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India's Solar Industry Hopeful of a Brighter 2022

Solar industry stakeholders are hopeful that 2022 will prove to be a breakthrough year for the sector



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CONTENTS

Volume 01 | Issue 11 | January 2022

04

TECHNOLOGY

29.8% Conversion Efficiency in Perovskite Silicon Solar Cells

The researchers believe efficiency of solar cells made from perovskite and silicon could be increased to over 30% by nanostructuring the absorber layers on both sides

07

MARKETS

Round-the-Clock Power Projects are the Future

Ample storage capacity and no risk of fuel price hike is found to make round-the-clock power projects more attractive

10

POLICY

Renewables Can be Bundled with Thermal & Hydro power Under Existing PPAs

Detailed process of bundling of thermal and hydropower projects with renewable energy projects without the financial burden of a separate power purchase agreement has been released by the ministry

14

INTERVIEW

Jakson's Module Production Capacity to Reach 1 GW

The company has 600 MW of fully automated module manufacturing capacity to produce modules up to 850W

18

POLICY

Benchmark Costs for Rooftop Solar Projects Reduced

MNRE has reduced the benchmark costs in the wake of revised GST rates for renewable energy equipment

20

POLICY

Punjab Passes Bill to Revise Long-Term PPAs

In a move reminiscent of the Andhra Government, Punjab passed a bill to renegotiate PPAs signed with renewable energy project developers

26

MARKETS

Indian Storage Market to Make Inroads in 2022

Mercom spoke to executives of storage companies in India to gauge the mood in the market going into 2022

31

MARKETS

Wind-Solar Hybrid Projects Set to Grow in India

Hybrid projects along with a battery energy storage system can solve the problem of intermittency and ensure grid stability

CONTENTS

Volume 01 | Issue 11 | January 2022

36

POLICY

Increasing Power Tariffs Gets Easier for DISCOMs

The ministry has asked the states to allow DISCOMs to pass on the increase in power purchase costs onto consumer power tariffs to ensure timely recovery of costs

38

MARKETS

India Added 1.3 GW of Rooftop Solar Capacity in 9M 2021

The rooftop solar capacity additions increased by a massive 202% YoY in 9M 2021, led by the residential segment

42

MARKETS

Green Energy Corridor Phase-II to Integrate 20 GW of Renewables

The program is set to add 10,750 ckm of transmission lines and 27,500 MVA transformation capacity of substations

45

MARKETS

India Installed 7.4 GW of Solar Capacity in 9M 2021

According to Mercom India Research's Q3 2021 India Solar Market Update, solar installations grew by 335% in 9M 2021 compared to the same period last year

49

MARKETS

India's Solar Industry Hopeful of a Brighter 2022

With 2021 turning out to be one of the better years for the solar industry despite the challenges, the stakeholders are hopeful that 2022 will prove to be a breakthrough year for the sector

56

POLICY

ISTS Projects to be Fast-tracked for Greater Renewable Integration

The ISTS project approvals will now be expedited through capital based classifications by central transmission utility, National Committee on Transmission, and the Ministry of Power

58

POLICY

Local Suppliers to Get Purchase Preference in Power Sector

As a boost to the 'Make in India' program, the government to now provide preference to local manufacturers of electric equipment in the power sector

65

TENDERS & AUCTIONS

Major Tender and Auction Announcements in December

This is a list of major tenders and auctions from December. A comprehensive list can be found on Mercom's Tender and Auction Tracker and Alerts

Foreword



The Indian solar industry is generally upbeat going into 2022.

Solar installations could grow by over 30% in 2022 (if all goes well),

which would make it the best year for solar in India by far. That said, there is a lot of uncertainty around the Great Indian Bustard issue in Rajasthan, which could affect project commissioning timelines significantly. The 'Approved List of Models and

Manufacturers (ALMM) of Solar Modules order is another big headache for the developers as the supply of imported modules has been cut off. Developers claim that there just isn't enough supply of quality modules to meet the demand, which could again slow down the pace of installations.

Developers are nervous about the coming Basic Customs Duty on top of ALMM and the high price of components in the market. The question is, who will absorb the higher costs that will inevitably result as bids in future auctions go up? DISCOMs who have been spoilt by ever-falling bids will most certainly not pay higher tariffs. If that is the case, who will procure more expensive solar power?

Developing a local manufacturing ecosystem is a needed and important step for the Indian solar industry. But, policymakers need to be extremely careful as they push to make India a production hub for solar that they do not throttle the demand growth by affecting price or supply negatively.

On a positive note, India added 448 MW of rooftop solar capacity, registering a 14% drop quarter-over-quarter (QoQ) in the third quarter (Q3) of the calendar year (CY) 2021, compared to 521 MW in Q2 2021. According to the recently released Mercom report - 'India Rooftop Solar Market Report Q3 2021.'

The rooftop market is showing signs of recovery and back to pre-COVID levels. However, the rise in component costs and availability of materials is weighing heavily on the market, throttling growth. States have continued to put up restrictions on rooftop solar, making new development challenging.

The Ministry of Power's notification allowing net metering for prosumers with load up to 500 kW positively affected rooftop installations. In Q3 2021, the residential sector led the growth for the second quarter in a row, making up for 54% of total rooftop installations. The commercial & industrial sector and the government sector followed with 44% and 2%, respectively.

The C&I segment has been showing constant growth over the past few quarters, but rising system costs have been worrying.

Clear execution plans, long-term policy stability, and lowering offtake risk should be the focus for the government to attract foreign investments at a larger scale to facilitate rapid market expansion.

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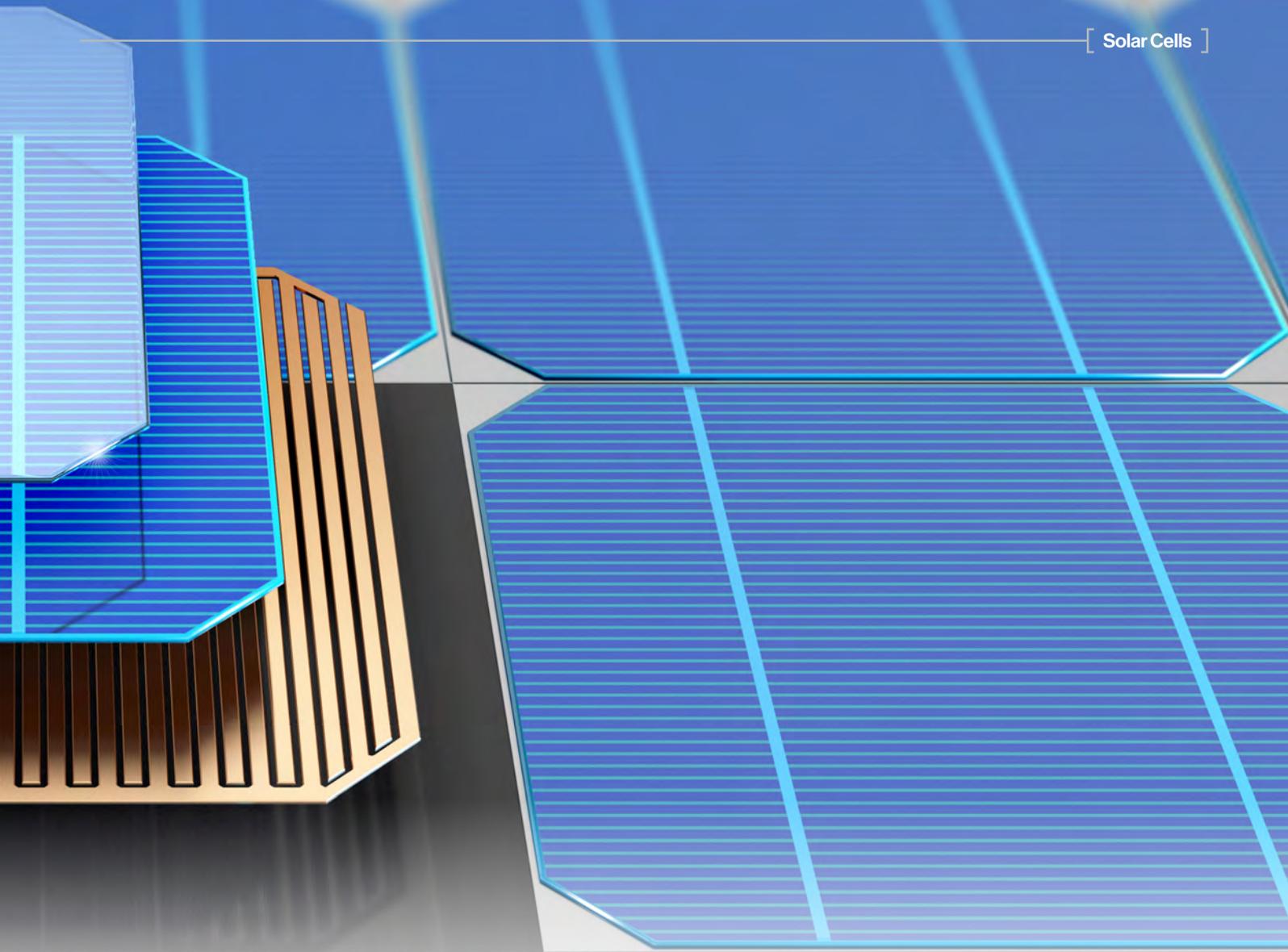
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29.8% Conversion Efficiency in Perovskite Silicon Solar Cells

The researchers believe efficiency of solar cells made from perovskite and silicon could be increased to over 30% by nanostructuring the absorber layers on both sides

By : Arjun Joshi



Researchers from Helmholtz-Zentrum Berlin (HZB) have claimed to have set a new conversion efficiency record of 29.80% in a tandem solar cell made of perovskite and silicon. The result was certified by Fraunhofer ISE CalLab.

The researchers improved upon their earlier conversion efficiency record of 29.15%. They claim the results suggest that the conversion efficiency of perovskite silicon tandem solar cells could be increased to over 30% by nanostructuring the absorber layers on both sides.

“An efficiency of 30% is like a psychological limit for this fascinating new technology. That could revolutionize the photovoltaic industry soon,” said Steve Albrecht, who examines the perovskite thin films in

the HySPRINT innovation lab at HZB.

The researchers examined how nanostructures at different interfaces affect the performance of a tandem solar cell made of a ‘perovskite on silicon’ solar cell. The team used a computer simulation to calculate the photocurrent density in the perovskite and silicon sub-cells with and without nanotextures for various geometries.

The team then fabricated perovskite-silicon tandem solar cells with various structures. According to the researchers, even one-sided nanotexturing improves light absorption and enables a higher short-circuit current than a flat reference.

The researchers claim it is remarkable that nanotextures also lead to a slight improvement in the electronic quality of the tandem solar cell and a better film formation of the

perovskite layers.

They also improved the backside of the cell by using a dielectric reflector which absorbs sunlight more efficiently, leading to a higher photocurrent. The backside of a cell is supposed to reflect the infrared light into the silicon absorber.

In August 2020, researchers at Fraunhofer Institute for Solar Energy Systems ISE had announced a new record efficiency of 25.9% for the III-V/Si tandem solar cell grown directly on silicon.

Scientists at Helmholtz Zentrum Berlin had earlier developed tandem cells that combine two different semiconductors and convert different light spectrum parts into electrical energy. That perovskite CIGS tandem cell had achieved a record efficiency of 24.16%. 🌞



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Round-the-Clock Power Projects are the Future

Ample storage capacity and no risk of fuel price hike is found to make round-the-clock power projects more attractive

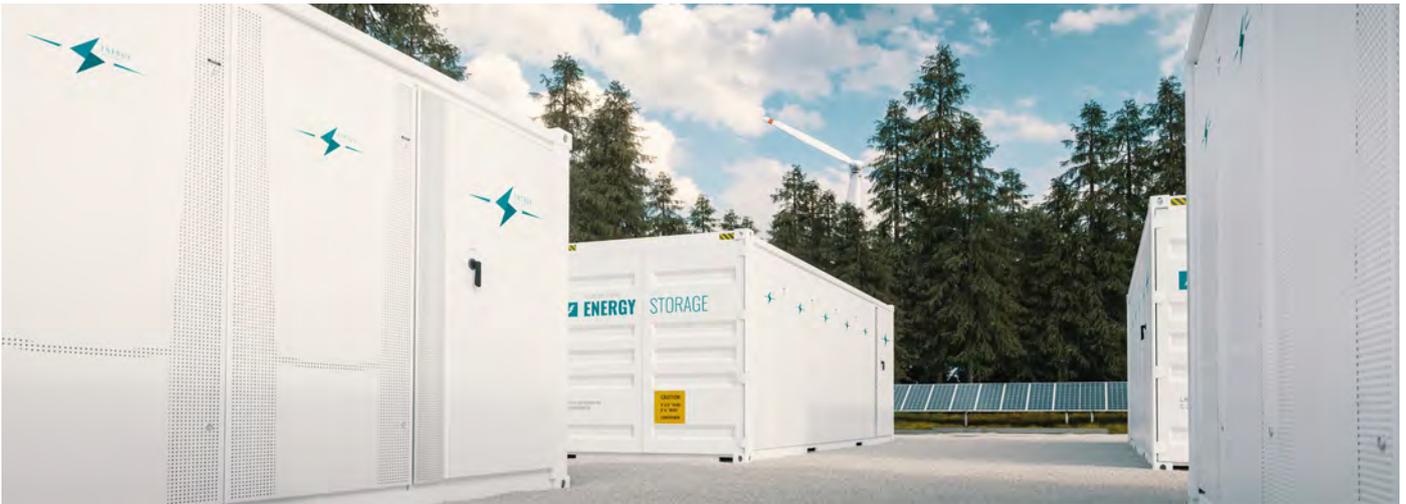
By : Arjun Joshi

Renewable energy supply round-the-clock (RTC) with the help of battery storage overcomes the intermittency associated with solar and wind, which generate energy only when there is

enough sunshine and wind.

Such projects provide generation flexibility to meet the peak loads of distribution companies (DISCOM), which typically change with seasons and undergo pattern shifts over time.

With ample energy storage capacity, they can provide flexibility to DISCOMs to dynamically requisition firm, hourly energy matching the evolving demand curve. Since there is no fuel price hike risk involved, DISCOMs have shown



interest in renewable RTC projects.

The price discovered in RTC auctions is slightly more than regular wind and solar energy projects, as costs are high due to the expensive battery energy storage systems.

In May 2020, SECI announced the 400 MW renewable RTC tender winner. ReNew Power won the auction for the entire tendered capacity of 400 MW at a tariff of ₹2.90 (-\$0.038)/kWh. The project is under development.

High battery cost

Sharing her thoughts on the cost of batteries and its impact on RTC projects, Vibhuti Garg, Senior Energy Specialist at International Institute for Sustainable Development, said, “Developers will have to build more than the stated capacity to meet the monthly Capacity Utilization Factor (CUF) of 70% and the annual CUF of 80% of RTC projects. The reliance on batteries will remain even though they are currently expensive.”

She said that battery storage system prices would drop as deployments increase, which will make these projects viable within a few years.

An executive of a major developer told Mercom that the primary reason RTC projects are not yet attractive to

most developers is the high cost of setting up battery storage systems. However, he noted that with new technologies and competition, the cost of batteries would come down in the future, making RTC renewable projects more attractive and becoming mainstream.

At a recent webinar hosted by Mercom on energy storage systems, Vallisaranya Guruprasad, whose company Tata Power had won the Solar Energy Corporation of India’s (SECI) auction for a 20 MW solar power project with a 50 MWh BESS in Ladakh, said, “I believe more battery technologies should be explored. Battery with lower production cost and increased recyclability would lead to broader adoption of energy storage systems.”

Better policies

Vallisaranya’s opinion is that the government should introduce a framework to support the adoption of energy storage systems— like how Jawaharlal Nehru National Solar Mission was instituted to promote solar power in India. Even the 28% goods and services tax (GST) on the battery is detrimental for broader adoption.

She drew a parallel with the journey of solar power in India. She said, “Even solar started in solar parks as small megawatt-scale modular installations before becoming huge. Energy storage systems should also follow the same path and should start with small-scale modular projects. The government should rethink the announced huge projects as it is hard to execute these massive projects because it is hard to

find suppliers for such vast amounts of batteries.”

The road ahead

The executive of a major developer further believes that the future of RTC projects looks bright in India. “With this project, utilities would get electricity supply round-the-clock from renewables at a very affordable rate while meeting their RPO targets. RTC projects like this will be the future of renewable energy in the country,” the executive added.

The executive noted that their company’s RTC project would require nominal battery storage and build this capacity through wind and solar farms across Karnataka, Maharashtra, and Rajasthan. The company has obtained the requisite approvals to connect the project sites with the grid and has secured connectivity through the inter-state transmission system.

According to him, renewable hybrid projects with storage can go a long way in meeting demand at a competitive tariff during peak hours. These projects can meet the RTC baseload without any external balancing need or strategy.

Developers of renewable energy projects set up for round-the-clock and peak power supply need to tread a delicate tightrope of balancing cost with the right mix of renewables with battery storage. One of the strategies is to limit the battery storage to one or two hours instead of long hours until the price of storage systems drops. As is with any new technology, the industry is trying to find the ideal mix of renewable sources, balancing it with the cost. 📍

The 28% GST on batteries is detrimental to the broader adoption of RTC projects

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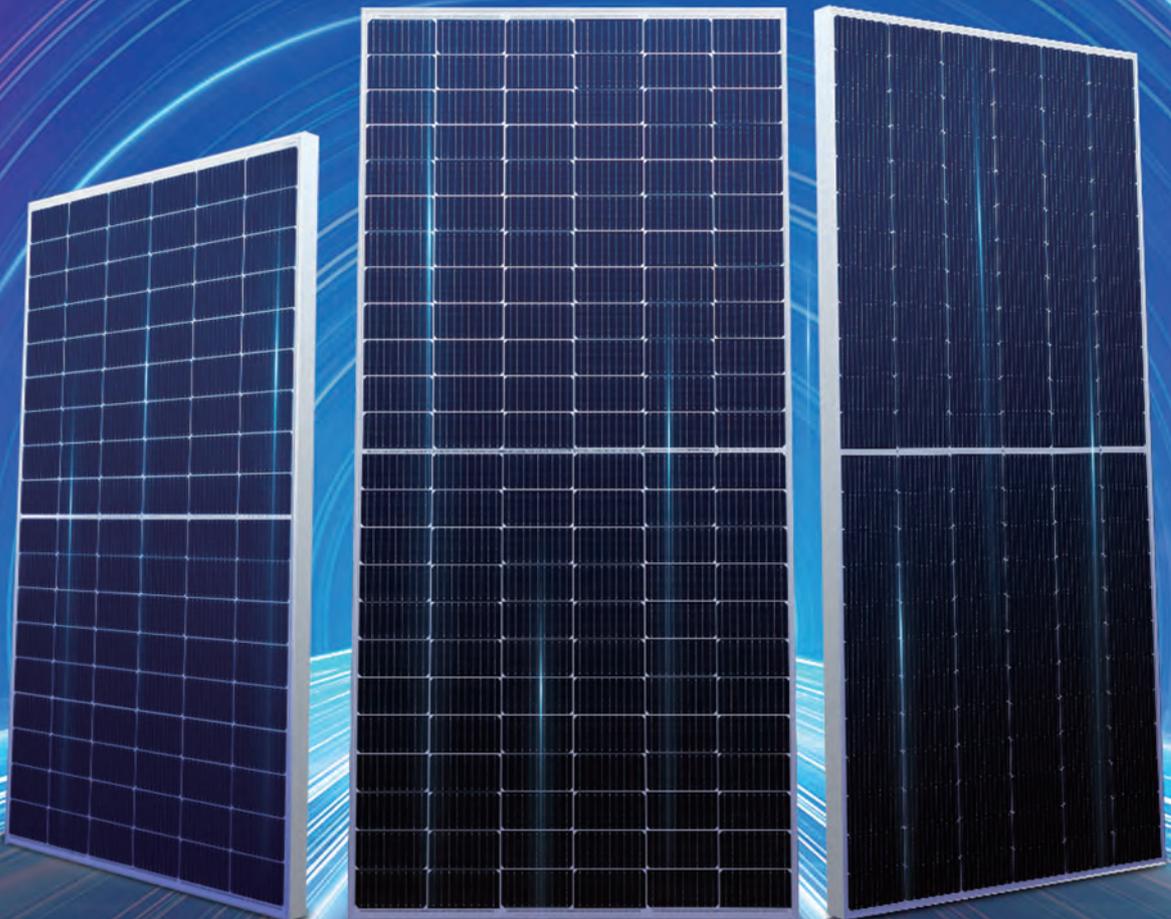
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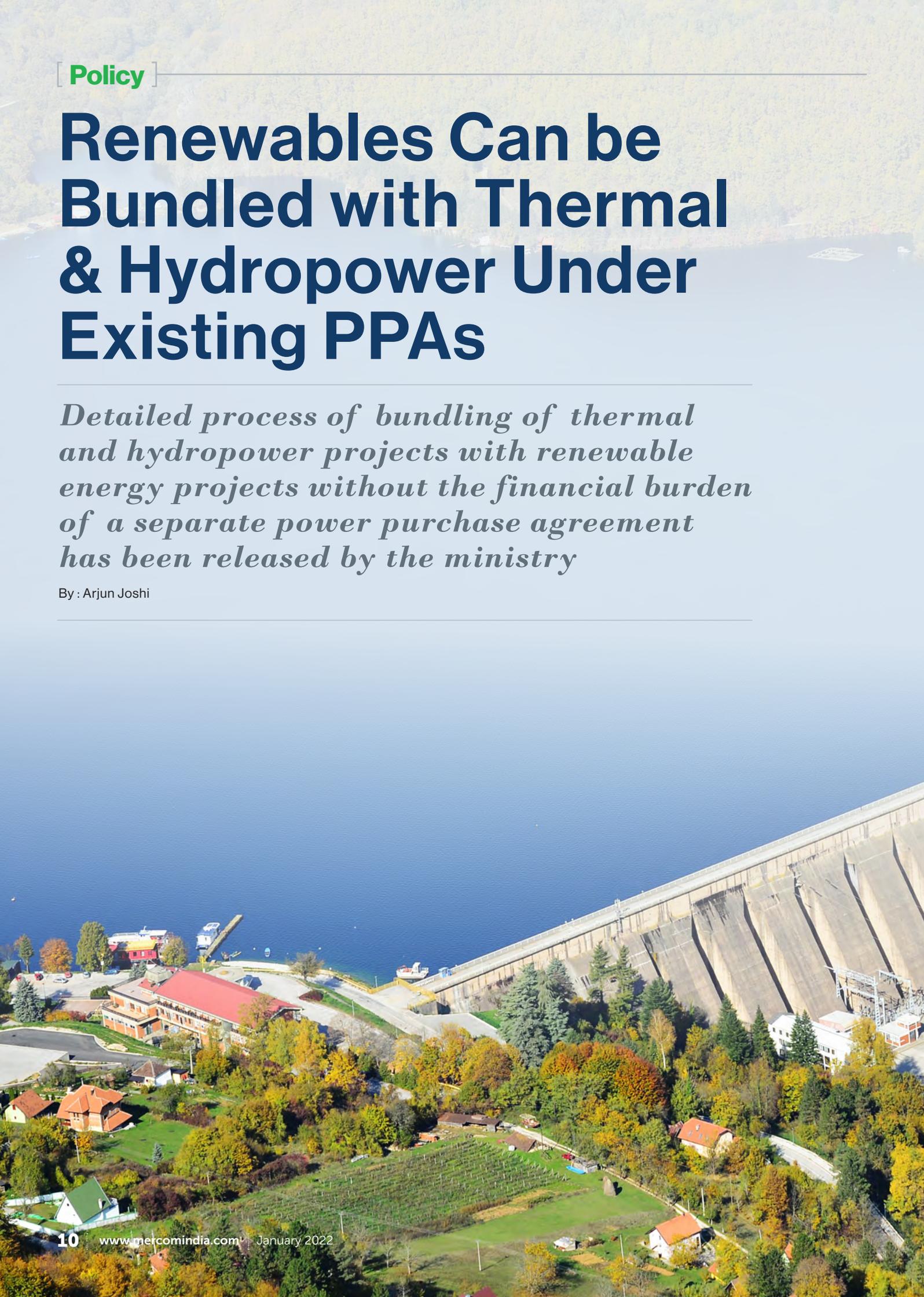
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Renewables Can be Bundled with Thermal & Hydropower Under Existing PPAs

Detailed process of bundling of thermal and hydropower projects with renewable energy projects without the financial burden of a separate power purchase agreement has been released by the ministry

By : Arjun Joshi



The Ministry of Power has outlined a detailed mechanism allowing the bundling of thermal and hydropower projects with standalone renewable energy projects or renewable energy projects with battery storage systems either through setting up renewable energy generation capacities themselves or through developers by inviting bids.

The generated power can also be supplied to distribution companies (DISCOMs) under existing power purchase agreements (PPAs). DISCOMs can count the renewable energy procured under the new mechanism towards their renewable purchase obligation (RPO) without the financial burden of a separate power purchase agreement (PPA).

Renewable power projects co-located within the premises of the generation station or within 100 kilometers will be eligible under the program. The power generators can also be eligible under the new mechanism if the renewable power is supplied to DISCOMs procuring power

No DSM charges will be levied on generating stations meeting scheduled generation in any ratio

from another project owned by the same power generator.

Tariff determination

For projects co-located within a generating station, the appropriate commission will determine the tariff for the renewable energy supplied. In this case, the project has to be set up through competitive engineering, procurement, and construction (EPC) tendering.

In the case of renewable power projects located near a generating station, power will be procured on a competitive bid basis.

A generating company or its

subsidiary will be allowed to establish a renewable power project within its vicinity through a tariff-based competitive bidding process provided a government-approved third party calls the bids.

The battery energy storage system with the renewable project should also be set up through a competitive bidding process.

Transmission charges

No additional transmission charges will be levied for bundling renewable power with thermal or hydropower when the renewable power project is co-located within or near a generating station.

There will be no transmission charges for using the inter-state transmission system (ISTS) when power from a renewable project situated at one generating station is supplied to procurers of another generating station owned by the same generating company. This guideline applies to renewable energy projects where the evacuation is from the same switchyard of the thermal





or hydropower project and to renewable projects evacuated through the existing ISTS network without any augmentation.

The waiver of ISTS transmission charges for sale through power exchanges or to any third party will be per the existing policy.

Scheduling and commercial mechanism

Regarding the scheduling and commercial mechanism, the notification states that once the schedule for the next day is received, the power generator will have the flexibility to use thermal or hydropower and renewable power to meet the scheduled generation.

Also, the total power supplied from thermal or hydropower plus renewable sources on an actual basis will be considered for the Deviation Settlement Mechanism (DSM).

The thermal or hydropower generating station's declared capacity will be as per the terms of the PPA

and the availability of primary fuel. However, the declared capacity cannot be based on the availability of additional renewable power.

The renewable power supplied to the DISCOMs should be at a tariff less than the generating station's Energy Charge Rate (ECR). This tariff should include the balancing cost and the tariff risk of the power generator.

The notification adds that the net savings realized from the supply of renewable power in place of thermal or hydropower under existing PPA will be passed on to the DISCOMs by

PPA holders possess the first right to schedule power from generating stations

the generating company monthly. The savings will be shared equally between the DISCOMs and generating company, subject to the power generator's cap of ₹0.07/ kWh (-\$0.0094).

Deviation settlement mechanism and scheduling

As per the notification, for the flexible scheduling and operation of the thermal or hydro projects, while providing the declared capacity of a generating station, the generator must not consider the forecast of generation from the renewables. Once the schedule for a specific thermal or hydropower generating station is received, then depending on forecast for renewables, the generation station must supply to meet the schedule from thermal or hydropower and replace with renewables.

Deviation, if any, will be made applicable to the scheduled generation from the thermal or hydropower



generator and the sum of actual generation from thermal or hydropower and renewable sources.

DSM charges will not apply to generating stations that can meet their scheduled generation by supplying thermal, hydropower, and renewable power in any ratio.

Central Electricity Authority shall monitor the implementation and suggest changes, if required, in the scheme to the Central Government. In doing so, CEA may consult MNRE, POSOCO, CERC, Distribution Licensee, and other stakeholders.

Additional mechanisms for renewable energy bundling

The DISCOMs can procure renewable power per the existing PPA to meet their renewable purchase obligation (RPO). They will not be required to sign any additional agreements in cases where the tariff of renewable power is less than the energy charge rate of the

generating station.

Selling renewable power in exchanges

The power generator can sell renewable power to third parties or at power exchanges to avoid stranding when replacing thermal or hydropower is not feasible due to the generation station's technical minimum schedule or forced shutdown. The power generator can do so without clearance from DISCOMs.

However, the right to schedule power from the generating stations will first rest with the PPA holders. If they do not schedule the power, the generating station will have the right to sell the unscheduled renewable power in the market.

A renewable power project would not be operating under the flexibility program during such conditions. Therefore, there will not be any requirement of sharing gains or losses

derived by selling such renewable power in the market.

The concerned Regional Load Despatch Centres or Regional Power Committees will facilitate the sale of such power in the power market by separate scheduling of renewable power for either co-located or located near renewable projects.

Recently, the Ministry of Power issued revised guidelines for thermal power generation companies to either set up renewable energy generation capacities themselves or through developers by inviting bids and supply power to consumers under existing PPAs.

India's installed renewable energy (including large hydro projects) capacity stood at 143.9 GW, accounting for a share of 37.4% in the overall power mix at the end of Q2 2021, according to preliminary data from the Central Electricity Authority (CEA), Ministry of New and Renewable Energy (MNRE) and Mercom's India Solar Project Tracker. ☉

Jakson's Module Production Capacity to Reach 1 GW



The company has 600 MW of fully automated module manufacturing capacity to produce modules up to 850W

The Indian solar market is steadily recovering after facing several challenges due to the Covid-19 pandemic and subsequent lockdowns in the past two years.

According to Mercom's Q2 2021 India Solar Market Update, India installed 2.48 GW of new solar capacity in the second quarter (Q2) of 2021, a 19% quarter-over-quarter increase compared to 2.09 GW installed in the previous quarter.

Jakson Group, an engineering, procurement, and construction (EPC) company, shifted from fossil fuel power to renewable energy resources about a decade ago. The company is an independent power producer (IPP) and manufacturer of solar modules.

According to Mercom's India Solar Project Tracker, the Jakson Group has 124 MW of installed solar capacity and 220 MW of solar projects in the pipeline.

Mercom spoke to Sameer Gupta, Chairman and Managing Director of

Jakson Group, to discuss the company's plans and his perspective on India's solar industry and the policy regime.

1. What has the journey been like from fossil fuel power (diesel generators) to renewable energy (solar projects)?

Jakson Group's journey in renewable energy began in 2011 with a Solar IPP project of 20 MW in Rajasthan. The project was designed, installed, and commissioned by Jakson's in-house team. After that, we continued developing our portfolio and bidding for EPC services for other developers.

We have successfully commissioned more than 1 GW of solar projects (EPC and IPP) with about 220 MW under development. We set up a solar module manufacturing plant, including a module mounting structure facility at Greater Noida. We now have a manufacturing capacity of 600 MW, which we would scale up to 1 GW by 2022.

Today, we are a diversified energy

company providing customized turnkey solar solutions for all customer segments, including residential, commercial, industrial rooftop, and utility-based large power projects.

2. How has the market and the economy evolved to embrace renewable energy from fossil fuels?

India started with the objective of cutting down the import of fossil fuels. In 2015, India was one of the countries to have signed the Paris Agreement on Climate Change, which aims to limit global warming. Under the leadership of Prime Minister Narendra Modi, India announced its mission to have 175 GW of renewable power by 2022 and 450 GW by 2030. India today is amongst the top five nations in the world in terms of installed renewable capacity.

Thanks to India's focus on innovation and technology, today, solar power prices are even lower than thermal power. Renewables offer a vast potential that helps us meet our objectives of energy security, Aatmanirbhar Bharat,

job creation, climate change, and making India a global manufacturing hub.

3. Jakson is an IPP, an EPC, and a domestic manufacturer for solar modules and other products. What are your experiences from diversifying the business within the solar sector, and how has it helped position the company?

Jakson is present across the value chain within the solar sector, manufacturing solar modules, solar rooftop solutions, utility-scale EPCs, or having company-owned IPPs.

We are a one-stop-shop for all energy solutions for our customers across segments. Jakson has positioned itself as a reliable partner, and we command a premium due to the quality of our products and services. We leverage technology for on-time or before-time completion of projects, differentiating us from the rest.

4. How badly did the pandemic hit your business, especially the EPC segment? Has the market fully recovered?

The pandemic can be divided into two phases. There was 100% closure of all production activity during the first lockdown while expenses continued on fixed costs. During the second wave and phase of the lockdown, productivity was low. The supply chain was impacted due to freight disruptions and delays.

The lockdown impacted the possibilities to explore new business opportunities, both domestic and international, since there was a complete travel ban. Tender opportunities were also significantly lesser, and most active tenders kept getting deferred. Today, the market has gradually returned to pre-pandemic levels, which is a great sign.

5. As a domestic manufacturer, do you believe India has what it takes to take on China to cater to the growing solar sector domestically and internationally?

We depend on China to supply all the primary raw materials, solar modules, particularly solar cells.

In recent months, the central government has proactively announced many schemes, including the

production-linked incentive (PLI) program, which has ignited the interest of many Indian and global companies to invest in India for manufacturing right from polysilicon to wafer to cell to solar modules. India has made significant investments in manufacturing other related raw materials, like glass, back sheets, and frames.

The availability of raw materials from Indian manufacturers will increase in the coming years, reducing our dependency on China. Our quality is second to none in this sector, and there is no reason why India will not have a dominant presence across the globe for various solar products.

6. Tell us about your 1 GW solar manufacturing plant. What kind of production should the market expect from Jakson? What are the technology capabilities?

We are scaling up our existing capacity to 600 MW which should be fully commissioned by November 2021. There are firm plans to increase capacity to 1 GW of solar modules before we integrate backward and venture into the manufacturing of solar cells.





Our production line is fully automated and capable of manufacturing modules even up to 850 Wp or higher capacity. Our 600 Wp Helia series launched recently, will be manufactured on this new production line. We are utilizing the latest technology like the multi-bus bar for manufacturing these modules. The fully automated line has relevant elements of Industry 4.0 and Artificial Intelligence, ensuring consistent quality and high productivity, thus improving our competitiveness.

7. How do you see the future of solar in India?

The future of solar is, in theory, unlimited. India's current installed capacity is about 35 GW, and the mission is to have more than 300 GW of solar power generation out of 450 GW of renewables by 2030. Moreover,

the recent adoption of hydrogen will further increase the potential of the solar sector as mega solar power projects would come up for the production of green hydrogen.

It is envisaged that by 2030, India would need an investment of more than \$500 billion in this sector. All across the globe, investors are taking a keen interest in India, and thanks to improved ease of doing business, we seem to be the most promising country to invest in.

Solar power can position India from being a net importer of fuel to a net exporter of energy.

8. Are the incentives offered enough to meet the government's aspirations and targets?

To fast-track investment and facilitate the speedy development of renewable energy, the government has

come out with several encouraging policy initiatives. The initiatives include 100% foreign direct investment in renewable energy through the automatic route, setting up of a renewable energy investment promotion board and a facilitation board to provide one-stop assistance to investors, signing long term power purchase agreements, transparent bidding process, promotion of open access policy, safeguard duty, and basic customs duty.

The recently announced PLI program to promote renewable manufacturing in India has drawn massive attention worldwide. Renewable energy adoption can be fast-tracked if the government focuses on electricity distribution reforms, embraces best global practices on reverse bidding, and promotes distributed energy adoption. 🌞



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Benchmark Costs for Rooftop Solar Projects Reduced

MNRE has reduced the benchmark costs in the wake of revised GST rates for renewable energy equipment

By : Rakesh Ranjan Parashar

The Ministry of New and Renewable Energy (MNRE) has reduced the benchmark costs, excluding the Goods and Services Tax (GST), for grid-connected rooftop solar photovoltaic

(PV) projects for the financial year (FY) 2021-22.

The revised benchmark costs for general category states vary from ₹35.89 (-\$0.48)/W to ₹46.92 (-\$0.62)/W (for capacities up to 500 kW). Earlier,

they were in the range of ₹39.08 (-\$0.53)/W to ₹51.1 (-\$0.69)/W.

In August this year, MNRE issued benchmark costs for grid-connected rooftop solar photovoltaic (PV) systems for FY 2021-22.



The benchmark cost for FY 2021-22 is applicable for all projects awarded and for empanelment of vendors by state implementing agencies under Phase-II of the MNRE's rooftop solar program.

In its latest notification, MNRE said that after the revision of GST rates for renewable energy equipment, it decided to revise the benchmark costs excluding GST.

The applicable GST rates could be added to the benchmark costs to calculate the central financial assistance (CFA), MNRE said.

For special category states (North-eastern States, Uttarakhand, Himachal Pradesh, Jammu and Kashmir, and the Union Territories of Andaman and Nicobar and Lakshadweep), the revised benchmark costs are in the range of ₹39.47 (-\$0.53)/W to ₹51.62 (-\$0.69)/W.

Earlier, the benchmark costs for various capacities up to 500 kW were in the range of ₹42.98 (-\$0.58)/W to ₹56.12 (-\$0.76)/W.

Subsidies for residential rooftop solar systems will be calculated based on the benchmark costs determined for the specific years or the lowest cost quoted in a tender, whichever is lower.

According to MNRE, subsidy under Phase-II of the grid-connected rooftop solar program will be available to all eligible households for rooftop solar installation as per respective State Electricity Regulatory Commission regulations and program implementation guidelines. Under the program, distribution companies—or their authorized agencies will invite Expressions of Interest (EoI) for empanelling the agencies to supply, install, test, and commission rooftop solar systems in residential premises. Bidders within the lowest bid (L1) price bracket will be empanelled and provide services to the consumers at the lowest agreed tariff rate. ☺

Benchmark Costs for Grid-Connected Rooftop Solar Power Projects for the Financial Year 2021-22

Capacity	Benchmark Costs (Excluding GST)			
	For States Other than Special Category States		For Special Category States including North Eastern States, Uttarakhand, Himachal Pradesh, J&K and UTs of Andaman & Nicobar Island and Lakshadweep	
	₹/W	~\$/W	₹/W	~\$/W
1 kW	46.92	0.62	51.62	0.69
Above 1 kW to 2 kW	43.14	0.57	47.45	0.63
Above 2 kW to 3 kW	42.02	0.56	46.22	0.62
Above 3 kW and Upto 10 kW	40.99	0.55	45.09	0.60
Above 10 kW and Upto 100 kW	38.24	0.51	42.06	0.56
Above 100 kW and Upto 500 kW	35.89	0.48	39.47	0.53

Source: MNRE

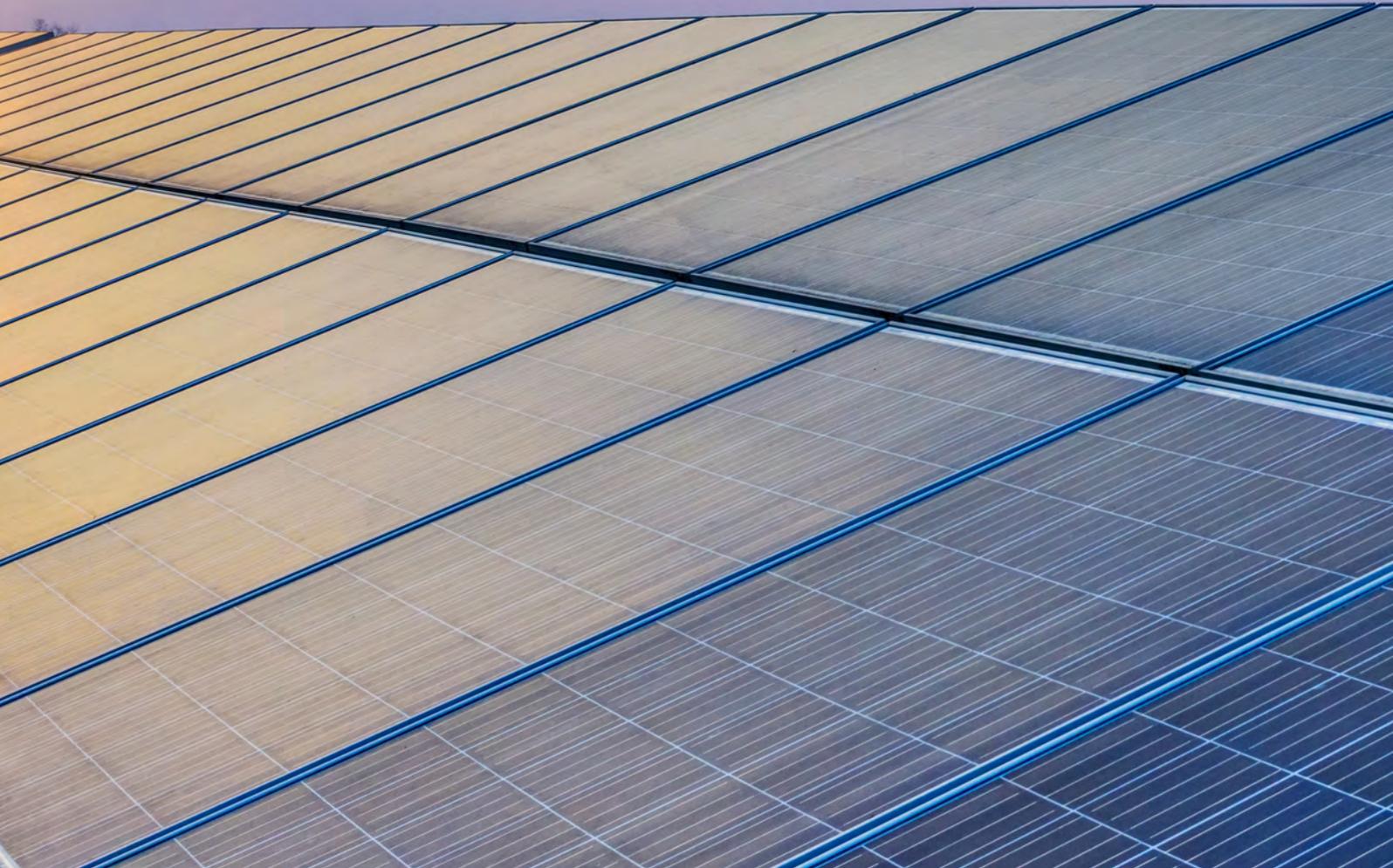
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Punjab Passes Bill to Revise Long-Term PPAs

In a move reminiscent of the Andhra Government, Punjab passed a bill to renegotiate PPAs signed with renewable energy project developers

By : Rakesh Ranjan Parashar





The Punjab Government passed a Bill to revise the long-term power purchase agreements (PPAs) between the Punjab State Power Corporation Ltd (PSPCL) and the renewable energy generators. The Bill seeks to reduce the tariffs for renewable energy projects approved by the state electricity regulatory commission.

The Punjab Renewable Energy Security Reform, Termination, and Redetermination of Power Tariff Bill, 2021, was unanimously passed in the state Legislative Assembly.

The government's move follows recent statements by the state's New and Renewable Energy

The legislation could come in for a legal challenge, according to some experts

Sources Minister Raj Kumar Verka that the tariffs discovered through a competitive bidding process in the range of ₹7 (-\$0.094)/kWh to ₹8 (-\$0.11)/kWh seven to eight years ago were considerably higher than the current tariffs.

The Bill provides a list of solar projects with a total capacity of 886 MW and 97.5 MW of biomass projects for which PPAs with independent power producers have been signed.

In the Bill, the government has argued that it is necessary to enact a law in the public interest and implement measures to provide electricity to the consumer at an affordable price.

It argued that the state regulatory commission has the statutory authority to redetermine renewable energy tariffs in the interests of consumers. The commission could set temporary tariffs until they are finally redetermined.

Speaking to Mercom, a senior executive at a leading solar developer with projects in Punjab, said, "It's just not right to renegotiate the tariffs now. The Punjab State Power Corporation Limited had signed the PPAs with the developers at tariffs discovered through a competitive bidding process. They cannot revisit the tariffs and reduce them as it would hurt the developers and create a sense of uncertainty.

It will be a disaster and would not be permissible under any law. This move would have a negative impact on the investor sentiments and

would affect the investor community in a big way. The renegotiation of tariffs is not in the hands of the state government, and they cannot change it whenever they like."

As some experts have pointed out, the legislation could come in for a legal challenge.

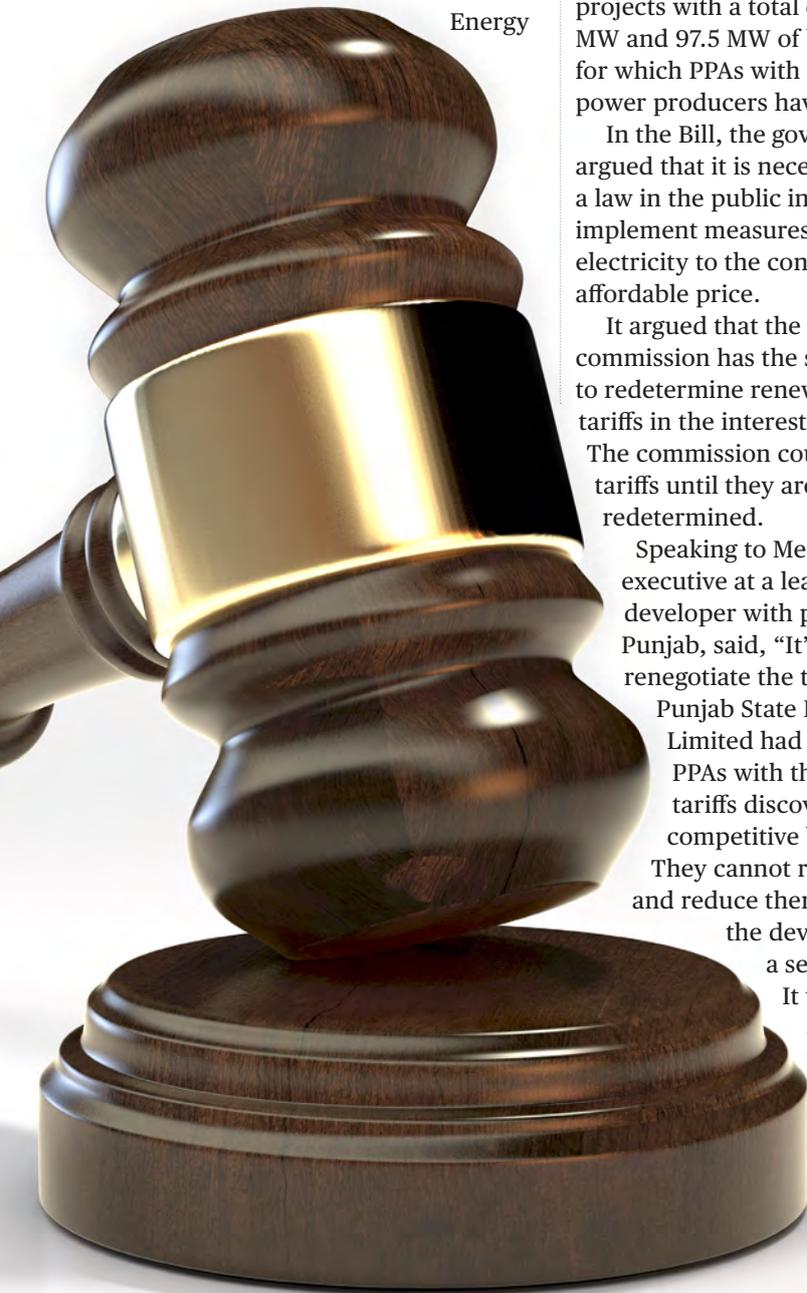
Attorney Aditya K Singh, an Associate Partner at Link Legal, had earlier said that this step would go against the provisions of the Electricity Act, 2003. "The state government cannot legislate or issue directions concerning The Electricity Act, 2003. State actions cannot be contrary to a Central Act. The Electricity Act is a complete code in itself, and its power under Sections 61 and 62 of determining tariffs has been validly exercised."

Singh said that developers had made significant investments in these renewable energy projects, and they calculate the return of investment based upon the tariff agreed, among other parameters. If the tariffs are terminated and revised, it will jeopardize their financial arrangements.

This is not the first time a state government has tried to renegotiate tariffs. In 2019, Chief Minister of Andhra Pradesh YS Jaganmohan Reddy announced that the government would review the PPAs signed between the state's DISCOMs and power generators.

The decision had alarmed power producers, investors, policymakers, and legal experts. However, the Andhra High Court had quashed the state government's order along with the letter issued to renewable developers to reduce their quoted tariffs. After the developers went to Court to resolve this issue, the High Court directed the DISCOMs to pay the monthly bills at ₹2.44 (-\$0.033)/kWh for solar power and ₹2.43 (-\$0.033)/kWh for wind. But the generators are still filing affidavits in the Court for the due payments.

According to Mercom India Solar Project Tracker, over 800 MW of large-scale solar projects are operational in Punjab, and about 440 MW tendered pending auctions. The tariffs for the projects in operation range from ₹5.62 (\$0.075)/kWh to ₹8.74 (\$0.12)/kWh. ☺





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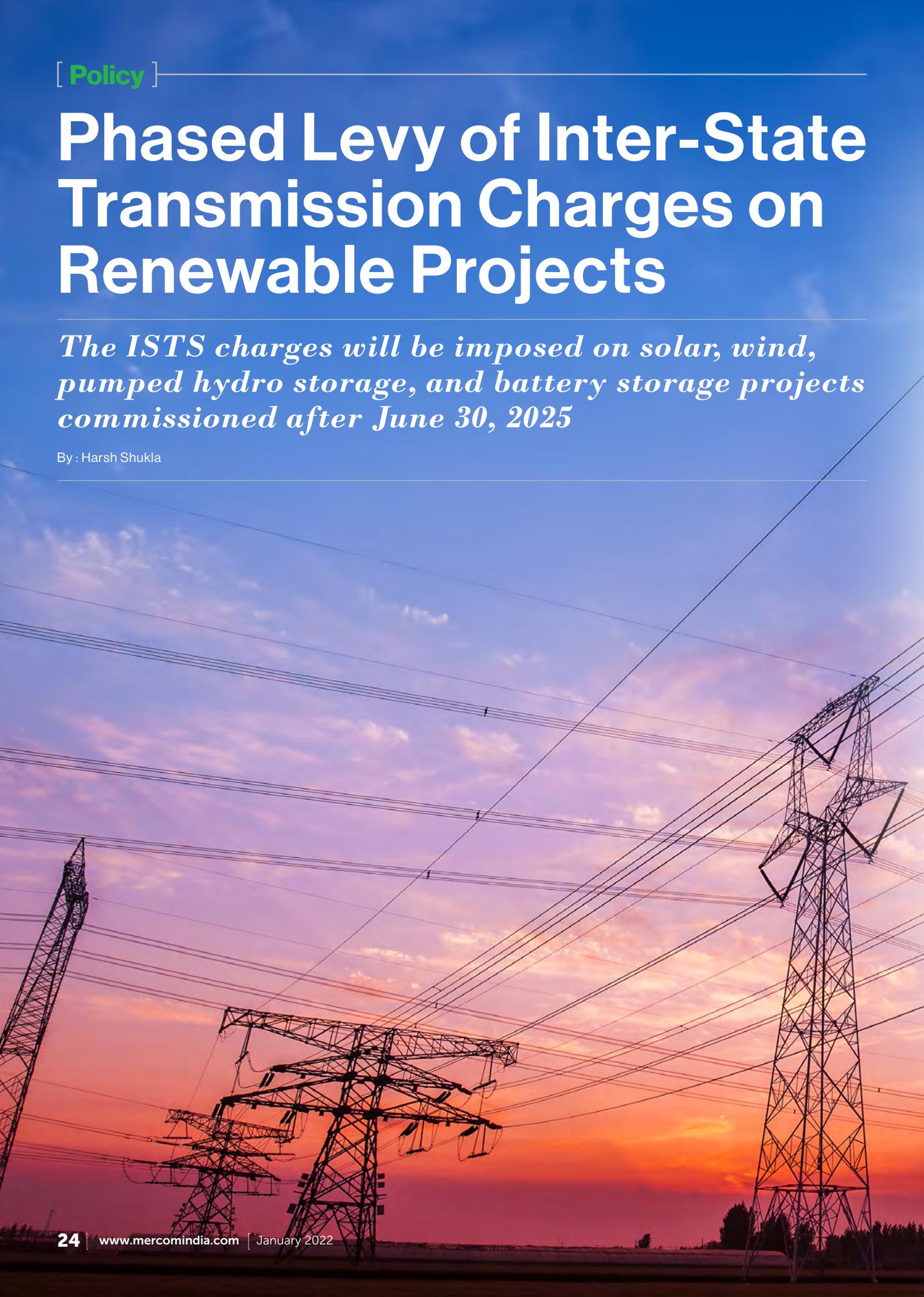
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Phased Levy of Inter-State Transmission Charges on Renewable Projects

The ISTS charges will be imposed on solar, wind, pumped hydro storage, and battery storage projects commissioned after June 30, 2025

By : Harsh Shukla



The Ministry of Power (MoP) has announced that inter-state transmission system (ISTS) charges will be levied on renewable energy projects, including solar, wind, pumped hydro storage, and projects with battery energy storage systems (BESS) commissioned after June 30, 2025.

The ISTS charges for power generated from renewable energy sources will be levied gradually.

As per the order, 25% of the applicable ISTS charges will be levied on projects commissioned between July 1, 2025, and June 30, 2026. The charges will be increased by 25% annually, and 100% of ISTS charges will be levied from July 1, 2028.

The ministry said the waiver would be applicable for 25 years for solar, wind, and pumped hydro storage projects. BESS projects would get a waiver for 12 years or a period notified by the government from commissioning the project.

In June 2021, the ministry extended ISTS charges waiver on solar and wind energy projects commissioned until June 30, 2025. In addition, no ISTS charges will be levied if generating stations procure power from solar and/or wind power from the project situated at a thermal or hydropower generation facility.

BESS projects commissioned before June 30, 2025 would get a waiver for 12 years

The waiver applies to ISTS charges only and not losses. However, the waiver of losses would be applicable for projects whose bidding was completed before January 15, 2021.

The waiver is also applicable to pumped hydro storage and BESS projects commissioned until June 30, 2025. These projects could be set up for captive use or sold to an entity under competitive bidding, power exchanges, and bilateral agreements.

To be eligible for ISTS waiver, at least 51% of the annual power needed

for pumping water in the pumped hydropower project must be met through solar and/or wind power. Similarly, at least 51% of the annual electricity requirements for charging BESS should be sourced from solar and/or wind power for BESS projects. Earlier, the projects were eligible for a waiver if at least 70% of their annual power requirements were procured from wind and solar projects.

For green hydrogen-generating projects commissioned up to June 30, 2025, the waiver is applicable for eight years from the date of commissioning of projects. However, these green hydrogen projects should use solar and wind power to produce hydrogen to be exempted from ISTS charges.

Mercom had earlier reported that the ministry waived ISTS charges and losses on all solar and wind projects commissioned before June 30, 2023.

Inter-State Transmission System (ISTS) Charges Applicable to Solar, Wind, Pumped Hydro and Battery Storage Projects Commissioned After June 30, 2025

Period of Commissioning	ISTS Charges
01.07.2025 to 30.06.2026	25% of the applicable charges
01.07.2026 to 30.06.2027	50% of the applicable charges
01.07.2027 to 30.06.2028	75% of the applicable charges
From 01.07.2028	100% of the applicable charges

Source: Ministry of Power

Mercom India Research



Indian Storage Market to Make Inroads in 2022

Mercom spoke to executives of storage companies in India to gauge the mood in the market going into 2022

By : Harsh Shukla

India's renewable energy capacity is growing exponentially, driven by the ambitious target of achieving 500 GW of non-fossil energy capacity by 2030. Energy storage is expected to play a critical role in reaching India's target.

Although the energy storage capacity addition has been negligible through

2021, developers believe that the market will take off in 2022 and expect higher storage deployments in the country.

According to Mercom India Research, India currently has only 20 MW of installed battery storage capacity, with 1.3 GW of storage capacity under various development stages.

The Solar Energy Corporation of

India (SECI) and NTPC Limited have announced tenders for 4 GWh of standalone battery energy storage capacity, which is yet to be auctioned.

Outlook for 2022

Mercom spoke to executives of storage companies in India to gauge the mood in the market going into 2022.



Harendra Tomar, Lead - Business Development, Sungrow, said, “Considering the progress in 2021, and the Government’s intent to develop renewables with storage, 2022 looks promising for energy storage projects. SECI has tendered two major battery energy storage system (BESS) projects and awarded engineering, procurement, and construction (EPC) contracts. A few other hybrid projects with storage were also closed. More projects may progress to the final stage of execution.”

Subhamay Ganguly, AGM - Energy Storage and Innovation, Amp Energy India agreed with Tomar. He said 2021 had seen some storage projects taking off. The momentum is likely to sustain in 2022, with some government tenders expected to be bid. Around 2-3 GW of energy storage project tenders floated towards the end of 2021 are expected to progress in 2022.

Recently, Tata Power Solar Systems received the letter of award from SECI to provide EPC services for a 100 MW solar project with 120 MWh BESS.

According to Vivek Bhardwaj, Sales Head of India GoodWe, if the right policies are announced, over 1 GW of decentralized hybrid storage inverters can be installed until 2023.

Manish Kumar, COO - New Energies at Jakson Group, was equally optimistic about the storage market. “India’s requirement for battery storage is estimated at 120 GWh by 2030 to support its 500 GW renewable capacity target. Lithium-ion battery technology will drive the growth of stationary storage within BESS over the next ten years. Progress on other battery chemistries like sodium-ion also continues apace.”

Anil Bhat, Business CEO - Distributed Generation at Amplus Solar, said energy

storage is imperative to achieving scale for India’s cost-effective clean energy sector. There is an unprecedented rise in demand for renewables; the industry can offer round-the-clock grid stability if supported by integrated energy storage solutions.

“As a part of its solar Aatmanirbhar (self-reliance) vision, the Government is working towards mainstreaming the energy storage sector. Recently, it sought recommendations for bringing in a comprehensive policy framework for the energy storage sector,” he said.

Bhat said the industry consistently invests in research and development to create technologically advanced storage equipment.

Lulu Tu, Brand Manager at Growatt, is very optimistic about the global energy storage market and believes that the more mature European and Australian markets would see significant

growth in 2022. She suggests that the Indian energy storage market, on the other hand, needs policy push to help promote it, given the high battery prices.

Storage costs

The high cost of energy storage is one of the primary hurdles for the market’s rapid expansion. Stakeholders have mixed opinions about how storage prices would behave in 2022.

Kumar feels that the cost of standalone lithium-ion battery storage systems globally declined from \$1,100/kWh in 2010 to \$200/kWh in 2020. He expects a steep decline in battery prices in the next couple of years with the support of production-linked incentive (PLI) programs for manufacturing Li-ion cells and batteries in India.

Bhat concurred. “With improved adoption of flow batteries like zinc and vanadium, we can expect enhancement of technological efficiencies that reduce storage cost in long-duration applications.”

Citing the supply chain disruptions caused due to the global pandemic and trade disputes, Amp Energy’s Ganguly debated the lithium-ion battery prices going down anytime soon. He suggested that according to different studies, it is forecasted that the battery storage prices are expected to come down only by 2023.

According to Tomar, it is difficult to forecast the reduction in battery cell costs, which

India’s requirement for battery storage is estimated at 120 GWh by 2030

makes up 80-85% of BESS project costs, as there is a big gap in demand and supply globally. “However, if the supply chain achieves stability, a cost reduction may be expected in the near future. Some breakthroughs are expected on the technology and R&D front, which may help cut down the costs; however, it is a time-consuming process.”

Industry’s expectations

The industry is counting on the Government to provide financial support to domestic battery manufacturing facilities and lower the Goods and Services Tax on batteries, 28% currently.

Bhat wants the Government to focus on policies and tax benefits to attract investments into the battery manufacturing sector on the lines of the incentives for the battery ecosystem for electric vehicles. The reduction in GST for batteries could undoubtedly help improve storage projects’ viability for commercial and industrial consumers.

Kumar said higher subsidies on energy storage systems that help increase

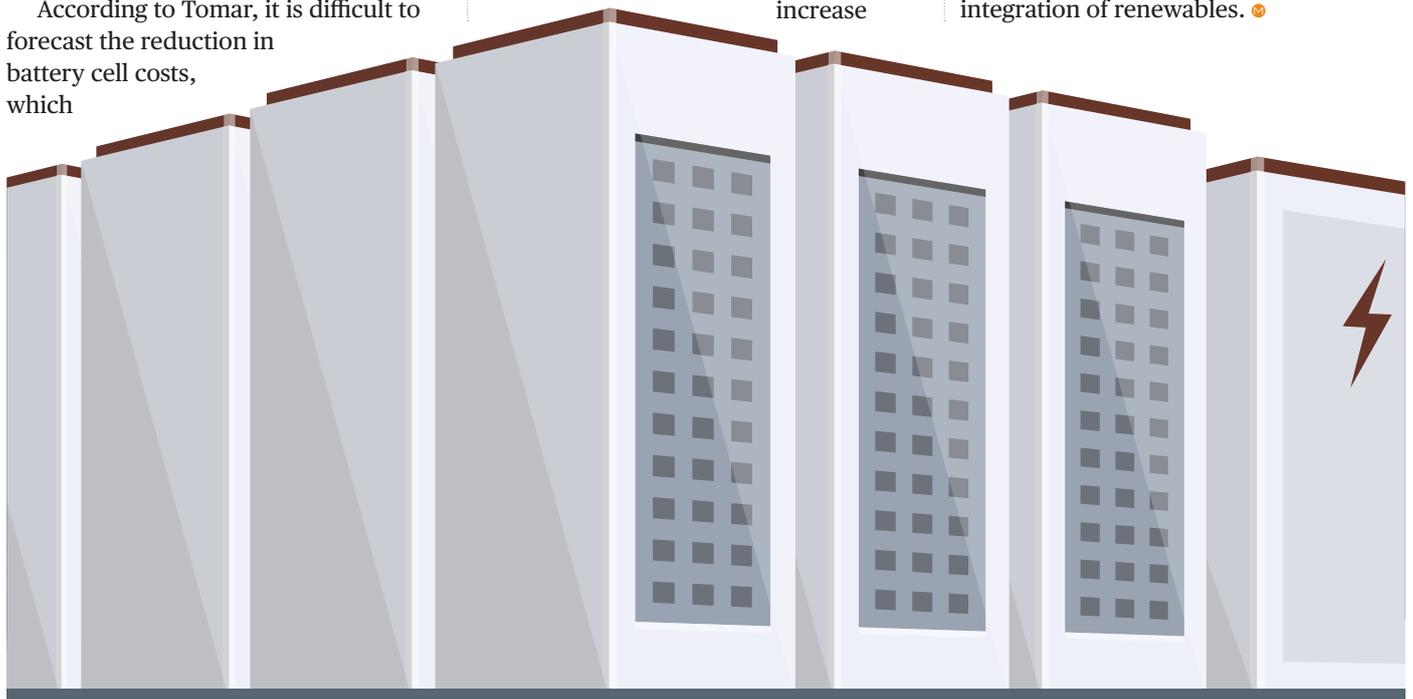
deployments would be welcome.

Regarding the Government’s policies for the storage sector, Bhardwaj said, “If the Government passes the Electricity Amendment Bill 2021, it will allow delicensing of the distribution sector, letting private firms enter the distribution sector and compete with distribution companies (DISCOMs). This would give consumers more choices and allow decentralized technologies to take off.”

“Unprepared to handle complexity, the Government is giving too much attention to simplistic centralized storage technology compared to the decentralized one. The decentralized storage technology simultaneously allows energy generation and consumption, increasing efficiency and saving India billions by avoiding adding more transmission infrastructure,” he added.

Tomar from Sungrow said the Government must support the deployment of more BESS projects to boost the confidence of storage developers and suppliers.

According to Wartsila and KPMG, supply-side flexibility is needed at the pan-India level to integrate the 2030 renewable energy target. The study indicated that by 2030, India would need 38 GW of four-hour battery storage and 9 GW of thermal balancing power projects for cost-efficient and reliable integration of renewables. ☺



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Wind-Solar Hybrid Projects Set to Grow in India

Hybrid projects along with a battery energy storage system can solve the problem of intermittency and ensure grid stability

By : Rakesh Ranjan Parashar



The intermittent nature of standalone wind and solar power sources has made it essential for policymakers to promote wind-solar hybrid projects that provide a longer-duration power supply and maximize resources. Adding a battery energy storage system (BESS) to these hybrid projects would solve the problem of intermittency and ensure higher grid stability.

To boost the development of hybrid projects in the country, in 2018, the Ministry of New and Renewable Energy (MNRE) announced the Wind-Solar Hybrid Policy.

The renewable companies believe that solar and wind resources complement each other in India, and hybrid projects would go a long way in optimizing land and transmission systems.

Speaking to Mercom, Keyur Vora, Head, Wind Engineering, Amp Energy India, said, “Wind-solar hybrid projects, which harness both solar and wind energy, are fast emerging as a viable renewable energy option in India. As

we advance, hybrid projects promise massive gains in the Indian renewable energy market mainly because it minimizes the resource risk of overall hybrid projects where the overloading design of the projects is significantly higher to achieve tariffs comparable to a standalone wind or solar project.”

But how cost-effective are hybrid projects? Vora said, “The cost justification is highly dependent on the availability of the interstate transmission system (ISTS) hybrid grid substation. The government needs to ensure as much grid availability as requested by the developer so that power can be dispatchable and the entire ecosystem can be sustained on a long-term basis.”

Hybrid with battery storage-a picture of things to come

Combining wind and solar can yield higher levels of electricity, as solar power can meet the daytime demand, and wind power generation tends to be stronger at night.

Adding battery storage to the mix can

ensure uninterrupted power for close to 24 hours. However, battery storage adaption is still in the early stages in India, and the cost of battery storage remains high, making it economically unviable for developers.

On the prospects of integrating hybrid with storage, a top executive of a leading developer said that currently, the cost of BESS is high and so cannot be an alternative to a solar or wind project. There can be no definitive ratio in which storage can be combined with hybrid projects.

“With more and more renewables added, we will need more hybrid projects which should be co-located. For grid management, you need hybrid projects. With only solar, the supply curve is skewed. To moderate this in the evening, the supply should come from wind, pumped storage, BESS, or higher generation from thermal plants during the nighttime. Today BESS is costly. On a standalone basis, storage will be costly, so it must be mixed with hybrid projects,” he noted.

Manoj Gupta, Director- Corporate



Affairs at Fortum India, concurred. He said hybrid projects would come into the equation whenever round-the-clock (RTC) power is required. “The cost of storage projects is still high. So, considering this, three to four hours of storage is fine. We need to have a different tariff for peak hours, making it attractive for DISCOMs. Solar can take care of peak power demand during the daytime, and wind can take care of peak power demand during the night time.”

Gupta agreed there can be no formula for combining hybrid projects with storage. “We need to consider the LCOE (levelized cost of energy). Three to four hours of battery storage integrated with wind and solar will be the way going forward.”

Cost-effectiveness of hybrid projects

Cost-wise, how do hybrid projects compare with standalone wind and solar projects?

The executive of a leading developer gave a breakup. “The minimum share of technology for a project to be termed as a hybrid is now 33%. For a 1 MW hybrid

Co-location is the ideal way to maximize the output of a hybrid project

project, the cost is nearly ₹60 million (-\$786,840), greater than solar, which is around ₹45 million (-\$590,414)-₹50 million (-\$656,015), and lower than wind, which comes to around ₹70 million (-\$917,980).”

“This is a rough estimate. The cost varies depending on various factors. If you go for co-location, the wind states are suitable for hybrid projects. Gujarat, Rajasthan, Tamil Nadu, and parts of Karnataka are ideal for hybrid projects,” he said.

Gupta came up with similar numbers. “The tariffs for hybrid projects will go up. Co-location is the ideal way to maximize the output of a hybrid project, but it is only possible at a few locations. The integration of storage with hybrid depends on the decline in

storage cost. We can always play around with the power curve of wind.”

Tariffs will see an upward trend

The Solar Energy Corporation of India (SECI) has floated tenders for approximately 9 GW of hybrid projects, of which over 6 GW projects have been auctioned, according to Mercom’s India Solar Tender Tracker.

Recently, SECI invited bids for setting up 1,200 MW of interstate transmission system (ISTS)-connected wind-solar hybrid power projects (Tranche-V) across India. In the auction for 1,200 MW (Tranche-IV) held in August this year, the lowest discovered tariff was ₹2.34 (-\$0.031)/kWh.

SECI’s Tranche-I & II auctions had registered the lowest bid tariffs of ₹2.67 (-\$0.035)/kWh and ₹2.69 (-\$0.036)/kWh, respectively.

While the tariffs have come down in the last few years, the general perception is that tariffs will go up in the short term with higher module prices and other factors affecting the solar supply chain.



Markets

“Module prices have gone up by 40-50% during the last year, and so we can’t expect the tariffs of hybrid projects to go down. SECI has plans to introduce three to four hybrid tenders each year. There is a better acceptance for hybrid projects among the DISCOMs than solar projects, which bodes well for hybrid projects,” the top executive of a leading developer said.

Challenges

One of the impediments to the growth of hybrid projects in the country is land.

“Land availability is a significant challenge. Matching the scheduled commissioning date with connectivity and the long-term access (LTA) also creates delays. Hybrid projects are necessary, and the next version of hybrid projects is round-the-clock (RTC) projects. Co-located hybrid projects help in the grid stability than standalone wind and solar projects, which is another aspect in favor of hybrid projects,” the developer said.

Another hurdle is the availability of wind turbines. The turbine suppliers

have been unable to supply in time.

Need for government support

Last November, MNRE issued a detailed proposal for developing wind parks and wind-solar hybrid parks. According to the document, the ministry will consider areas with a wind potential of more than 30% capacity utilization factor (CUF). Each park’s capacity should be 500 MW or more; however, parks of lower capacity may also be developed depending on land and resource availability.

Another developer also explained that the main challenge for wind-solar hybrid projects is the availability of land sites conducive for solar and wind development.

The challenge for hybrid projects is the availability of land conducive for both solar and wind

“Another challenge is transmission and connectivity. The projects can flourish in Rajasthan, Gujarat, and Karnataka, which are suitable for wind projects. Wind-solar hybrid projects with BESS are for the future. Pumped hydro is another technology that can be combined with hybrid projects,” the developer said.

The renewable market in India is well-positioned for the growth of wind-solar hybrid projects. As energy storage gets cheaper, these projects can become even more attractive. Governments need to get creative with land optimization programs and financial incentives to promote hybrid projects to complement the policy push.

“While more wind-solar hybrid projects are needed to optimize resources, energy storage must be incorporated into these tenders going forward. Battery storage costs are not going to get cheaper on their own. Demand for storage must be created, followed by funding for research and development, and eventually a manufacturing ecosystem,” said Raj Prabhu, CEO of Mercom Capital Group. 🌞

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Increasing Power Tariffs Gets Easier for DISCOMs

The ministry has asked the states to allow DISCOMs to pass on the increase in power purchase costs onto consumer power tariffs to ensure timely recovery of costs

By : Harsh Shukla

The Ministry of Power (MoP) has notified Electricity (Timely Recovery of Costs due to Change in Law) Rules, 2021, and asked states to allow distribution companies (DISCOMs) to pass on the increase in power purchase

costs to power tariffs that regulatory commissions could evaluate.

The Ministry said some states already had a formula for fuel surcharge adjustment to pass on any increase in cost to power tariffs. However, this was not an automatic

pass-through and required approval by state regulatory commissions, leading to delays.

The existing mechanism should be changed to provide automatic pass-through in tariff change based on a change in law or power purchase costs



in line with the formula laid down by the state regulatory commission.

Generating companies that intend to adjust and recover costs due to a change in law should give a three-week notice about the proposed impact on tariff. They also need to furnish details of the calculation within thirty days of the implementation of the change in law to an appropriate commission for adjusting the extent of impact in the monthly tariff.

Accordingly, DISCOMs will pass through the change in costs as per the formula whenever the difference in cost occurs due to a change in law or power purchase costs. DISCOMs can adopt the formula mentioned in the Electricity Rules, 2021, until state regulatory commissions do not provide a suitable formula.

The Ministry said that the state commissions should verify and confirm the pass-through of the tariff within 60 days, which can reduce the working capital requirements for DISCOMs and consequently lesser power costs for consumers.

State governments can subsidize consumer tariffs by advance payments to DISCOMs

State governments could subsidize consumer tariffs by advance payments to DISCOMs.

MoP said that the power sector was facing issues related to the availability of fuel, primarily coal and gas, for power plants with the recent price hike in international markets.

The Ministry said that all stakeholders in the power sector value chain should ensure timely recovery of the cost to maintain an assured power supply. This includes the costs passing through by generating companies to DISCOMs and DISCOMs to consumers.

Generating companies faced constraints in maintaining fuel stock due to the lack of a robust mechanism

of timely automatic pass-through of fuel and transportation costs. Consequently, there was a shortage of power supply into the grid that may affect the electricity supply to consumers.

Similarly, DISCOMs faced revenue constraints as the corresponding pass-through of costs was not done regularly in retail tariff. DISCOMs can ensure payment on time to power generators and coal companies if there is a timely collection of revenue from consumers. This can help maintain the availability of electricity supply to meet the expected increase in power demand.

Last month, the Ministry issued a draft proposal for amending the Electricity Act, 2021, to ensure that DISCOMs provide round-the-clock uninterrupted power supply to all consumers and prevent the need for the use of diesel generators.

Mercom had earlier reported that the Ministry directed DISCOMs to undertake energy accounting periodically to develop a comprehensive energy accounting system to quantify distribution losses. ☺



India Added 1.3 GW of Rooftop Solar Capacity in 9M 2021

The rooftop solar capacity additions increased by a massive 202% YoY in 9M 2021, led by the residential segment

By : Rakesh Ranjan Parashar



India added 448 MW of rooftop solar capacity, registering a 14% drop quarter-over-quarter (QoQ) in the third quarter (Q3) of the calendar year (CY) 2021, compared to 521 MW in Q2 2021. The numbers were revealed in Mercom India Research's latest report, 'India Rooftop Solar Market Report Q3 2021.'

Rooftop installations were up by 189% compared to the same period last year.

The total rooftop capacity installed in 9M 2021 stood at 1.3 GW, a 202% increase compared to the same period last year. The numbers were the highest recorded for the 9M period of a year.

At the end of Q3 2021, cumulative

rooftop installations stood at 6.7 GW.

In Q3 2021, the residential sector led the growth for the second quarter in a row, making up for 54% of total rooftop installations. The commercial & industrial sector and the government sector followed with 44% and 2%, respectively.

The C&I segment has been showing

**At the end of
Q3 2021, cumulative
rooftop solar
installations stood
at 6.7 GW**

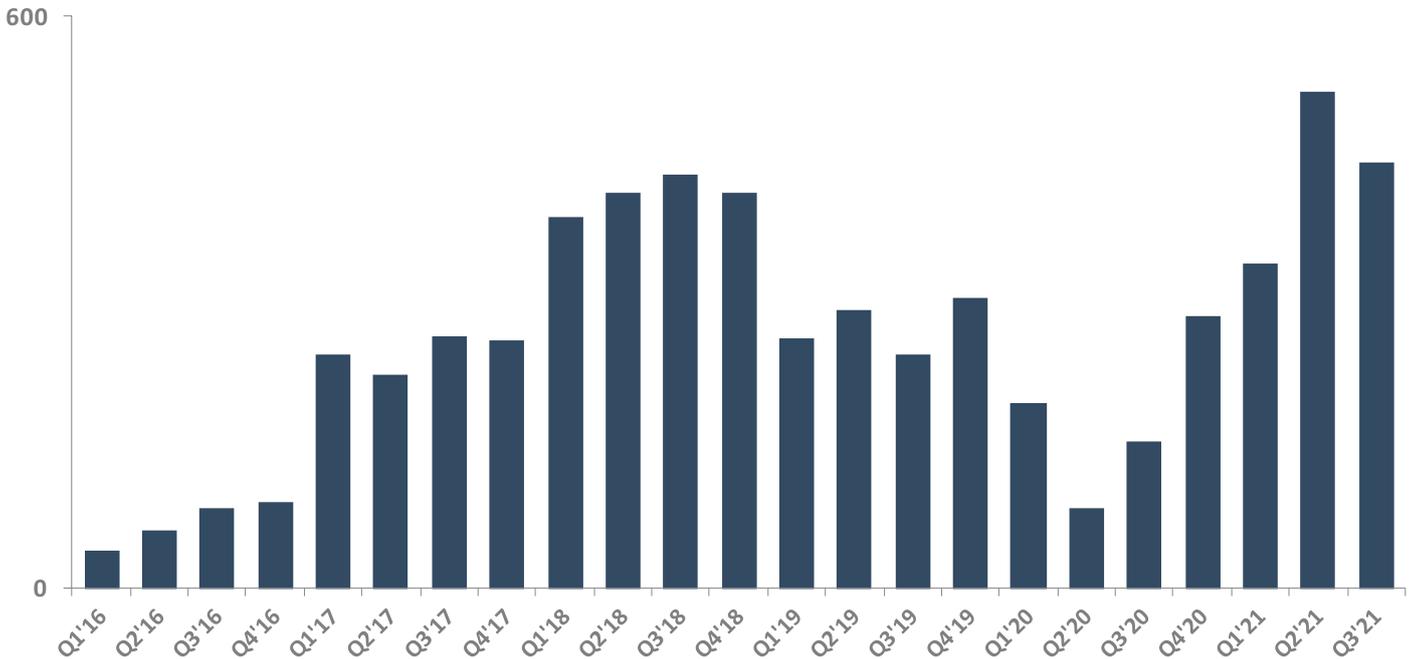
constant growth over the past few quarters but rising system costs have been worrying.

"The rooftop market is showing signs of recovery and is back to pre-COVID levels. However, the rise in component costs and availability of materials is weighing heavily on the market, throttling growth. States have continued to put up restrictions on rooftop solar, making new development challenging," said Raj Prabhu, CEO of Mercom Capital Group.

The Ministry of Power's notification allowing net metering for prosumers with load up to 500 kW positively affected rooftop installations. Following the announcement, Rajasthan, Chhattisgarh, Karnataka, and Punjab



Rooftop Solar Installations by Quarter (MW)



Source: Mercom India Research (Sep 2021)

also released their net metering regulations with a similar cap of 500 kW.

According to the report, tenders were floated for over 200 MW of rooftop solar projects, an increase of 62% QoQ and 125% during the same period last year.

The Kerala State Electricity Board accounted for 47% of the total tenders announced in the quarter, followed by the West Bengal State Electricity Distribution Company with 24%. Other nodal agencies accounted for 29% of the tenders in Q3 2021.

Gujarat remained on the top with 26% of cumulative solar installations, followed by Maharashtra and Rajasthan, respectively, with 14% and 10%.

Uttarakhand had the highest compounded quarterly growth rate of nearly 35%, followed by Maharashtra and Haryana with 31% and 29%, respectively.

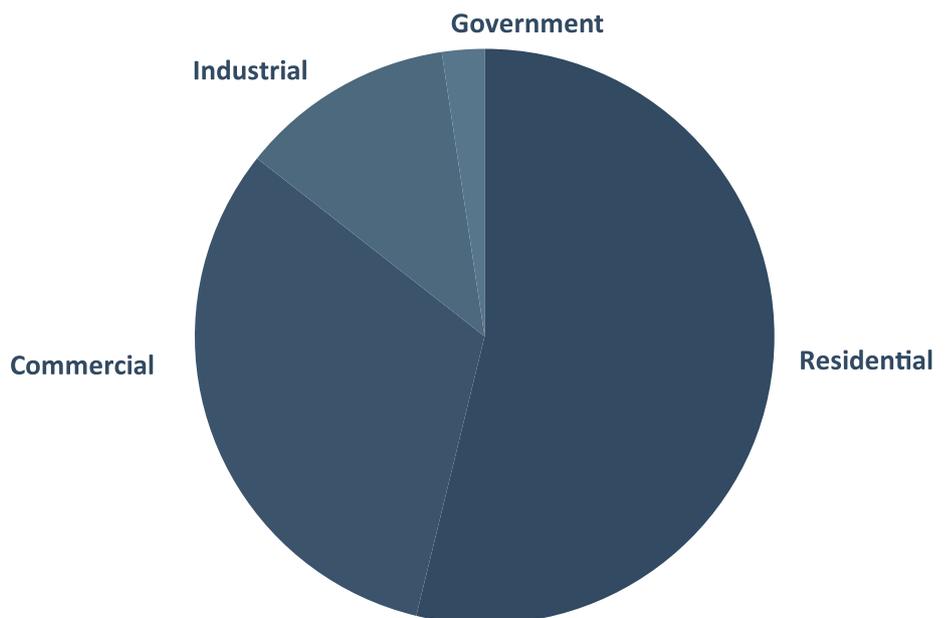
One of the reasons for the downward trend in rooftop solar installations in Q3 2021 is the growing component prices after the second wave of the Covid-19 pandemic. Prices rose by 3.84% in Q1

2021, 3% in Q2, and 2.3% in Q3.

India had registered a 53% QoQ increase in rooftop solar installations

in Q2 2021, the highest for any quarter, with 521 MW installations compared to 341 MW installed in Q1 2021. 📈

Q3 2021 Rooftop Solar Installations Breakdown (MW)



Source: Mercom India Research (Sep 2021)

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Green Energy Corridor Phase-II to Integrate 20 GW of Renewables

The program is set to add 10,750 ckm of transmission lines and 27,500 MVA transformation capacity of substations

By : Harsh Shukla



The Cabinet Committee on Economic Affairs (CCEA), chaired by Prime Minister Narendra Modi, has approved the Green Energy Corridor Phase-II program for intrastate transmission systems.

The program aims to add around 10,750 circuit kilometers (ckm) of transmission lines and 27,500 Mega Volt-Amperes (MVA) transformation capacity of substations. The program will facilitate grid integration and electricity evacuation of around 20 GW of renewable energy projects in states like Gujarat, Himachal Pradesh, Karnataka, Kerala, Rajasthan, Tamil Nadu, and Uttar Pradesh.

The Phase-II of the Green Energy Corridor will be set up at an estimated cost of ₹120.31 billion (-\$1.61 billion). As central financial assistance (CFA), the government will provide 33% of

the project cost, which is ₹39.7 billion (-\$533.19 million), as central financial assistance (CFA). The CFA is expected to help offset the intra-state transmission charges to help keep the power costs low.

The intrastate transmission system is expected to be developed over five years, from 2021-22 to 2025-26. The system will help achieve the country's installed renewable energy target of 450 GW by 2030.

Last year, at the COP26 Summit, Prime Minister Narendra Modi announced India's aim to become a net-zero economy by 2070 and set a target to install a non-fossil energy capacity of 500 GW by 2030.

The Green Energy Corridor Phase-I is under implementation in states like Andhra Pradesh, Gujarat, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Tami Nadu.

The Phase-I program is expected to integrate around 24 GW of renewable energy into the grid by 2022.

The corridor will contribute to the country's long-term energy security and promote sustainable growth by reducing carbon emissions. It is also expected to generate direct and indirect employment opportunities for skilled and unskilled labor in power and other related sectors.

In 2021, the Ministry of Power said that as the intrastate transmission systems have a major share in the country, the adoption of tariff-based competitive bidding can effectively reduce the burden on the state governments. It would also lead to reduced tariffs, benefitting consumers.

Earlier in 2019, Minister of Power RK Singh informed the Lok Sabha that 10,261 MW of renewable energy capacity had been added to the Green Energy Corridor. ☺





India Installed 7.4 GW of Solar Capacity in 9M 2021

According to Mercom India Research's Q3 2021 India Solar Market Update, solar installations grew by 335% in 9M 2021 compared to the same period last year

By : Rakesh Ranjan Parashar

India added 2,835 MW of solar capacity in the third quarter (Q3) of the calendar year (CY) 2021, increasing by 14% compared to 2,488 MW installed in Q2 2021. The figures marked a massive 547% year-over-year (YoY) surge, according to Mercom India Research's Q3 2021 India Solar Market Update.

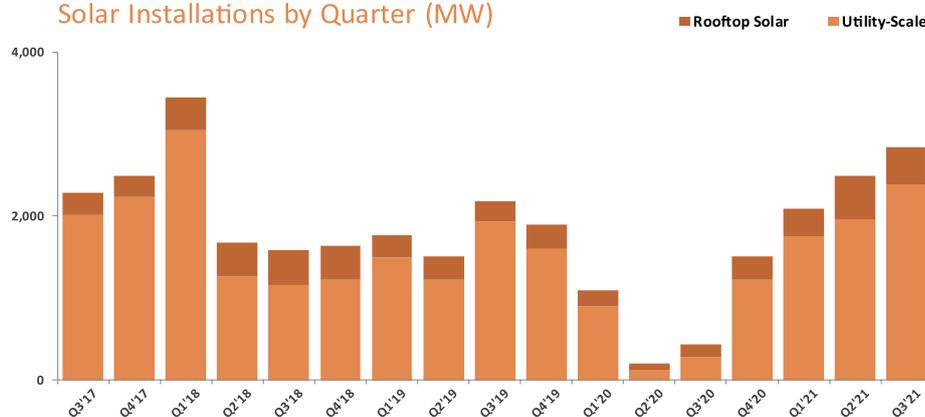
As per the report, in 9M 2021, India

added over 7.4 GW of solar capacity, an increase of 335% compared to 1.73 GW in 9M 2020.

The cumulative installed capacity at the end of Q3 2021 stood at 46.6 GW.

The figures acquire greater significance because installations grew despite various market challenges. Ongoing projects have been burdened by the increase in raw material prices and a sudden spike in freight charges in

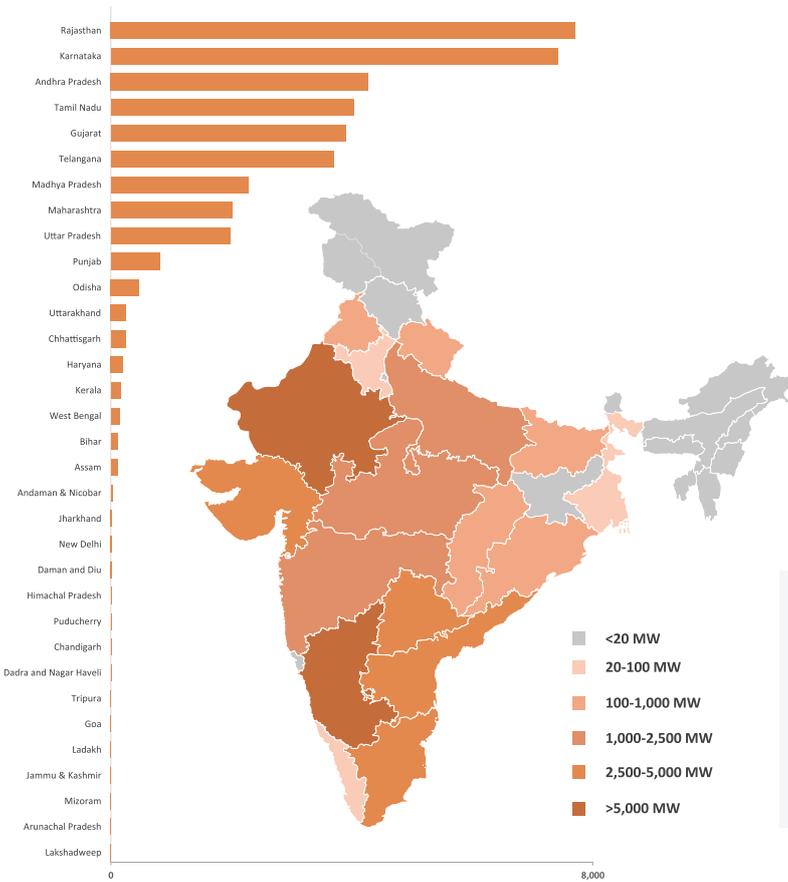
Solar Installations by Quarter (MW)



Source: Mercom India Research (Sep 2021)

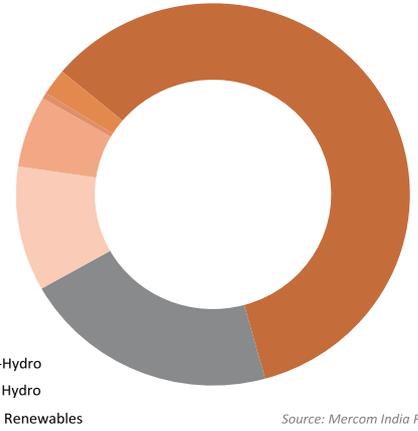
INDIA SOLAR KEY STATS Q3 2021

Utility-scale Cumulative Solar Installations by States (MW)



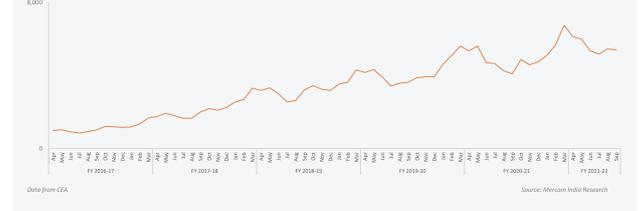
Source: Mercom India Research (Sep 2021)

New Installed Power Capacity Additions in 9M 2021



Source: Mercom India Research

Solar Electricity Generation by Month (in MU)



Data from CEA

Source: Mercom India Research

“Despite supply challenges, the Indian solar market is headed towards one of the best years on record, and a complete turnaround from 2020, which was one of the worst years for solar due to COVID-19,” said **Raj Prabhu, CEO of Mercom Capital Group**. “We expect a strong 2022 despite the high price of components and uncertainties surrounding the Great Indian Bustard related transmission issue in Rajasthan. An increase in GST, curtailment, and payment issues are adding to the challenges facing developers and constraining growth.”

recent months.

Solar module prices have been spiraling for quite some time. According to the report, module prices have increased for the sixth consecutive quarter, something not seen in the past ten years.

“Despite supply challenges, the Indian solar market is headed towards one of the best years on record, and a complete turnaround from 2020, which was one of the worst years for solar due to COVID-19,” said Raj Prabhu, CEO of Mercom Capital Group. “We expect a strong 2022 despite the high price of components and uncertainties surrounding the Great Indian Bustard related transmission issue in Rajasthan. An increase in GST, curtailment, and

Rajasthan is now the top state for solar in India

payment issues are adding to the challenges facing developers and constraining growth.”

The quarter also saw the largest QoQ increase in large-scale system costs by over 10%, attributed to the increase in raw material and component prices.

“Manufacturing capacity ramp-up continues at a brisk pace as domestic producers look to take advantage of the 40% basic customs duty scheduled to be imposed from April 2022. In the second quarter of next year, we can

expect to see procurement strategies starting to change drastically as imports become expensive,” added Prabhu.

Rajasthan remained the top state for the third consecutive quarter by contributing 63% of the total large-scale solar installations in the country. As of September 2021, the top 10 states accounted for about 96% of the country’s cumulative large-scale solar installations.

According to the report, India added close to 11.6 GW of power capacity in 9M 2021. Solar dominated capacity additions, accounting for close to 60%, followed by thermal power, which contributed 21%. Renewables (including large hydro) made up 79% of total power capacity additions in 9M 2021. ☺

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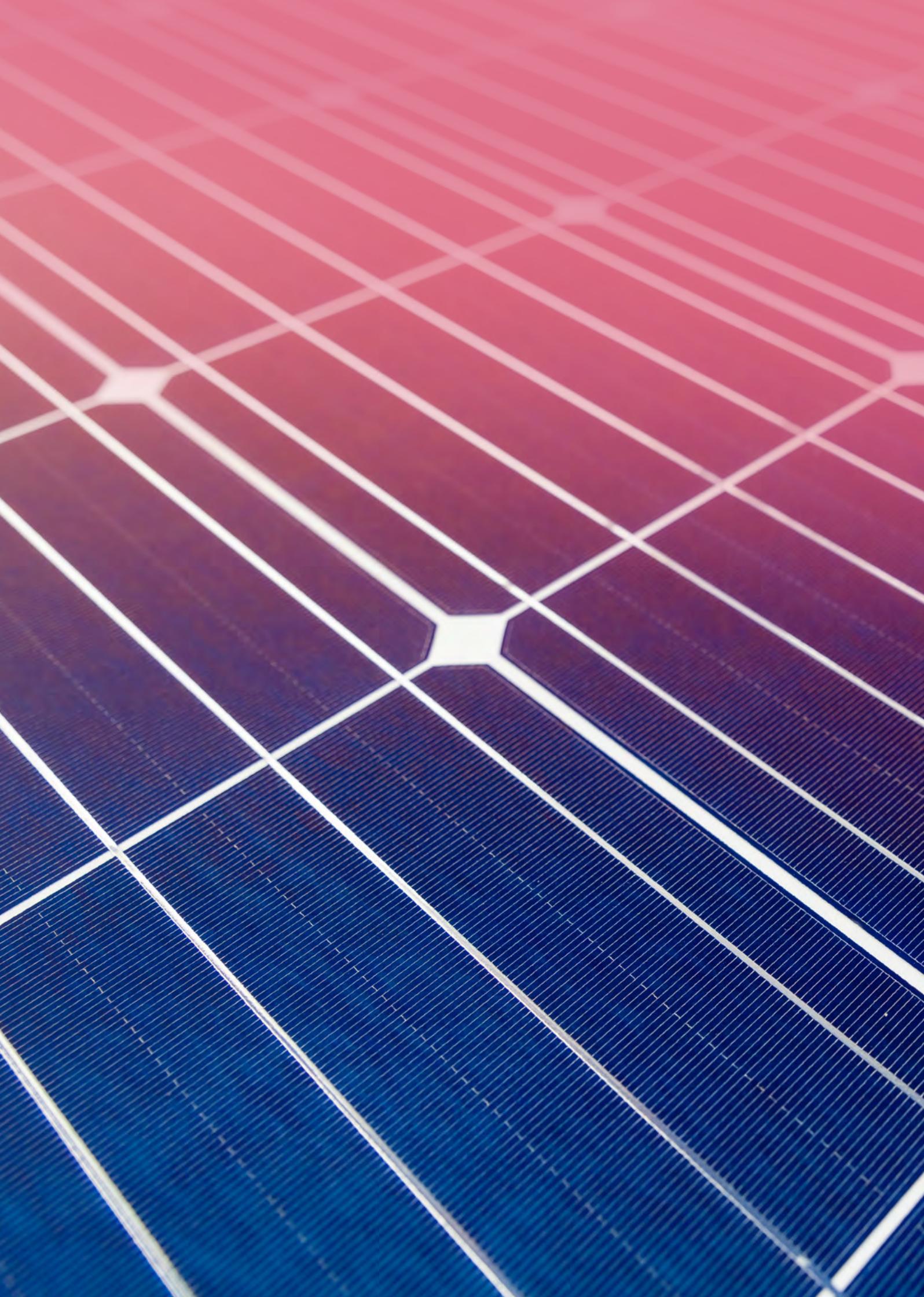
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India's Solar Industry Hopeful of a Brighter 2022

With 2021 turning out to be one of the better years for the solar industry despite the challenges, the stakeholders are hopeful that 2022 will prove to be a breakthrough year for the sector

By : Rakesh Ranjan Parashar



The challenges during the year notwithstanding, 2021 turned out to be one of the better years for the Indian solar industry. The outlook for 2022 looks promising, according to stakeholders from across the sector.

Solar capacity additions have been consistent in the last few years, except for 2020, on account of the Covid-19 pandemic.

India has an aggressive installation target of 280 GW of solar by 2030. Reaching the target requires adding nearly 24 GW of solar each year - a daunting prospect.

India added 7.4 GW of solar capacity in 9M 2021, an increase of 335% compared to 1.73 GW in the same period in 2020, according to Mercom India Research's recently released report Q3 2021 India Solar Market Update. India's cumulative installations at the end of Q3 2021 stood at 46.6 GW.

2021: One of the better years for the solar sector

In 2021, the installation numbers were affected by several reasons: the second wave of the Covid-19 pandemic, spike in raw material prices, increase in freight charges, and disruptions in the global supply chain. The ongoing

projects were impacted, but better preparedness led to fewer disruptions than last year.

Pinaki Bhattacharyya, the Managing Director, and CEO, Amp Energy, said, "2021 proved to be a comeback year for renewables in India. The sector displayed resilience and strength despite the unprecedented setbacks faced in 2020 due to the Covid-19 pandemic and has been able to achieve significant milestones."

We will see more wind-solar hybrid projects in 2022

"We were able to reach 100+ GW of installed renewable capacity despite the challenges. The solar installed capacity surpassed wind, increase in investments in the sector with large merger and acquisition deals being announced, and aggregation across the supply chain," he said.

Outlook for 2022

Stakeholders believe that renewables in general and solar in particular will grow in 2022.

"The commercial and industrial (C&I)

segment is fast becoming the major consumer of renewables driven by cost savings and their RE100 targets. The utility sector slowed down with delays in PPA signing. The right-directional approach is that the government graduated from the regular plain vanilla tenders to floating solar, peak power, round-the-clock, and more hybrid bids. The success of the initial bids has ensured that such tenders will be the next growth frontier. We believe that with the proper focus and approach, we would be able to achieve the target of 500 GW of renewable energy by 2030. 2022 will prove to be a more decisive year for renewables in India," Bhattacharyya said.

Ritu Lal, Senior VP and Head (Institutional Relations), Amplus Solar, agreed. "Energy transition in India is gaining momentum, and we expect 2022 to be a record year for the growth of solar. Even though there will be challenges regarding raw material prices and supply fluctuations, we look forward to significant capacity additions across all solar segments - utility, hybrid, distributed, and residential. We will see more wind-solar hybrid projects in 2022 and solar for generating green hydrogen in the utility sector. We also see attractive growth potential in the



residential rooftop solar and battery storage this year.”

Vinay Pabba, CEO and Founder of VARP Power, feels that the solar sector is in the initial stages of the steep ramp of the archetypal ‘S curve.’

“2022 will be the last year for achieving the milestone of 100 GW and would be a good time to pause and reflect before powering on towards the next target of 300 GW by 2030. I see record capacity addition in 2022 as developers race to meet project execution timelines and clear backlogs of delayed projects. We hope that the proposed solar tariff hikes and the non-tariff barriers like the Approved List of Models and Manufacturers (ALMM) will be deferred to give the industry breathing time to adjust to the new requirements arising from these compliances.”

According to Pabba, supply chain disruptions and the high price of solar modules and cells will continue to plague the solar sector well into Q2 of CY 2022. Projects will get delayed as developers defer module purchases, hoping to soften prices.

He believes that energy storage will come into its own in 2022 and demand a seat at the table. Round-the-clock and hybrid tenders will drive more

Clear execution plans, long-term policy, and lower offtake risk should be the focus to attract foreign investments

deployment of grid-connected storage. Indian manufacturing across the solar value chain, wafers, cells, and modules will ramp up substantially.

Manjesh Nayak, Director and CFO of Oorjan Cleantech, was equally optimistic. “Individuals are actively considering the transition to non-conventional energy sources and consumption. Solar in particular and renewables, in general, should see a lot of demand. Further, the ‘Aatmanirbhar Bharat’ policy should push domestic manufacturing of hardware. If implemented effectively, along with a dedicated policy push for net-metering and subsidies, it would facilitate the growth of the solar sector.”

Nayak expects the solar sector to explore novel configurations and business models to exercise its competitive muscle. In 2022, the sector might witness a surge in solar-plus-storage installations, the exploration of the floating solar market, and the expansion of community solar projects

into new markets.

N Venu, Managing Director and CEO, India and South Asia, Hitachi Energy, said 2022 would see green shoots of recovery in core sectors - mainly government-owned metals and oil and gas industries.

“With India aiming to hit 500 GW in renewable energy by 2030, the pace of development in sunrise sectors will also pick up. As ESG (Environmental, Social, and Governance) gains spotlight, industry-wide collaboration in greening the power infrastructure and investment in sustainable power solutions will help India progress steadily toward its energy goals. Yet challenges ranging from new variants of the Covid-19 virus, high commodity prices, and raw material shortages will likely weigh on market recovery,” he commented.

A top executive from ReNew Power said, “The basic customs duty (BCD) is expected to be implemented by April 1, 2022, and, so, there will be a shift towards ‘Make in India,’ which is critical





from an energy security perspective. Further, with PLI-linked capacity coming into play, India should become a net exporter from a net importer of solar equipment. There will be fewer vanilla bids coming in as DISCOMs realize the need for value-added products. Therefore, we foresee more bids coming in where projects have one-hour storage, which will give additional value to DISCOMs. We further foresee that such innovation will increase in future years to up to three hours by 2025.”

“Despite some current uncertainty around PPAs, we expect that PPAs for all pending capacity will be resolved in the initial six months so that we can move forward, and new bids can come. This will also increase investor confidence and inflow of foreign capital in the country,” he added.

Bringing the manufacturer’s perspective to the table, Avinash Hiranandani, Global CEO and MD of RenewSys, said, “This year, everything

depends on the implementation of the BCD. If BCD doesn’t come in April, the domestic manufacturing industry will take a big hit. It will push the domestic manufacturing industry back by 5-7 years. The ‘Make in India’ plans will be in big trouble. All the stakeholders have pinned their hopes on this. It has already been promised, and it will be a big boost for the manufacturing segment. The demand side is there, and the supply side will also build-up, and we are capable of meeting the demands going forward.”

Wishlist for 2022

The industry is looking at the government for more support to make the renewable energy targets a reality.

Bhattacharyya wants the government to provide soft loans to manufacturers and not impose artificial duties. “The imposition of BCD must be deferred by 3-6 months for manufacturing capacity to be deployed in India. Otherwise, renewable energy prices may

increase further to make it unviable for consumers,” he said.

Lal calls for a holistic developmental approach because renewables are not just one industry but an ecosystem. A long-term policy framework, programs for boosting financing for the solar sector, support for the rooftop segment, including a concrete plan that does away with distribution companies’ opposition to reforms, are on his wishlist.

“While the government is working towards integrating the domestic solar supply chain through the production-linked incentive (PLI) program for solar module manufacturing, issues like unpredictable tariff and non-tariff barriers and frequent policy changes continue to hamper solar capacity growth despite increasing demand,” he said.

Focus on Rooftop Solar

Stressing the need for better-balanced growth for the sector, Lal noted that the underperforming rooftop segment

should be given the requisite support it desperately needs. “While at first glance, a utility-scale generation might seem like the way forward, a closer analysis will reveal that the net delivered price of energy at the point of consumption will perhaps be in favor of distributed generation, which does not require land acquisition, creation of dedicated transmission lines and distribution infrastructure.”

For Pabba, the biggest ask is benign and supportive policies and regulations, especially when the solar sector faces a multitude of challenges, including the supply chain quandary, high modules prices, environmental issues (Great Indian Bustard, etc.), and the Covid-19 rebound. “The sector hopes that the regulatory and policy ecosystem understands these challenges the sector is passing through and tune and re-calibrate policy and its implementation.”

“Two major initiatives were taken

last year: The imposition of the BCD on imported solar cells and modules, and the announcement of the Production Linked Incentive (PLI) program for domestic solar manufacturing. With these two announcements, the timelines were aligned to ensure sustainable capacity addition in India at the most optimal tariffs. As a result, developers who set up solar capacity will have to import modules in the short term. Our suggestion, therefore, is to ensure alignment with the entire BCD pushed out by one year. Alternatively, there should be grandfathering of existing bids, and the BCD on cells at least

The C&I segment is fast becoming the major consumer of renewables

should be pushed out by one year because India does not currently have sufficient cell manufacturing capabilities to support our capacity development program,” added the executive from ReNew Power.

The executive said battery storage would be an essential part of the overall energy transition plan. Therefore, it would require support in the initial few years until a domestic ecosystem is established.

“The government of India has come up with a PLI scheme for storage manufacturing in India, and it will take some time to start coming out with storage systems. We suggest that there should be lower rates of taxes, and there could be a roadmap towards that announced for the time being and then possibly higher taxes in the future when manufacturing makes a headway. Currently, our focus in the energy ecosystem is on low tariffs,





while the focus should be on lower system costs. Therefore, high-capacity utilization factor bid constructs should be encouraged to ensure low system costs. General Network Access, which is currently under draft stage under the ‘Connectivity and General Network Access to the Interstate Transmission System (ISTS) Regulations, 2021,’ can be a gamechanger for the sector,” he noted.

From the manufacturing side, Hiranandani said, “The ALMM list has been issued, and most domestic manufacturers have already registered. The ALMM should be implemented for all projects with government subsidies and should not be limited to projects with subsidies from the central government. The PLI program is also going to help the domestic manufacturing segment going forward. Also, we are paying 12% GST for the finished products in solar panels, whereas the input GST is 18%. 6% always gets stuck, which is significant for large-scale panel manufacturing. The

Solar installations could grow by 30-50% in 2022, making it the best year by far

government should look to make the input and output value the same.”

Making his case for a policy push for large-scale solar development, Nayak said, “India’s solar ecosystem has come a long way. It is developing to become self-sufficient in terms of technology, manufacturing, hardware supply, and funding to support ongoing expansion. 2022 is critical since March 2022 is the first deadline for the 175 GW target. The government needs to give a policy push for large-scale solar implementation, certainty around the signing of PPAs (power purchase agreements), attracting foreign investments, improving

the transmission and distribution infrastructure, and supporting banking. This would help us meet our 2030 target.”

The general sense of optimism among the stakeholders that things will be much better in 2022 is tempered by their concerns over Covid-19 and other challenges that continue to disrupt the solar space.

“Solar installations could grow by 30-50% in 2022, which would make it the best year for solar in India by far. However, policymakers need to be extremely careful as they push to make India a production hub for solar that they do not throttle the demand growth by affecting price or supply negatively,” said Raj Prabhu, CEO of Mercom Capital Group.

“Clear execution plans, long-term policy stability, and lowering offtake risk should be the focus to attract foreign investments at a larger scale to facilitate rapid market expansion,” Prabhu added. ☺

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ISTS Projects to be Fast-tracked for Greater Renewable Integration

The ISTS project approvals will now be expedited through capital based classifications by central transmission utility, National Committee on Transmission, and the Ministry of Power

By : Rakesh Ranjan Parashar

The Ministry of Power has revised the terms of reference of the National Committee on Transmission (NCT) to fast track the planning and

approval of interstate transmission systems (ISTS) projects to facilitate greater renewable energy integration.

This is part of the reforms being carried out in the power sector. The

Ministry believes that this would go a long way in facilitating the integration of renewable energy in the power sector.

To expedite the approval of ISTS projects, proposals of up to ₹1 billion



(-\$13.34 million) will be approved by the central transmission utility (CTU). Proposals over ₹1 billion (-\$13.34 million) and up to ₹5 billion (-\$66.67 million) will be approved by the NCT, and the Ministry of Power will approve the proposals above ₹5 billion (-\$66.67 million).

To meet 40% of its electricity needs from non-fossil fuel-based sources by 2030, India had set a target of 450 GW of renewable capacity by 2030. Prime Minister Narendra Modi has now revised this target to meet 50% of its electricity requirements from renewable energy by 2030.

The Ministry noted a need to fast-track the transmission planning and approval to minimize the mismatch between the commissioning of renewable projects and the development of ISTS infrastructure. The changes are expected to facilitate the growth of renewable energy in the country.

The Ministry said that the two regional committees, namely Regional

Power Committee and the Regional Power Committee (Transmission Planning), which had to be consulted separately, had delayed the planning and approval of ISTS projects. The Regional Power Committee (Transmission Planning) had been dissolved to cut down the time taken for approval. The terms of reference of the Regional Power Committee had been modified to facilitate regional consultation for planning and approval of ISTS projects.

The National Committee on Transmission will vet proposals up to ₹5 billion

After considering the recommendations of the CTU and the Regional Power Committee, the NCT

will propose the expansion of ISTS. It would examine the cost of the proposed ISTS program and decide on the roadmap for its implementation.

The Ministry of Power has carried out several reforms recently to foster the growth of transmission infrastructure in the country.

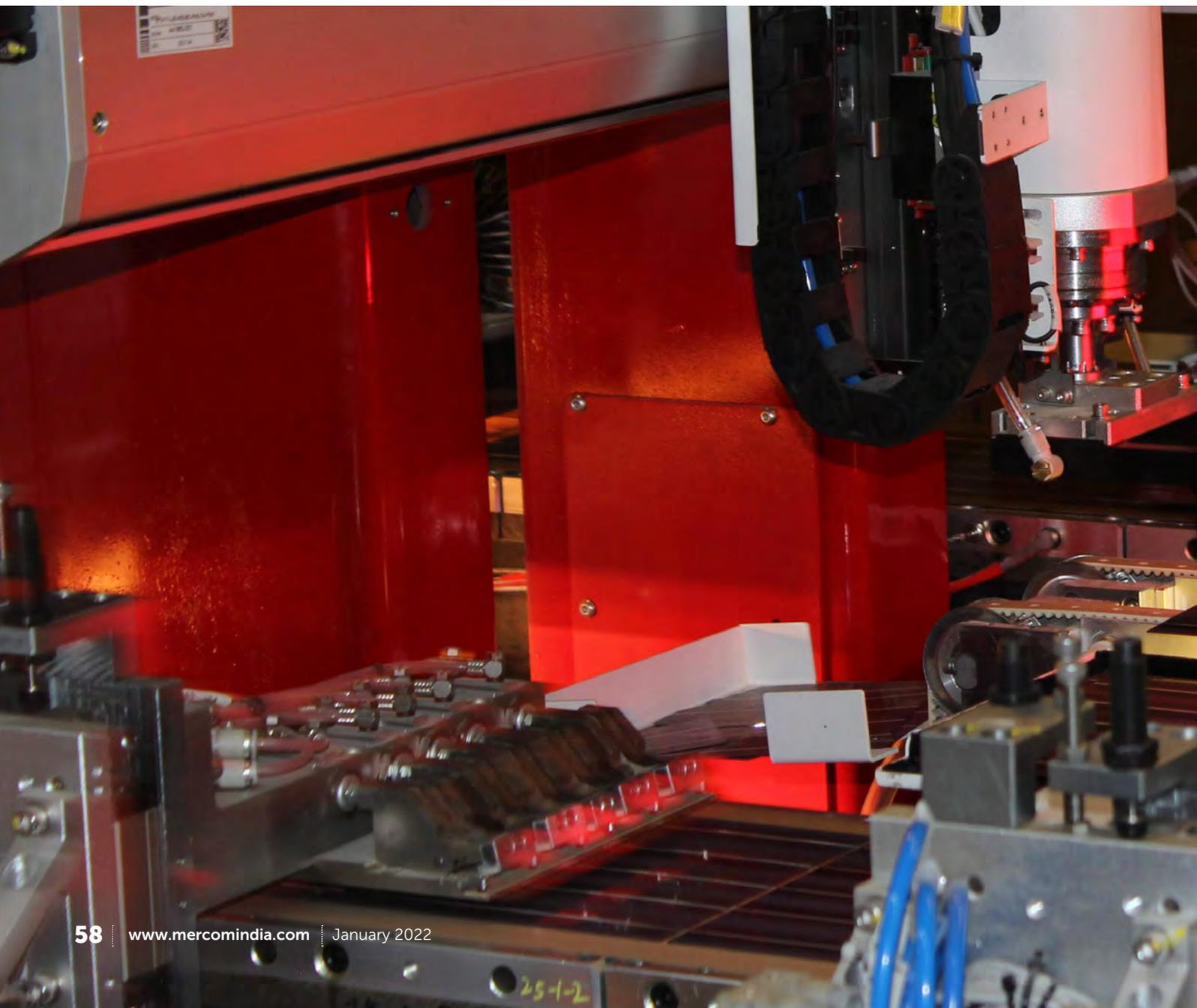
Last month, the Ministry of Power notified the Electricity (Transmission System Planning, Development, and Recovery of Interstate Transmission Charges) Rules 2021 to enable power utilities to smoothly access the transmission network across the country.

The Ministry earlier issued amendments to the 'equity lock-in period' given in the standard bidding documents to select transmission service providers for ISTS projects. As per the amendments, the chosen bidder's aggregate equity shareholding in the special purpose vehicle should not be less than 51% up to one year after the project's commercial operation date. 📌

Local Suppliers to Get Purchase Preference in Power Sector

As a boost to the 'Make in India' program, the government to now provide preference to local manufacturers of electric equipment in the power sector

By : Rakesh Ranjan Parashar



In an initiative to boost the 'Make in India' program, the Ministry of Power has issued a notification to provide purchase preference for local suppliers in the power sector.

Only 'Class-I local suppliers' will be eligible to bid irrespective of the purchase value while procuring goods, services, or works with sufficient local competition.

The local content requirement to categorize a bidder as a 'Class-I local supplier' is a minimum of 50%, and 'Class-II local supplier' is 20%.

Only Class-I local suppliers and Class-II local suppliers will be eligible to bid except when a global tender is issued. For global tenders, non-local suppliers will also be eligible to participate in the bidding process alongside Class-I local and Class-II local suppliers.

A global tender will be issued for procuring goods worth more than ₹2 billion (-\$26.91 million), with the approval of the authority designated by the Department of Expenditure.

In March last year, the Ministry of Power had issued a public procurement order with revised requirements for locally made components in electrical equipment used in the power distribution center.

Purchase preference

For procuring goods, Class-I local suppliers will be given preference over Class-II local suppliers and 'non-local suppliers.'

If Class-I local supplier quotes the L1 (lowest) bid, the contract for the total quantity will be awarded to the L1 bidder. If the L1 bidder is not a Class-I local supplier, 50% of the quantity will

be awarded to the L1 bidder. The lowest bidder among the Class-I local suppliers will be invited to match the L1 price for the remaining 50% quantity.

If the Class-I local supplier fails to match the L1 price, the next highest supplier within the margin of preference will be invited to match the L1 price for the remaining quantity.

Awards to multiple bidders

For tenders, where the contract is to be awarded to multiple bidders subject to matching the L1 price, 'Class-I local suppliers' will get purchase preference over 'Class-II local suppliers' and 'non-local suppliers.' Only 'Class-I local suppliers' will be eligible to bid if there is sufficient local capacity and competition to procure the items.

If a 'Class-I local supplier' qualifies for the award of contract for at least 50% of





the tendered quantity, the contract may be awarded to all the qualified bidders as per the provisions of the bidding document. However, if the 'Class-I local supplier' does not qualify for at least 50% of the tendered quantity, a 'Class-II local supplier' will be preferred over the 'Class-II local supplier' and the 'non-local supplier' provided the quoted rate falls within the 20% margin of the highest quoted bidder.

First preference will be given to the lowest quoting 'Class-I local supplier,' whose quote falls within the 20% margin. If the lowest quoting 'Class-I local supplier' does not qualify for purchase preference, the opportunity will be given to the next 'Class-I local supplier' falling within the 20% margin.

Small purchases exempted

Procurements of value less than ₹500,000 (-\$6,725) will be exempted

from the provisions of this order. However, it should be ensured by the procuring entities that the buying is not split to avoid the provisions of the order.

Specifications in tenders

The procuring entity should ensure that the eligibility conditions do not require proof of supply to other countries. The procuring entities should ensure that eligibility conditions do not

'Class-I local suppliers' will get purchase preference over 'Class-II local suppliers' and 'non-local suppliers'

result in the unreasonable exclusion of 'Class-I local suppliers' and 'Class-II local suppliers.'

The notification adds that entities of countries that do not allow Indian companies to purchase items will not be allowed to participate in the procurement process in India.

The notification states that all administrative departments whose purchases exceed ₹10 billion (-\$134.51 million) per annum should update their procurement projections on their respective websites for the next five years.

In 2018, the MNRE had issued a memorandum to implement public procurement in the renewable energy sector giving preference to 'Make in India' products. It was in response to an order issued by the Department of Industrial Policy and Promotion to promote. ☺

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Azure Power, an independent solar power producer, reported a **25% year-over-year (YoY) increase** in its operating revenue in **Q2 of the FY 2022**, driven by projects commissioned after Q2 2020. The revenue jumped to ₹4.38 billion (-\$59.1 million) during the quarter from ₹3.50 billion (-\$46.30 million) in the same period last year.



The **Ministry of Power** approved **23 new interstate transmission system (ISTS) projects** to augment the seamless transfer of power from surplus to -deficit regions. The estimated cost of the projects is ₹158.93 billion (-\$2.11 billion).

The **Solar Energy Corporation of India** disbursed ₹5.21 billion (-\$68.9 million) to solar and wind developers for the power purchased in **October 2021**. The disbursed amount accounted for 96% of the total amount paid by the nodal agency in October 2021.

Indian renewable energy company **CleanMax** received \$34 million in funding from the **Danish Investment Fund for Developing Countries**. The company is expected to utilize the funding to enhance its commercial and industrial (C&I) renewable energy portfolio in India, the Middle East, and Southeast Asia.

Bengaluru-based renewable energy platform **Ayana Renewable Power** announced a deal to acquire a 100% equity stake in a 250 MWac solar photovoltaic (PV) power project developed and operated by **ACME Solar Holdings**.

Reliance Industries availed **\$736 million** equivalent **green loans** from five banks to fund its acquisition of Norway-headquartered solar cells, modules, and polysilicon manufacturer **REC Solar Holdings**. The five lending banks were ANZ, Credit Agricole, DBS Bank, HSBC, and MUFG.

REC Limited, a public infrastructure finance company involved in financing power projects, entered into an agreement with Germany-based **KfW Development Bank** to avail official development assistance loan of \$169.5 million.



Ultraviolet Automotive, a Bengaluru-based electric vehicle (EV) startup, raised an undisclosed amount in a Series C funding round led by **TVS Motor Company**.



Reliance New Energy Solar Limited, the green energy arm of **Reliance Industries Limited**, signed an agreement with sodium-ion battery technology provider **Faradion Limited** to acquire a 100% stake for £94.42 million (-\$127.42 million). Faradion has an enterprise value of around £100 million (-\$134.96 million).

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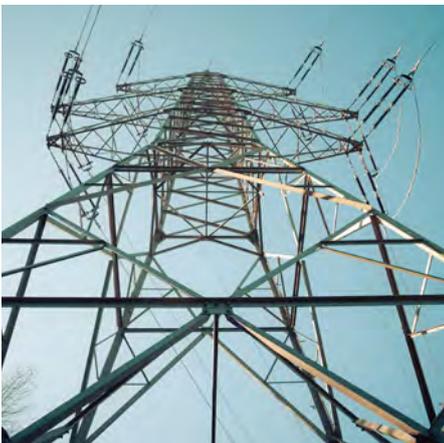
The **Rajasthan Electricity Regulatory Commission** included hydropower purchase obligations in the seventh amendment to its **renewable power purchase obligations (RPO)**. The Commission revised the RPO target for financial years (FY) 2021 to 2024 and included hydropower purchase obligation under the non-solar RPO.

The **Tamil Nadu Electricity Regulatory Commission** revised the rules for the **verification of captive open access projects**. The data verification procedure for providing captive status to a power project will be applicable from the financial year (FY) 2020-21.

The **Telangana State Electricity Regulatory Commission** approved an **additional surcharge of ₹0.96 (-\$0.013)/kWh** for consumers sourcing power through open access from January 1 to March 31, 2022.

Center

The **Ministry of Power** said that **39 out of 55 electricity distribution companies (DISCOMs)** had submitted draft proposals under the ₹3.03 trillion (-\$40.82 billion) reforms-based result-linked power distribution program.



The **Punjab State Electricity Regulatory Commission** approved an increase in the **additional surcharge to ₹1.22(-\$0.016)/kWh** from ₹1.16 (-\$0.015)/kWh for consumers to avail open access beyond their contract demand with the distribution company (DISCOM).

The **Uttar Pradesh Electricity Regulatory Commission** ruled that peak hours for **banking and withdrawal of energy** would be from 18:00 to 24:00 and off-peak hours from 00:00 to 18:00. The Commission determined the peak and off-peak hours while disposing of a petition filed by an open access solar project developer.

The **Delhi Electricity Regulatory Commission** set the additional surcharge payable by open access power consumers under the jurisdiction of three distribution licensees. Based on the projections mentioned in the tariff order, the average fixed cost per unit from October to April was considered the additional surcharge.

The **Central Electricity Regulatory Commission** issued a draft regulation - **‘Connectivity and General Network Access to the Interstate Transmission System (ISTS) Regulations, 2021.’** The proposed regulations provide the framework to facilitate **open access power** to consumers, generating companies, and distribution licensees for ISTS use through **General Network Access**.

The **Ministry of New and Renewable Energy** clarified that **Central Financial Assistance (CFA)** for rooftop solar systems would be calculated as per the revisited **Goods and Services Tax (GST)** if the price discovered in the tender excludes GST rates and invoices of the commissioned systems are issued on or after October 1, 2021.



The **Ministry of New and Renewable Energy** reinstated the **earnest money deposit** requirement and set it at 2% of the estimated project cost for upcoming renewable energy tenders. It also directed the implementing agencies to set the **performance bank guarantee at 4%** of the estimated project cost (**in cases where the procurer specifies the site**) and **5% (in cases where the generator chooses the site)** for all upcoming tenders.

Major Tender and Auction Announcements in December

This is a list of major tenders and auctions from December. A comprehensive list can be found on Mercom's Tender and Auction Tracker and Alerts. Please contact info@mercomindia.com for more information.

Rooftop Solar Tenders

The Ministry of New and Renewable Energy (MNRE) invited expressions of interest (EoI) from consultants to evaluate **Phase-II** of the 'Grid-Connected Rooftop Solar Program.'

The Chhattisgarh State Renewable Energy Development Agency (CREDA) issued an empanelment tender for vendors to set up **1 kW to 500 kW** grid-connected residential rooftop solar systems in Chhattisgarh.

Jammu and Kashmir Energy Development Agency (JAKEDA) invited bids to empanel vendors to develop **20 MW** of grid-connected residential rooftop solar

systems in Jammu and Kashmir under **Phase-II** of the Grid-Connected Rooftop Solar Program of the Ministry of New and Renewable Energy (MNRE).

The Mumbai Metropolitan Region Development Authority (MMRDA) issued a tender to install **2 MW** rooftop solar systems at **Mumbai Monorail** Project stations and sites.

The **Kagal Municipal Council**, Maharashtra, invited bids to design, engineer, supply, install, test, and commission an aggregate capacity of **1.1 MW** of rooftop solar projects at various locations.

Auctions

NTPC, Sprng Energy, UPC Renewables, Metka EGN Singapore Pte, ReNew Power, and ACME Solar were declared winners in the **SECI** auction for **1,785 MW** of solar power projects (**Tranche IV**) in **Rajasthan**.

The Kerala State Electricity Board Limited (KSEB) has released the list of empaneled EPC contractors of **100 MW** of grid-connected residential rooftop solar systems under the Soura subsidy program.





Top Large-Scale Solar Tenders

The Maharashtra State Electricity Distribution Company Limited (**MSEDCL**) has invited bids to procure **500 MW** of solar power from decentralized solar projects under Component C of the Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (**PM KUSUM**) program to be developed in the state.

NTPC Vidyut Vyapar Nigam Limited (**NVVN**), a wholly-owned subsidiary of NTPC Limited, has invited bids from contractors for an engineering, procurement, and construction (EPC) package along with the land to develop grid-connected solar photovoltaic (PV) projects of up to **100 MW** in **Maharashtra**.

The West Bengal Power Development Corporation Limited has invited bids for setting up **22.5 MW** of grid-connected floating solar projects at the thermal power stations in Bakreshwar, Santhaldih, and Sagardidhi.

The Punjab Energy Development Agency (**PEDA**) has invited bids for a cumulative capacity of **18 MW** of grid-connected solar power projects at four Bhakra Beas Management Board (BBMB) locations on a build own and operate basis.

The **Durgapur Projects** Limited, a government of West Bengal enterprise, has floated two tenders for **15 MW** of grid-connected ground-mounted solar projects in Durgapur on a turnkey basis.

The **Gujarat Urban Development Company** has invited bids to empanel consultants to set up **7.7 MW** of

grid-connected solar power projects at water treatment plants, sewage treatment plants, and pumping stations of municipality-owned buildings and land in the state.

Kerala State Electricity Board (**KSEB**) has issued an EPC tender for grid-connected solar PV projects with a total capacity of **5,995 kW**.

The Solar Energy Corporation of India (**SECI**) issued an EPC tender for a **5 MW** grid-connected solar project at V.O. Chidambaranar Port Trust in Tuticorin, **Tamil Nadu**.

The Steel Authority of India (**SAIL**) invited bids to develop a **4 MW floating solar** project on a turnkey basis at its IISCO Steel Plant in Paschim Bardhaman district, **West Bengal**.

Thanjavur Smart City Limited released a tender to set up a **2 MW** ground-mounted solar project at Sirajudeen Nagar Sewage water treatment plant in Thanjavur, **Tamil Nadu**.

The Himachal Pradesh Energy Development Agency (**HIMURJA**) has invited bids from **Himachali entrepreneurs** to set up ground-mounted solar projects ranging from **250 kW** to **1 MW** each in the state.

The **Paschim Gujarat Vij Company** Limited invited bids to design, supply, install, and commission solar projects of an aggregate capacity of **1.024 MW** for various agricultural feeders along with the associated 11 kV line and the remote monitoring system under the renewable energy service company (**RESCO**) model.

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Other Tenders

SECI invited expressions of interest (EoI) for the supply of **1,800 MW** (DC) of solar modules (including cells manufactured in India) under the domestic content requirement (**DCR**) category.

The Maharashtra State Electricity Distribution Company (**MSEDCL**) issued separate tenders to procure **342 MW** of energy from grid-connected intrastate **wind** projects and **300 MW** from interstate and intrastate wind projects.

NTPC Renewable Energy issued a tender for a balance of system (**BoS**) package for **325 MW** of projects located at Shajapur Solar Park, **Madhya Pradesh**.

NTPC Renewables also invited bids from **consultants** to conduct a geotechnical investigation for **105 MW** and **220 MW** solar power projects at Shajapur Solar Park in **Madhya Pradesh**.

NTPC Limited released tender for the comprehensive operations and maintenance (**O&M**) of its **260 MW** solar project at the Bhadla Solar Park in **Rajasthan** for three years.

SECI invited bids to set up an **8 MW** grid-connected **waste-to-energy** project in Kanpur, **Uttar Pradesh**.

Bharat Heavy Electricals Limited (**BHEL**), Haridwar, invited bids from contractors for the **O&M** of a **5 MW** solar power project at its Heavy Electricals Equipment Plant in Haridwar, **Uttarakhand**.

The **Maharashtra Energy Development Agency** invited bids to design, supply, install and commission electrical systems required for a **1.168 MW** solar power project at Shri Mahalaxmi Jagdamba Temple at Koradi in Nagpur district of **Maharashtra**.

The **Karnataka Power Corporation** Limited floated operations and maintenance (**O&M**) tenders for two solar projects in **Karnataka**.

The **Nashik Municipal Corporation** in **Maharashtra** invited bids from **consultants** to set up solar power projects providing services for the common infrastructure in the NMC area.

BHEL has invited bids from original equipment manufacturers (**OEMs**) to enter into a memorandum of understanding (MoU) to supply **42,000 metric tons** (MT) of **module mounting structures**.

The Rajasthan Electronics and Instruments Limited (**REIL**) announced a tender to supply **200,000** monocrystalline or multicrystalline silicon **solar cells** of 4.57 W.

REIL also invited bids to procure **40,000 aluminum channels** and aluminum corner keys for solar modules with 72 cells with a 300 W or more wattage.

REIL issued tender to procure solar photovoltaic (PV) **module mounting structures**.

The Agency for New & Renewable Energy Research and Technology (**ANERT**) issued a rate contract tender to list **solar power components** for supply in **Kerala**.

ANERT also invited bids to **register vendors** for the installation of solar projects in **Kerala**. The scope of work includes the supply, installation, testing, and commissioning of on-grid, off-grid, and hybrid solar power projects in the state.

Uttarakhand Power Corporation invited bids to select **traders** to purchase and sell energy, renewable energy certificates (solar and non-solar), and energy savings certificates (ESCerts) through **exchanges**.

Convergence Energy Services Limited (**CESL**), a wholly-owned subsidiary of Energy Efficiency Services Limited (EESL), invited bids to **empanel** vendors to lease an estimated **1,000** electric four-wheelers (**E4Ws**) for various government departments and other clients across **India**.



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