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India

India Added 4.6 GW of New Solar Capacity in 1H 2021

Mercom India Research's latest report reveals solar capacity additions in the first half of 2021 increased by 251% compared to the same period last year



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Foreword



It was a great second quarter for the Indian solar industry all around. The rooftop segment of the market also had a record quarter with 521 megawatts of rooftop solar in the second quarter of the calendar year 2021, a 53% increase quarter-over-quarter and up 517% year-over-year compared to the 85 MW installed in Q2 2020, which was severely affected by COVID-19.

The demand for rooftop solar is up across the board. Finalizing the net metering cap at 500 kW has removed uncertainty for installers and paved the way for future growth. However, haphazard rooftop solar policies across states and a lack of support from distribution companies are holding back the sector from realizing its true potential to bring in new investment, create jobs and drive the clean energy economy forward.

The industry is witnessing a surge of inquiries from commercial and industrial consumers even during the lockdown from the second wave of COVID. The first half of the year could have seen higher installations if not for the uncertainty in the net metering regulations.

With the second wave of COVID-19 and the imposition of state-wise lockdowns, a majority of the commercial and industrial units were shut down for the larger part of the quarter in some key states. The lockdown affected the industrial segment the most since most of them were shut down for a longer duration due to the restriction on the labor movement. The demand for larger capacity rooftop solar systems mainly comes from the industrial segment. The uncertainty on the net metering cap resulted in the first half of the year being lost for the segment.

The most vital policy supporting the rooftop solar segment - net metering - witnessed a series of revisions in the first half of the year. The government's bold target for rooftop solar installations is not aligned with enabling policies; on the contrary, the restrictive regulations contradict the goals. Restricting net metering is taking away the viability factor from the projects. Finding a way around the net metering cap, some consumers are resorting to installing systems of smaller capacities where the solar power generated can be fully consumed and not injected into the grid.

There seems to be no end to the supply chain issues. The current energy crisis in China is trickling down to the rest of the world. Solar component costs are rising as most of the solar component manufacturing is still in China. There is also a chance that we could see shortages of components again. The power is being rationed in China, which could affect manufacturing output.

The Chinese energy crisis seems to have come out of the blue. It is another reason developers always have to hedge against unforeseen market events and bid cautiously in solar auctions.

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Removing Lock-in Period Could Boost Foreign Investment in Solar

Allowing foreign investors to hold controlling stakes can give them the confidence to invest in the sector

By : Harsh Shukla

Removing the one-year lock-in period for controlling shareholding could help increase investment flow into the solar market in India. A 'controlling shareholding' is the ownership (directly or indirectly) of over 51% of a company's voting shares or the right to appoint most directors to the company board.

Earlier, this time frame was three years. Many solar developers had told Mercom that the three-year timeline was too long and unreasonable and restrict short-term equity investment in the sector.

The Ministry of New and Renewable Energy (MNRE) amended the guidelines to specify that the shareholding in the special purpose vehicle or company executing the power purchase agreement (PPA) should not fall below 51% for one year from the commercial operation date (COD) of the project. Similarly, for a consortium, the members' combined shareholding should not fall below 51% in the one year from the COD.

According to this rule, developers who want to exit by selling their projects in the secondary market cannot do so

for 2.5-3 years from the date of signing the PPA.

The rationale for the lock-in period

When the national solar mission was announced in 2010, solar photovoltaic technology was new and very expensive and had to be bundled with thermal power from NTPC, for which the subsidiary, NTPC Vidyut Vyapar Nigam Ltd (NVVN), was brought in. The initial projects had feed-in-tariffs as high as ₹17.90/kWh. Even when the reverse bidding started, the tariffs discovered were as high as ₹10.95/kWh to ₹12.75/



kWh. To ensure the ownership of solar projects bundled with thermal power did not change until their performance was established and the quality of projects was good, the government advocated the lock-in period to control shareholding.

But now, the scenario has changed, and there are over 35.5 GW of large-scale solar projects in operation. Also, solar is the most competitive source of power and does not need to be bundled with thermal. Developers are aggressively bidding in e-reverse auctions even after considering the risks involved. Investors are aware that low-quality projects would have no buyers in the market; hence the fear that a short lock-in period would lead to low-quality assets is unsubstantiated.

Over the years, the government has relaxed several regulations, including net worth, bank guarantee requirement, and bidders' qualifications. But the lock-in period clause remains unchanged for over ten years now. The time has come for this rule also to be revised based on the changing market conditions.

Manoj Gupta, Vice President of Solar and West Energy Business, Fortum India, said, "The lock-in period concept was good initially while the market size was small, and the developers put in all

the capital. However, the market size is moving towards 10-15 GW projects annually. And to grow in this range, we need to have substantial capital from international funds. In the past, we have seen many projects were not delivered or constructed on time due to capital shortage and shareholding restrictions."

Gupta also said that developers are also facing issues like delays in signing PPAs and the availability of short-term equity for projects due to the lock-in period. This is causing further delay in securing the land to bring the lenders to the table.

Echoing similar thoughts, a senior executive of the French renewable

***Currently,
investors can
only hold
49% of equity
despite investing
large amounts
of capital***

energy developer said there is no logic or need for any lock-in restrictions for developers because it does not serve any purpose. During the project development, developers need the flexibility to get the best financing, undertake restructuring for legal framework compliance and tax optimization. Developers also do not get the benefit of real-time evolving financing scenarios in Indian as well as global renewable energy markets.

"It's become difficult for any developer to bring investors on board for projects due to the lock-in period. Investors can only hold 49% of equity despite investing huge capital, which makes them uncomfortable to invest even in investment-worthy projects in India," said Animesh Damani, Managing Partner, Artha Energy Resources.

However, Vinay Kumar P, Founder and Chief Executive Officer (CEO) of Varp Power believes that the apparent reason for lock-in is to ensure that developers do not build projects only to flip them after commissioning. In the industry, it is a general hypothesis that promoting a build-and-flip approach harms asset build quality with consequent impacts on solar/wind projects' useful life and yields during operation.



“The concern about developers building and flipping projects is baseless. We are assuming that investors lack the ability to do proper due diligence and will readily invest millions on low-quality assets. On the contrary, most large-scale solar project investors are sophisticated and understand what they are getting into. Solar is a mature asset class with over a hundred GW of solar projects being built globally every year. Almost 40 GW of solar projects were bought and sold worldwide in just the first six months of this year,” said Raj Prabhu, CEO of Mercom Capital Group.

Disadvantages of lock-in period

Most foreign investors planning to acquire quality projects would like to invest in the early stages to have a say in the construction of the projects and ensure the adoption of the latest technologies. Without a controlling stake in the projects, investors are skeptical about early-stage investments.

A senior executive of a Mumbai-based investment company said, “If MNRE removes the lock-in period, investors tend to acquire the entire project in a single shot. The current situation doubles the efforts of investors to acquire the whole project. Investors do not like to be in a position where

Over the years, the government has relaxed several regulations, but the lock-in period clause has remained unchanged for over ten years

they are not in control despite investing a substantial share of capital in the project. At the moment, investors are not in a controlling position, as they can have only 49% equity shareholding, compelling them to create a new structure to secure shadow control, especially in the project development stage.”

“All these issues can be avoided and simplified if there are opportunities to acquire the overall project in one go or by allowing investors to hold at least 51% or more controlling shareholding. The Ministry should at least allow majority controlling shareholding to investors to give them the confidence to invest heavily in the sector.”

According to Mercom’s Q1 2021 India Solar Market Update, the large-scale solar project pipeline stands at 53.6 GW, with 24.1 GW tendered and

pending auctions at the end of Q1 2021. Developers find it difficult to bring in the volume of investment that the sector needs. The participation of international investors is integral, which makes a case for relaxing the current equity lock-in norm.

Benefits of relaxing the rules

Solar is now a mature technology finding its way into the portfolio of investors, pension funds, development banks, and utilities alike. Indian developers bring in over a decade of experience constructing these projects and no longer need to be monitored with the lock-in period as earlier.

“A project goes through several stages; the pre-construction period is when the risk is at its highest. Investors who come in at this stage expect healthy returns for the risks they are taking,





along with control of the technology, component selection, and build quality,” commented Prabhu.

According to a U.K.-based investor, the government is now concerned about the net worth of the developers rather than the technical qualifications as the case was earlier. To bring in net worth, the regulations need to be flexible. There are many benefits in relaxing the controlling shareholding rules - the developers must linearly grow with their internal investments, due to which the growth is curtailed. Instead, they could capitalize the asset as soon as it is built or the PPA is signed so they can work on a more robust portfolio. The added advantage of having access to a larger pool of capital is that the bids will be competitive, which is the government’s main goal, to discover lower tariffs.

The investor further added that if the financial strength of international investors should be merged with the project execution capabilities of Indian developers, investors need to have major shareholding at an early stage. Also, the government is aiming at foreign direct investments or low cost of investment, and for that, enabling regulations are required and not restrictive ones. Removing the equity lock-in regulations can unlock huge benefits but retaining these regulations has none.

Developers also believe that reducing

or removing the lock-in period can enhance foreign investment in the Indian solar market. They believe that despite many barriers, investors are investing heavily in the market, which could be increased further by removing barriers like the lock-in period.

Speaking to Mercom on investing in the solar market, Rahul Varshney, Country Head, India, at Statkraft, said uncertainty around local laws, bidding procedures - including the foresight on timelines or possible procedural delays - offtake risks, or adoption of tariffs by utilities are the main issues while acquiring early stage projects. That said, removal of lock-in period is expected to facilitate greater participation by investors in good quality operational solar assets, which is a positive development for the industry.

Gupta said, “There should not be any lock-in period after issuance of letter of intent (LoI) or PPA signing. It will help in boosting investment in the solar sector. Investors would be involved in project development activity from day one.”

A senior executive of the French renewable energy developer echoed similar thoughts and said removing this one-year lock-in period would increase the foreign investment. The executive feels that this would allow foreign investors to aggressively invest in new projects as India requires to develop over 200 GW of solar capacity to achieve

its 350 GW solar capacity target by 2030.

“Billions in foreign capital with an ESG investment priority is out there to be deployed with the expectation of higher returns than what is available in developed countries. To tap into this pool, restrictions need to be removed; PSA and PPA signing should be made automatic and guaranteed. This will ramp up foreign investments exponentially,” noted Prabhu.

“Investments will not increase overnight, but will see a big uptake if MNRE removes the lock-in period,” said Damani.

“It would certainly have a positive impact. The fact that investors could have control from the beginning would be a big attraction for investors, as those waiting to acquire a project could do so in a single shot,” said a senior executive of a Mumbai-based investment company.

Varshney said foreign investors prefer to circumvent initial developmental hurdles by deploying capital while acquiring quality operational projects whose costs are crystallized. Shortening or removing the lock-in period would be an enabler for such deals, although this may not be the sole driver to magnify merger and acquisition activities.

“The time is right for the government to remove the equity lock-in period and open up the solar sector for much-needed foreign investments,” added Prabhu. ¹⁰



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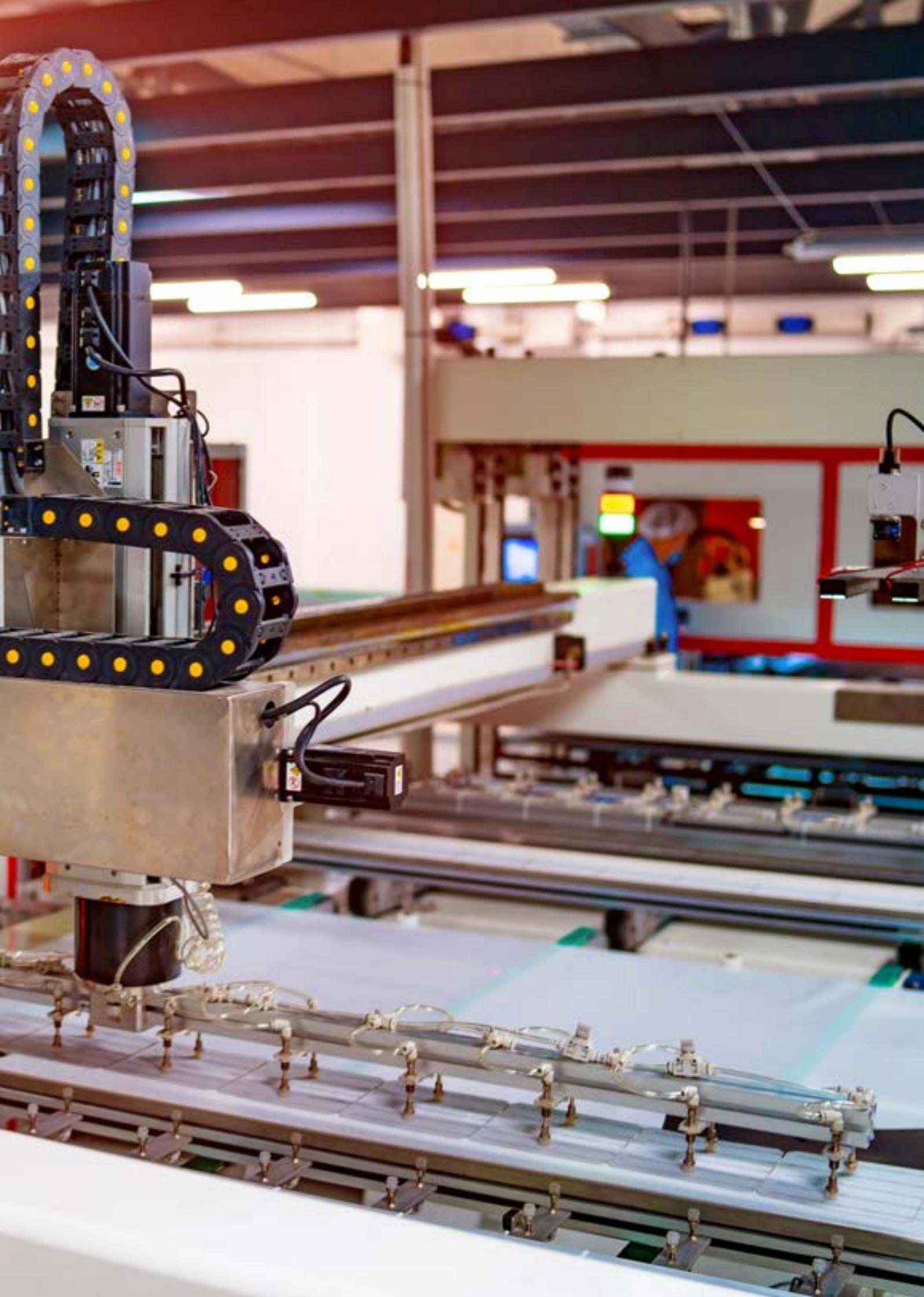
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Solar MSMEs Need a Technology Upgradation Fund

As smaller solar MSMEs struggle to keep pace with the bigger players in the expanding manufacturing space, there is a need to upgrade technology to help them survive

By : Rakesh Ranjan Parashar





The government has come up with several protectionist policies to give impetus to the manufacturing sector in the solar space, but the deck is stacked against the smaller players who are struggling to compete with the bigger entities.

Things are looking bleak for solar micro, small, and medium enterprises (MSMEs) who are trying hard to find a way out of the financial constraints and the rising prices of commodities that have made it much harder for MSMEs to survive in this competitive environment.

In April this year, the Union Cabinet approved the production-linked incentive (PLI) program for the 'National Program on High-Efficiency Solar PV (Photovoltaic) Modules' to achieve gigawatt-scale manufacturing with an outlay of ₹45 billion (-\$605 million).

There is a general belief that the program is meant for bigger Indian players and will not help smaller manufacturers. With the government's push for the solar manufacturing sector, it remains to be seen how things will play out.

Increase in raw material prices - a concern for MSMEs

The increase in raw material prices

has made the matter worse for smaller manufacturers.

Speaking on the increase in raw materials prices and its impact on the manufacturing segment, R Chellappan, Managing Director of SWELECT Energy Systems, said, "The increase in raw material prices has put a strain on module manufacturers in terms of longer business cycles and lower inventory control with uncertainty in terms of deliveries. This has led developers to wait and watch for the prices to stabilize, move down, and not hurry to commission the projects at such high prices. As a result, manufacturers

MSMEs believe the PLI program is meant for larger entities and will not help small manufacturers

are holding higher module inventory and finally dumping the product in the market at a lower cost, thereby driving the price down and selling the materials at a loss. As a consequence, manufacturers are looking at better self-reliance and setting up their ethylene-vinyl acetate and backsheet lines."

Commenting on the impact of the shift from M2 to M6 and up to M12 wafers, Chellappan said, "The manufacturers have already moved or are in the process of upgrading their equipment to new sizes (up to M12 - 210 mm cells). By Q2 2022, most manufacturers will shift, and only a few will run with the old line. With the equipment costs lower than before and better financing options available, most established manufacturers will not have much of a challenge in upgrading. But the smaller and unorganized manufacturers will face challenges, especially those with manual lines since new cells require automation."

Need for a technology upgradation fund

Technology upgradation is another aspect that is of utmost importance for domestic manufacturers who are trying to meet the changing demands of the solar market and remain



competitive. Technology upgradation requires investments, making it difficult for MSMEs to keep pace with the advancements in the solar sector.

“A technology upgradation fund is definitely required for all cell and module manufacturers, which must be independent of the PLI program. The resources for this fund can very well come from the vast amount of safeguard duty, anti-dumping duty, and BCD that are being collected by the government and can be funneled into the industry for technology and manufacturing line upgradation. The machinery upgradation happens every three years in this industry, which needs government support - especially for the small and medium manufacturers who are the backbone of the country’s growth, employment, and gross domestic product,” Chellappan said.

In August last year, the Gujarat government announced a new industrial policy to boost MSMEs. Currently, Gujarat has over 3.5 million MSMEs, which are a significant source of employment and form a critical part of the larger industrial ecosystem. The new policy focuses on promoting MSMEs to

make them globally competitive. They would be eligible for capital subsidy of up to 25% of the suitable loan amount of up to ₹3.5 million (-\$46,755).

Ankit Kapadia, Regional Manager at Lubi Solar, said, “A considerable amount of investments will be required for modifying the existing machinery, the possibilities of which are limited. Costs will also have to be incurred on updating the certifications in line with the product upgrades. All this is bound to push the prices up. It will be a challenge to remain competitive in the

Solar cell sizes are changing rapidly, and it is a constant struggle to remain competitive

market dominated by Chinese imports. It will not be surprising to see small-scale players shut shop. A technology upgradation fund in the form of access to easy and cheap capital could help MSME manufacturers stay afloat.”

Need for MSMEs to keep pace with the changing demands

Solar cell sizes are changing rapidly, and it is a race to keep pace with the market’s changing demands. It is being argued that the current developments can lower the levelized cost of energy by bringing down the balance of system cost considerably.

“We feel the development would push the prices of solar modules upwards. The decision from the cell manufacturers to upgrade to large cell sizes will require considerable investment by module manufacturers on the upgradation of existing machinery and require fresh costs to be incurred on getting the required certifications. The small-scale manufacturers, especially in India, face the harsh reality of incurring the cost of capital and certificates and yet remain competitive in the market dominated by imports,” added Kapadia.

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There is also the question of shifting from M2 to M6 up to M12 wafers, which would require manufacturers to install new equipment. For this, infusion of new capital would be needed, which would significantly impact the MSMEs.

Looking for government to help

MSMEs are looking for government support to survive in this competitive market.

“The government should look at the statutory and regulatory aspects, which would make both upstream and downstream deployment of projects more manageable. This would involve the setting up of manufacturing plants, expansion, and approvals. For project developers, the access to land, transmission line infrastructure, and upholding the sanctity of the power purchase agreements. Policies to support domestic manufacturing, as well as offtake guarantee, have to be strengthened,” said Chellappan.

“There is also a need for better regulation and control of the modules being manufactured and sold in the

Large investments are required to upgrade technology, making it difficult for MSMEs to keep pace

market - in terms of quality, compliance, and assured warranty. The above factors need to be looked at on the ground by interacting with MSME manufacturers instead of from a high macro level with inputs taken only from a few large manufacturers,” he added.

DV Manjunath, Managing Director of EMMVEE Photovoltaic Power, said, “The situation is good as of now. There is no other alternative other than upgrading to better technology. The process is time-intensive, and an infusion of capital will be required. We are ready to meet the market demands, and there is no shortage of supply. Right now, if we shift from M2 to M6, the only way out is to upgrade and be ready for the change. Many players have already done it, and we are also in the process of doing so.

The government should continue with the safeguard duty until BCD is enforced next year. It will help in protecting smaller players. M6 will be there for at least five to seven years, and it is the new norm.”

As the prominent players gear up to meet the market demands and compete with the Chinese imports, MSMEs find the going tough. .

“While the government can ensure a level playing field and policy support, it will not be able to prop up every manufacturer that decides to enter the ultra-competitive solar manufacturing sector. Manufacturers attracted by the solar industry’s market potential have to assess the risks that come with it seriously,” said Raj Prabhu, CEO of Mercom Capital Group. 

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Wind Installations See 76% YoY Spike in Q2 2021

Wind installations witnessed a sharp increase of 76% YoY in Q2 2021 but fell 62% QoQ, with 239 MWs added during the quarter

By : Rakesh Ranjan Parashar



Wind installations in India in the second quarter (Q2) of 2021 were down by 62% quarter-over-quarter (QoQ), with 239 MW added in Q2 2021, compared to 623 MW added in Q1 2021.

The year-over-year (YoY) installations increased 76% compared to 136 MW in Q2 2020.

The cumulative installations at the end of Q2 2021 stood at 39.6 GW.

A major share of the installations in Q2 2021 came from Gujarat, Tamil Nadu, and Maharashtra.

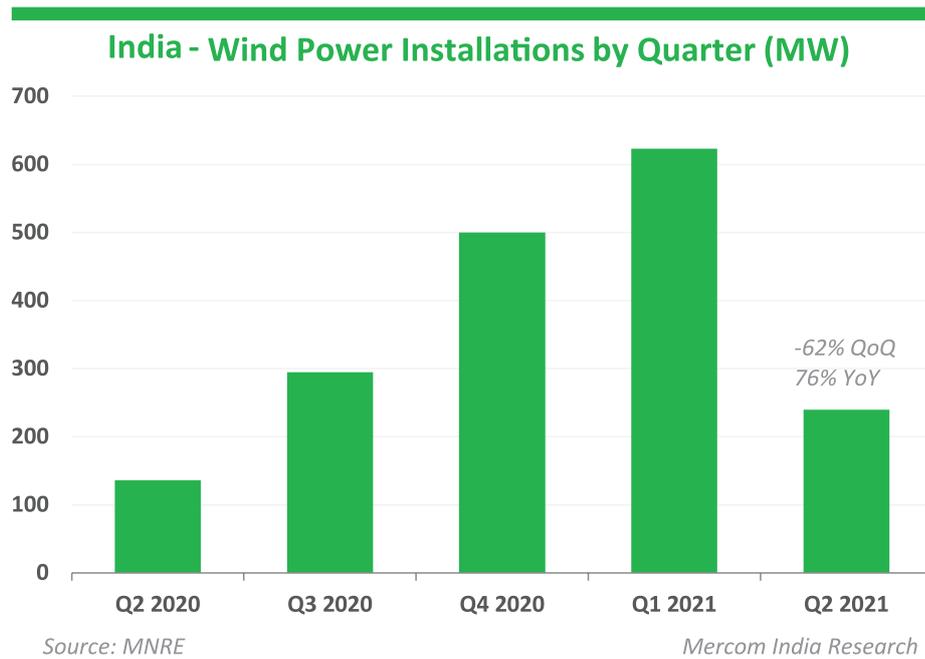
Gujarat added nearly 220 MW of wind capacity as of June 2021. The state had a 22% market share and was ranked second in the cumulative installations with 8.78 GW of total installations. Tamil Nadu added 109 MW of capacity as of June 2021. The state was ranked first in cumulative installations in the country, with 9.72 GW of wind installations accounting for 25% of the total market share.

Most of the installations in Q2 were in Gujarat, Tamil Nadu, and Maharashtra

Maharashtra installed 12.5 MW of capacity with an overall market share of 13%. The state was ranked third in terms of cumulative capacity with 5.01 GW at the end of July 2021. Karnataka did not install any wind capacity in Q2 2021 but had a 13% overall market share, thanks to cumulative installations of 4.9 GW. Rajasthan rounded off the top five with a cumulative installation of 4.3 GW at the end of July 2021, accounting for 11% of the market share.

Wind installations in India in Q1 2021 were up by 25% QoQ, with 623 MW added compared to 500 MW installed in Q1 2020. Cumulative installations at the end of Q1 2021 stood at 39.2 GW.

In June this year, the Global Wind Energy Council and MEC Intelligence released the 'India Wind Energy Market

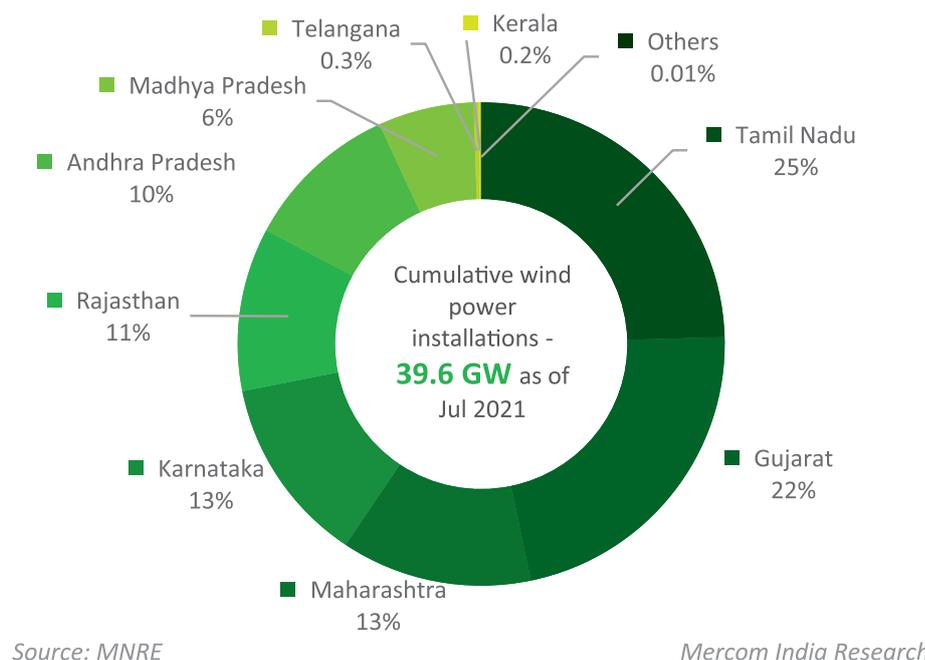


Outlook 2025' report, which predicted that the world's fourth-largest wind power market would add nearly 20.2 GW of new wind power capacity between 2021 and 2025. The report pointed out that the market would bounce back with nearly 20.2 GW installed wind power capacity between 2021 and 2025, especially with wind-solar hybrid projects.

The government is also assessing s

the offshore wind resource potential in designated locations off the coast of Tamil Nadu and Gujarat. The Ministry of New and Renewable Energy has instituted a committee to draw a roadmap for offshore wind development in the country. The government has allowed 100% foreign direct investment under the automatic route for renewable energy projects, which also includes offshore wind energy projects. ☺

India - Cumulative Wind Power Installations by States (%)



Can Developers Depend on Domestic Solar Manufacturers?

Mercom spoke with manufacturers and solar developers to understand how the solar sector expects to meet its goals and challenges along with being self-reliant

By : Rahul Nair





The government's focus lately has shifted strongly towards establishing a domestic solar manufacturing base.

The government has levied safeguard duty, Basic Customs Duty (BCD), introduced the approved list of module manufacturers (ALMM) and mandated domestic content requirement (DCR) for modules (for central public sector undertaking projects) to support manufacturing in India. But it could take some time before the developers can completely depend on domestic manufacturers for solar modules.

India still relies heavily on Chinese imports. Chinese companies, including those with operations based outside China, meet 95% of India's solar module requirements.

Mercom spoke with the manufacturers and solar developers to understand how the solar sector expects to meet its goals and challenges along with being self-reliant.

Can domestic manufacturers meet the demand?

The general opinion seems to be that domestic manufacturers are able to supply more than 50 MW per month. According to the founder and director of Goldi Solar, Bharat Bhut, 50 MW is not a

challenge in the present scenario.

He said, "Looking at the manufacturing expansion plans, original equipment manufacturers, including Goldi, will have the capabilities to deliver 100 MW and above monthly. There are some issues with prices and availability of raw materials, which the government is addressing."

Manufacturing 50 MW a month of solar cells and modules, is not an issue for most domestic suppliers

Mukeshbhai Singhala, Chairman of Pahal Solar, told Mercom that their current manufacturing capacity is 210 MW, and in the next two or three months, the company is expected to reach 300 MW capacity.

Speaking from the developer's perspective, sources from Greenko

Solar told Mercom that, as for the total manufacturing capacity of solar cells and modules, 50 MW a month is not an issue.

The source added, "It must be noted that only a few companies have automated lines that can churn out reasonably good-quality modules. The rest of them are all small players catering to off-grid applications."

However, according to Gajanan Joshi, who heads project development in Asia for the German company WattKraft Solar, what matters is whether the manufacturers are already booked for other projects when developers approach them.

He said, "It is necessary to assess this because manufacturers will accept orders irrespective of their delivery capacity and delay the project significantly by not delivering on time. In such a scenario, the developers will start competing with each other because they want to meet their deadlines, and will try to convince the manufacturers by promising additional down-payment before delivery to ensure their shipment reaches in or before time."

He added, "If they don't have the equipment, workforce, or bandwidth, they will not be able to deliver as per developers' deadline. For a



manufacturer, 50 MW/month (600 MW/year) is not a difficult task at all. There are manufacturers in India who are already going above 1 GW.”

Recently, Vikram Solar inaugurated a solar photovoltaic (PV) module manufacturing facility in Tamil Nadu. The new manufacturing unit has a 1.3 GW solar PV module manufacturing capacity annually.

According to Joshi, the real question is whether Indian manufacturers can meet the 100 GW deadline within the next 18 months.

He said, “Based on the National Solar Mission target, the manufacturers need to deliver roughly 2.5 GW per month. The top Indian manufacturers should manage 500 MW per month, which means their practical manufacturing capacity should be roughly 6 GW each year. When you consider these parameters, it is obvious that none of the Indian manufacturers can boast of such a capacity.”

Combating rising costs and Chinese imports

Bhut said that the Covid-19 pandemic had created a host of issues, including an increase in shipping costs, an almost five times increase in freight charges, and a multifold increase in raw material

prices.

“Polysilicon cells and wafers are in short supply, and there is a rise in the cost of the total bill of materials (aluminum, backsheet, and ribbon) as well. Owing to the shortage of raw materials, India is now trying to manufacture them domestically, and the country is seeing growth in the ancillary industry,” Bhut said.

Chinese companies, including those with operations based outside China, meet 95% of India's solar module requirements

“We need to start seeing policies that will help the MSMEs and ancillary industry keep up with the

pace of manufacturing modules.

The government needs to extend the performance-linked incentive (PLI) program to solar raw material and other solar component manufacturers like glass, ethylene-vinyl acetate, backsheet, etc.,” he said.

Meanwhile, one of the biggest concerns for manufacturers is the end of the safeguard duty regime. The crucial duty protecting domestic solar cell and module manufacturers in India against imports from China, Thailand, and Vietnam ended on July 29, 2021.

Commenting on the future of the industry, the All India Solar Industries Association (AISIA) told Mercom, “There will be no duty barriers for imports of solar modules from the date of safeguard duty expiry to the date of implementation of BCD in April 2022. This nine-month period will have a crippling effect on domestic manufacturers, which may also lead to the shutdown of units in India, putting 200,000 jobs at stake in the sector. If the government fails to bring in any substantial measures, history will repeat itself, thus making India a dumping ground for solar equipment.”

According to the AISIA, anti-dumping duties levied on raw materials like glass and EVA will remain intact, resulting





in substantial cost differences in indigenously produced solar modules.

“Domestic manufacturers will have to continue paying hefty duties on raw materials imported, thereby being unable to compete with the cost of internationally produced modules. The lack of clarity on the interim measures is problematic and dissuades domestic players from purchasing solar cells and modules from Indian manufacturers,” it said.

AISIA said that they are already witnessing delays in project installations and cancellations of orders as most are awaiting cessation of safeguard duty to place orders for imported modules. From August 2021, 100% of solar modules will be imported, with no tariff restrictions or policies to aid Indian manufacturers to sustain operations.”

Impact of duty regime

Meanwhile, Bhut told Mercom that the introduction of BCD, PLI program, and ALMM are all government initiatives supporting domestic manufacturing.

He said, “Irrespective of size, small or big, the new duty regime will have a beneficial role to play. BCD has also helped generate positive sentiment among Indian solar manufacturers and the auxiliary industry. Investor sentiment has also gone up, and the move will help the manufacturing industry explore its potential. We expect

Anti-dumping duties levied on raw materials like glass and EVA will make domestic modules expensive

the domestic manufacturers to catch up and meet the sales numbers of imported modules by mid-June 2022.”

However, the duty regime does not offer the developers any incentive to buy from the domestic manufacturers.

A source at Greenko Solar told Mercom that although the duty regime prepares the Indian developers to get accustomed to domestic procurement in fulfilling the nation’s ‘Make in India’ goals, several challenges need to be addressed before this dream becomes a reality.

The source said, “Under the changed scenario, i.e., the post-pandemic period, it is not just the duties that matter. The

backend support in terms of creating conducive infrastructure, inclusive development, and push towards building necessary technological innovations by the government and private parties alike also play a major role. Otherwise, these duties are mere disguises to promote inefficient solar manufacturers within the country. In this very sense, the duties do more harm than good to the solar industry.”

The source at Greenko stated, “Given the shortage in the time available for manufacturers to gear up to the Tier-1 Qualified Product Database requirements, it is certain that solar developers would continue to face the brunt of increased engineering, procurement, and construction costs, which might in turn adversely affect the construction quality of solar PV projects and their long-term performance therein.”

The Indian domestic solar manufacturing sector has an opportunity now to rise to international standards. In the future, Indian manufacturers should work on new and advanced proven technologies such as TopCon and silicon heterojunction technologies, among other passivated emitter rear cell (PERC) technologies, that benefit the developers with 35 years’ linear warranty by increasing the return on investment and levelized cost of energy. ☺

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Power Ministry Promotes Green Energy Open Access

Consumers who have contracted demand or sanctioned load of 100 kW and above can procure power through green energy open access

By : Rahul Nair





The Ministry of Power (MoP) has issued the Draft Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2021. The last date for submission of feedback is September 15, 2021.

The rules are applicable for the purchase and consumption of green energy, including the energy from waste-to-energy projects. The entities covered under the rule are all consumers who have contracted demand or sanctioned load of 100 kW or more, except for captive consumption.

As per the draft rules, a uniform Renewable Purchase Obligation (RPO) would apply to all obligated entities - distribution licensees (DISCOMs), open access consumers, and captive power consumers. Whether obligated or not, any entity may choose to purchase and consume renewable energy based on their requirements through one or more avenues.

Self-Generation from Renewable Energy Sources

There is no capacity capping on ‘behind the meter’ renewable energy power projects, according to the draft rules. ‘Behind the meter’ refers to electricity generated for self-use and not meant for injecting into the electricity grid. DISCOMs are not liable to purchase such energy.

Meanwhile, the power generating unit may be set up by

the commercial and industrial (C&I) consumer or by a developer. The consumer and the developer can enter into a medium or long-term power purchase agreement (PPA).

Renewable Energy Certificates can be purchased after following the applicable regulations to meet the RPOs. RPOs can also be through other sources, as prescribed by the Union Government.

Requisition from DISCOMs

The obligated entities can also procure renewable energy through open access from any developer by entering into an agreement.

The entity may decide to purchase green energy up to a certain percentage or for its entire consumption. The entity may also place a requisition with the DISCOM to procure green energy for consumption.

Similarly, green energy can be purchased against RPO on consumption from the captive power project or energy availed through open access from sources other than renewable energy sources.

The consumer may voluntarily purchase a larger share of renewable energy than obligated. For ease of implementation, this may be a minimum of 50% of consumption from green energy, which can go up to 100% through 25% increments (i.e.,

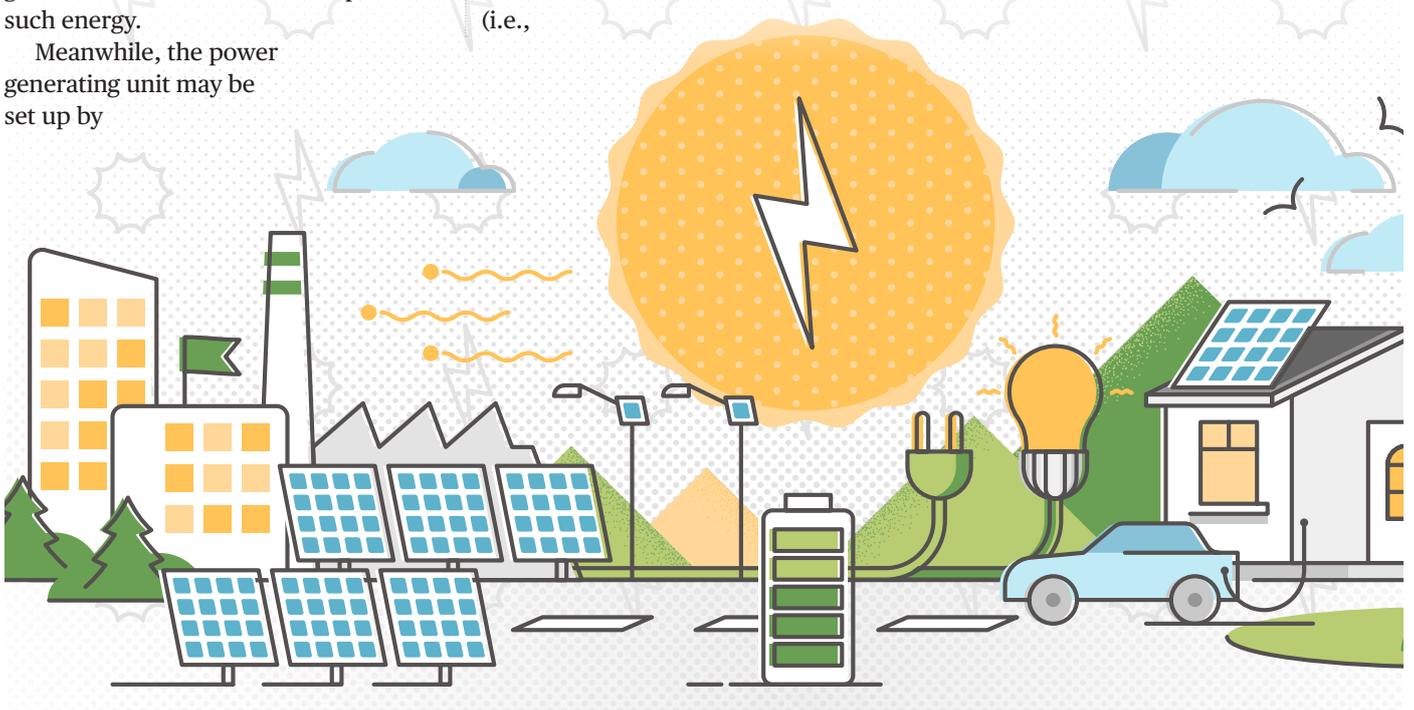
50%, 75%, 100%).

The appropriate commission would determine the green energy tariff, including the average pooled power purchase cost of the renewable energy, cross-subsidy charges (if any), and service charges covering all prudent costs of the distribution licensee for providing the green energy.

Any request for green energy from a DISCOM would be for a minimum of one year

Any requisition for green energy from a DISCOM would be for a minimum of one year, and the capacity of green energy would be pre-specified for at least a year.

Green energy purchased from DISCOMs would be counted towards their RPO compliance. Accounting for renewable energy supplied at the DISCOM level would be done every month.





Purchase of Green Hydrogen

The obligated entity, including industries, can meet their RPO by purchasing green hydrogen. The quantity of green hydrogen would be computed by considering the equivalence to the green hydrogen produced from 1 MWh of electricity from the renewable sources or its multiple. The Central Commission would notify the norms.

Green Energy Open Access

The appropriate commission would formulate the regulations by following the draft rules to provide 'green energy open access' to consumers willing to consume the green energy. All applications for open access green energy would be approved within a maximum of 15 days.

Consumers who have contracted demand or sanctioned load of 100 kW and above can procure power through green energy open access. There is no limit on the power supply for the captive consumers buying power under green energy open access.

The consumer may voluntarily purchase a larger share of renewable energy than obligated

To avoid high variation in demand to be met by the DISCOMs, reasonable conditions are imposed - such as the minimum number of time blocks for which the consumer will not change the capacity of power consumed through open access.

Nodal Agency

The Union Government would notify the central nodal agency, which would operate a single-window green energy open access system for renewable energy. The agency would set up a

'centralized registry' for all green energy open access consumers.

All the green energy open access applications would be submitted on the portal set up by the agency. The application will then get routed to the nodal agency notified by the appropriate commission for green energy open access approval.

The commission would notify the load despatch center as the nodal agency to authorize the green energy open access for a short term. Meanwhile, the state or Central Transmission Utility (CTU) would be notified as the nodal agency to approve green energy open access for the medium and long term. The commission would define the terms.

Procedure for Grant of Green Energy Open Access

The 'forum of regulators' would prepare a common application format for green energy open access in 60 days, which would be adopted by the appropriate commission.

The application would be approved



within 15 days, failing which it will be deemed approved subject to the fulfillment of the technical requirement specified by the appropriate commission. Short-term and medium-term open access will be allowed if there is sufficient spare capacity in the transmission system without any augmentation.

For long-term open access, the transmission system may be augmented. Priority will be given to the long-term applications in the existing system if spare capacity is available.

Further, open access for non-fossil fuel sources would be given priority over open access from fossil fuel. No application for open access would be denied without a written order after giving the applicant an opportunity of being heard.

Appeals against a nodal agency order remain with the appropriate commission.

Banking

Banking may be permitted every month on payment of charges to compensate the DISCOMs for any additional costs; the appropriate

Additional surcharge is not applicable for green open access consumers

commission would determine these charges. The quantity of banked energy by the green energy open access consumers would not be more than 10% of the consumers' total annual consumption of electricity from the DISCOMs.

Cross Subsidy Surcharge

Cross subsidy surcharge will be levied on open access consumers as per the provisions of the tariff policy under the Electricity Act 2003.

The surcharge for open access consumers purchasing energy from renewable energy projects would not be increased during the 12 years from the

date of commissioning of the project. The surcharge will not be increased by more than 50% of the surcharge set for the year in which open access is granted.

The additional surcharge is not applicable for green open access consumers. Cross subsidy surcharge and an additional surcharge are not applicable if the energy generated from a waste-to-energy project is supplied to the open access consumer.

Cross subsidy surcharge payable by a consumer would meet the current level of cross-subsidy within the DISCOMs supply area. The state commission would specify standby charges if required.

The DISCOM would issue green certificates every year to consumers for the green energy supplied on the consumer's request beyond its RPO.

The State commissions may rate the DISCOMs' consumers based on the percentage of green energy purchased. The forum of regulators would prepare a model regulation on methodology for calculating open access charges for open access consumers in four months from the date of notification of the draft rule. 

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Steel Prices Adversely Affect Solar Mounting Structures and Projects

Prices of mounting structures increased 25% to 28% between March and June 2021 due to higher steel prices

By : Harsh Shukla

Manufacturers of mounting structures for solar modules have been facing a severe shortage in a critical raw material - steel. The price volatility of steel and the disruption in supply have created a challenge for the manufacturers to supply mounting

structures to solar projects on time.

Global steel prices surged in the first four months of 2021. But, producers struggled with supply due to a shortage of iron ore, the raw material used to produce steel.

Mercom spoke to several mounting structure manufacturers to understand

their challenges in procuring the raw material, balancing demand with supply, and meeting deadlines.

Procurement of raw material

According to the data released by the Ministry of Steel, in April 2021, steel exports increased by 121.6%, and



imports declined by 10.7%.

In the first quarter (Q1) of the financial year (FY) 2021-22, the export of steel increased 43.9% compared to Q4 FY 2020-21, and the import declined by 4.5% during the same period.

Harshal Akhouri, Chief Executive Officer at Strolar, said, “Due to the uncertainty in the market, the steel manufacturers have been offering rates with weekly validity to the mounting structure suppliers.”

Mounting structure manufacturers take six to eight weeks to supply structures against an order. The price is decided with solar developers at the time of placing the order. However, steel manufacturers offer the price to mounting structure manufacturers weekly. Since structure manufacturers procure steel in tranches, they have faced losses due to price volatility.

“In addition, the solar project work order does not come with a price escalation clause from the developer. With no backing on price validity from the steel manufacturers, the mounting structure suppliers find it difficult to manage price uncertainties while

procuring steel,” Akhouri said.

Samir Agarwal, Sales Officer, Man Structural, said the government focused on exporting steel to maintain the gross domestic product (GDP), causing a shortage of steel in the domestic market. In addition, fluctuation in the supply of steel and transport delays disrupted supply. “We also have to bear losses in some projects due to the hurdles in procuring raw materials.”

However, a senior executive of a steel manufacturing company said these

***In April 2021,
steel exports
increased
by 121.6%,
and imports
declined by
10.7%***

issues faced by mounting structure manufacturers are things of the past. Currently, there is enough steel production to meet the demand. The steel supply shortage existed until the last month due to a scarcity of iron ore.

Animesh Damani, Managing Partner, Artha Energy Resources, said, “The price of mounting structures increased by 25% to 28% between March and June 2021 as the price of base metal (steel) had risen during the same period. Therefore, the cost of solar projects increased by around 2%, and developers have been forced to reduce their profit margin. However, we did not face any delay in the procurement of mounting structure that forced us to delay any projects beyond scheduled commissioning date or lead to losses.”

Echoing similar thoughts, a senior executive of a multinational renewable energy company said commodities are at an all-time high, and steel prices increased to around ₹96 (-\$1.29)/kilogram from ₹56 (-\$0.76)/kilogram. Consequently, the cost of mounting structures and solar projects increased. There were issues in the procurement of





mounting structures due to the Covid-19 lockdown and unavailability of labor. However, solar developers did not miss the scheduled commissioning date because the government had provided adequate timeline extension to complete projects.

Domestic demand for mounting structures

Despite the Covid-19 and volatility in the global steel prices, the demand for mounting structures is high as the construction of solar projects continues post lockdown.

According to Mercom India Research’s Q1 2021 India Solar Market Update, India added 2,056 MW of solar capacity in the first quarter of 2021, a 37% increase quarter-over-quarter, compared to 1,505 MW installed in the fourth quarter of 2020.

Akhouri said, “The demand for mounting structures is high despite radical changes in the global steel prices. However, the apprehensions regarding the prices have left a dent in the minds of the mounting systems’ suppliers, but this will slowly heal as we move towards a new normal.”

However, Agarwal disagreed with this view and said that the demand is

relatively low due to the pandemic. He said that the higher prices of steel and zinc increased the prices of raw materials by approximately 20-25%, leading to a fall in the overall demand for mounting structures.

A senior executive of a steel manufacturing company said, “The steel demand is higher from mounting structure manufacturers as several solar projects are being constructed simultaneously. In addition, the solar industry has aggressive installation targets due to which the steel demand will remain high.”

Mounting structure manufacturers take six to eight weeks to supply structures against an order

Pricing challenges

The Indian solar market has always been price sensitive. Mounting structure manufacturers are adopting new strategies and business approaches to survive in these unusual times.

Akhouri said the uncertainty in the global steel market added to the woes of domestic mounting structure manufacturers and negatively impacted the financial health of solar project developers. With this, steelmakers also hiked booking amounts by five times. This has affected the availability of working capital for mounting structure manufacturers.

However, a senior executive of a steel manufacturing company said there are no specific challenges for steel companies. Until last month, there was a shortage of steel. However, the market has stabilized, and the industry is expected to come back to normalcy soon.

Mercom recently reported that steel, aluminum, and copper prices had risen in recent months and increased the burden of solar developers. With solar tariffs remaining low in the recent auctions, the pressure on component suppliers remains high. 📌



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Rooftop Solar Market to More Than Triple in Size in Five Years: Interview

Mercom spoke with Ravinder Singh, Chief – Solar Rooftop Business, Tata Power, to discuss the company's plans and his thoughts on the existing policies related to the rooftop solar

The government of India has a bold target of 40 GW by 2022 for rooftop solar installations in the country. However, the cumulative installations as of March 31, 2021, are only about 5.4 GW.

Rooftop solar accounts for around 13% of the cumulative solar installations in India. The segment has a long way to go and needs significant support from the government with innovative financial models and efficiently managed

incentives. But, businesses are realizing the financial and environmental benefits of going solar, and the adoption has been hastened by the COVID-19 pandemic.

Tata Power Solar has been the

leading rooftop solar installer in India. The company emerged as the top solar rooftop installer in India in the calendar year (CY) 2020, according to Mercom's India Solar Market Leaderboard 2021, accounting for 20% of the total rooftop installations in the country.

Mercom spoke with Ravinder Singh, Chief - Solar Rooftop Business, Tata Power, to discuss the company's plans and his thoughts on the existing policies related to the solar sector.

What is the scope for rooftop solar in India for residential and C&I segments, and what is Tata Power's focus and why?

The rooftop solar segment in India is significantly underpenetrated, and there is huge growth potential. This growth potential is due to the compelling economics (on-site generation through rooftop solar is the cheapest source of power) of rooftop solar and the increasing consumer awareness of rooftop solar and its impact on the environment. Over the next five years, we expect the rooftop solar market to more than triple in size from its current

installed base.

At Tata Power, our focus is on commercial and industrial (C&I), including Small and Medium Enterprises (SME) and residential segments. While so far, the growth in the rooftop solar segment has been driven by the C&I segment, in terms of the sheer size of the opportunity, both the residential and SME are extremely attractive. Towards that end, we are focused on significantly ramping up our 'on-ground presence through a mix of channel partners as well as our own sales team and investing heavily in digitization to improve the overall customer experience.

What is Tata Power's stand on the net metering cap of 500 kW for rooftop solar installations down from the earlier 1 MW, and how does it impact business, particularly for the C&I clientele seeking ways to cut costs and generate green power?

Lowering the net metering cap from 1 MW to 500 kW is not ideal. Nevertheless, it is welcome as in the earlier government directive, it was proposed that net metering be done

away totally for all segments other than the residential segment. This revised net metering cap of 500 kW would enable SMEs and other institutional customers that do not have round-the-clock power requirements to adopt rooftop solar and make their economics even more attractive.

We do not believe that this downward revision of the net metering cap from 1 MW to 500 kW would impact the larger C&I customers as their power demand is typically much more significant than 1 MW and is mainly round the clock.

For the medium-sized C&I customers, in the immediate term, -15-20% of the demand could be impacted by this revision in the net metering cap. However, once customers accept this new reality in the short term, we expect them to continue to adopt rooftop solar, albeit with a smaller capacity sized to match their minimum load demand. In the medium-to-long term, with the cost of energy storage coming down, we expect almost all such customers to adopt solar rooftops with energy storage.





How is Tata Power managing the rising cost of installations (modules, cells, panels, mounting structures) and staying competitive?

The rising installation costs are an ‘industry’ issue and not something specific to Tata Power. However, given our volumes (including utility-scale solar, microgrids, and pumps), where we are on an average sourcing -3-3.5 GW+ of solar components, we are in a somewhat better position than smaller players and are thus able to negotiate better prices from the suppliers and minimize the price impact for our customers.

Is rooftop demand back after COVID-19 after disruptions?

The ongoing pandemic has disrupted almost all sectors, and the solar industry is no different. The pandemic affected the sector greatly, with the sales and service teams unable to move about and visit the existing or potential customers.

However, we see early signs of revival and are getting the sense that there is

a lot of pent-up demand in the market. Our current order book and pipeline are significantly greater than what it was even before the advent of pandemic last year.

Tata Power is also financing solar systems. Can you elaborate on the various financing programs for residential and C&I clients?

Easy, quick, and attractive financing with flexible tenors is the key to unlocking rooftop solar potential. We believe that financing would have a force multiplier effect on the growth of the rooftop solar segment. As the market leader, Tata Power has tied up with various financing entities (both banks and NBFCs) to offer a variety of financing products to meet the needs of residential and C&I clients. These offerings include non-collateral financing, lease finance, and pure vanilla EMI options through our various partners. Our sales team works closely with our financing partners to make the entire loan approval process as

convenient and hassle-free as possible for our clients. In the future, we plan to develop specific financing products tailored to meet rooftop customers’ needs.

What policy changes would you like to see to help rooftop solar flourish? Is there anything else that can boost rooftop solar installations?

Rooftop solar is the most cost-effective way of generating power at the point of consumption. It will be a shame if its latent potential is not tapped fully due to policy-related constraints/barriers. We believe that there is an obvious need for the industry to work with all stakeholders, including electricity distribution companies and regulators, to device policies that are a ‘win-win’ for all stakeholders. Lastly, more than anything, this sector needs policy stability. Frequent policy flip-flops are not suitable for the overall health as well as the growth of the sector. 



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Solar Developers Find Bidding Below ₹2.50/kWh Difficult

In auctions of solar projects since ALMM has been applicable, over 70% of bidders quoted tariffs over ₹2.50 (~\$0.034)/kWh

By : Harsh Shukla



Solar developers are finding it challenging to execute solar projects with a tariff lower than ₹2.50 (-\$0.034)/kWh with the Approved List of Models and Manufacturers (ALMM) restrictions.

According to the developers, the prices of domestic modules - procured from manufacturers enlisted in ALMM - are 20% higher than Chinese modules. This has increased the overall cost of solar projects.

In October 2018, the Ministry of New and Renewable Energy (MNRE) introduced a rule requiring solar cell and module manufacturers to register under ALMM to supply to the projects tendered by government agencies.

On March 10, 2021, the ministry released the first list of module manufacturers registered under ALMM. For tenders issued after April 10, 2021, it was mandated that bidders must procure modules only from manufacturers enlisted under ALMM.

Currently, there are no foreign solar manufacturers on the ALMM list. Many foreign manufacturers have paid the inspection fee, but the government inspection teams have not made any factory visits abroad due to the Covid-19 pandemic.

Most bids are over ₹2.50 (-\$0.034)/kWh

In auctions of solar projects since ALMM has been applicable, most of the bidders (more than 70%) have quoted tariffs over the ₹2.50 (-\$0.034)/kWh threshold. Only a few winning bidders with access to either foreign funds or

low-cost debt have quoted aggressively.

In the recently concluded Maharashtra State Electricity Distribution Company Limited's 500 MW solar auction, only three bidders quoted tariffs below ₹2.50 (-\$0.034)/kWh. Of this, ACME Solar Holdings and ReNew Solar Power won 300 MW quoting ₹2.42 (-\$0.032)/kWh and 200 MW quoting ₹2.43 (-\$0.033)/kWh, respectively. In contrast, eight bidders quoted between ₹2.51 (0.0337)/kWh and ₹2.95 (-\$0.0396)/kWh.

With ALMM in place, developers are forced to procure comparatively expensive domestic modules

Similarly, only three bidders out of 13 quoted tariffs below ₹2.50 (-\$0.034)/kWh in the Rewa Ultra Mega Solar Limited's (RUMSL) 550 MW solar auction. Of this, Avaada Energy won a capacity of 200 MW, quoting ₹2.459 (-\$0.033)/kWh, and O2 Power won 350 MW, quoting ₹2.444 (-\$0.032)/kWh.

Ten bidders quoted a price over ₹2.50 (-\$0.034)/kWh, with the highest being ₹3.64 (-\$0.049)/kWh.

In RUMSL's auction for 450 MW of solar projects at the Shajapur Solar Park in Madhya Pradesh, NTPC Renewables won a capacity of 105 MW quoting ₹2.35 (-\$0.0316)/kWh, and also a capacity of 220 MW quoting ₹2.33 (-\$0.0313)/kWh. Talettutayi Solar Projects Nine (SolarArise) won a capacity of 125 MW quoting ₹2.339 (-\$0.0314)/kWh. In this auction, only four bidders quoted a tariff below ₹2.50 (-\$0.034)/kWh, while nine bidders quoted a price over ₹2.50 (-\$0.034)/kWh. The highest bid was ₹3.45 (-\$0.046)/kWh.

Domestic modules are comparatively expensive

Commenting on the auction, a senior executive of a Pune-based solar energy company said that solar projects at such low tariffs seem to be financially unviable. Due to the ALMM order, developers are forced to procure modules from the domestic market that are around 25% more expensive than imports. "We also don't know if international companies would be enlisted or not under ALMM, and even if these companies are enlisted, the basic customs duty (BCD) of 40% would be enforced on these imported modules from April 2022."

"In recent auctions, state-owned companies like NTPC and SJVN and a few private developers bid aggressively because they have lower return expectations compared to the majority of the private developers," he said.

Majority of the Bids are Over ₹2.50 (~\$0.034)/kWh in the Auctions after the Announcement of ALMM

Tender Details	Capacity (MW)	Lowest Tariff Quoted by Winning Bidders		Total Bids (Nos.)	Bidders who quoted less than ₹2.50/kWh (Nos.)	Bidders who quoted more than ₹2.50/kWh (Nos.)	Bidders who quoted more than ₹2.50/kWh of the total Bids (%)
		(₹/kWh)	(~\$/kWh)				
MSEDCL Phase VI Solar	500	2.42	0.033	11	3	8	73%
RUMSL, Agar Solar Park	550	2.444	0.033	13	3	10	77%
RUMSL, Shajapur Solar Park	450	2.33	0.031	13	4	9	69%

Note: \$1 = ₹74.32

Source: Mercom India Research



According to Mercom's Q1 2021 India Solar Market Update, the cost of domestic solar modules was 15-20% higher than modules procured from China in Q1 2021.

A deputy general manager of a Bangalore-based solar energy company said that project costs and solar tariffs would increase because of ALMM. For solar developers, it is financially unviable to execute projects at such a low tariff, as seen in recent bids. The impact of ALMM would depend on the supply and demand of solar modules as domestic manufacturers do not have enough module manufacturing capacity.

However, Ajay Kumar, Senior Engineer at SJVN Limited, believes that solar projects are viable at a tariff below ₹2.50 (-\$0.034)/kWh despite ALMM. "The company's funding and credit rating play an important role in solar projects as companies like SJVN can arrange debt at 6-6.5% interest rates from the market. This can improve the financial viability of solar projects. To reduce the cost of projects despite an increase in module costs, solar developers are using modules with

increased capacity that reduce land requirements, artificial intelligence, and high-quality trackers."

"Solar developers can also optimize operation and maintenance (O&M) costs through short-term contracts and engaging smaller companies for O&M services," he said.

An executive at a foreign investment-backed renewable energy platform

Only a few winning bidders with access to either foreign funds or low-cost debt have quoted aggressively

said several solar developers quoted tariffs around ₹2.50 (-\$0.034)/kWh, which suggests that solar projects are financially feasible at that tariff. "We secured solar capacity with a tariff below ₹2.50 (-\$0.034)/kWh. However, we do not like to reveal the reason behind quoting that tariff as a part of our business strategy."

Signing power sale agreements has been a formidable task for implementing agencies like the Solar Energy Corporation of India and other state agencies. Higher tariffs have mostly been the primary reason for the cancellation of auctions and power purchase agreements in the past. With the ALMM restrictions, tariffs are bound to go up in the short term unless bids are won by a state-owned company or a prominent developer with access to cheaper foreign debt. For all others, it is becoming increasingly challenging to win large-scale solar auctions.

If the intention was to close the procurement window between the safeguard duty expiration and the BCD start date, the goal has been achieved but at a cost. ☹

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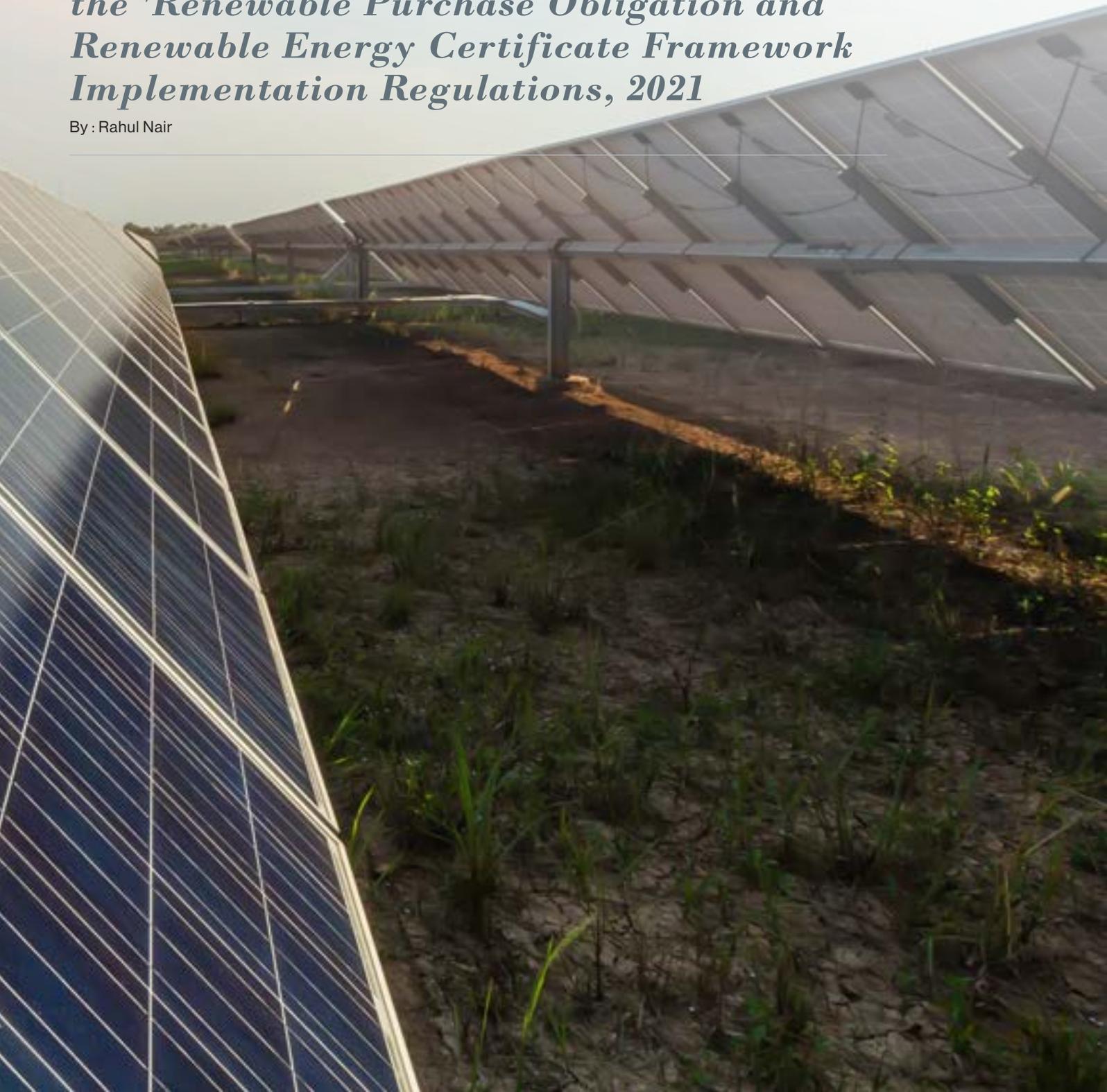
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Delhi Gets New Renewable Purchase Obligation Rules

Delhi Electricity Regulator has announced the 'Renewable Purchase Obligation and Renewable Energy Certificate Framework Implementation Regulations, 2021

By : Rahul Nair





The Delhi Electricity Regulatory Commission has announced the 'Renewable Purchase Obligation (RPO) and Renewable Energy Certificate Framework Implementation Regulations, 2021.' The regulations are effective from April 13, 2021.

The rules govern obligated entities mandated to fulfil their renewable purchase obligation (RPO), which includes distribution licensee (DISCOMs), captive user, open access consumer, or any other entity in the National Capital Territory (NCT) of Delhi.

Renewable Purchase Obligation (RPO)

Every obligated entity must purchase electricity from renewable energy sources to fulfill the defined minimum percentage of the total consumption during the year, under the RPO, as specified below:

The targets specified for obligated entities for the financial year (FY) 2022-23 will be continued beyond FY 2022-23 unless specified by the Commission separately. The obligated entity has to comply with its RPO targets separately for solar and non-solar.

The RPO is inclusive of the purchases from renewable energy sources already developed by the obligated entity. On achieving the solar RPO compliance up to 85% and above, the remaining can be met by excess non-solar energy or non-solar renewable energy certificates (REC) procured beyond that year's non-solar RPO.

On achieving other non-solar RPO compliance up to 85% and above, the shortfall can be met by excess solar energy or solar REC or eligible hydro energy purchased beyond the solar RPO

or Hydro Purchase Obligation (HPO) for that year.

Meanwhile, HPO benefits may be met from the power procured from eligible large hydropower projects above 25 MW capacity. DISCOMs can utilize the 'Hydro Energy Certificates' to meet their HPO

DISCOMs can procure 100% power generated from all the waste-to-energy plants in Delhi

compliance. Hydropower imported from outside India would not be.

On achieving HPO compliance up to 85% and above, the shortfall can be met by excess solar or other non-solar energy consumed beyond the specified solar RPO or other non-solar RPO for that year.

Other Conditions

Power purchase from the renewable energy-based generating station registered for issuing REC under the CERC (Terms and Conditions for recognition and issuance of Renewable Energy Certificate for Renewable Energy Generation) Regulations 2010 will not qualify for the obligated entities' RPO.

Electricity generated by net metering consumers qualifies towards RPO compliance for the DISCOMs in the area.

DISCOMs can procure 100% power

generated from all the waste-to-energy plants in Delhi in the ratio of their power procurement from all sources or as approved by the Commission.

Renewable energy procured by the obligated entity from renewable energy generating stations bundled with coal or lignite generating stations would be considered towards RPO compliance to the extent of the power procured from such renewable energy generating station.

DISCOMs will have to submit quarterly progress reports to the Commission and RPO compliance status of open access consumers and captive users. They have to upload the progress report on the website on capacity addition, generation, and electricity purchase from renewable energy sources and purchase of RECs.

Nodal Agency

The state nodal agency would regularly develop protocols to collect information from various sources such as renewable energy generating companies, obligated entities, and state load despatch center (SLDC) and compute the RPO compliance target of the obligated entities.

It would also publish a monthly statement of renewable energy procurement and RPO compliance by the obligated entities on a cumulative basis by the 25th day of the next month on its website, along with a quarterly progress report.

Open Access Consumers

All open access consumers receiving electricity from renewable energy sources are exempted from the wheeling, transmission, cross-subsidy surcharge, and additional surcharge to the extent of the RPO compliance.

Generators using renewable energy sources will provide a certificate to obligated entities that no REC or RPO claim for the power has been made. The extent of RPO compliance only for computation of open access charges must be calculated for non-obligated open access consumers.

Open access consumers must submit details of the consumption of electricity and renewable energy purchase for the fulfilment of RPO every year to

DERC: RPO Targets for Obligated Entities

Particulars		FY 2020-21	FY 2021-22	FY 2022-23
Non-Solar	Other Non-Solar RPO	10.25%	10.25%	10.50%
	HPO (applicable only for Distribution Licensees)	-	0.18%	0.35%
Solar	-	7.25%	8.75%	10.50%
Total		17.50%	19.18%	21.35%

Source: DERC

Mercom India Research



the DISCOM within 15 days from the notification of these regulations.

DISCOMs must consider the projections submitted by the open access consumer to compute the value of bank guarantee or fixed deposit receipt for the financial year.

The open access consumer must submit a bank guarantee or fixed deposit receipt to DISCOMs before the compliance report for completion of metering formalities is issued. The bank guarantee or fixed deposit receipt must be valid up to three months from the completion of the financial year.

Open access consumers must submit the details of the RPO compliance for reconciliation to the DISCOMs of their area within two months from the completion of the financial year.

In case of partial or non-fulfilment of RPO of the open access consumer, DISCOM would encash the bank guarantee or fixed deposit receipt for the amount equal to shortfall units towards the RPO target.

DISCOMs would pay an interest of 1% per month for the delayed period on the amount of bank guarantee or fixed deposit receipt to be released.

DISCOMs must purchase RECs within 30 days of receiving the reconciled

statements from open access consumers from the amount realized from encashing bank guarantee or fixed deposit receipt. The balance, if any, is realized through the bill of open access consumer.

Captive Users

Captive users must submit the details of electricity consumption from the captive generating project and purchase of energy from renewable sources

On achieving the solar RPO target up to 85% and above, the remaining can be met by excess non-solar energy

for RPO fulfillment every year within 15 days from the notification of these

regulations.

DISCOMs must consider the projections submitted by the captive user to compute the bank guarantee or fixed deposit receipt for the relevant financial year.

DISCOMs

The cost incurred by the DISCOMs to meet their RPO target would not be allowed to be recovered in aggregate revenue requirement (ARR). After physical power procurement, the DISCOMs may be allowed the REC cost at a floor price if they are short of units to meet the RPO target.

However, if the floor price is zero, the REC cost may be allowed at an average of the floor price and forbearance price, as determined by CERC, for such shortfall of units which will be adjusted subsequently.

DISCOMs must submit the details of electricity sales of the consumers in their area and energy purchase from renewable sources to fulfill their RPO on an annual basis within three months from the completion of the financial year to the state nodal agency and the Commission.

RPO compliance is allowed through bank guarantee or fixed deposit receipt



for other obligated entities in their respective supply area on an annual basis within three months from the completion of the financial year to the state nodal agency and the Commission.

Treatment of surplus shortfall of RPO Compliance

In case of genuine difficulty in complying with the RPO targets due to non-availability of RECs or delay in commissioning of tied-up renewable power projects, the obligated entity can file a petition before the Commission to carry forward the RPO in subsequent years.

Renewable Energy Pricing

A renewable energy project can adopt either the tariff pricing structure or the REC mechanism for pricing the electricity generated from the project. The projects opting for a tariff must continue with the same tariff pricing structure until the power purchase agreement (PPA) period.

Renewable energy projects can exercise their choice to select an appropriate pricing mechanism before executing the PPA with the DISCOM or

Renewable energy open access consumers are exempt from wheeling, transmission, cross-subsidy, and additional surcharge

with an open access consumer.

Penalty for Non-Compliance

Non-compliance of the RPO, other than HPO targets, by an obligated entity, will attract penalty at the rate of 10% of the weighted average floor price of solar and non-solar REC, specified by the Central Electricity Regulatory Commission (CERC) for the year, for the quantum of shortfall in RPO.

If the floor price specified by CERC is zero for the year, then the penalty will be levied at 10% of the weighted average forbearance price of solar and non-solar renewable energy for the quantum of shortfall in RPO.

The penalty imposed on the DISCOM due to non-compliance of RPO targets

would be reduced from the ARR during the true-up of the financial year. The penalty levied on obligated open access consumers will be computed for the relevant year by the state nodal agency and communicated to DISCOMs.

The DISCOMs will bill such penal amount in the electricity bill of the open access consumers. The state nodal agency will compute the penalty levied on the remaining obligated entities for the year. The recovery mechanism will be dealt with by the Commission on a case-to-case basis.

Earlier, instead of penalizing the defaulters, the DERC would allow DISCOMs to carry the shortfall forward to the next year. As a result, the exemption did not include a penalty. ☺



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1,000% YoY Spike in Q2 2021 Solar Imports

In a first big sign of market recovery and demand bounce back since COVID-19 shut down the markets at the end of March 2020, solar imports and exports surged

By : Rahul Nair



Imports of solar cells and modules surged by a staggering 1,000% in the second quarter (Q2) of the calendar year (CY) 2021, totaling \$762 million (-₹56.6 billion) as compared to \$69 million (-₹5.25 billion) during the same period last year which was severely affected by COVID-19.

Quarter-over-quarter (QoQ), Indian solar imports rose by 194% in Q2 2021 compared to \$259.5 million (-₹18.9 billion) in Q1 2021.

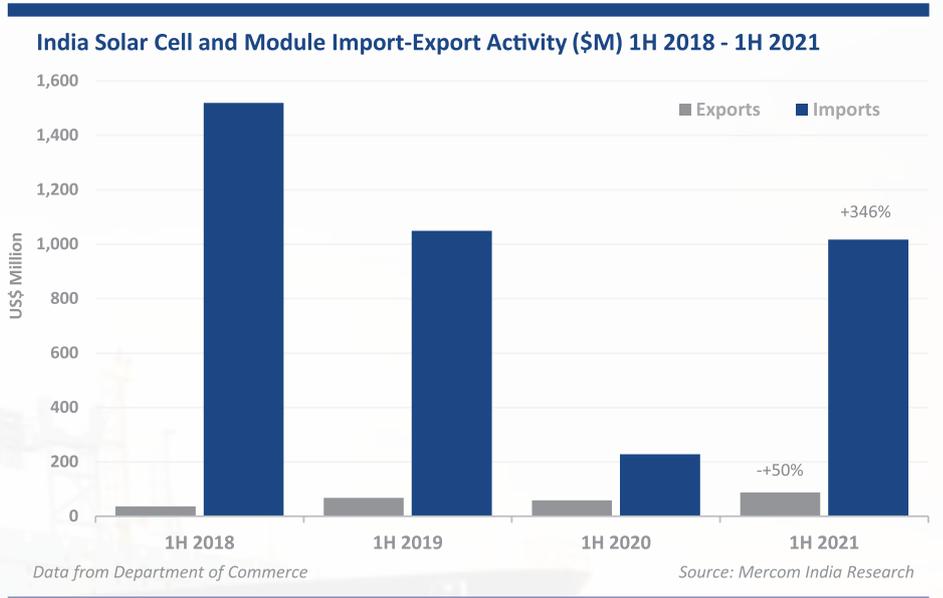
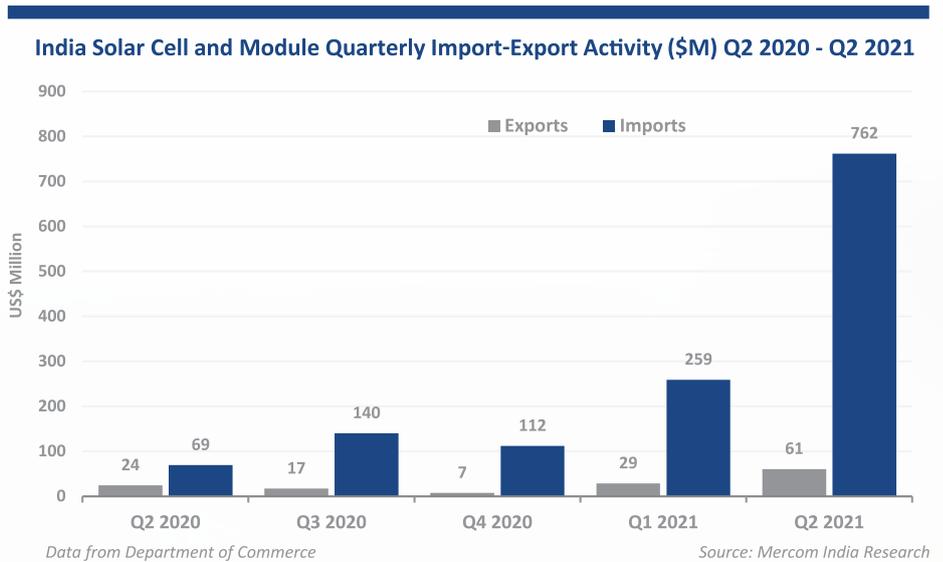
Similarly, solar exports also rose by 151% to \$61 million (-₹4.4 billion) year-over-year (YoY) in Q2 2021, compared to \$24 million (-₹1.8 billion) during the same period last year. Exports surged 113% compared to \$29 million (-₹2.08 billion) in Q1 2021.

Imports soared 346% in the first half (1H) of 2021

This is the first big sign of market recovery and demand bounce back since COVID-19 shut down the markets at the end of March 2020. After the lockdown was announced on March 25th last year, solar construction activity was muted, and solar installations were down to just 3.2 GW in the calendar year 2020.

Activity has picked up this year, and the lockdowns were more targeted and managed by states resulting in a lot less disruption in construction and development activity.

Despite higher component costs and



shortages, Imports soared 346% in the first half (1H) of 2021 compared to the 1H 2020, while exports rose by 50% compared to the same period last year. However, compared to pre-pandemic activity in 2019, imports were slightly

lower. Exports, on the other hand, were up by 30%.

The effect of ALMM on imports is expected to show up in the second half of the year. 📌



Indian Researchers Develop a Dendrite-Free Zinc-Iron Redox-Flow Battery

Availability and low costs make zinc a viable option to commercialize the production of redox-flow batteries

By : Arjun Joshi

The widespread deployment of renewable energies such as wind and solar has increased the demand for energy storage. Redox-flow batteries are scalable energy-storage devices that

are one of the most promising scalable electricity-storage systems to address the intermittency issues of renewable energy sources.

Researchers from the P.G. and Research Department of Chemistry

at Christ College in Kerala, India, have claimed to have developed a dendrite-free zinc-iron redox flow battery. The paper, titled "A Dendrite Free Zn-Fe Hybrid Redox Flow Battery for Renewable Energy Storage", was

published in the Energy Storage journal.

Previously, redox-flow batteries have used materials like vanadium, copper, iron, and lead. According to the researchers, none of these were suitable for commercialization due to factors such as high costs, toxicity, low energy efficiency, low cell voltage, hydrogen evolution, and coulombic loss, to name a few.

Researchers have now come up with a dendrite-free zinc-iron redox-flow battery. The abundance and relatively lower costs make zinc a viable option to commercialize the production of redox flow batteries.

The researchers fabricated a novel zinc-iron hybrid redox flow battery (Zn/Fe hybrid RFB), in which Zn/Zn(II) redox acted as the negative redox material and Fe(II)/Fe(III) redox as the positive redox material. A self-made anion exchange membrane separated the two redox couples. Densified graphite sheets were used for the electrodes; cell housings were made of acrylic sheets. Researchers stated that zinc

and iron are advantageous elements for energy storage due to their low cost and abundance. Due to its rapid kinetics, ferric/ferrous chloride redox pair, used in various flow battery systems, is promising as active material on the battery's positive side.

The battery supposedly delivered an

The researchers achieved homogenous zinc coatings with no dendrite growth on zinc electrodes

average discharge voltage of 1.34V at 25 mA cm⁻² approximately, with a high average coulombic efficiency of 92%, voltage efficiency of 85%, and energy efficiency of 78.2% over 30 cycles at 298 Kelvin.

According to the researchers, this version of a zinc-iron hybrid redox flow battery is notable because it overcame serious drawbacks that many previous iterations of zinc-based redox flow batteries had reported by achieving homogenous zinc coatings and no dendrite growth on zinc electrodes after repeated galvanostatic charge and discharge cycles.

Previously, researchers at TU Graz University claimed that they had developed a redox flow battery that utilizes conventional vanillin instead of liquid electrolyte, making the battery more environmentally friendly.

Researchers at Friedrich Schiller University said that they had developed a new polymer electrolyte for redox flow batteries that enhances its efficiency and heat-resistance capacity. 🍌

Benchmark Costs for Rooftop Solar & Off-grid Systems

MNRE has increased the benchmark costs for FY 2022, applicable to all rooftop solar projects awarded after August 28, 2021

By : Rahul Nair







The Ministry of New and Renewable Energy (MNRE) has issued benchmark costs for grid-connected rooftop solar photovoltaic (PV) systems for the financial year (FY) 2021-22.

The benchmark cost for FY 2021-22 is applicable for all projects to be awarded and for empanelment of vendors by state implementing agencies under phase-II of the MNRE's rooftop solar program after ten days from the notification, i.e., August 28, 2021.

The benchmark cost covers solar photovoltaic (PV) modules (with domestic cells and modules) and inverter (single/3 phase).

These benchmark costs are important as the applicable subsidies for residential rooftop solar systems announced by MNRE will be calculated based on the benchmark costs determined for the specific years or the lowest cost quoted in a tender, whichever is lower.

It also includes the balance of system such as cable, switches, circuit breaker, connector, junction box, mounting structure, earthing, lightning arrester, civil works, installation and commissioning, comprehensive maintenance contract for five years, transportation, insurance, and taxes.

However, the benchmark costs exclude net metering costs and battery backup costs.

Benchmark costs for rooftop solar projects in states other than special category states for system capacities of 10 kW-100 kW is ₹41.64 (-\$0.56)/W.

MNRE: Benchmark Cost for Standalone Solar Pumps for FY 2021-22

Pump Capacity	Universal Solar Pump Controller (USPC)	Benchmark Cost			
		General Category States		Northeastern region/hilly states/islands/union territories	
		(₹/HP)	(\$/HP)	(₹/HP)	(\$/HP)
1 HP	Without USPC	105,500	1418.58	114,900	1544.98
2 HP	Without USPC	134,700	1811.21	146,800	1973.91
3 HP	Without USPC	181,100	2435.12	197,300	2652.95
	With USPC	217,300	2921.88	236,800	3184.08
5 HP	Without USPC	255,500	3435.53	278,400	3743.44
	With USPC	306,600	4122.63	334,100	4492.40
7.5 HP	Without USPC	56,000	752.99	387,000	5203.71
	With USPC	408,300	5490.12	445,000	5983.60
10 HP	Without USPC	444,200	5972.84	484,100	6509.35
	With USPC	510,800	6868.36	556,700	7485.55

Source: MNRE

Mercom India Research

The benchmark costs will apply to all the implementing agencies developing projects awarded under the off-grid and decentralized solar systems.

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

Capacity	Benchmark Cost for States Other Than Special Category States					Benchmark Cost for Special Category States including North Eastern States, Uttarakhand, Himachal Pradesh, J&K and UTs of Andaman & Nicobar Island and Lakshadweep				
	2021-22		2020-21		% of variation	2021-22		2020-21		% of variation
	₹/W	\$/W	₹/W	\$/W		₹/W	\$/W	₹/W	\$/W	
1 kW	51.1	0.69	47	0.63	8.7%	56.12	0.76	52	0.70	7.9%
Above 1 kW to 2 kW	46.98	0.63	43	0.58	9.3%	51.67	0.70	47	0.63	9.9%
Above 2 kW to 3 kW	45.76	0.62	42	0.57	9.0%	50.33	0.68	46	0.62	9.4%
Above 3 kW and Upto 10 kW	44.64	0.60	41	0.55	8.9%	49.1	0.66	45	0.61	9.1%
Above 10 kW and Upto 100 kW	41.64	0.56	38	0.51	9.6%	45.8	0.62	42	0.57	9.0%
Above 100 kW and Upto 500 kW	39.08	0.53	36	0.49	8.6%	42.98	0.58	40	0.54	7.4%

Source: MNRE

Mercom India Research

This is an increase of 9.6% compared to the benchmark costs determined in FY 2020-21.

Benchmark costs have also been raised for special category states (Northeastern States, Uttarakhand, Himachal Pradesh, Jammu and Kashmir, and the Union Territories of Andaman and Nicobar). The MNRE set the cost for system capacities of 1kW to 2kW at ₹51.67 (-\$0.70)/W, a 9.9% increase over the benchmark costs set in the previous year.

In FY 2020-21, for systems between 10-100 kW, the benchmark costs had been reduced to ₹38 (-\$0.51)/W from the ₹48 (-\$0.70)/W in the previous year. The cost for system capacities of 100-500 kW was lowered by 20% when compared to the preceding year's cost of ₹45 (-\$0.66)/W.

The government has been keeping a close watch on the market movement and the rise in cost of components and commodities, which is reflected in its move to increase the benchmark costs this year.

Benchmark cost for off-grid solar systems

The MNRE also notified new benchmark costs for off-grid solar photovoltaic (PV) systems and decentralized solar PV systems for the financial year (FY) 2021-22.

The benchmark costs are applicable from August 18, 2021.

The benchmark costs are applicable in all cases where the letter of award (LoA) is issued post this order. If multiple LoAs are issued under the same program, the benchmark cost will apply from the first LoA.

The benchmark costs include the

MNRE: Benchmark Cost for Solar Lighting Systems FY 2021-22

System	Benchmark Cost	
	(₹/System)	(\$/System)
Solar Study Lamps*	395	5.3
Solar Street Lights** (with Li batteries)	14,200	191.1

* Solar study lamp with 2.5 Wp solar panel, 1 W LED luminaire and 3.2 V mAh Li Battery as per MNRE specification

** Solar street lights with 75 Wp solar panel, 12 W LED Luminaire and 12.8 V- 30 Ah Li battery as per MNRE specification

Source: MNRE

Mercom India Research

total system and installation, commissioning, transportation, insurance, five-year annual maintenance contract, and comprehensive maintenance contract.

Solarization of Grid-Connected Agriculture Pumps for FY 2021-22

Capacity	Benchmark Cost	
	(₹/W)	(\$/W)
Above 1 kW and Upto 3 kW	48.3	0.65
Above 3 kW and Upto 6 kW	47.1	0.63
Above 6 kW and Upto 10 kW	44.3	0.60
Above 10 kW and Upto 15 kW	41	0.55

Source: MNRE

Mercom India Research

The table below shows the benchmark cost per horsepower (HP) for standalone solar pumps in the general category states and northeastern region, hilly states, islands, and union territories (UT). The pump capacity ranges from 1 HP to 10 HP.

The new benchmark cost for solar study lamps is ₹395 (-\$5.3)/system in general category states, northeastern and hilly states, islands, and Union Territories (UTs).

The benchmark cost for solar street lights (with lithium batteries) is ₹14,200 (-\$191)/system in general category states, northeastern and hilly states, islands, and UTs.

With a battery backup of six hours, the new benchmark cost for standalone solar systems/packs up to 10 kW (general

Benchmark costs exclude net metering costs and battery backup costs.

category states) is ₹94 (-\$1.3)/W. For capacities above 10 kW and up to 25 kW (general category states), the benchmark cost is ₹84 (-\$1.1)/W with a six-hour battery backup.

In the northeastern states, hilly states, islands, and UTs, the benchmark cost for projects up to 10 kW with a battery backup of six hours is ₹103 (-\$1.4)/W. For capacities above 10 kW and up to 25 kW, the MNRE's new benchmark cost is ₹92 (-\$1.3)/W.

The new benchmark cost for solarization of grid-connected agriculture pumps applies to general category states, northeastern and hilly states, islands, and UTs. The capacities are divided into four sub-groups - 1 kW to 3 kW; 3 kW to 6 kW; 6 kW to 10 kW; and 10 kW to 15 kW. 📍

MNRE: Benchmark Costs for Standalone Solar Systems/Packs for FY 2021-22

Capacity	Battery back-up (hrs)	Benchmark Costs			
		General Category States		Northeastern region/hilly states/islands/union territories	
		(₹/W)	(\$/W)	(₹/W)	(\$/W)
Upto 10 kW	6	94	1.3	103	1.4
	3	74	1.0	81	1.1
	1	62	0.8	68	0.9
Above 10 kW and Upto 25 kW	6	84	1.1	92	1.2
	3	66	0.9	72	1.0
	1	55	0.7	60	0.8

Source: MNRE

Mercom India Research

India Added 4.6 GW of New Solar Capacity in 1H 2021

Mercom India Research's latest report, Q2 2021 India Solar Market Update, reveals solar capacity additions in the first half of 2021 increased by 251% compared to the same period last year

By : Rakesh Ranjan Parashar







The second quarter (Q2) of the calendar year (CY) 2021 brought some good news for the solar sector, with India adding 2,488 MW of solar capacity, an increase of 19% quarter-over-quarter (QoQ) compared to 2,090 MW installed in Q1 2021. The figures were revealed in Mercom India Research's latest report, Q2 2021 India Solar Market Update.

Solar installations were up by 1,114% year-over-year (YoY) compared to 205 MW added in Q2 2020. Installations in Q2 2020 were adversely affected by the Covid-19 pandemic. The capacity additions in Q2 2021 were the highest in a quarter since Q2 2018.

The report revealed that the cumulative solar installations at the end of Q2, 2021 reached 43.6 GW.

In the first half (1H) of 2021, India added 4,578 MW of solar capacity, growing 251% over the same period last year, surpassing installations in all of 2020.

The report states that installations increased despite the second wave of the Covid-19 pandemic and the lockdown imposed by various states during 1H. The growth was attributed to targeted lockdowns this year, enabling the solar industry to better deal with the

contingencies.

“Even with a strong quarter, the industry continues to battle uncertainties around higher component costs and logistical issues. With duties and import restrictions, purchasing quality solar components at the best price will be the biggest challenge for the industry going forward as solar system costs ticked up for the fourth quarter in a row,” said Raj Prabhu, CEO of Mercom Capital Group. “The demand for building large-scale projects is extremely high, while auctions have slowed down. The government focus has shifted towards building domestic manufacturing capacities.”

The report forecasts solar installations in the range of 8-9 GW

The capacity additions in Q2 2021 were the highest in a quarter since Q2 2018

in the calendar year (CY) 2021, as the industry fared much better during the second wave of the Covid-19 pandemic. The report provides detailed analyses and forecasts for the best, medium, and worst-case scenarios.

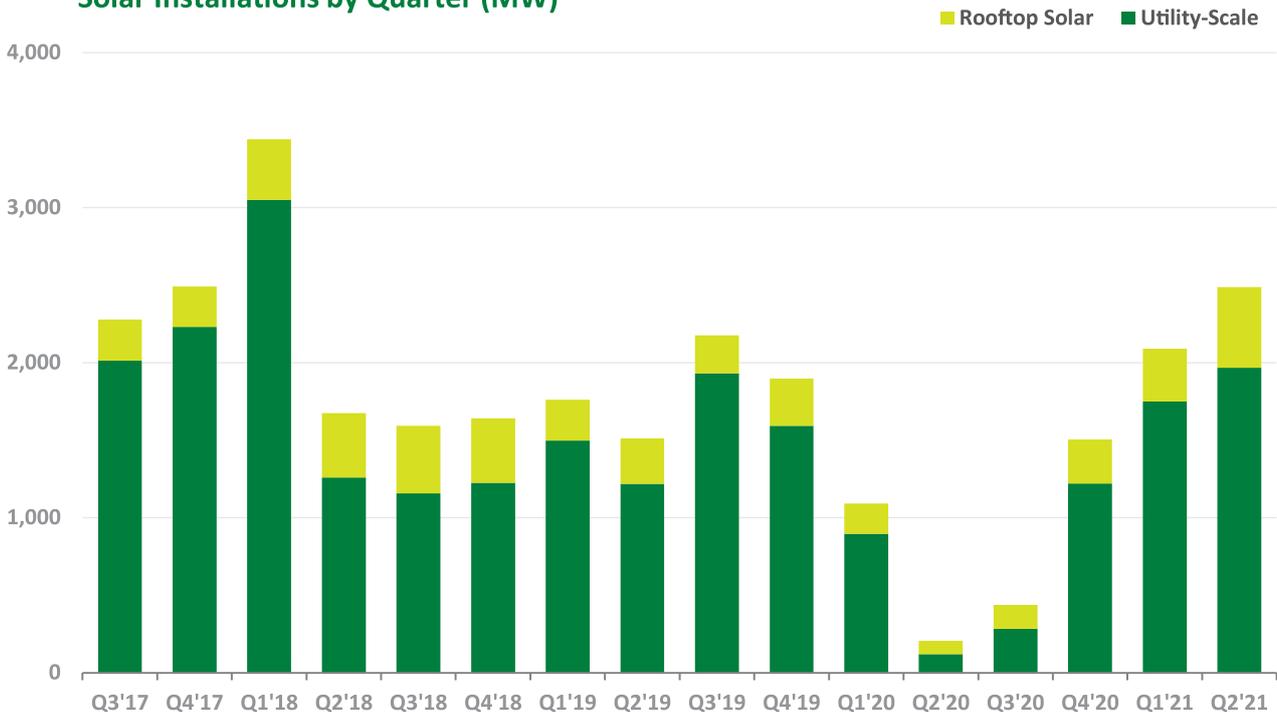
The report states that the average selling prices of solar modules have risen for the fifth quarter in a row, and this trend would continue for another couple of quarters. Similarly, freight charges are also moving up, showing no signs of recovery in the short term.

Over the last six months, the rising price trends in commodities, including steel, aluminum, and copper, have started to take a toll on solar developers. In addition, the spike in steel prices has exacerbated the situation for engineering, procurement, and construction players and module manufacturers in the solar space.

According to the report, the large-scale solar project development pipeline stood at 52.8 GW, with 28 GW of projects tendered and pending auction at the end of Q2 2021.

Gujarat and Rajasthan were the top two states in installations, followed closely by Uttar Pradesh and Andhra Pradesh. The top ten states accounted for 95% of the total installations during

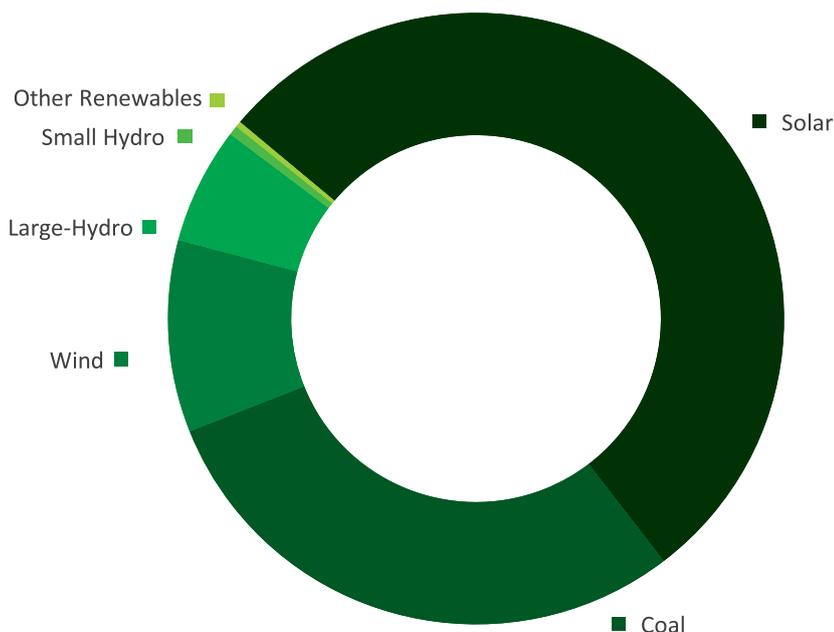
Solar Installations by Quarter (MW)



Source: Mercom India Research (Jun 2021)



New Installed Power Capacity Additions in India in 1H 2021



Source: Mercom India Research

Cumulative solar installations at the end of Q2 2021 reached 43.6 GW

the quarter.

“Although the component costs continue to rise, bids have fallen recently, bucking the trend as developers are taking a win-at-all-costs approach as new projects are not being auctioned at the required pace for the developers to sustain their operations,” added Prabhu.

The report also adds that the new solar capacity additions in 1H 2021 were the highest ever for any year at 53% of the total power capacity additions. Renewables, including solar, wind, and hydro, made up 71% of total capacity additions in 1H 2021. ☺

Industry News and Policy Briefs

Sterling and Wilson International Solar FZCO (SWFZCO) has fully acquired the equity share capital of **Sterling and Wilson Middle East Solar Energy (SWME Solar)**. SWFZCO, a 100% subsidiary of Sterling and Wilson Solar, the solar engineering and construction arm of the Shapoorji Pallonji Group, increased its shareholding in SWME Solar from 147 fully paid equity shares of AED 1,000 (-\$272), representing 49%, to 300 fully paid-up equity shares representing 100% of the shareholding.



The **Solar Energy Corporation of India** paid ₹6.6 billion (-\$89.3 million) to solar and wind developers for the power it purchased in July 2021, according to data released by the nodal agency. The disbursement accounted for 94.5% of the total amount disbursed by the agency in July 2021.

Pune-based renewable energy solutions provider **Suzlon Energy Limited** announced the results for the first quarter (Q1) of the financial year (FY) 2022. As per its financial statement, the company reported net revenue of ₹11.35 billion (-\$152.87 million), an increase of 122% compared to ₹5.13 billion (-\$69.09 million) during the same period last year.

Natural gas company **Gas Authority of India Limited (GAIL)** intends to take the acquisition route to scale up its renewable energy portfolio as it plans to venture beyond natural gas. GAIL is working proactively to achieve carbon neutrality by exploring the possibility of blending green hydrogen with natural gas in pipelines as a pilot. The company's move reflects the energy transition in progress globally.

Sterling and Wilson Solar, the solar engineering and construction arm of the **Shapoorji Pallonji Group**, recorded revenue of ₹11.95 billion (-\$161.12 million) in Q1 of FY 2022, up from the ₹10.68 billion (-\$144.07 million) posted in the same quarter in FY 2021. This represents a growth in revenue of 11.8%.

ReNew Power listed on the Nasdaq after completing a business combination with **RMG Acquisition Corporation II**, a special purpose acquisition company (SPAC). In February 2021, ReNew Power had announced a merger with a SPAC, offering the combined company a market value of around \$8 billion.

Researchers from the **PG and Research Department of Chemistry at Christ College in Kerala**, India, claimed to have developed a **dendrite-free zinc-iron redox flow battery**. Previously, redox-flow batteries used materials like vanadium, copper, iron, and lead. According to the researchers, none of these were suitable for commercialization due to high costs, toxicity, low energy efficiency, low cell voltage, hydrogen evolution, and coulombic loss.



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The **Indian Energy Exchange** traded an all-time high volume of 726 MU of renewable energy in July 2021, a 76% month-over-month (MoM) increase compared to 412 MU in the previous month. The volume of green energy traded during the month accounts for about 10% of the total power volume traded at the Exchange.



OMERS Infrastructure announced that it had signed a **stock purchase agreement** to acquire a 19.4% stake in Indian independent power (solar) producer **Azure Power Global** for \$219 million from International Finance Corporation (IFC) and IFC GIF Investment Company.

CleanMax, an Indian renewable energy company, announced that **Augment Infrastructure**, a U.S.-based investment company, had acquired a majority stake in the company investing ₹16.5 billion (-\$222.23 million) in equity.



Tata Power, which declared its financial results for **Q1 FY 2022**, recorded a **47% growth** in consolidated revenues to ₹98.31 billion (-\$1.32 billion) compared to ₹66.71 billion (-\$900.3 million) in Q1 FY 2021. The figures rose mainly due to the acquisition of Odisha distribution companies and higher execution of its solar engineering, procurement, and constructions projects.

Renewable energy company **Adani Green Energy Limited** reported a total income of ₹10.79 billion (-\$145.40 million) in **Q1 FY 2022**, a **23% increase** compared to ₹8.78 billion (-\$118.31 million) in the same period last year.

Torrent Power declared its financial results for **Q1 FY 2022**. It recorded a **3.05% year-over-year (YoY) growth** in its revenue from operations to ₹30.99 billion (-\$417.57 million) from ₹30.07 billion (-\$405.17 million) in the same period last year.

NTPC Limited invited offers from banks and financial institutions to raise **₹50 billion (-\$672 million)** as rupee term loans. The loan proceeds would be utilized towards capital expenditure for the ongoing and new capacity addition programs, renewable energy projects, and buying out Government of India equity stake in public sector undertakings under the government's disinvestment program, refinancing loans, and general corporate purposes.

Electric scooter manufacturer **Lords Automotive** acquired a 100% stake in Ahmedabad-based **Devam Electric Vehicles**, manufacturer of e-rickshaws and e-autos. Through the acquisition, Lords Automotive will take over Devam Electric Vehicles' assets and patents.



Through its 100% subsidiary **Azure Power Energy**, **Azure Power Global** issued a **dollar green bond** of \$414 million. The bonds will have a tenor of five years at a coupon of 3.575%. The issue marks the lowest ever coupon in the high-yield segment for any Indian business.

ReNew Power signed a definitive agreement to acquire 260 MWac of operational solar projects in Telangana. In addition, the company also signed an agreement to acquire a 99 MW hydropower project in Uttarakhand.

Renewable energy-focused infrastructure fund manager **Copenhagen Infrastructure Partners**, through its **Copenhagen Infrastructure New Markets Fund**, signed an investment agreement with **Amp Energy India** to enable joint equity investments of over \$200 million in renewable energy projects in India.

Policy Briefs

States

The **Delhi Electricity Regulatory Commission** announced the 'Renewable Purchase Obligation and Renewable Energy Certificate Framework Implementation Regulations, 2021.' The regulations came into effect on April 13, 2021.



The **Karnataka Electricity Regulatory Commission** issued an order to set the generic tariff for solar power projects (including rooftop solar projects) for FY 2022 and 2023. The Commission set a tariff of ₹3.10 (-\$0.042)/kWh for grid-connected MW scale solar power projects of capacity less than 5 MW and ₹3.19 (-\$0.043)/kWh for grid-connected rooftop solar projects of 1 kW to 2,000 kW (excluding 1 kW to 10 kW).

The **Karnataka Electricity Regulatory Commission** ruled that the generic tariff for wind power projects will continue to be ₹3.26 (-\$0.044)/kWh as determined in the order dated February 27, 2019. It will be subject to the disposal of the appeal by the **Appellate Tribunal for Electricity**.

The **Odisha Electricity Regulatory Commission** invited suggestions on the proposed Forecasting, Scheduling, and Deviation Settlement of Wind and Solar Generating Stations at the State Level Regulations, 2021.

The **Chhattisgarh State Electricity Regulatory Commission** proposed amendments to the Grid-Interactive Distributed Renewable Energy Sources Regulations, 2019. The maximum size of the renewable energy system that can be set up under the net metering arrangement is 500 kW.



The **Tamil Nadu Electricity Regulatory Commission** issued new guidelines and a consultative paper on 'Generic Tariff order for Grid Interactive Solar Photovoltaic (PV) Energy Generating Systems.' The government issued the regulations to review the existing rules and set generic tariffs for rooftop solar systems of capacities in the range of 1-10 kW, 11-100 kW, 101-500 kW, and 501-999 kW.

Center

The **Ministry of Power** issued the **Draft Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2021**. The rules are applicable for the purchase and consumption of green energy, including the energy from waste-to-energy projects. The entities covered under the rule are all consumers who have contracted demand or sanctioned load of 100 kW or more, except for captive consumption.

The **Ministry of New and Renewable Energy (MNRE)** issued **benchmark costs** for grid-connected rooftop solar systems for FY 2021-22. The benchmark cost for FY 2021-22 is applicable for all projects to be awarded and for empanelment of vendors by state implementing agencies under phase-II of the MNRE's rooftop solar program after ten days from the notification, i.e., August 28, 2021.



MNRE issued a fresh notification extending the **self-certification** of solar inverters from June 30, 2021, to December 31, 2021, subject to the condition that the manufacturers have valid International Electrotechnical Commission certificates and test reports from international test labs.

The **Ministry of Power** notified the timelines to replace existing meters with **smart meters with a prepayment feature**. The notification is effective from August 17, 2021. All consumers (other than agricultural consumers) in areas with a communication network will install smart meters working on prepayment mode, conforming to relevant information systems.

The **Ministry of Environment Forest and Climate Change** stipulated that all coal-fired power generating units need to reduce harmful sulphurous gas emissions by retrofitting necessary pollution control equipment. According to the Central Electricity Authority, bids for flue gas desulphurization installations at 69.26 GW of thermal power units have been awarded by the Ministry of Power so far since 2019 against a planned capacity of 169.26 GW.

Major Tender and Auction Announcements in August

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



Top Large-Scale Solar Tenders

The Maharashtra State Electricity Distribution Company (MSEDCL) issued requests for selection (RfS) to procure **500 MW** from intrastate wind power projects and **300 MW** from grid-connected new inter-state and intrastate wind projects.

NHPC Limited invited bids for engineering, procurement, and construction (EPC) of a **500 MW** solar project connected with the interstate transmission system (ISTS) in **Tamil Nadu**.

MSEDCL also invited bids for **487 MW** of decentralized solar projects of **500 kW to 2 MW** capacity under **Component A** of the Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (PM-KUSUM) program in **Maharashtra**.

Madhya Pradesh Urja Vikas Nigam invited bids to select developers to set up **225 MW** of grid-connected solar projects of capacity **500 kW to 2 MW** under Component A of the **KUSUM** program.

The Gujarat State Electricity Corporation invited bids for the design, engineering, supply, installation, and commissioning of **224 MW** of grid-connected solar projects ranging from **10 MW to 55 MW** at various substations of the Gujarat Energy Transmission Corporation.

Railway Energy Management Company invited bids to develop **210 MW** of grid-connected solar projects under the domestic content requirement (DCR) category on vacant railway land.

Central Electronics invited expressions of interest (EoI) to empanel EPC contractors to develop **200 MW** of solar projects anywhere in India.

NHPC invited bids for EPC of a **100 MW floating** solar power project and the associated **220 kV transmission line** for connectivity to the 400 kV substation at the Rengali reservoir in **Odisha**.

NHPC also invited bids from EPC contractors for a **100 MW** ground-mounted grid-connected solar project and associated power evacuation system connected with a state transmission utility substation in **Tamil Nadu**.

Mahanadi Coalfields issued EPC tender for a **50 MW** grid-connected solar power project with evacuation infrastructure in **Odisha**.

The **Jharkhand Bijli Vitran Nigam** issued a request for proposal (RfP) to select solar power generators to install **50 MW** of grid-connected solar power projects connected to **33/11 kV substations**.

Bharat Heavy Electricals Limited (BHEL) invited bids for the operation and maintenance (O&M) of a **25 MW** floating solar power project at NTPC Simhadri in **Andhra Pradesh**.

The Gujarat State Electricity Corporation released a tender for **4.5 MW** of grid-connected solar projects. A **2.5 MW** solar project will be developed at Gandhinagar thermal power station and a **2 MW** solar project at Sikka thermal power station in the **Jamnagar** district.



With three parallel energy exhibitions, The smarter E India is India's innovation hub for the new energy world. It presents cross-sector energy solutions and technologies and reflects the interaction of the solar, energy storage and electric mobility industry. The smarter E India brings together the renowned Intersolar India, ees India and Power2Drive India. The exhibition trio will take place in Gandhinagar in December 2021.

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Rooftop Solar Tenders

West Bengal State Electricity Distribution Company announced an empanelment tender to install **50 MW** of grid-connected rooftop solar projects on **residential buildings** in **West Bengal**.

Lucknow Smart City invited EoI for the installation of **8.5 MW** of grid-connected rooftop solar systems under the renewable energy service company (**RESCO**) model on government buildings under the 'Smart City Mission' in **Lucknow**.

The Jharkhand Renewable Energy Development Agency (**JREDA**) invited bids for the design, manufacture, testing, installation, and commissioning of **6 MW** of grid-connected rooftop solar projects on **government buildings** in the state.

The **Municipal Corporation of Greater Mumbai** issued an e-tender on an item-rate-basis to appoint a contractor to operate and maintain (**O&M**) a **2.5 MW** solar power project at the **Bhandup** Complex, Water Treatment Plant for two years.

The **Bihar Renewable Energy Development Agency** invited EoI to empanel installers for grid-connected solar projects of **2 MW** capacity at various government buildings in the state under the capital expenditure (**CAPEX**) model.

The Bihar Renewable Energy Development Agency also

invited bids to install **1 MW** of hybrid rooftop solar projects with a **net metering** facility under the **CAPEX** model at various government buildings in **Bihar**.

The **Tripura State Electricity Corporation** invited bids to empanel developers to design, supply, install, and commission **1 MW** of grid-connected rooftop solar projects on residential buildings at different locations in the state under **Phase-II** of the rooftop solar program.

Jai Narain Vyas University issued an RfS inviting bidders to set up a **1 MW** rooftop solar project with **net metering** facility under the **RESCO** model in Jodhpur, **Rajasthan**.

The National Institute of Animal Biotechnology, an autonomous institute under the Ministry of Science and Technology, Government of India, invited bids for the survey, design, supply, installation, and commissioning of **900 kW** of solar power projects (rooftop/ground-mounted) under the net metering arrangement at the premises of NIAB in **Hyderabad**.

Convergence Energy Services, a wholly-owned subsidiary of Energy Efficiency Services Limited (**EESL**), invited e-bids for setting up a **242 kW** (tentative) solar **carport** and rooftop solar system with a **762 kWh** (tentative) **lithium-based** battery energy storage system (**BESS**), including five years of **O&M** at Leh, **Ladakh**.

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Auctions

NTPC Limited, **NLC India**, **Project Ten Renewable Power** (Ayana Renewable Power), and **Azure Power** were declared winners in the Solar Energy Corporation of India's (SECI) auction for **1,200 MW** ISTS-connected **wind-solar hybrid** power projects (**Tranche-IV**) on a build, own, and operate basis across **India**.

TP Saurya, a Tata Power subsidiary, and **AlJomaih Energy** and **Water Company** are winners in the **RUMSL** auction for **500 MW** of projects at the **Neemuch** Solar Park in **Madhya Pradesh**.

SJVN Limited, a joint venture between the Union

government and the Himachal Pradesh government, has bagged a **200 MW** grid-connected solar photovoltaic project in Bihar in an auction held by Bihar Renewable Energy Development Agency through the **open competitive tariff bidding** process.

Tata Power Solar Systems has won **SECI's** auction for a **20 MW** solar power project with a **50 MWh** battery energy storage system. The project would be set up in Phyang, located in Leh district of the union territory of **Ladakh**.

Other Tenders

Rewa Ultra Mega Solar Limited (**RUMSL**) launched a **consultancy tender** to assess the environmental and social impact of a **600 MW floating** solar project on the Kaveri branch reservoir at Omkareshwar dam in **Madhya Pradesh**.

BHEL has offered to enter memorandum of understanding (**MoU**) with vendors for procuring **multicrystalline** and **monocrystalline** passivated emitter and rear cells (**PERC**) cells for **manufacturing** solar modules to meet the **annual capacity** of **200 MW**.

Meja Urja Nigam, a joint venture of **NTPC** and the Uttar Pradesh Rajya Vidyut Utpadan Nigam, released a **consultancy tender** to prepare a detailed project report for setting up a **55 MW** solar power project and propose a suitable business model.

BHEL announced tenders for solar cells and modules.

One tender was for solar module **manufacturers** to supply **multicrystalline** solar modules to be used in the **6.5 MW** Nalanda rooftop solar project in **Bihar**. The other one was for the supply of **1.513 million multicrystalline** solar **cells** with a wattage output of **4.67 Wp**.

The Rajasthan Electronics and Instruments issued a notice inviting a rate contract tender for **8,000 monocrystalline** or **polycrystalline** solar photovoltaic (PV) **modules** of **160W**, **320W**, **325W**, and **340W**. The company also invited bids for the supply of **36,000 raw material kits** for the production of solar **modules** of **330 W** output for a total capacity of **12 MW**.

Central Electronics invited bids for the supply of **2,000 monocrystalline** passivated emitter and rear cell (**PERC**) cells with an output of **5.67 W** or above.



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