

Feed-In Tariffs Emerge As Key Driver For Solar Development

FIT programs are slowly taking off in several U.S. cities and states. However, FITs cannot be used with third-party system financing.

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This year, both the government of Japan and the Los Angeles Department of Water and Power (LADWP), the largest municipal utility in the U.S., launched new feed-in tariffs (FITs). This article compares the key features of these new FITs to existing FITs in other jurisdictions, including California, Vermont, Washington, Hawaii, Ontario, Spain and Germany, with an emphasis on the key differences in project eligibility, output controls and pricing mechanisms.

FIT programs typically entail streamlined long-term power purchase agreements (PPAs) between utilities and generators, under which the generator receives a predetermined price for each kilowatt-hour of electricity produced for the life of the PPA. FIT programs encourage the widespread deployment of solar systems by providing price certainty to project developers and incentives for utility customers to install solar systems with capacity beyond their individual electricity needs.

In the U.S., project developers can aggregate numerous FIT PPAs to attract tax-equity investors, thereby monetizing federal and state solar investment tax credits. Under such

arrangements, the tax-equity investor finances the solar installations in exchange for the right to all tax benefits for the installations. By providing a guaranteed price for all electricity produced and standardized PPAs, FITs help attract tax-equity investors and facilitate financing for solar installations.

FIT programs across the globe have established varying maximum project size limitations. (See figure.) Typically, maximum project size limits exclude utility-scale projects (larger than 1 MW) from FIT eligibility. In addition to maximum project size limits, most FITs have overall program capacity limits based on the total installed capacity or a specified percentage of peak energy demand in the jurisdiction.

FITs generally require that all electricity output from the solar facility be fed into the grid. By contrast, under net-metering arrangements, the utility bills the customer for net energy usage (energy consumed on-site less energy generated by the solar facility).

Jurisdictions that offer both FIT and net-metering programs (including California, Hawaii, Vermont and Washington) usually require participants to choose between the FIT and net metering. Because FITs require that all electricity generated be fed

into the grid upon generation, they preclude the use of energy-storage technologies.

The requirement that all electricity be fed into the grid also prevents FIT participants from utilizing third-party PPA arrangements that are often used in conjunction with net metering. Third-party PPA arrangements, used popularly by companies such as SolarCity, Sungevity and SunRun, allow electricity users to save on their electricity bills and avoid the up-front costs of installing solar. Under a typical third-party PPA arrangement, the utility customer pays a fixed monthly rate for the solar power produced from a solar system that the third-party solar integrator installs, owns and operates on the customer's property.

The installer takes the value of any tax breaks, solar incentive programs or renewable energy credits generated by the solar system and can attract tax-equity investors willing to finance installations in exchange for the tax credits generated by the solar panels.

Because net-metering utility customers use the solar system to offset electricity that would otherwise be purchased at the retail rate, installers can negotiate attractive PPA prices that are below retail but well above the wholesale price of electricity. In states with high retail electricity rates, such as California, third-party PPA arrangements are particularly attractive.

Third-party PPA arrangements have been a major contributor to recent growth in residential solar installations and commercial-scale projects for customers with high energy demands, such as school districts and shopping malls. Notwithstanding the success of third-party PPA arrangements, FITs will be particularly attractive to solar developers in jurisdictions where the FIT price is higher than the

Jurisdiction	Maximum Project Size	Pricing Mechanism
LADWP	999 KW	Auction
Washington	2 MW	Fixed-price based on average cost of generation plus 10% rate of return
Vermont	2.2 MW	Fixed-price but adopting market-based mechanism by 2013
California's Re-MAT	3 MW	Fixed-price based on RAM results with adjustments based on developer participation
Hawaii	5 MW*	Fixed-price
Japan	10 MW	Fixed-price with annual adjustment
Ontario	10 MW	Fixed-price
Spain**	10 MW (ground-mounted systems); 2 MW (rooftop)	Fixed-price
Germany	10 MW	Fixed-price with annual declines***
California's RAM	20 MW	Auction

* Maximum project size varies according to region of state

** Currently closed to new projects

*** Current legislative proposals would significantly curtail German FIT prices for new projects.

Source: Akin Gump

retail rate of electricity, such as in Vermont, Ontario and Japan.

Pricing mechanisms

FIT programs establish the long-term PPA price for each kilowatt-hour of electricity fed into the grid through fixed-price or market-based auctions. Many fixed-price FITs pay more than the retail electricity rate for renewable power. For instance, in Vermont, where the retail electricity rate is \$0.12/kWh, the FIT price is \$0.27/kWh.

The market certainty and higher prices offered by fixed-price FITs have spurred the rapid deployment of solar technologies in jurisdictions with such FITs. In 2011, Germany (which has long offered FIT prices higher than the retail electricity rate) installed over 7,500 MW of new solar capacity, more than triple the 1,855 MW of new solar installed over the same period in the U.S.

Notwithstanding the success of the German FIT in spurring new solar

installations, generous fixed-price FITs have been criticized for providing unsustainably high price supports.

Spain's notoriously generous FIT price of up to \$0.55/kWh proved unsustainable in the midst of the country's ongoing fiscal difficulties, and the FIT program was temporarily closed to new applicants in January.

To avoid the pitfalls of the higher-priced FITs, Washington's FIT prices are based on the average cost of generation plus a 10% rate of return. The Washington methodology is similar to rate-setting methods traditionally used by public utility regulatory commissions throughout the U.S.

Similarly, Japan's fixed FIT price (initially \$0.53/kWh) will be adjusted annually, taking into consideration installation and electricity costs, the project's service life, and a rate of return. The customer surcharge used to fund the FIT will be evaluated yearly to help stabilize funding for the FIT PPAs.

Market-based FITs seek to take advantage of falling solar panel prices

and avoid the pitfalls of the fixed-price FITs by requiring developers to submit bids that are ranked based on price. Since a high-priced bid may be rejected, developers have an incentive to submit competitive bids with lower PPA prices.

For example, the LADWP established a market-based mechanism in which project developers' bids will be ranked by giving preference to the lowest prices.

The LADWP's pricing mechanism is similar to the California Public Utilities Commission's (CPUC) Renewable Auction Mechanism (RAM), which requires California's investor-owned utilities to hold biannual competitive auctions for renewable energy projects up to 20 MW in size.

Under the RAM rules, the utility must rank proposals based on the proposed price and automatically select the lowest-priced bids until the auction's total megawatt cap is met. The CPUC is implementing the Renewable Market Adjusting Tariff (Re-MAT) for renewable projects with a capacity of 3 MW or less. The Re-MAT will offer participating developers a fixed-price PPA initially based on the average price of the winning RAM bids.

While the Re-MAT PPA prices are fixed for the PPA term, the PPA price offered to new projects will be adjusted every two months based on the number of eligible developers that accept the price offered in the previous two-month period. The RAM price bids are not publicly disclosed, whereas the Re-MAT starting price will be based on the average winning RAM bid, thus providing an important benchmark for project developers.

The results of Southern California Edison's (SCE) first RAM auction demonstrate that larger solar projects are more likely to receive awards under the auction method. The average installed capacity of SCE's winning bids was 9.57 MW, and the smallest winning bids were for 2 MW of installed capacity.

In an effort to protect smaller projects from competing against larger projects (which typically have a lower price per kilowatt), under the LADWP FIT, similarly sized projects (up to 150 kW, and 151 kW to 999 kW) will be ranked against each other, and a specified number of megawatts must be awarded in each category.

Overall, third-party PPA arrangements used in conjunction with net

metering may be more lucrative than FITS in states with high retail electricity prices but relatively low FIT prices. FITs and net metering both allow developers to aggregate and finance various solar installations while monetizing U.S. federal tax benefits for solar production.

Additionally, the Re-MAT starting PPA price for California projects with 3 MW or less of installed capacity will serve as an important benchmark for

developers submitting future bids for California's RAM. ☞

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