RENEWABLE ENERGY

ROUNDTABLE REPORT 3

ROOFTOP SOLAR

ACCELERATING PARTNERSHIP BETWEEN DISCOMS AND THE RESIDENTIAL SECTOR

ROOFTOP SOLAR

Overview

India has set an ambitious target of achieving 40 gigawatts (GW) of rooftop solar capacity by 2022. There have been improvements in the rooftop solar sector in terms of quality and performance of solar panels; policy and regulatory support; and greater options for financing. However, as of today, the country still lags behind the intended levels of installation capacity by a fair deal, as rooftop solar installations add up to only around 6 GW. Within this, residential rooftop solar accounts for only about 14 per cent (~840 MW). The reasons for poor uptake include technical, institutional, and financial barriers. Rooftop solar projects are distinct from large-scale solar projects in their requirements and meeting the 40 GW rooftop solar targets requires the active participation of residential consumers.

The roundtable

The work of the Renewable Energy programme of Centre for Science and Environment (CSE)'s has been focused on shaping policies and building public awareness to accelerate renewable energy deployment, strengthen energy access for the poor, and facilitate creation of opportunities for people for making the best use of RE technologies. As part of its continuing efforts to highlight important issues concerning energy security and energy sustainability in India, CSE planned a series of nine stakeholder roundtables, held in 2020–21.

This roundtable, the third in the series, was organized on 9 December 2020 and brought together representatives of distribution companies, residential welfare associations and solar plant developers to deliberate on reasons behind the slow growth of rooftop solar in the residential sector. The background research is available in the form of a factsheet, addressing some of the key barriers facing rooftop solar deployment in India.

Key speakers at the roundtable were:

Mr Samrat Sengupta

Director, Climate Change and Renewable Energy, CSE

Samrat is a development and operations management professional with 24 years of experience in sustainable energy and climate change cross-sectoral domains. His specific interests include renewable energy power projects, low carbon development and mainstreaming climate change in developmental planning. He has worked with power producers (solar, onshore and offshore wind, and hydro), management and engineering consulting houses, international trade associations for renewable energy promotion, national and international civil society organizations, and government research institutions. Samrat holds an MBA with a specialization in energy management from the Indian Institute of Social Welfare and Business Management (IISW and BM), Calcutta. He has also represented Indian and South Asian civil society in various multilateral forums like the UNFCCC, IPCC and G8.

Mr Sengupta moderated the Roundtable.

Ms Vineeta Singh

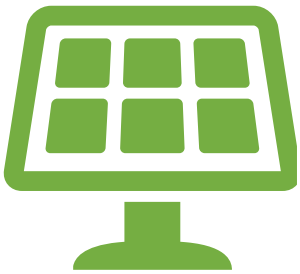
Chief Engineer, SMART City Project, Dakshin Haryana Bijli Vitran Nigam (DHBVN), Gurugram

Ms Singh has been working with HSEB since December 1989. Presently, she is the Chief Engineer of the Smart Grid Project in Gurugram. She has vast experience in solar rooftop promotion and implementation. She is an alumna of the National Institute of Technology, Kurukshetra and MDI, Gurgaon.

Mr Pramod Singh

President, Regulatory and Commercial, India Power Corporation Ltd

Mr Singh has more than 28 years of experience in the power infrastructure sector. Before India Power, he has worked in two of the largest private sector power companies, Tata Power and BSES; and has been extensively involved with power sector reforms and private sector participation, covering various segments of the sector, including power generation and distribution. He has a BE degree from NIT Rourkela, and is a postgraduate in management from IMI, Delhi.



Ms Shubhra Puri

Founder, Gurgaon First

Ms Puri, a well-known social entrepreneur, is dedicated to providing a credible voice to various stakeholders of Gurugram to make it a sustainable, empowered and inclusive city. Her interventions span areas of waste, solar, water, sustainability, women's safety, sustainable mobility and youth empowerment, through active engagement with local authorities, ministries, MLAs as well as other social groups and NGOs. She is also a member of the District Development Coordination and Monitoring Committee, Gurugram; and a trustee with the Raahgiri Foundation. She has conducted workshops and roundtables on solar power, engaging various stakeholders including HAREDA, DHBVNL, RWAs and solar players and is committed to encouraging solar rooftops in the city. Ms Puri is an MBA. She started her career with *Economic Times* as a journalist and has written extensively on power and renewables sectors.

Mr Rajib Das

Deputy General Manager, Calcutta Electric Supply Corporation (CESC Ltd)

Mr Das is a veteran in the area of electricity distribution planning, regulatory affairs, capex budget planning, monitoring and control, and project management. He has been involved in technical consultancy jobs and in electricity reform activities in association with global professional services companies. He has command over policy making and policy advocacy of smart grid initiatives including DER integration, EVCS, BESS; and has been actively involved in imparting training to distribution personnel in India and abroad on power quality, distribution losses, net metering, etc. He is an alumnus of Bengal Engineering College, Shibpur under Calcutta University, from where he did his graduation in electrical engineering.

Mr Indukalpa Saikia

Head Business Development (North India), Clean Max Solar

Mr Indukalpa currently heads business development in North India at Clean Max, with a focus on developing solar PV plants on a private power sale model. He has 14 years of experience in renewable energy and carbon markets. Before joining Clean Max, Indukalpa played a key role in setting up the rooftop solar business of Sun Terrace Energy. He earlier worked with Emergent Ventures (EVI) for developing rooftop solar projects on the RESCO mode in 2012. He was also involved in solar projects under the Gujarat State Policy and RPSSGP. He also worked for GIZ and Eco Securities Group Plc as an origination manager in carbon market. Mr Indukalpa holds an MSc in energy efficiency from University of Petroleum and Energy Studies, Dehradun.

Mr Ashish George

Programme Manager, Renewable Energy, CSE

Ashish has over ten years of professional experience in the fields of renewable energy and energy access. His work has focused on providing analytical and strategic support, project development and programme management. He has worked on evaluating policies and regulations, preparing feasibility studies, strategy papers, roadmaps and policy briefs for state and national governments in India. He holds a BSc in physics from Loyola College, Chennai, and an MSc in environmental management from the Yale School of Environment, New Haven, Connecticut, US.

Agenda and discussion

> We have a positive outlook on rooftop solar and have issued over 4,000 rooftop solar connections. In Gurugram alone, over 1,500 connections have been issued
>
> **Vineeta Singh**

> Residential welfare associations need 'neutral handholding' on rooftop solar—technical advice and assistance from an agency without vested interests
>
> **Shubra Puri**

> Lack of standardized products and lack of depth in the market hold back greater deployment of rooftop solar. There is also a need to recognize the true economic value of rooftop solar
>
> **Pramod Singh**

According to the International Energy Agency, a slump is expected in distributed PV deployment due to COVID-19 disruptions, with the deficit continuing till 2022. This is attributed primarily to the reduction in budget and consumption of individuals and organizations.

Ministry of New and Renewable Energy (MNRE) has tried to stimulate growth by offering targeted capital subsidies to the residential segment and by making distribution companies nodal points for rooftop solar deployment.[1]

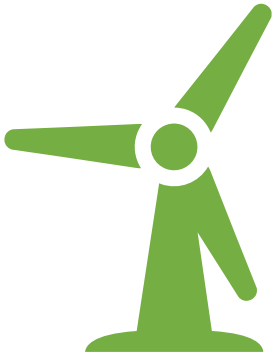
» Phase II of the rooftop solar programme takes a new approach by making distribution companies the nodal points for implementation of rooftop solar. This includes activities like vendor management and empanellment and subsidy disbursement. The rationale, as mentioned in the rooftop solar policy document, is to reduce coordination challenges with multiple agencies, lack of uniform and mandatory regulations, and low consumer awareness.

» The policy targets 4,000 MW and incentives for residential sector include a subsidy of 40 per cent of benchmark system cost for systems sized 1–3 kW, 20 per cent for systems sized 3–10 kW, and 20 per cent for housing societies and RWAs for systems sized 10–500 kW. Most of the installations in the residential sector are paid for through self-financing or subsidy (due to lack of standardized financing products for residential rooftop solar sector).

The general policy and regulatory environment in India prescribes parameters such as permitted system size, sanctioned load, transformer capacity, metering and billing, among others. Although there is some convergence on these parameters between states, further alignment is welcome. States in India have come up rooftop solar policies indicating modalities of installing a grid-connected rooftop solar and to determine how consumers are compensated for the electricity produced. So far, 19 states offer both net metering and gross metering (subject to conditions) while 17 states permit only net metering. The allowed limit of the system size lies between 1 kW and 1 MW for most states.

The panelists included a diverse gathering of representatives of public and private distribution companies, residential welfare associations and rooftop solar developers with the aim of discussing problem points in the rooftop solar sector and reflecting on the drastically low uptake of this technology vis- -vis official targets. Rooftop solar projects interact with local distribution grids managed by a distribution company. Distribution utilities have been lukewarm towards rooftop solar projects. These projects cut into their revenues by providing customers an alternate source of electricity. Power procurement by distribution companies is done through long-term (25-year) contracts with power generating companies that legally bind them into paying the generating company a lump sum annual amount for fixed costs, and a per unit charge to cover variable costs. Distribution companies must pay fixed charges even if they do not draw power from the generating company for a particular time. In situations where there is surplus power (which cannot be sold), it is backed down, which means power generators lie idle at that time, incurring fixed costs, but generating no electricity. Distribution companies still need to pay for the surplus power that they do not use. The cost of backing down and incurring the fixed charge is quite considerable, with some incurring costs that amount to roughly 50 per cent of the total electricity subsidy payments.[2]

Although such a situation is also caused due to planning on faulty premises such as expecting unrealistically high future demand, it is also exacerbated by increased sales migration to open access and captive options (such as rooftop solar). Surplus can have a significant financial burden on distribution companies and may adversely impact their already precarious financial positions. Distribution company representatives pointed out this problem and said that without their buy-in, rooftop solar in the residential segment would not grow. They also referred to problems in tariff design and cross-subsidy. Discoms are concerned that increased migration of customers would lead to greater under-recovery and a greater burden on non-solar consumers. In terms of metering, discoms are of the view that gross metering provides more 'equity' as they can buy electricity generated by residential rooftop solar plants at the prevailing market purchase price. There is an ongoing debate among the stakeholders in the solar industry about the government's intentions towards rooftop solar



[1] Available at https://mnre.gov.in/solar/schemes, as accessed on 21 January 2021

[2] Anon 2019. *Elephant in the Room: Implication of subsidy practices on DISCOM finances*, Prayas (Energy Group)

as in the draft Electricity (Rights of Consumers) Rules 2020, Ministry of Power has suggested limiting net metering to 5 kW of installed capacity and allowing only gross metering beyond 5 kW. This has sparked fears that the draft rules would reduce capacity and limit growth of rooftop solar.

» In the net metering mechanism, electricity generated by the RTS system is consumed by the user and any excess electricity is injected into the grid. In case the consumer requires more power than what is produced by the RTS system, they can import the balance from the grid. At the end of the settlement period, the consumer is only charged for the 'net' energy utilized—the difference between the energy produced through the RTS system and the energy consumed over the billing period. A bi-directional meter is used to measure the net electricity consumption of the system.

» In case of gross metering, the total electricity generated by the solar system is injected into the grid, and the consumer imports electricity from the grid for consumption. At the end of the settlement period, the consumer is compensated for the electricity exported to the grid at the feed-in tariff (FiT) rate determined by the State Electricity Regulatory Commission.

Metering regulations are of importance and for rooftop solar consumers with high electricity tariffs, net metering regulations may be of more value than gross metering. This is because net metering allows a consumer to offset electricity purchases from the grid by exporting electricity from rooftop solar, while gross metering allows the user to sell what is generated at the average power purchase cost of the discom.

Another key issue that was discussed was the need for greater support for residential welfare associations and the need for 'neutral handholding'—technical advice and assistance from an agency without vested interests. Due to institutional barriers like policy uncertainty and absence of clear information about rooftop solar products, processes, and approvals required, and the lack of credible and objective sources of information, there is strong reliance on vendors as exclusive sources of information. Residential customers need to rely on developers or on anecdotal information from individual experiences, both of which are insufficient to make an informed decision. The relatively higher costs of rooftop vis- -vis utility-scale solar, along with lack of standardized products and lack of depth in the market, holds back greater deployment and does not let realization of the true economic value of rooftop solar.

The developers' perspective included stating challenges of working with RWAs, some of whose 'priorities can change over time' and ensuring bankability with creditworthy customers that can guarantee payments for a long-term contract. Developers feel that discoms can play a much bigger supporting role by pooling of capacity and supporting developers in recovering steady payments. Regarding government subsidies for residential rooftop solar, it is believed that subsidy creates a 'disbalance' as payments from the government are often delayed. In many cases, developers try to avoid projects availing subsidies to maintain a steady product offering. However, several vendors use this to promise lower prices without highlighting the risks inherent in subsidy payments, thereby creating an uncertain market environment.

> Without buy-in from discoms, rooftop solar in the residential segment will not grow
>
> **Mr Rajib Das**

> Government capital subsidies create a 'disbalance' in the market as subsidy payments are often delayed
>
> **Mr Indukalpa Saikia**

The way forward

The rooftop solar sector is nowhere near the intended levels if we consider the official target of 40 GW, as only about 6 GW has been realized so far, with over 80 per cent of it coming from installations at the commercial and industrial (C&I) level. Although MNRE has brought out national-level subsidy policies, these would do little to stimulate the market as the volume to be financed by subsidy is merely 4 GW, notwithstanding the additional challenge of dealing with delays in subsidy disbursement. The step taken by the Central government to make distribution companies the most important stakeholder for the success of rooftop solar is a bold move that needs to be backed by quick action that should foresee and prevent negative fallouts and implementation problems. National-level directives have limited impact as state regulatory commissions decide the regulations that would affect participants in the electricity system. However, MNRE can leverage its substantial position for consensus-building among states such that policies and regulations move in a predictable direction across the country and ensure that feedback from private developers and the public is taken to arrive at a consensus for issues in the rooftop solar sector. At the moment, there is a high level of uncertainty about how the rooftop solar sector will progress and a large part of it is due to a policy and regulatory environment that does not provide sufficient stability and a long-term vision.

Special attention must also be paid to disagreements around metering regulations as limiting net metering would affect the micro, small and medium enterprises (MSME) segment adversely. Rules should not create regulatory uncertainty concerning the applicability of net metering regulations for existing and ongoing projects in states as it would affect several smaller developers who do not have financial buffers.

Distribution companies across India also need to deal with rooftop solar more proactively and take a long-term view on matters. Excess power purchase projections also lock-in discoms to paying commitments to large generators due to regulatory commissions approving sale of surplus power based on norm-based performance vs actual performance of plants (resulting in higher generation assumptions) and the assumption of regulatory commission that surplus power will be sold at high rates. Such issues need to be resolved along with other improvements in the general operation and forward planning of distribution companies to ensure rooftop solar in the residential sector succeeds in India.