

OPINION: Rooftop solar — A boon for India's energy transition

The emphasis should be on large-scale implementation of RTS. Greater cohesion between the various stakeholders will quicken India's transition to fossil-free energy.

ETEnergyWorld
December 15, 2020



The overall story of India's [solar power](#) sector is one of extraordinary growth. India has grown its solar power capacity from 2.5 GW in 2014 to almost 36 GW today. Of this, over 30 GW capacity is generated by ground-mounted solar power plants, such as the Bhadla [Solar Park](#) in Rajasthan and the Pavagada Solar Park in Karnataka — both developed by the Government of India under the National Solar Mission — among others.

However, the [rooftop solar](#) (RTS) segment looks unlikely to meet the Government of India's 2022 target of 40 GW. The segment has witnessed installations of only around 6 GW so far. [Residential rooftop solar](#) installations account for 30 per cent of this capacity but have the slowest uptake in the

country. This can be traced to lack of public awareness, slow and cumbersome installation process, and high upfront costs.

The government has responded to the tepid uptake of RTS with measures such as 20–40 per cent capital subsidy for consumers and the launch of the Sustainable Rooftop Implementation for Solar Transfiguration of India ([SRISTI](#)) scheme to incentivise distribution companies (DISCOMs) and residential consumers to install RTS. The COVID-19 pandemic has disrupted supply chains and created financial instabilities (for consumers and RTS developers alike), slowing down installations further.

Dilemma of distribution companies

DISCOMs have to play a key role as implementation agencies in the central and state governments' RTS policies. However, they are concerned about perceived revenue losses when consumers switch to RTS. This has led to a push for gross-metering policies, which will dissuade consumers, and a passive response in promoting the technology. RTS is also tougher to install and maintain compared to ground-mounted plants; it requires engaging with multiple consumers for large-scale capacities.

Hurdles in the implementation of RTS have invariably pushed investments towards ground-mounted solar plants. While the concerns raised against RTS could be valid, DISCOMs maintain a myopic view of the technology without understanding its potential benefits to them, the consumers, and the energy system.

Benefits of rooftop solar

Compared to ground-mounted solar power plants, RTS systems have lower water requirements and need no additional land acquisition. Ground-mounted solar plants require expensive, large-scale transmission infrastructure to connect them to the grid. This results in periods of grid congestion as well as under-utilisation for 15–16 hours a day (during low/no sunshine). Both are expensive problems that can be mitigated with RTS systems, where electricity is either consumed at the source or within the vicinity. Critically, the lower transmission distances help DISCOMs reduce their aggregate technical and commercial

(AT&C) losses, which is a major cost-saving measure.

For consumers, switching from the grid to RTS through net metering results in significant savings. Commercial and industrial (C&I) consumers with higher electricity tariffs are pre-emptively installing more RTS systems. For governments, it is important to realise how RTS systems can help create employment. A 2019 report stated that for a given MW of installed capacity, RTS can provide more than seven times the employment compared to ground-mounted solar systems.

The role of DISCOMs

If DISCOMs don't promote RTS systems, they will risk losing out on the benefits and will be left with lower revenues and an unbalanced grid. Therefore, they (and state governments) must work actively with RTS developers in the market. This requires aggregating the potential from rooftops under their authority—the key to bringing down the costs through economies of scale. They should quantify the impact of RTS penetration on their finances and provide justifiable recommendations to the respective State Electricity Regulatory Commissions (SERCs) regarding net metering for residential consumers and third-party investments for larger rooftops with gross metering. Long-term policy certainty is the key to attracting developers and consumers to RTS.

Interested consumers today want additional financing options with low upfront costs. DISCOMs can work with banking institutions to facilitate this, as it would also allow them to implement business models that support DISCOMs better. Having a consumer-centric approach is also vital to increase the adoption of RTS systems. This requires more public drives and an efficient application processes with absolutely no delay in installation.

The path ahead

The Government of India should play a more supportive role in helping state governments and DISCOMs in expanding the rooftop solar segment. Some of the measures which could aid are ensuring greater [renewable](#) purchase obligation compliance, increased public awareness, efficient run of existing schemes such as SRISTI, timely disbursement of subsidies to states, and capacity

building for DISCOM officials.

The ambitious 40 GW target is indicative of the fact that the Government of India recognises the importance of RTS for a sustainable future. Given this, the emphasis now should be on large-scale implementation of the approach. Greater cohesion between the various stakeholders will quicken India's transition to fossil-free energy.

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