Photo: Gainesville Regional Utilities:

Gainesville Regional Utilities and the City Commission ceremonially sign off the feed-in tariff ordinance.

FiTs in the U.S.A.

U.S. energy policy: Future U.S. policy may have begun on March 1 in Gainesville, Florida – population 250,000. The local municipal utility company adopted feed-in rates based on the European model. The new policy is straightforward. 32 cents is paid for each kilowatt-hour of solar electricty exported to the grid. Could Gainesville be the tipping point for U.S. solar policy?

Initially, no one knew quite what to call it. The policy initiated in the proposal to the city council of Aachen, Germany – population 250,000 – in the early 1990s was called "break-even compensation" or "full-cost compensation" and later simply became known as the Aachen Model when applied to photovoltaics. By 2004 – more than a dozen years later – feed-in tariffs (as this compensation was originally called in 1991, when it only applied to wind and micro-hydro) had been expanded to cover all renewables, including photovoltaics, all over Germany.

Gainesville, Florida may go down in history as the Aachen of North America. On March 1, Gainesville Regional Utilities (GRU), the local public power provider, rolled out its new solar policy, which it calls Solar Energy Purchase Agreements (SEPA). The name may be a bit of an insider; SEPA is also, of course, the acronym for the Solar Electric Power Association, and SEPA itself had a hand in Gainesville's SEPAs, so to speak. Last summer, GRU's assistant general manager Ed Regan went on a fact-finding mission organized in part by SEPA to look into what exactly feed-in tariffs (FiTs) are. "I had a local solar advocate here who kept asking me why we don't just do what Germany is doing," Regan explains, "so when I got the chance, I decided to have a look myself." The surprising thing is that it only took Regan 9 months to turn the fact-finding mission into applied policy.

Of course, a number of countries in Europe have FiTs, and they all differ slightly from each other, so it comes as no surprise to hear that some Americans believe that California and North Carolina, to take just two examples, already had FiTs before Gainesville. Europeans are likely, however, to agree with a number of FiT supporters in the U.S. that Gainesville's SEPAs are indeed the first FiTs in the U.S.

"I already have a backlog of about two megawatts that could be allocated on the very first day," explains Rachael Meek, commercial analyst at GRU who is overseeing the SEPAs. She feels that the policy could, like the FiTs in Ontario, be so successful that a gap might occur if the 4-megawatt annual ceiling is reached too soon. "Right now, it's too early to tell how local contractors will benefit, but investors from out of town are swamping the place," she explains.

A lot of pent-up demand

Regan is less worried about the ceiling. "We would like to avoid a stop and go situation," he says. "Just because we have set a cap does not mean the program will definitely be discontinued at that point. We simply need to see if our pricing model is accurate, and the City Council is free, at its discretion, to extend the program," Regan explains, adding, "It is a lot harder to raise the rate if it turns out to be too low. People already on board feel greatly disadvantaged then. But we can always lower the rate a bit to keep demand going."

Regan agrees with Meek that it is too early to tell whether the program will become a success story for middle-class homeowners after the initial wave of out-of-town investors has subsided. "We definitely want to have lots of small, distributed systems, not large ground-mounted arrays," Regan comments on the four-megawatt cap, which a single utility-scale solar plant could theoretically exhaust. "Right now, we are simply witnessing a lot of pent-up demand, so we have to see how enticing rates are once this initial interest has subsided. I think demand will taper off quickly once this initial wave of investors has been served."

Florida has net-metering and also covers a large chunk of the purchase price, but Regan says his utility was nonetheless not satisfied. Production-based compensation was an easy sell, Regan adds, because his colleagues already advocated support for solar energy in general. In fact, in addition to the upfront bonus of four dollars per installed watt paid in Florida, his utility tacked on another 1.50 dollars (a rooftop system is estimated to cost some 7-8 dollars per installed watt). Christy Herig, the Solar Electric Power Association's regional director for the eastern U.S., says Gainesville accounted for nearly 13 percent of all of Florida's rebate applications. "We were handing out all of this money to people," explains Regan, "but then we never heard from them again. We had no idea whether their systems were still up and running properly – in fact, we didn't know if they were still installed at all."

The new policy is fairly straightforward. 32 cents is paid for each kilowatt-hour of solar electricity exported to the grid (the average retail rate in the Gainesville area, by comparison, is around 12.5 cents). The rates are guaranteed for 20 years. Customers within the GRU area are free to choose between the old and the new system. The question is whether SEPAs actually pay better in the end than the "old" combination of net-metering and upfront bonuses – and whether homeowners will be able to understand the differences. "We are not actively marketing SEPAs at the moment," Meek says, "but in my experience, people have not gotten so used to net-metering that they don't want to hear about another option. In fact, the calculation for the old policy is more complicated than for SEPAs, so it should be an easy sell."

The SEPAs in Gainesville are comparable to the previous policies for a reason: they are not intended to cost more. "We took the example of the most lucrative customer under the net metering/bonus system and found that the party would get 26 cents per kilowatt-hour. We then added on a conservative estimate for income tax under the new FiT system and came up with 32 cents," Regan explains. Despite the apparently high rate offered under SEPAs, neither Meek nor Regan believes that the return on investment is necessarily better in all cases under the new policy. "FiTs seemed to be better, but the income from power production is taxable, so it does depend a bit on your individual situation," Meek explains. "Commercial investors are more likely to benefit from FiTs," Regan agrees, adding that all parties will nonetheless benefit from the better quality of planning.

So what is Regan's utility getting out of the deal? After all, the policy encourages customers to become power producers themselves – and compete with the utility. "As a municipal utility, we are part of the community, and this new policy is good for the community. We are looking to the larger social good," Regan argues. His reasoning sounds a bit like that of Aachen's solar pioneer Wolf von Fabeck, who argues: "Levee construction, the fire department, the police, schools, and the switch to renewables are all tasks for society at large; we cannot afford to leave them up to idealists."

So does that mean that investor-owned utilities (IOUs) see things differently? Regan looks across his desk to his colleague Diane Wilson, who has been assisting him in the rollout. "How would you, Diane, describe the attitude of private utilities to feed-in rates?" he asks. "Let's just say they uniformly oppose them," she words it diplomatically.

The Gainesville model?

In addition to attracting investors from all over the country, the new policy has Ed Regan doing a lot of explaining not only in Florida, but throughout the nation. "I'm telling a lot of people how it works these days," he says. John Burges, a Florida-based energy investor, is calling for FiTs to become state policy in his state. The Florida chapter of the Solar Energy Industries Association threw its weight behind the policy a year ago. If things go well in Gainesville, there might be pressure in Florida to adopt the policy statewide.

"I am working hard to replicate Germany's success in California," says Craig Lewis of RightCycle Enterprises. He has spent the past weeks trying to find out exactly how the extra cost is passed on to all power customers through utilities in Germany. But at some point, Germany cannot be taken as an example anymore. For instance, the borders between the power grids of different operators rarely follow the political borders of state lines, so if Germany is to serve as a model, a national policy could be the best approach.

In addition, power bills are different in the U.S. and Germany. German power customers pay an estimated monthly rate, and meters are only read once a year; the difference between those 12 monthly installments and the actual consumption for the year is then credited or payable at the end of the year. In most cases, solar power production is handled in the same way. "Owners of solar arrays get paid a monthly estimate, and when the power consumption meter is read at the end of the year, the power production meter is also read and the difference tallied," explains Gabriele Möbitz of Freiburg's fesa, a regional organization that promotes renewables locally. "But payment modalities are left up to the discretion of the grid operator," explains Stuttgart-based energy consultant Ole Langniß. "German law does not stipulate how this is to be done." And while German households are free to choose their power producer, they cannot choose which power grid they want to live within in order to get better payment modalities from a different grid operator. "In a few rare cases, utilities actually pay a monthly estimate that varies according to season, with more paid in the summer than in the winter, for instance – which only makes it harder for homeowners with solar roofs to pay any loan installments," complains fesa's Möbitz.

In contrast, U.S. utilities are generally still vertically integrated: the power provider is also the grid operator, and U.S. households are generally not free to choose their utilities any more than Germans can choose their grid operator. Meter reading is also different. Americans pay a different power bill every month; the amount reflects the exact number of kilowatt-hours consumed. In areas without automated meter reading (i.e., most of the country), utility technicians drive around town reading power meters manually every month. The Gainesville Regional Utilities has chosen, for the time being, to have power production meters for SEPA clients read at the same time, so the monthly amount paid for power production will also reflect the exact number of kilowatt-hours produced – a relatively costly approach. "It will cost us about 50 cents per household per each meter reading, and the way we have designed the policy, we will have to eat the full amount," Regan explains.

Other models

The list of states in the U.S. that are considering FiTs varies in length according to who puts the list together. For instance, North Carolina is almost never included although since 2003 it has been offering fixed rates for small wind and solar generators: currently, ten cents per kilowatt-hour for small wind and 19 cents for solar arrays. The reason why North Carolina is nonetheless not considered a leader in solar and wind is because these prices are not guaranteed; rather, they depend upon the number of power consumers who volunteer to pay more for green power and can be discontinued anytime. North Carolina thus violates two principles behind FiTs: prices need to be guaranteed, and the added cost of green power has to be spread across all members of society, not limited to idealists (see box). Having said that, the policy has not yet been limited by an insufficient number of power consumers willing to pay a premium for green power. "I cannot remember turning anyone down," explains Katie Shepherd, communications director at NC GreenPower.

Nonetheless, North Carolina is not a leader in solar, possibly because the 19 cents is clearly not enough to cover the cost of a PV array. "We have roughly one megawatt of PV installed under this program," Shepherd says. Other policy proposals have caused much more excitement in the FiT community, though none have become law. The first was Michigan's Renewable Energy Sources Act (House Bill 5218) drawn up by Representative Kathleen Law. It was read on September 15, 2007 and referred to the Energy and Technology Committee, where it has effectively been filed away without further discussion. An onlooker, who wished to remain anonymous, said that energy lobbyists came to Ms. Law's office at some point and "basically told her to back off." Ms. Law reached her term limit in 2008 and could not stand for reelection, so it is unclear that Michigan will ever vote on her proposal.

A slew of other states in the U.S. followed Law's lead. Illinois Representative Karen May's Renewable Energy Sources Act (House Bill 5855) fared somewhat better than Law's proposal in Michigan – at least May's bill was passed from the Rules Committee to the Electric Utility Oversight Committee before being handed back to the Rules Committee, where it, too, has spent the last year with no further action taken.

That was last March – the same month that Rhode Island Representative Raymond Sullivan introduced House Bill 7616 and just weeks after Minnesota Representative David Bly presented House Bill 3537. All of these bills are based on the "Michigan model," which Europeans would easily accept as a full feed-in tariff (see box).

FEED-IN RATE FACTS

Feed-in rates vary from one country to another. Rates certainly differ, as do the duration of payment guarantees, which generally range from 10 to 20 years. But they do share a number of attributes:

All power consumers share the cost, not only those willing to pay a premium for green power.

Funding is therefore not a budget item for the government, but something utilities pass on to consumers more or less immediately.

Rates offered are guaranteed for the reasonable service life of the generator; if your generator is connected to the grid in 2009, it will therefore receive whatever rate applied in 2009 for the duration of the policy.

Power production is paid irrespective of the owner's power consumption.

The goal, however, is to make renewables competitive without subsidies, so rates are reduced for new installations in increments, generally of one or two years. In banking jargon, one speaks of "degression." In other words, if you connect your solar roofs in 2009, you may get 40 cents per kilowatt-hour for the next 20 years, but if you connect in 2010 the rate may have fallen to 38 cents.

Rates are designed to cover the investment costs and offer a modest return on investment, estimated to be around six percent in Germany and five percent in the current policy in Gainesville.

Renewable generators are given priority over conventional power generators; grid access cannot be denied, and conventional generators may have to be ramped down when a lot of renewable electricity is generated.

Beyond these common general principles, the details vary widely. For instance, many countries – such as France, Ireland, and Greece, but not Germany – not only have degression, but also adjust their rates for inflation. Theoretically, the upward adjustment for inflation could zero out or exceed degression, so that rates would actually rise in absolute terms. Likewise, not all types of systems receive special rates: no special rate is offered for small wind generators in Germany, but Germany actually pays more for almost all other types of small generators. For instance, a higher rate is paid for a kilowatt-hour from small biomass units and PV arrays because economics of scale make large biomass generators and PV power plants cheaper per kilowatt-hour. Obviously, FiTs are exposed to the criticism here that they do not promote the cheapest systems, but proponents argue that is their strong point – they provide a brief window of opportunity to all renewable generators considered desirable.

Finally, feed-in rates need not be above the retail rate. In fact, they are generally below the retail rate for all sources of renewable electricity aside from photovoltaics.

Most recently, Indiana State Representative Matt Pierce introduced an Advanced Renewable Energy Tariffs Act (House Bill 1622), which was first read on January 16 before also being sent off to the Energy Committee. On the same day, Wisconsin's Public Service Commission officially began looking into FiTs. California's Energy Commission (CEC) openly reported in December of 2007 that "California will not achieve its goals of 33 percent renewables by 2020 without these policies (FiTs)"; workshops are currently being held on the matter.

Some argue that California already has a type of FiT, but Californian FiT advocate Paul Gipe is not impressed. "If anything, it is a crude feed-in tariff, with one price for everybody," he points out. Indeed, the price varies according to what is called the "market price referent" – essentially, the price paid for power from a combined cycle gas turbine – not according to the level needed to cover the cost of the specific renewable generator. "FiTs represent a completely different way of looking at things, and Americans have not yet quite gotten their heads around it," Gipe complains. Far from being "full cost compensation," California's current policy "woefully underpays solar" in California, Gipe says. "Less than 20 megawatts of renewable generating capacity has been newly installed under this policy, and none of it is solar to my knowledge."

Nonetheless, Gipe is optimistic. "Bills are popping up everywhere, and events in Ontario are very encouraging." Although all of these proposals outside of Ontario and Gainesville have yet to even be voted on, Gipe says that they are fundamentally better than what California is doing, and he fears that "California will set a bad example" if its policy becomes known as an example of feed-in tariffs in the US.

Indeed, the first true FiT in North America based on the European model came from Canada, and Gipe was one of the architects. In March 2006, Ontario began paying 11 Canadian cents per kilowatt-hour for power from small hydro, wind, and biomass generators and 42 Canadian cents for solar. The policy was so successful that the cap of 1000 megawatts for the first 10 years of the policy was reached within the first year. Since 2007, Ontario has been discussing how to proceed, and by the time these words go to press Ontario's new policy may have been announced, including a modified system of feed-in tariffs, possibly with rate degression rather than a ceiling this time.

So what will it be in the end: the Michigan model, the Gainesville model, the Ontario model, or the Aachen model? It hardly matters – "a rose by any other name would smell as sweet". What does matter is that the switch to renewable electricity gets underway fast, and up to now the countries that have been most successful are the ones with FiTs. For the moment, public utilities in the US are easy to win over, whereas IOUs correctly see the new policy for what it is: the democratization of power generation, and hence a threat to monopolistic power structures.

It is also clear that FiTs stand a real chance in 2009. While Jay Inslee's FiT proposal, like all of those House bills at the state level, has also basically been tabled since it was first read in the US House of Representatives, Paul Gipe says that a senator now supports the idea and may get the ball rolling again, though he did not wish to divulge the senator's identity. It may well be Florida Democrat Bill Nelson. Ed Regan says that Nelson has shown keen interest in Gainesville's new rates. ◆ CM