Solar Roof Top Energy

Present status of Solar Roof top energy in India

India receives about 300 clear and sunny days in a year and a solar exposure of 5,000 trillion kilowatt-hours every year. It makes India a high potential country for solar power generation.

Considering the potential Indian government set a target to achieve 100 GW power capacity through grid-connected solar energy, out of which 40 GW is estimated to come through rooftop solar installations by 2022.

Towards this objective several steps have been taken, and as a result as of December 2018, cumulative installed capacity of Roof Top systems reached 3,260 MW. Rooftop installations grew 66% (year-over-year) with capacity additions of 1,655 MW in 2018.

Maharashtra (473 MW), Tamil Nadu (312 MW), Karnataka (272 MW), Rajasthan (270 MW) and Uttar Pradesh (223 MW) are the top five states accounting for 54 per cent share of the total market.

Advantages of Roof-top program over solar power generation

No additional land required: Rooftop solar offers certain advantages over large solar plants as no land and additional transmission capacity is required.

Transmission cost: it saves transmission and distribution losses, which are to the tune of 30 percent. Ne unit energy generated by rooftop solar is equivalent to 1.4-unit energy generated from large solar power plant considering 30 percent of transmission and distribution losses.

Reducing cost: With decreasing prices of solar panel, the rooftop solar has become even more promising, it is now not only cheaper than commercial and industrial power. A one-kilowatt (kW) rooftop system can produce three to five units of electricity a day.

Owners of the rooftop systems can also earn by supplying excess power to state-owned power distribution firms (discoms). The concept, known as “net metering,”

Energy access: Access to affordable power is a major issue for Indian households in both urban and rural areas. Renewable energy and in particular rooftop solar can greatly contribute to improve this situation.

Rooftop solar projects help in decreasing air pollutants that contribute to smog and acid rain and further cause serious health consequences including heart attacks and poor lung function.
Challenges

**Lack of clarity:** detailed approval process for rooftop solar plants, including net-metering billing, is not clear.

Although cost has been reduced, but it is not less than the cost of conventional energy sources such as thermal power. Moreover, a residential building’s power consumption is charged at a lower rate than that of commercial and industrial buildings.

**Financing:** Although cost of power production from solar power is very less, households lack easy access to capital for the purchase of equipment.

**Less household involvement:** India’s rooftop solar capacity rose to about 3.4 gigawatts (GW) in September, at a year-on-year growth rate of 75%, but most of it came from commercial and industrial buildings, whereas households account for only 9% of the total rooftop solar capacity.

**Net metering issue:** Net metering concept has found very little acceptability among the discoms, as they are already financially stressed and it put additional burden on them. Also, only a few states have begun the actual implementation of the policy.

**Consumer perception:** there is a perception that it may not perform as expected over its lifetime. Additionally, there are trust issues as several entrepreneurs in the rooftop solar market are comparatively new with little track record.

Although progress in solar rooftop power is considerable, but due to lack of major participation from households, government target of 40 GW by 2022 will not be achieved and only 38% of the target will be achieved.

**Cost of energy storage:** as solar power can only be generated during the day time, it warrants energy storage to ensure continued usage at night time and the cost of battery storage per KW is significantly high.

**Lack of information:** One of the key barriers to installing rooftop solar systems is that they do not know who to contact to understand the processes to be followed and permissions required. Government initiatives
Grid Connected Rooftop Solar Programme

Government has recently approved 2nd phase of the Grid Connected Rooftop Solar Programme.

Program is mainly aimed at achieving the cumulative capacity of 40,000 MW from Rooftop Solar Projects by the year 2022 and will be implemented with total central financial support of Rs.11,814 crore.

Under program Central Financial Assistance (CFA) for the residential sector is available for

- 40% for Rooftop Solar (RTS) Projects up to 3 kW capacity.
- 20% for RTS system capacity beyond 3 kW and up to 10 kW.

Central financial support will not be available for other category i.e., institutional, educational, social, government, commercial, industrial, etc.

This phase will basically focus on the increased involvement of DISCOMs. They will be provided with the performance-based incentives based on RTS capacity achieved in a financial year.

The incentives to the DISCOMs will be available only for initial capacity addition of 18,000 MW under the scheme.

Net-metering

Net metering allows residential and commercial customers who generate their own electricity from solar power to sell the electricity they aren't using back into the grid. This billing mechanism credits solar energy system owners for the electricity they add to the grid. Each state has its own net metering mechanism as per the requirement.

Other government initiatives

central government has now prepared single window clearance online portal with a feature to track the approval process for different agencies such as state nodal agencies, electricity distribution companies, chief electrical inspector, urban local bodies, etc.

For capacity building of discoms, state nodal agencies, chief electrical inspectors, lenders, etc. special training programmes are being organized under technical assistance programs of multilateral and bilateral agencies.

On the financing side, different mechanisms are being explored including the RESCO model, leasing a roof, demand aggregation, credit risk guarantee mechanism, etc.

Under the Ministry of New and Renewable Energy (MNRE), Indian schools are also eligible for a subsidy covering up to 30 per cent of the benchmark cost of a solar project.
Environment Impact Assessment (EIA) Notification, 2006 requiring buildings with an area over 5,000 square metre to have at least 1 per cent of their connected load through SRT.

The Reserve Bank of India has identified solar rooftop as a priority sector for lending. Eight public sector banks have included SRT systems under their housing or housing improvement loans.

**Way forward**

**Financing:** To meet the 40 GW rooftop solar target by 2022, a total of INR 2.07 trillion is required, in addition to current subsides and INR 2.52 trillion (USD 39 billion) excluding subsidies. Government must put efforts for this much of financing.

**New policy initiatives:** To drive SRT installation, government must focus on new and updated policy initiatives and administrative interventions, rather than relying totally on subsidized model.

Net metering policies must be reformed, so that they become attractive to the consumer.