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Report on EU-India CECP session on

“Road ahead for Rooftop Solar”

at

Renewable Energy India (REI) Expo 2021

September 2021



 Renewable Energy
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ROAD AHEAD FOR ROOFTOP SOLAR

15TH SEPTEMBER, 2021

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1. Introduction

On 15th September 2021, The EU organized a session titled “Road ahead for Rooftop Solar” at REI Expo 2021, to deliberate upon the ways to expand rooftop solar footprint in India. India has set an ambitious target to achieve 450GW of RE capacity by the year 2030. This target will see considerable contribution from solar energy – from both large scale and small-scale projects. While the large-scale projects are being planned by central and state level agencies through auctions, the small-scale projects, especially rooftop solar projects have witnessed limited progress in recent times. These projects offer value proposition to other consumer segments as well by off-setting (partly/completely based on the state policy and regulations) their electricity requirement and reducing the cost implications; however, the same is yet to be realized on ground in terms of capacity addition. The session was attended by experts across the industry including policy makers, financial institutions, project developers, electricity utilities, academia, researchers, etc.

1.1 Opening remarks

Mr. Edwin Koekkoek, Counsellor- Energy and Climate Action, EU Delegation, welcomed the participants and the guests to the session on rooftop solar markets in India. He informed participants about the rooftop solar work undertaken as part of EU-India CECP which includes a study focusing on rooftop solar market in India, analyzing the barriers, challenges, that might limit the growth of the sector. The report also looks at possible business solutions that were successful in the EU and may be explored in Indian context.



Edwin briefed the audience on the EU-India CECP, which was agreed at the highest level in 2016. At the recent EU-India Leaders Meeting on 8th May 2021, the partnership was one of the key priorities and the leaders agreed again about the need to further strengthen the cooperation. With the EU Recovery Package, which focuses on recovering from the pandemic, and the European Green Deal at the core of this Package, the objective is to have Europe be the first climate neutral continent by 2050. EU has been working with India in the areas of EE, RE including Offshore wind energy, floating solar, rooftop solar and solar parks, smart grid, power market design, sustainable finance, cooling and cold chain and climate proofing.

1.2 Presentation of the report on “Enhancing Solar PV rooftop uptake in India through innovative EU business models”

Mr. Miguel Herrero, Policy Advisor, SolarPower Europe, briefed about the report on “Enhancing solar PV rooftop uptake in India through innovative EU business models” which was presented in this session. He mentioned that of the total installations, on-site solar installations represent 70% of total installed capacity in EU. Germany has the largest share of rooftop solar which is 40.8% of total solar capacity across the EU. He also touched base upon ambitious policy and regulatory initiatives like Climate and Energy Package in 2009, Clean Energy Package (REDII and EMDII) in 2018, Green Deal and Feed in Tariff for 55 heralding period



of accelerated new growth period in 2021. Secondly, he spoke about stable support schemes which helped growth of rooftop solar. He emphasized on the fact that solar panel prices have declined by 96% since the year 2000 and that there is a growth in environmental consciousness encouraging 9 out of 10 EU citizens to invest in RE.



Even though the technology has so much potential and advantage, he stated that only about 10% of the EU’s rooftop solar potential is currently met. He then explained that the rooftop solar has the potential to create sustainable job opportunities and stable support schemes have driven growth of rooftop solar in the past decade. Key support schemes include Feed-in Tariff, net metering, net-billing, virtual net-metering, self-consumption, and collective self-consumption. He also threw some light on Renewable Energy Service Company (RESCO) model having a contribution in the increased rooftop solar deployment in India. He explained that RESCO model, in India, has seen an increasing share since 2016, reaching 31% in 2020 from meagre 2% in 2014. Mr. Herrero then mentioned that RESCO model is preferred by commercial and industrial consumers as it assures savings from the high grid tariffs, there is no capital investment, and the system installation and maintenance is managed by a third party.

Miguel then stated that lower levelized cost of electricity has driven growth in the commercial and industrial rooftop systems. He also depicted graphically how India has progressed in the rooftop solar segment from 623 Mega Watt (MW) installed till 2015 to 1,534 MW in 2019. He then went ahead informing that around half of the share of solar rooftop in India till the year 2020 is held by industrial system, 21.5% is commercial and both residential and public sector consumers have 13% share respectively. He then explained various innovative financing instruments that are key to unlock full potential of rooftop solar like private equity, grants, loans, leasing, crowdfunding and community-based investments and financial aggregation. He went ahead to elaborate how digital solutions like big data analytics, smart meters, Internet of Things (IoT), block chain, 3D printing, etc. hold the key to higher flexibility, increased profitability, and enhanced system integration.

1.3 Address by Dr. Nicole through a video message

Dr. Nicole Glanemann, Deputy Head of Division IIA2 – bilateral cooperation on energy policy, Federal Ministry for Economic Affairs and Energy, Germany, shared her address through a video message. On the global scale, annually up to 40% of solar panels are being installed on roofs. Germany is no exception and more than 70% of all solar capacity installed in the country is mounted on roofs of building and on facilities belonging to farmers. There is a clear trend of self-consumption of generated electricity, especially in residential and commercial sectors where the tariffs are highest in Germany. Today, consumers still benefit from secured feed-in of surplus electricity but try to maximize their self-consumption. With increase in consumption of own electricity, battery storage systems, especially for residential systems have become quite popular. More than 50% of new installed rooftop solar systems in Germany have come up with battery.



Virtual power plants are already connected with each other over the internet and participate in electricity trade in the exchanges and balancing markets. The German government has decided to end coal fired power generation by the year 2038, and all the nuclear power plants will be shut by the next year. Germany plans to become completely climate neutral by 2045. Last year, almost 50% of Germany's entire electricity was contributed by RE. Buildings, integrated with solar, are a small but a promising niche market.

1.4 Panel Discussion

Following the inaugural session and presentation on the report, a panel discussion was conducted with the industry players on key areas including business models for rooftop solar in India, issues and challenges and way forward. The panel discussion was moderated by **Mr. Vinay Rustagi**, Managing Director, Bridge to India Private Limited.



1.4.1 Key messages from panellists

Kushagra Nandan, Co-Founder and President, SunSource Energy

Kushagra shared his experience by highlighting that the biggest hurdle is certainty on the regulatory front. He went ahead elaborating that in states where net metering was there, a considerable amount of rooftop solar installations happened. However, in states where net metering was not there, the solar installation came down. Secondly, he emphasized upon the accessibility to finance the projects. He elaborated the same by stating it is very easy to finance large scale solar projects and a lot of institutions have supported the same but that is not the case with rooftop solar. He then mentioned examples of other South-East Asian countries where there is clarity from regulatory point of view like Vietnam which has built GWs of rooftop solar in some years. He suggested that Distribution Companies (Discoms) should start seeing this as a positive. He mentioned that with adaptation of storage, more options will start coming in, leading to rapid adoption of solar.

He further mentioned about his observation in Rajasthan where some already existing projects were asked to operate now on a group captive model. He then stated that Supreme Court had mentioned on this that retrospectively the tax can also not be calculated. He concluded by stating that the short-term challenges restricting the rooftop solar industry growth may go away with encouragement from government.

Sanjeev Agarwal, Managing Director (MD) and Chief Executive Officer (CEO), Amplus Solar

Sanjeev shared his views by mentioning that there are two segments in rooftop solar - commercial and industrial consumers, ones who are trying to reduce their cost and others who want to meet their environmental commitments. He emphasized the need to find out the ways through which the grid will



support the increased rooftop solar consumption and added that this can be facilitated from utilities. He then stressed upon the need for a facilitation mechanism to be established to meet the targets set by the government. Therefore, utilities have to change their role from monopolistic supplier to someone who is facilitating this transition.

Sanjeev further mentioned that after discussion with The World Bank and some other multilateral agencies, one of the possible mechanisms considered is to create an assurance like a product. Explaining the same, he added that assurance will be provided for the loan being taken by Small and Medium Enterprises (SMEs). He again emphasized on the fact that financing is a challenge for small industries as neither do they have the capital, nor will someone underwrite them from bank or developer point of view. He suggested that a multilateral agency can be introduced rather than routing their funds through big corporates. He added that a separate line in SME segment can be introduced which can be used as credit enhancement and some sort of guarantee that they will pay if the small segment industry defaults.

Ankit Rastogi, General Manager, Enerparc

Ankit highlighted that the challenges in the rooftop solar are more focused on economics rather than the sustainability. He mentioned that cost savings is important, but emphasis should also be given on quality aspects. Price variation over the years has been an issue as the sector has seen fluctuation in module prices due to raw material availability and freight cost which affects the viability of the project. He then threw light on how policies are defined both by center and state and there in lack of consistency between them. He also added, the impact of duty structure and taxes play an important role. Ankit suggested that having a uniform policy across the country for rooftop solar would be helpful. He added that even a rule like defined timeline, a single approval process or GST and duty structure modifications may affect the project viability.

Chintan Shah, Director (Technical), Indian Renewable Energy Development Agency (IREDA)

Mr. Chintan Shah mentioned that RESCO is the most preferred model by financing companies for rooftop solar in India as there is a Power Purchase Agreement (PPA) involved, the ownership exists, net metering is not a concern as the mapping is undertaken to meet the base load and counter party exists with good sense of commercial sense to honor the PPA. The second segment is commercial and industrial sector which faces some issues as the base load may be lower than the generation capacity. He further mentioned that the following questions are put forward by the bankers - How robust is their business, would they walk out of the PPA because they do not have any mortgage as only roof is there and would substitution right over PPA be allowed to take charge over roof which are the major challenges in this segment. Adding to this, Chintan mentioned about third segment i.e., domestic segment. He explained that it is an advantage for Discoms as the tariff paid is lower than cost to serve. Hence, no resistance is observed across the country for domestic rooftop. He further elaborated that rooftop solar is a fragmented market for central bankers like IREDA to get involved. Thus, local banks need to be approached to fill the credit gap. He then suggested that large bankers or central financing agencies can have intermediary financing. Local banks, MFIs, etc. can create portfolio and central bankers can buy out the entire portfolio or essentially give a line of credit to them.

Chintan mentioned that IREDA has been financing rooftop solar projects for last 5-7 years and have supported 60MW of capacity, which is sizable. He further suggested that some more models need to be introduced like utility based model which railways has adopted and almost all bankers are supportive of the model. IREDA has also financed projects from railways as they understand the sector well.

Abhishek Ranjan, VP - System Operation, Power Markets and Head Renewable, Smart & DSM projects, BSES Rajdhani Power Limited

Abhishek explained that the Distributed Energy Resources (DER) are becoming a main stake as Discoms transition to Distribution Service Operator (DSO) role. He added that rooftop solar becomes a very important DER and to enable it, the current business models i.e., RESCO and CAPEX might not be sufficient to drive growth. He then elaborated on a study carried out by GIZ in 2017 on the feasibility around the capacity of the network to absorb rooftop solar without any upgrades. The outcome highlighted that 75% of Distribution Transformer (DT) capacity can be utilized.



Abhishek then mentioned about Discom's opinion on commercials and reasons behind the utilities hesitant on embracing on rooftop solar with wide capacity. He mentioned that there is tariff arbitrage or the cross subsidy, which goes away as more commercial and industrial consumers opt for solar rooftop projects. He emphasized that the challenge today is 80% cost is power purchase cost and 50% of that 80% is fixed cost PPA; whereas in retail tariff 90% is variable and 10% is fixed. He then explained about a Government of India initiative where plants older than 25 years can be exited from PPA and thus reduce fixed cost burden and create room for promotion of distributed energy. Lastly, he mentioned about the ways in which Government of India and MNRE are working on specifications for the inverter where standardization of communication protocol is introduced. It is important as in the times to come there would be a need for demand response from these inverters. He also added that situational awareness of the grid will be very important, and DER will have to be dispatched. He went ahead explaining that this is the transformation, which is happening, and, in this direction, they have proposed an alternate business model to the Hon'ble Commission in Delhi for aggregation of small, fragmented rooftop solar and convert them to a hybrid model under a RESCO mode. Subsequently, sign a PPA with Discom, have an improved payment security, and the consumer is not required to make capital investment and avail benefit under the net metering or, in future, net billing. He then mentioned that despite efforts by The World Bank, there is no retail product for solar specially in the residential sector. He then concluded by explaining the two models adopted in Kerala in India – Capex where the state government is helping and RESCO model where they have fixed the rental of the roof to a specific number. However, in Delhi, there is no fixed rental and rather net metering benefit.

Federico Fucci, Policy Officer, EuropeOn

Federico shared his experience from electrical contractor's point of view - undertaking electric work and taking work of solar panel on roof, with key aim of human capital. He mentioned that this is a key area of concern and hence is the focus of the firm, ensuring no bottleneck at the installation stage. He then discussed about the regulatory certainty and financing for the solar panels. He mentioned about the ways in which they are emphasizing EU member states to focus on skills and climate considerations. He suggested to meet the targets in India, human capital should be considered and ensured that there are enough workers with the right skills to install in the safe way. One major approach should be upscaling the available workforce starting with right education, technical knowledge, to have people get some confidence on this career path and ensure there are upscaling and rescaling opportunities. He emphasized that to meet the pace of installation where skilling will be a necessity. He mentioned about a study where they evaluated job potential in rooftop solar sector and analysed that there would be 225,000 jobs created at the installation stage for the rooftop solar sector in EU. He again elaborated that investing and upscaling the skillset in the sector is important for environment and economy and supports consumers as well with optimum installations. He concluded by mentioning about stability of support schemes which give confidence to the electrical contractors, being similar to the SMEs investing in their own workforce and creating their own business models such as leasing in this sector.

Faustine Gaymard, Public Affairs, Akuo Energy

Faustine shared her rooftop installation experience and narrated that when they started working in this sector in EU, there were no regulatory measures and they had to write inferences and certifications, qualification of construction material, insurance, etc. as these products qualify for construction material and can be insured, benefitting the people. She expressed her hope of having clearer regulatory scheme in future in the sector. She mentioned the two-part mechanism is the key to rooftop solar sector. She then emphasized on the importance of having dedicated rooftop support schemes. She then gave an example from France where a scheme dedicated to rooftop was approved two weeks ago which allows rooftop installations to upscale in next 3 to 4 years. She believes there should be an incentive for private investors to invest more. She indicated that everyone wants rooftop solar but are not aware about the financing of the same. She concluded by giving an instance where they made a French partner, created a 3rd party investment tool wherein the cost can be reimbursed through electricity sale and can help with ease of rooftop development.



1.5 Vote of Thanks / Closing remarks

Mr. Matthieu Craye, International Relations Officer, European Commission concluded the session by thanking the speakers and panelists, and the report presentation during the session. He mentioned that the recommendations highlighted in the report would hopefully be helpful for scaling up of rooftop solar in India. The major topics discussed in this session such as smart grid, financing, power sector regulations, and market functioning are taken up through various activities under the EU-India CECP. He highlighted that the regulatory certainty and availability of support schemes relate to the residential consumers and which has also enabled the role for intermediaries such as aggregators. He highlighted that the EU has co-financed a number of joint EU-India demonstration projects demonstrating rooftop solar integration, with deployment of some local storage. He also mentioned the EU-India High Level Smart Grid Platform which assesses the plan to move from demonstration to large scale project deployment on ground. He informed the participants about Financing Investments in Clean Energy Projects (FICEP) platform and how it is focusing on distributed renewable energy, as this sector faces challenges related to financing. Finally, he mentioned the work stream under the CECP project on regulatory power sector reform which analyses the evolution of support scheme for RE and regulation of power market to enable role for intermediaries, which in turn incentivises rooftop solar.

About EU-India CECP

The EU-India CECP aims to reinforce cooperation between the EU and India on climate change and energy with a view to ensure a secure, clean, affordable, and reliable energy supply for all and to progress in the implementation of the Paris Agreement.

For more details, please visit: www.cecp-eu.in



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