NET METERING
A VIABLE OPTION

Rooftop solar projects have operated primarily as gross metering arrangements or as net energy metered worldwide. In either case, it has been successful in the adoption of rooftop systems. With the governme laying increased thrust on solar rooftop, net metering has acquired a great deal of importance. *Praveer Sinha* analyses the challenges and opportunities for net metering in India

In a gross metering concept, initiated in Germany, the entire amount of energy generated by the system is fed directly into the grid and the owner of the system benefits by the sale of power generated irrespective of consumption back to the utility at a pre-defined feed- in - tariff (FIT) rate.

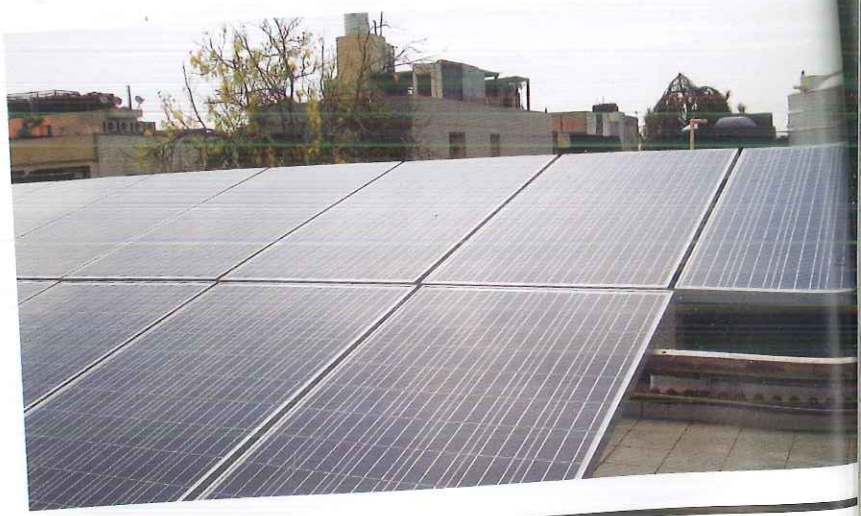
In contrast, net–metering, which is popular in countries like the US and Japan, primarily allows self-consumption of generated power while enabling the sale or banking of additional generation with the local DISCOM. Based on international experience, while both methods enable adoption of rooftop solar, it is believed that net metering will lead to a significant increase in adoption of distributed solar photovoltaic installations in India.

On September 2, 2014 the Delhi Electricity Regulatory Commission (DERC) announced the "Net Metering for Renewable Energy Regulations".

For the billing and energy accounting under NEM Regulations, the energy exported to the grid by the consumers during a billing cycle will be adjusted in the consumer's bill for that billing cycle. In case the energy exported is more than that consumed, the surplus units will be carried forward to the next billing period. At the end of each financial year, any surplus energy export credits after net energy accounting will be paid to the consumer as per the Average Power Purchase cost approved by DERC.

In the near term, we find that the adopted Net Energy Metering (NEM) policy results in an economically attractive proposition for commercial and industrial customers. The NEM policy is likely to be sufficient to moti commercial & industrial customers to adopt solar because the C&I NEM tari is greater than the cost of solar on a lifecycle basis. NEM will provide more benefit to the consumer who utilises the solar generation for his or her own consumption rather than exporting po to the grid.

However, the NEM policy can result in a cross-subsidy over time because th revenue losses to the utility which are needed to maintain the upkeep of the grid will need to be recovered. This cos shift can be relegated to the consumer group that benefits from the NEM polic



(i.e., C&I) but can be problematic over a long term. As a solution, a shift to a NEM alternative, similar to a "feed-in-tariff" or "generation based tariff" as it has been applied in Germany, provides the regulator with more flexibility to simultaneously manage the cost shift and tune the payment to encourage adoption.

Given that the NEM tariff has already been adopted by the DERC, a more realistic scenario is one in which the NEM policy is used to promote adoption in the early years with a transition to an alternative policy. Since the NEM policy will be revisited every five years, we analysed the tariff impacts if the NEM policy is maintained through 2020, with a transition to the alternative policy in 2020. By transitioning away from the NEM policy, the tariff impact can be stabilised beyond 2020.

- The tariff increase from NEM is tolerable at low levels of penetration but will have high tariff impact as penetration increases.
- The NEM Alternative can stabilize the tariff increases that NEM policy will create under significant amounts of solar adoption.
- Transition from NEM can occur after a set number of years or after a solar penetration limit is reached (e.g., 100 MW).

CHALLENGES

We as a utility need to work with stakeholders like manufacturers and regulators to define net metering standards and specifications for successful implementation of roof-top solar. In a conventional metering system, the meter registers electricity consumption from grid only and any reverse flow to grid is considered as tempering to the metering system.

The major challenge for utility is on how to distinguish between the export of excess generation from distributed renewable resources (after the meter) to grid and any intentional malpractices to the metering system. The net meter should be capable of taking care of it. This is required to ensure proper accounting of energy exported to (energy being generated from alternate facilities) and imported from the utility system. Also, Net metering implementation requires standards for measuring important parameters like voltage, flicker, and harmonics.

We as a utility need to work with stakeholders like manufacturers and regulators to define net metering standards and specifications for successful implementation of roof-top solar. In conventional metering system, meter registers electricity consumption from grid only and any reverse flow to grid is considered as tempering to the metering system

Further considering dynamics of power flow in distributed generation scenario, utility operator needs to have real time information of energy generation from individual generators. The smart net meter will help utility to get this information in 15 minutes interval basis and manage operation in efficient manner to prevent grid disturbances like sudden demand ramp up and ramp down.

The more detailed technical guidelines need to be defined to connect small-scale distributed power generation systems into the grid, which as of now poses a barrier to extensive deployment of net metering systems.

As a utility, we can address and streamline interconnection standards, taking the best practices from abroad, to encourage adoption of roof-top solar. en

The author is CEO, Tata Power Delhi Distribution Ltd.

(Views expressed by the author are personal)