar

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The added cost per household in Germany in 2007 for the feed-in tariff was between 3 and 4 euros a month.

The value of this certainty to those who manufacture solar technologies cannot be underestimated. “The feed-in tariff made Germany a viable long-term market for us,” said Michael Ahearn, president and CEO of First Solar.

Critics, especially those in German industry, complain that the feed-in tariff raises utility bills unnecessarily. In 2008, the tariff’s estimated cost was 3.2 billion euros, or \$5 billion. This amounts to less than two-tenths of 1 percent of the German economy, hardly a significant price tag to encourage a technology that delivers 15 percent of the nation’s electricity. Furthermore, the cost is spread across the entire ratepayer base. In 2007, the added cost per household was 3 to 4 euros per month, about the price of a latte.

Encouraging the production of renewable energy does not always drive up costs. Feed-in tariffs in Spain and Denmark actually reduced the cost of power from wind, in part because the price is not subject to inflation or to the ups and downs of the global oil and natural-gas markets.

Plus, utilities don’t always use the lowest-cost energy source; they hedge their bets by diversifying. “If cost were the only driver,” Couture observed, “100 percent of U.S. generation would be hydro or coal. But the largest source of new, installed capacity is natural gas, even though it is costlier and the price is more volatile.” Greater reliance on renewable production is just an extension of that diversified portfolio approach.

A narrow focus on cost is shortsighted, warned David Wortmann, director of renewable energies and resources at Germany Trade & Invest, a government agency. “If you only look at costs today,” he said, “you will lock yourself in to today’s technologies.”

Draft energy legislation in the U.S. House does not contain a feed-in tariff, and obstacles in the United States might make it hard to include one. In the U.S., because state authorities and not the federal government set electricity rates, there can’t be a nationwide mandate. It also isn’t clear that Washington could legally force utilities to pay a premium for renewable energy. Monopolistic utilities, meanwhile, often

have great influence over rate-setting and have no interest in competition from multiple small suppliers that will eat into their market share and profits.

The House draft does promote renewable energy by requiring utilities to obtain 25 percent of their electricity from wind, biomass, solar, and geothermal by 2025. Such a renewable-energy portfolio standard is already mandatory in 28 states and the District of Columbia.

Germans say that this kind of requirement is necessary for an energy transition, but they warn that it’s not sufficient. A standard is simply an aspiration, an unfunded mandate that prescribes how much customer demand must be met with renewables; it does nothing to help a nation attain that goal. A feed-in tariff is needed to promote new supplies of renewable energy.

Moreover, a renewable portfolio standard implicitly favors onshore wind as the principal source of renewable energy because that is now the lowest-cost means of generating such power. It does not encourage the development of a range of renewable technologies.

The German Green Party’s Fell notes that although a renewable-energy standard looks like a floor, it effectively acts like a ceiling. Manufacturers see the potential renewables market as limited to the percentage allocated to them by law and plan their investments accordingly. Fell argues that by coupling a standard with a feed-in tariff, which sets no limit on renewable-energy production, government can give solar panel and wind-turbine manufacturers the long-term planning horizon they need to create jobs.

In the U.S., only Gainesville, Fla., has a German-style feed-in tariff. “It was the simplest rate design I have ever done in my life,” said Ed Regan, an assistant general manager at Gainesville Regional Utilities. It took but five months to implement. The compensation is cost-plus, with a 5 to 6 percent profit, and is limited to solar technology. Consumers pay 32 cents per kilowatt hour, about triple the national average for electricity in general. Still, it has raised overwhelming interest: At a time when the entire state of Florida has 4 megawatts of installed solar power, Gainesville has requests to install 40 megawatts.

Last year, Rep. Jay Inslee, D-Wash., and other House members proposed a U.S. feed-in tariff that would guarantee access to the power grid for renewable-energy producers and assure them cost-plus compensation for 20 years. But they have not reintroduced the bill this year.

As Congress wrestles with energy legislation, Germans say, Americans can learn several lessons from Germany’s experience.

“Don’t let the bureaucracy write the legislation,” advised Reinhard Butikofer, the former head of Germany’s Green Party. Members of the Bundestag, with input from consultants and government officials, drafted the German law. “If the bureaucrats had written it,” he said, “it would have taken a more conservative approach.”

And Butikofer counseled: “Listen to your critics. They worried that we would create a huge, permanent subsidy. We answered them by decreasing the subsidy over time.”

—Bruce Stokes