

# GREEN MARKET CAPSULE

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TPTCL'S E-NEWSLETTER



Tata Power Trading Company Limited (TPTCL)

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## Regulatory News

### Gujarat announces new solar policy

The new policy offers incentives such as no restriction on contract demand, allowing leasing of roofs, net metering, and a banking facility

The new solar policy announced by the Gujarat government on Tuesday offers a slew of incentives such as no ceiling on capacity to be installed and allowing consumers to lease their roofs and premises for setting up plants. In addition, residential and Micro, Small and Medium Enterprises (MSME) consumers can sell the surplus power generated after meeting their consumption needs at a tariff of ₹2.25 per unit.

"For Residential Consumers (Surya Gujarat Yojana) and MSMEs (manufacturing) for captive usage, DISCOMs will purchase surplus energy after set off against their consumption at ₹2.25 per unit for initial 5 years and thereafter at 75% of latest tariff discovered and contracted by GUVNL through competitive bidding process for non-park based solar projects in preceding 6 months which shall remain fixed for remaining life of the project," the state government said in a statement.

This comes in the backdrop of India's solar park power tariffs hitting a record low of Rs1.99 per unit at an auction conducted by Gujarat Urja Vikas Nigam Ltd and are expected to decline even further. Solar power developers have welcomed the move. "The policy is fairly progressive in terms of promoting distributed energy in terms of providing net metering, no restriction on contract demand and most importantly providing a banking facility for a fee, which is the right way to promote distributed solar," said Sanjeev Aggarwal, founder and managing director of Amplus, one of India's largest rooftop solar power producers. "Gujarat has also opened up setting up of plants by third party developers but the cross-subsidy surcharge issue still lingers on as the policy is still not allowing the Electricity Act mandated provision of captive with 26% equity participation by users. If this one more step is taken, this will be the most progressive policy for rooftop solar," he added.

India aims to have 175 gigawatt (GW) of clean energy capacity by 2022, including 100GW from solar projects. Of this, 40 GW is to come from solar rooftop projects. However, India's solar rooftop projects haven't taken off. The government on its part is trying to promote solar rooftop, with Prime Minister Narendra Modi recently calling for each state to have at least one "solar city" whose electricity needs would be met entirely through rooftop solar power.

"In order to encourage small scale solar projects, power Distribution Companies will now purchase power from these small-scale solar projects (up to 4 MW) at 20 paise / unit tariff higher than tariff discovered through competitive bidding while DISCOMs will purchase solar power from projects above 4 MW capacity through competitive bidding process," the statement said.

This comes at a time when India's power demand has been rising. According to the union government. India's electricity demand has risen on a yearly basis, with December's daily consumption in excess of 5-10 GW when compared to last year. "Any person/developer/consumer can set up solar projects without any capacity ceiling while the existing ceiling of 50% sanctioned load/contracted demand has been removed," the statement said and added, "The provision for security deposit to be submitted by developer to DISCOMs has been reduced from ₹25 lakh/ MW to ₹5 Lakh/ MW."

An investment of ₹4.7 trillion has been made in India's renewable energy space over the past six years. That is likely to rise to ₹1 trillion annually till 2030, according to government estimates. "Gujarat model is

already proving to be very important in solar power sector. Moving forward in the same direction, Gujarat Government has made an important decision to make Gujarat a hub of green energy by expanding RE (renewable energy) generation base," said chief minister Vijay Rupani in the statement. [Source](#)

## Power News

### Tata Power arm hits '100 solar microgrids' milestone

TP Renewable Microgrid has installed an aggregate 3 MW of solar microgrid capacity with its 100th project commissioned in Ratnapur, Uttar Pradesh.

TP Renewable Microgrid (TPRMG), a wholly-owned subsidiary of Tata Power, has announced that it has commissioned its 100th solar microgrid project, coinciding with its first anniversary. The 30kW microgrid project, installed in a remote and small village of Ratnapur, Uttar Pradesh, harnesses energy from the sun using solar panels. It comprises a battery energy storage system and a DG-set, allowing 24x7 power supply to the community.

TPRMG has installed a cumulative solar microgrid capacity of 3 MW with the commissioning of the Ratnapur project. "The company took ten months to commission its first 100th microgrid despite Covid-19 restrictions. However, it is now focusing on commissioning its next 100th microgrid in less than four months' time," read a company statement.

Currently, TP Renewable Microgrid has around 50 projects in various stages of project execution. "It is a huge milestone for us to be able to commission our 100th microgrid within less than a year. This also marks TPRMG's first anniversary. Through our off-grid solutions like solar microgrids, we wish to help rural communities in India meet their urgent power needs quickly and economically. This project will not only provide reliable power supply to the villages but also work towards improving the livelihood and bring about socio-economic development of the community as a whole," said Praveer Sinha, CEO and MD, Tata Power Company Limited.

While India has achieved 100% electrification under the government's Saubhagya scheme, communities in Indian states, especially Bihar and Uttar Pradesh, still have unreliable power supply and face unscheduled power cuts. Many micro-enterprises still use non-grid sources of electricity to run their machines such as flour mill machines (*atta chakki*), oil expellers and rice hullers. TP Renewable Microgrid bridges this gap by providing a cheap and reliable power supply through an off-grid AC microgrid solution.

[Source](#)

### Electricity Generation from Renewables Increased 6.9 percent in Nov'20: Ind-Ra

India Ratings has detailed that the electricity generation from renewables in November 2020 increased by 6.9 percent yoy to 9.2 BU.

In its latest power sector report, India Ratings (Ind-Ra) has detailed that the electricity generation from renewable sources in November 2020 increased by 6.9 percent yoy to 9.2 billion units. The report also highlighted that despite the energy demand increasing yoy for the third consecutive month in November, the improvement was slower than over the last few months.

The report found that in November 2020, the all-India energy demand increased yoy for the third consecutive month, after declining over March-August 2020; although the improvement slowed down to

3.7 percent yoy to 97.9 billion units (October 2020: up 11.5 percent; September 2020: up 4.0 percent). This was due to the early onset of winters impacting demand from the northern region (up 3.2 percent; October 2020: up 12.9 percent) and southern region (down 3.8 percent; up 3.3 percent). Even though the energy demand has been recovering, the demand over April-November 2020 came in 5.0 percent yoy lower (1QFY21: down 15.9 percent; 1HFY21: down 8.7 percent).

The report then goes on to add that electricity generation (excluding renewables) increased 1.9 percent yoy to 95.3 billion units in November 2020 (October 2020: up 8.9 percent), owing to 4.1 percent (up 13.3 percent) growth in thermal generation, although hydro generation was lower 17.0 percent (down 10.3 percent) yoy.

The thermal PLF over April-November 2020 was lower at 50.8 percent (April-November 2019: 56.0 percent), most impacted by the decline in power demand, given the must-run status of nuclear, hydro and renewables.

For renewables, the report added that generation increased by 6.9 percent yoy to 9.2 billion units with wind and solar generation improving 11.6 percent and 7.4 percent, respectively.

It also adds that the wind generation has shown 1.1 percent yoy improvement in April-November 2020 after being lower 17.1 percent in 1H FY21.

The short-term power price at Indian Energy Exchange (IEX) also decreased yoy to Rs 2.73/kWh in November 2020 (November 2019: Rs 2.86/kWh) with a 43 percent yoy increase in the traded volumes witnessed in the day-ahead market. The short-term price decreased yoy, despite increase in demand in the short-term market, due to a strong supply to match the demand. Finally, in the transmission segment it was found that the transmission line addition was lower at 12,266 circuit kilometres (km) over April-November 2020 (April-November 2019: 14,546 circuit km). The length of transmission lines added in November 2020 also lower at 345 circuit km (November 2019: 1,095 circuit km), with 96 percent addition coming from the state sector. [Source](#)

## Major UP highways to turn into green energy corridors

The state government said on Sunday that it has issued guidelines for the supply of piped natural gas (PNG) to industrial development authorities with the objective of environmental conservation and providing safe fuel to industries. The government said steps were being taken to convert major highways of the state into green energy corridors to promote the use of pollution free fuel in transport sector. "Industrial development authorities have been directed to facilitate authorized gas companies for laying of pipelines for network of natural gas in areas of state's industrial development authorities," industry minister Satish Mahana said.

Additional chief secretary, infrastructure and industrial development, Alok Kumar said directions had been issued to Noida, Greater Noida, Yamuna Expressway Industrial Development Authority (YEIDA), UP State Industrial Development Authority (UPSIDA), Gorakhpur Industrial Development Authority (GIDA), Satharia Industrial Development Authority (SIDA) and Lucknow Industrial Development Authority (LIDA) to provide required support to gas companies in development of piped natural gas (PNG) network.

Last week, the industry department had issued a government order to the chief executive officers of industrial development authorities asking them to implement the 'Dig and Restore' policy of urban development department in industrial areas in compliance with Petroleum Natural Gas Regulatory Board (PNGRB) directives for development of city gas distribution network based on geographical area.

The authorities were directed to permit and facilitate infrastructure development by authorized gas companies for PNG supply. Under the Dig and Restore policy, permission has been given for laying of underground pipelines for gas supply through the use of such technologies that do not affect or interrupt traffic and normal activities. An NoC will be provided only if digging and restoration work done by the company is found to be satisfactory. UP Expressways Industrial Development Authority officials said 4,875 sq mt land had been earmarked in Bilhaur on Agra-Lucknow Expressway for green energy corridor.

[Source](#)

## **Solar energy body urges Power Ministry to ensure AP discoms pay energy developers**

National Solar Energy Federation of India (NSEFI) has urged the Centre to ensure urgent release of payments by PFC and REC under Atmanirbhar Bharat Abhiyan scheme to renewable energy developers having PPAs with Andhra Pradesh discoms. In a letter addressed to RK Singh, Union Minister of State (I/C) Power, New and Renewable Energy, the Federation has brought to the notice of the Centre the problems of delayed payments faced by renewable energy companies.

Subrahmanyam Pulipaka, Chief Executive Officer, NSEFI, sought the relief under the the Government's move to infuse liquidity of ₹90,000 crore through Power Finance Corporation (PFC) and Rural Electrification Corporation (REC) to all States/UTs to assist discoms clear their liabilities as a part of the Atmanirbhar Bharat Abhiyan. NSEFI stated Andhra Pradesh Government had requested PFC and REC to disburse an additional loan to the State under Tranche-I for repayment to renewable energy developers. However, this is pending for few months and RE developers are yet to receive payments since April 2020.

Earlier, following concerns about payments and Power Purchase Agreement (PPA) renegotiation move, the AP High Court in September 2019 has directed discoms to pay an interim tariff of ₹2.43/kWh to wind and ₹2.44/kWh to solar developers. But, it is not enough to service debt and delayed payments are jeopardising international and also domestic investments.

“Non-payment of agreed tariff as per PPA and also not paying the interim tariff as directed by High Court has caused severe financial distress to our members and threatens the sustenance of the project operations, including payment of debts against the project, payment of salaries to its employees and other financial obligations as renewable companies are unable to service their debt obligations to lenders,” the NSEFI wrote.

The banking system is at the risk of suffering NPAs of ₹15,000-18,000 crore due to this delay, it said. The electricity falls under “Essential Service” and the renewable companies are performing their obligations to generate power, continue to pay salaries to their employees and are committed to assist the citizens even during these troubling times, NSEFI said. [Source](#)

## **Reasons Behind the Record Low Solar Bid of ₹1.99/kWh in the Gujarat Solar Auction**

Good ratings of Gujarat DISCOMs, detailed and clear tender documents, and offtake guarantee are some of the key reasons for the low tariff

The recent auction by Gujarat Urja Vikas Nigam Limited (GUVNL) (Phase XI) for 500 MW of solar projects set a new record for the lowest tariff an auction in India of ₹1.99 (~\$0.0269)/kWh. The record low tariff of ₹1.99 (~\$0.0269)/kWh was quoted by NTPC Limited for 200 MW, Torrent Power Limited for 100 MW, Al Jomaih and Water Company for 80 MW, and Aditya Birla Renewables for 120 MW respectively. The tender was floated in September by GUVNL for 500 MW of power from grid-connected solar projects.

The new record came close on the heels of the previous record of ₹2 (~\$0.0270)/kWh tariff quoted by AI Jomaih Energy and Water Company and Green Infra Wind Energy Limited, a subsidiary of Sembcorp, for 200 MW and 400 MW of solar projects, respectively. This auction was held by Solar Energy Corporation of India (SECI) for 1,070 MW of solar projects in Rajasthan (Tranche-III). SECI had received bids from 14 companies for a total of 4,350 MW, leaving the tender oversubscribed by 3,280 MW.

**Reasons for Dip in Tariff**

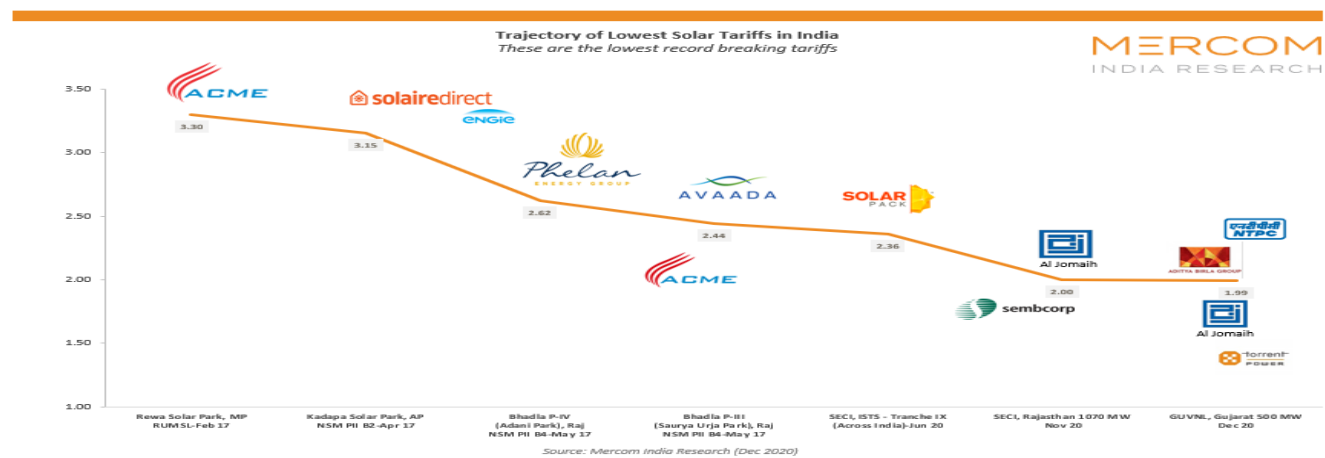
A GUVNL official told Mercom, “The ‘change in law’ will protect developers from upcoming basic customs duty (BCD). By the time they procure modules for the project, the safeguard duty will be over. It is also one of the reasons for such a low bid.” For NTPC Limited, this was an opportunity to expand its base and make its presence more noticeable in Gujarat. For AI Jomaih, it was another reason to celebrate, after its success in SECI’s 1,070 MW auction.

Ravi Khanna, MD of Aditya Birla Renewables, said, “The valuation in this tender is what makes a case for the low tariff quoted. It is a bid for pure solar project development. The Gujarat distribution companies (DISCOMs), who are the off-takers, all have AAA ratings. Above all, there is no uncertainty of signing power sale agreements (PSAs). We are a large group, and our economics are good, and we see value in the tariff we have quoted.” The high credit rating of the Gujarat DISCOMs coupled with the anticipated drop in module prices and a general sense of policy stability in the state seems to have been the main reasons for the bid breaching the ₹2 (~\$0.0270)/kWh mark.

“The drop in tariff can be attributed to many things, and the good credit ratings of Gujarat DISCOMs is one of them. The fall in module prices is another. Gujarat being our home turf and a renewable-friendly state was also one of the reasons why we bid for the project,” said one of the participants in the tender. Mercom, in a recent analysis, concluded that one of the biggest challenges solar project developers currently face in India is long delays in signing the PSAs with DISCOMs.

**2020: A Year of Falling Tariffs**

2020 has witnessed a continuous decline in solar tariffs. In July this year, solar power tariffs had dropped to a low of ₹2.36 (~\$0.032)/kWh in an auction held by SECI. The auction was conducted for 2 GW of the interstate transmission system (ISTS) connected solar projects (Tranche IX). The lowest tariff was quoted by Solarpack India, Avikaran Surya India (Enel Green Power), Amp Energy Green, and Eden Renewables.



Many stakeholders believe that the drop in tariffs is because of state-specific policies and favorable tender specifications. The choice given to the bidders to select the project sites also seems to have played its part in bringing down the tariff in the GUVNL auction.

"This time, GUVNL worked seriously on the tender. We consulted various stakeholders and our EPC contractors and asked for suggestions on how to bid competitively. GUVNL mentioned everything clearly in the tender document regarding 'change in law,' transmission of power, and guaranteed offtake. We don't see this in other tenders. We felt that the environment is right in the state, and there are no central bids at present, which also played a part in bids being aggressive," noted another participant.

"Compared to Rajasthan, Gujarat doesn't charge anything extra. Earlier in Gujarat, the auctions were mainly related to solar parks, and the developers didn't have the option of selecting the project sites. This is the first time GUVNL has given such a choice. Gujarat is a tough place in terms of terrain for solar projects. The freedom to select the locations is a good experiment. If the bid were for Raghnesda or Dholera solar parks, the tariffs would not have been so low," he added.

According to one of the bid winners, to achieve greater generation efficiency, bifacial, or monocrystalline solar modules with half-cut or triple-cut will be used for these projects. "Though the tariffs are trending really low, it may not be replicable as parameters vary from auction to auction. However, if the PSA and offtake are guaranteed, the tender is structured to remove uncertainties and allow flexibility for developers, there could be room for tariffs to come down in other auctions as well," said Raj Prabhu, CEO of Mercom Capital Group. [Source](#)

## **2021: India to bank on innovative ways to garner Rs 1.75 lakh cr. investment for renewable energy sector**

There is a fund requirement of Rs 1.75 lakh crore to achieve the balance capacity of 35 GW (under bidding/ to be bid out/ auctioned) to achieve an overall target of 175 GW," Director General of Solar Power Developers Association Shekhar Dutt told.

India will look to be more innovative in its approach to garner additional investments worth Rs 1.75 lakh crore for having 35 GW of renewable power generation capacity next year to meet the ambitious target of 175 GW of clean energy capacity by 2022. At present, the country has a total installed renewable energy capacity of 90 GW. This includes 39 GW of wind and 37 GW of solar generation capacity.

Around 50 GW of renewable energy capacity is under construction and there is also a strong pipeline of 30 GW for new bids. "There is a fund requirement of Rs 1.75 lakh crore to achieve the balance capacity of 35 GW (under bidding/ to be bid out/ auctioned) to achieve an overall target of 175 GW," Director General of Solar Power Developers Association Shekhar Dutt told PTI.

He also said that implementation of renewable projects and innovation in tendering them to attract investors would play a key role in 2021. According to him, India needs to design innovative tenders with the inclusion of wind, solar and energy storage to ensure that renewable can replace fossil fuels to a great extent. This year has been challenging for the renewable energy sector but the industry has been able to withstand the crisis caused by the pandemic with support of the government.

Moreover, confidence of investors in the sector has soared further as was evident from solar power tariff breaching the psychological barrier of Rs 2 per unit. Solar power tariff dropped to an all-time low of Rs 1.99 per unit in an auction of projects of 500 MW capacity by Gujarat Urja Vikas Nigam Ltd (GUVNL) in December.

Prior to that, the tariff had declined to a record low of Rs 2 per unit in an auction for 1,070 MW projects conducted by the Solar Energy Corporation of India (SECI) in November. In July this year, solar power tariffs fell to a low of Rs 2.36 per unit in an auction of 2 GW capacities by the SECI.

Now, in order to maintain the momentum, the government will have to be more proactive and innovative to attract investors into the sector. India had set an ambitious target of having 175 GW of renewable energy capacity by 2022. This includes 100 GW from solar, 60 GW from wind, 10 GW from biomass and 5 GW from small hydro power. Talking about the challenge of bringing required investment next year to achieve the 175 GW target, Union Power and New & Renewable Energy Minister R K Singh said, "We are going to come out with more innovative bids (in 2021)."

He told PTI that earlier efforts of the government helped to position India as the most favourite destination for investment, especially in the clean energy sector and it is evident from USD 64 billion investment in renewables. The minister also cited some examples of round the clock, hybrid and manufacturing linked auctions for clean energy in the country.

As per the government estimates, the demand for domestically manufactured solar cells and modules is likely to be around 36 GW over next three years. In November, Prime Minister Narendra Modi said there are huge renewable energy deployment plans for the next decade. "These are likely to generate business prospects of the order of around 1.5 lakh crore rupees or USD 20 billion per year. This is a big opportunity to invest in India," Modi had said.

With the impact of COVID-19 on a gradual decline and higher visibility of vaccine availability, 2021 promises to be an exciting year for the renewable sector. As per industry estimates, the cumulative capacity of 20 GW clean energy is scheduled to be commissioned, which shows increased opportunities for equipment suppliers. Dutt said that agencies implementing renewable energy projects are facing challenges with respect to signing Power Sales Agreements (PSA) for around 16 GW with power distribution companies (discoms) and electricity procurers.

Such a situation shows that the implementation of the ambitious target of 175 GW will be possible only when there are assured buyers for clean energy across the country. Otherwise, it will not be viable to set up huge generation capacities. Meanwhile, there is a continued focus on 'Aatmanirbhar Bharat' initiative to boost local PV (Photo Voltaic) manufacturing as well as ensure quality and competitiveness against imported PV cells. This is being done by way of providing support through the government's PLI (Performance Linked Incentive) scheme.

However, Dutt said that till the time domestic manufacturing capacity of requisite quality is not enough to meet demand, restrictive measures must be avoided. According to industry players, the current focus is on developing large-scale ultra mega solar power projects but there are challenges such as land acquisition, sub-optimal utilisation of power evacuation infrastructure and higher transmission losses and charges.

"India is endowed with abundant sunshine across the country with a variation of 15-20 per cent. Hence, small to medium scale projects (50-100 MW) can be developed at load centres in 700+ districts located across the country, which will result in lower transmission losses, better utilisation of transmission assets, equitable job creation and development etc," Dutt said.

Structural reforms for discoms are being looked at to ensure timely payment to power producers. Amendments to Electricity Act, 2003 and Tariff Policy, which has provisions to address the issues, are awaited by the industry. Imaan Javan, Director of Operations at Suntuity REI, said that "with sufficient



government policies, support and schemes in place and educating people on the advantages of clean and sustainable energy, I believe that we can definitely achieve our renewable energy target of 175 GW by 2022".

"Though we have already seen various measures from the government like Safeguard Duty, 'One Sun One World One Grid' initiative, anti-dumping duty, Vocal for Local and Make in India, more strict imposition of these policies will help India be at par with her global counterparts and penetrate into the world market," Javan said.

Suntuity REI is a leading solar energy solutions provider. The renewable energy industry also expects higher coordination between central transmission utility and agencies implementing renewable energy projects to ensure seamless development of transmission evacuation infrastructure. About increasing the share of renewables in the country's energy mix, the minister said that India already has 38 per cent installed electricity generation capacity (140 GW) coming from clean energy and that the 40 per cent target will be surpassed in 2021. India has set an ultimate target of having 450 GW of clean energy by 2030. [Source](#)

### **Indian government plans a green city in every state**

The Indian government has unveiled a concept note that envisages the creation of a green city in every state where all the power requirements are met by renewable energy.

The concept note also looks at combining all existing renewable energy programmes including ones dealing with solar street lights, rooftop solar, electric vehicles or waste to energy.

The government is hoping that this will also help promote the solar rooftop programme, which has not taken off in India.

Indian government wants to develop a 'green city' in every state of the country, powered by renewable energy. The 'green city' will mainstream environment-friendly power through solar rooftop systems on all its houses, solar parks on the city's outskirts, waste to energy plants and electric mobility enabled public transport systems. India's Ministry of New and Renewable Energy (MNRE) on December 3 unveiled a concept note stating that Prime Minister Narendra Modi desires one city in each state to be developed as a green city that will meet all its energy requirements from renewable sources of energy.

The ministry notes that the idea is in line with international trends in green energy. "Various countries have announced periods during which they will use only green energy. Many buildings and enterprises are declaring and moving towards net-zero emissions. The city will continue to be connected with the grid, and the renewable energy injected into the grid shall be equivalent to or more than the total consumption of electricity in the city," said the concept note. The idea is to have either the state's capital city or a renowned tourist area for this programme.

Of the 100 GW of solar power that the Indian government aims to have by 2022, 40 GW is targeted through solar rooftop by 2022. However, the solar rooftop sector's growth has been very poor with just over six GW installed capacity. Under this proposal, the government's objective is to install rooftop solar on most if not all rooftops in the green city. [Source](#)

### **Rajasthan: New draft rules to cloud rooftop solar power's future**

JAIPUR: The new regulations for rooftop solar projects proposed in the draft notification released on Wednesday by Rajasthan Electricity Regulatory Commission are likely to derail the growth of the segment

as much of the tariff incentives enjoyed by such projects will be unavailable. But if the state electricity regulator follows the Union ministry of power (MoP) regulations on 'Grid Interactive Rooftop Solar PV system', it will certainly help the financially stretched out discoms as migration of high value consumers to solar will be curbed.

The MoP's decision notification restricts net metering loads up to 10KW and thereby depriving benefits to projects above 10KW (gross metering). While the state regulator has not proposed any load caps, like the MoP it has created two segments – net metering and gross metering, which was not there earlier for projects up to 1 MW.

RERC has in the draft notification said for the gross metering projects, the discoms will enter into connection agreement at an average tariff of solar projects of 5MW and more, discovered through competitive bidding in previous financial year and an additional incentive of 25%. "We have not given caps for projects that would come under net metering. We will seek feedback from the industry and there are guidelines already announced by the MoP. We will consider all aspects before arriving at caps for net metering and gross metering," said Shreemat Pandey, chairman, RERC.

But industry experts said that if one goes by the cap of 10 KW laid down by MoP as eligibility criteria, 95% of the rooftop projects will be out of net metering. Under net metering, the consumer uses the cheaper rooftop solar power instead of the costly discom power. Under the gross billing or metering, as per the draft proposals, the project owner will have to pay normal electricity rate to discoms even though it uses cheap power from its rooftop plant. The discoms will pay the gross meter project owner for the solar rooftop energy generation at rates discovered through auction along with 25% incentive which would be far lower than the discom rates of around Rs 8 per unit.

The industry estimates projects under gross metering not getting more than Rs 4 per unit of solar power which is the cost of production. Sunil Bansal, general secretary Rajasthan Solar Association said, "At these rates for gross metering, nobody will come forward to set up rooftop plants. This segment, covering educational institutes, hospitals, offices, and factories, accounts for 95% of the rooftop industry. There will be very few new projects and will sound a death knell to the industry."

Bansal said after the focus of the Central government on the rooftop segment, a whole new MSME industry flourished to cater to the requirements of the rooftop plants. 'Now, all these MSME units are shocked to see the MoP bringing in rules that will not only create roadblocks for the solar industry but also put at risk the existence of MSME units in the solar sector,' added Bansal. [Source](#)

## **No Net Metering for Rooftop Solar Systems Over 10 kW: Ministry of Power**

Gross metering for loads greater than 10 kW has been mandated

The Ministry of Power (MoP) has issued The Electricity (Rights of Consumers) Rules, 2020 laying down the rights of power consumers to minimum standards of quality. The rules cover the rights of consumers and obligations of distribution licensees, the release of new connections and modifications in existing ones, metering arrangements, billing and payment, disconnection and reconnection, reliability of supply, among other areas.

One noteworthy provision in the rules is the provision that mandates net metering for loads up to 10 kW and gross metering for loads greater than 10 kW. This provision was created under the section addressing the rights of consumers as prosumers. The section said prosumers would enjoy the same rights as the general consumer. They will also have the right to set up renewable energy generation units,

including rooftop solar systems themselves or through a service provider. In September, the MoP had proposed net metering for rooftop solar projects of capacity up to 5 kW, and projects above 5 kW to have gross metering. The ministry had invited comments and suggestions from all the stakeholders regarding the regulations proposed.

Under gross metering, a consumer is compensated at a fixed feed-in-tariff for the total number of solar energy units generated and fed into the grid. The consumer then pays the DISCOM a retail tariff for the solar power consumed. Here the feed-in-tariff is always lower than the retail tariff. On the other hand, in net metering, the exported solar power is adjusted in the electricity bill against the energy consumed.

Net metering has been the primary impediment for rooftop growth in the country. Even though the net metering policy exists in most states, implementation has been rocky. Mostly, distribution companies (DISCOMs) are vehemently opposed to net metering across states. The primary reason for this aversion to net metering is that it deprives DISCOMs of the opportunity to earn more revenue from premium consumers.

Many rooftop installers believe that net metering is one of the major unique selling points which draw people towards solar installations. In the new rules, the Ministry also established a Consumer Grievance Redressal Forum (CGRF) to include consumer and prosumer representatives. DISCOMs are expected to specify a timeline for addressing these grievances and the maximum timeline to address them is 45 days.

The new regulations stipulate that it is the duty of distribution companies (DISCOMs) to supply electricity based on the request made by an owner or occupier of any premises. Consumers have the right to a minimum standard of service for the supply of electricity from DISCOMs.

The new regulations aim to ensure that new electricity connections, refunds, and other services are delivered in a timely manner and the government has imposed penalties on any infringements to consumer rights. These rules will benefit over 300 million existing and prospective consumers in the country, it added. New connections and modifications to existing connections must be released in a transparent, simple, and timely manner. They must be done within seven days in metro cities, 15 days in other municipal areas, and 30 days in rural areas. No connections must be issued without a meter.

Distribution licensees are now expected to supply power 24x7 to all consumers. Respective state commissions can specify shorter durations for certain categories like agriculture.

Licensees are expected to implement an automated mechanism to monitor and restore power outages if any. These measures come on the heels of several support measures announced in the past to help improve the status of DISCOMs. Despite financial support and incentives, DISCOMs owed over ₹110.67 billion (~\$1.5 billion) to renewable energy generators (excluding disputed amounts) in overdue payments across 439 pending invoices, according to data from the Ministry of Power. [Source](#)

## **Demand for Hydrogen in India can Grow 5-Fold by 2050: TERI**

A new report by The Energy and Resources Institute (TERI) suggests that the demand for hydrogen in India can grow 5-fold by 2050.

The demand for hydrogen in India can grow five-fold by 2050. Further, by 2030, the costs of “green hydrogen” from renewables will fall more than 50 percent and start to compete with hydrogen from fossil fuels. These were the findings in the latest report published by The Energy and Resources Institute (TERI). The report, titled “The Potential Role of Hydrogen in India”, was created under TERI’s Energy

Transitions Commission (ETC) India programme. It states that hydrogen needs to be targeted in sectors where direct electrification is not possible. These are heavy-duty, long-distance transport sectors, some industry sectors, and long-term seasonal storage in the power sector.

Further in transport, the report details that, battery electric vehicles (BEV) will become competitive across all segments, except for very long-distance, heavy-duty transport, which could be fuelled by hydrogen. And in industry, hydrogen can start to compete with fossil fuels in certain applications by 2030. For example, ammonia produced from green hydrogen will be competitive with the current incumbent technology of ammonia produced from fossil fuel-based hydrogen.

Further in the power sector, hydrogen could provide an important source of seasonal storage for variable renewables like solar and wind energy. Large amounts of seasonal storage will become necessary only when the share of wind and solar in total generation reaches very high levels (60-80 percent).

The report adds that green hydrogen production could require around 1000 TWh of renewables-based electricity by 2050, placing further pressure on power system decarbonisation. Dr. Rajiv Kumar, VC – Niti Aayog, who launched the report said “in Government of India, we see hydrogen as our next big sunrise sector and a transition to the hydrogen economy as the way forward for India. I, therefore, hope that some of my optimism about the sector will prevail in combination with a coordinated policy thrust from us.”

He added that improvement in technology and fall in the cost of hydrogen will happen sooner than estimated. Emphasizing the need to look at hydrogen growth in India from the point of view of demand, Dr. Ajay Mathur, Director General, TERI, said, “The falling cost of hydrogen will drive its uptake, with initial scale-up being driven by collaborations between progressive public and private players... India has an opportunity to grow an economically competitive low carbon hydrogen sector that can spur job growth to reduce energy imports, whilst drastically reducing emissions.” [Source](#)

## India's renewable energy capacity crosses 90 GW in November

The total installed capacity of Indian renewable sector has surpassed 90,000 MW during November 2020 amid continuing challenges for the developers in the segment. The new capacity addition in the renewable energy segment has been slow so far in this fiscal. During November, an estimated 463 MW of new capacity was added in the RE sector, taking the cumulative RE energy capacity in India to about 90.4 GW as on November 30, 2020.

For the April-November 2020 period, the RE segment has added a total new capacity of 3321 MW, which is little less than 1/4th of the capacity addition target for this fiscal. The government has fixed a new capacity target of 14,380 MW for this fiscal. Solar power is expected to add about 11,000 MW (9,000 MW from ground-mounted projects and 2,000 MW through rooftop capacity), while the wind power segment is expected to bring in 3,000 MW of capacity.

During the eight-month period of this fiscal, solar segment added 2,283 MW (includes of 1,396 MW of ground-mounted and 887 MW of rooftop), while wind power segment brought in 690 MW of new capacity to the grid, according to the data of Union Ministry of New and Renewable Energy (MNRE).

### ***Moderate tender activity***

Tender activity was moderate during this November with only three utility scale tenders issued for a capacity of 110 MW and two rooftop solar tenders for a total capacity 60 MW were issued. “Both tender

issuance and auctions have been slowing down month-on-month. Multiple amendments in bidding guidelines, changes in tender specifications and unwillingness of Discoms to sign PPA have resulted in uncertainty in the market,” says a report of Bridge to India, a renewable energy consulting firm. Meanwhile, the Centre has also come out with more measures to support the developers, who have been facing financial crunch and challenges in securing bank limits.

### **Relaxations**

Recently the Ministry of Finance has relaxed requirements of performance bank guarantee (PBG) and earnest money deposit (EMD). It instructed the public sector undertakings (PSUs) to reduce PBG for new tenders and contracts issued by December 31, 2021, to 3 per cent of the contract value from the earlier 5-10 per cent. PSUs have also been instructed not to demand any EMD in tenders issued until December 31, 2021. Bidders will instead submit a bid security declaration form as part of the bid response. These measures are aimed at reducing the cost relating to PBG and EMD.

Wind energy sector, where project installations decelerated in recent years, has sought efforts by the government to lower barriers and intensify grid infrastructure and land allocations to revive auction appetite and resolve the execution challenges facing India’s wind market. [Source](#)

### **Gujarat to get India's largest renewable energy generation park**

India's largest renewable energy generation park will come up in Gujarat with a generation capacity of 30 gigawatts (GW). The foundation stone of Hybrid Renewable Energy Park near Vighakot village in Gujarat's Kutch district will be laid by Prime Minister Narendra Modi on Tuesday, the PMO said. During his day-long visit to his home state, the Prime Minister will also lay foundation stone of a desalination plant and a fully automated milk processing and packing plant in Kutch, the statement added. The Renewable Energy Park will be spread over 72,600 hectares, and have dedicated zones for wind and solar energy storage as well as an exclusive zone for wind park activities.

Harnessing its vast coastline, Gujarat is taking a significant step to transform seawater to potable drinking water with the upcoming desalination plant at Mandvi, Kutch. The plant with capacity of 10 crore litre per day (100 MLD) will strengthen water security in Gujarat by complementing the Narmada Grid, Sauni network and treated waste water infrastructure.

It will be an important milestone for sustainable and affordable water resource harvesting in the country. Nearly 8 lakh people across the regions of Mundra, Lakhpat, Abdasa and Nakhatrana talukas will receive desalinated water from this plant, which will also help in sharing the surplus with upstream districts of Bhachau, Rapar and Gandhidham. It is one of the five upcoming desalination plants in Gujarat -- Dahej (100 MLD), Dwarka (70 MLD), Ghogha Bhavnagar (70 MLD), and Gir Somnath (30 MLD).

Modi will also lay the foundation stone of the fully automated milk processing and packing plant at Sarhad Dairy Anjar, Kutch. The plant costing Rs 121 crore will have the capacity to process 2 lakh litres per day. Gujarat Chief Minister Vijay Rupani will be present on the occasion. The Prime Minister will also undertake a visit to the White Rann, followed by participation in a cultural programme. [Source](#)

### **MNRE issues tender document for decentralised solar under KUSUM**

The Ministry of New and Renewable Energy has called for bids to develop decentralised solar projects under the PM-KUSUM scheme. The tender document has been issued for Design, Manufacture, Supply,

Transport, Installation, Testing and Commissioning of Off Grid Solar Photovoltaic Water Pumping Systems of 1-10 Horsepower in selected States on pan India basis.

The participants will also have to be offering complete system warranty and its repair and maintenance for 5 Years under MNRE off-grid and decentralized solar PV applications scheme on behalf of State Nodal Agencies (SNAs). [Source](#)

### **Uttar Pradesh to purchase solar power produced by farmers**

This was announced by state energy minister Shrikant Sharma while addressing a seminar on development of east UP, organised by DDU Gorakhpur University on Friday.

The state government would set up four sub-stations which would purchase solar power produced by farmers on their barren land. This was announced by state energy minister Shrikant Sharma while addressing a seminar on development of east UP, organised by DDU Gorakhpur University on Friday.

Sharma said farmers would be able to sell power to Uttar Pradesh Power Corporation Limited after using a part of it to meet their requirements under the PM Kisan Urja Suraksha Evam Utthan Mahabhiyan (PM-KUSUM) scheme. The minister said that of the 8,000 solar powered irrigation pumps, 2,882 have been allocated to east UP. The minister said that UP cannot progress without the development of east UP and for this availability of adequate power plays a key role. He said the state government is working towards increasing non-conventional energy from the existing 6% to 20% of the total energy availability by 2021. Sharma said that providing uninterrupted power supply is the key goal of the state government. He said the department was able to meet the power requirement even during the pandemic. In a veiled attack on the opposition, Sharma said earlier villagers had to collect funds through contribution for getting a dysfunctional transformer repaired, but that is no longer the case.

“Now, power department teams get active immediately on receiving information of a power outage,” he claimed, while maintaining that performance of power department played an important role in UP getting second rank in the ease of doing business survey. [Source](#)

### **Curtailment of Solar and Wind for Commercial Reasons Continues to be a Threat**

Renewable power generation, especially solar power, has seen phenomenal growth since the inception of the National Solar Mission and has accounted for most new capacity additions over the past three years.

However, the ongoing pandemic has disrupted this sector’s growth, much like the rest of the economy. India’s share of renewable energy (including large hydropower projects) increased marginally to 36.4% in the third quarter of 2020 (Q3 2020) from 36.3% in the previous quarter, according to the data from the Central Energy Authority (CEA) and the Ministry of New and Renewable Energy (MNRE).

### ***Flouting “must-run” in the name of grid security***

With rising renewable generation, grid security has become a concern for the transmission and distribution companies. The government has tried to encourage renewable generators by granting ‘must-run’ status to solar and wind energy supplied to the grid. The ‘must-run’ status means that solar and wind projects’ power cannot be curtailed except for conditions that threaten grid stability. Understandably, this has become a bone of contention between the distribution companies and renewable generators time and again.

The on the ground scenario is complicated for renewable generators. The distribution companies (DISCOMs) have the authority to curtail renewable energy power at times without even communicating it to the generators. The situation is more pronounced in renewable energy-rich states like Tamil Nadu, Rajasthan, Madhya Pradesh, Telangana, and Andhra Pradesh.

In January this year, a panel reviewing the Indian Electricity Grid Code (IEGC) 2020 suggested that wind, solar, wind-solar hybrid, and hydro projects must be treated as 'must-run' power projects. The draft report also indicated that these projects should not be subjected to curtailment based on merit order dispatch or any other commercial consideration. Speaking on the 'must-run' status of renewables in the country, Vinay Kumar Pabba, Founder and CEO of VARP Power, said, "It has been part of Indian Electricity Grid Code for quite some time now. Wind and other renewable energy sources, including solar projects, enjoy the must-run status, in the sense that except for technical and operational reasons, the grid operator cannot ask for a shutdown of the generators for commercial reasons."

The implementation of the 'must-run' status has been lax, and the reasons for curtailment lack clarity most of the time.

Commenting on the need for a stronger implementation of the 'must-run' status, Vinay said, "There is no transparency around power curtailment in India. Since the grid operator and the load despatch center is a part of the state transmission utility, instructions to solar and wind projects to back down rarely come with any reason. Often, the generators suspect that the curtailment is being ordered for purely commercial reasons and not truly for technical or grid-related reasons. There is a need to bring about transparency to the entire curtailment business."

### ***New rules to enforce the existing rules***

Recently, the Ministry of Power (MoP) came out with the draft of new electricity rules to make the compensation process easier for renewable project developers. The draft addresses several important aspects like the change in law and the must-run status of renewables, among other key concerns for renewable energy projects.

"The MoP in the draft amendments is going to continue the same, with an elevated legal status, and this 'must-run' injunction will now be part of the rules instead of merely being part of the IEGC," added Pabba. The new rules suggested that if a notice of curtailment is provided 24 hours before the scheduled supply, the generator must sell the unscheduled power to the power exchange. The ministry also stated that when the compensation rate is not specified in the power purchase agreement (PPA) or the power sale agreement (PSA), the rate will be set at 75% of the PPA rate per unit.

Aditya Malpani, Director- Open Access Business at Amp Energy India, said, "The must-run status is critical for developers to be able to sustain project viability and honor debt obligations. While regulations (central as well as state grid codes) have provided a 'must-run' status for a very long period, most projects across states have faced issues with the curtailment of generation. Most of the time, curtailments are not on account of technical constraints but for commercial reasons, i.e., such as oversupply, higher cost of renewable energy power, and difficulties in thermal power project outages. The proposed rules provide that the developer is entitled to the PPA rate for curtailed power, and the same should be adjusted with rates realized from the sale of power in exchange or alternate sources."

"This is a move in the right direction as it allows developers to realize revenues for curtailed electricity (which is nil in the current framework)," Aditya added.

Last year, MNRE had issued a letter to the chief secretaries of all states and union territories, asking them to ensure that ‘must-run’ status had been accorded to both wind and power projects in the states in line with the Indian Electricity Grid Code 2010 and the Electricity Act 2003.

### ***DISCOMs curtail without reason or notice***

“Grid operations under the load despatch centers should be carved out and made autonomous of the state transmission utility. This is analogous to the Power System Operation Corporation Limited (POSOCO) being separate from the Power Grid Corporation of India Limited (PGCIL) at the central level. It is necessary to make the grid operator independent of the transmission utility at the state level, too,” Aditya added.

The DISCOMs often decide to curtail power devoid of valid reasons, without communicating to the generator. But there are times when the curtailment is done on the part of the DISCOMs giving preferential treatment to some stations and at the same time holding power offtake from other stations. This creates an imbalance for the generators.

The curtailment of power on the part of the DISCOMs acts as an impediment for the solar generators, for whom the solar project is based on a single part tariff. The backing down of power leads to a substantial monetary loss for the developers, as they don’t get compensated for the loss of generation.

According to Aditya, “The new rules need to be adopted by the Central Electricity Regulatory Commission (CERC) and the state electricity regulatory commissions (SERCs) who need to amend the respective grid codes (especially, because rules require off-takers to pay for curtailed energy at PPA rate). One option is that regulators’ forum may issue standard amendments in grid code, which may be amended by various SERCs. It is important to incentivize SLDCs/DISCOMs to provide curtailments with a sufficient notice period. The curtailment on the grounds of technical constraints should be allowed only for grid failure or technical issues in the connecting infrastructure and when the physical flow of power is not possible from the project.”

### ***“Must-run” integral to meet India’s renewable energy goals***

While the government has issued numerous orders in support of the must-run status of renewable power, more needs to be done on the part of the government. The government needs to intervene and ensure that the solar and wind generators are not at the receiving end of this contentious issue.

“While it is nice to have a compensation provision, we easily tend to fall into this tempting and seductive trap of retrospective amendments to PPAs. PPAs are sacrosanct. They cannot be tinkered with, now and then. They should not be amended; even it means conferring a benefit on the generators. Instead of tinkering with the PPAs and the compensation mechanism, we need to implement the ‘must-run’ rule in a fair, transparent, and compliant manner. Also, this argument does not detract from a prospective implementation of a compensation mechanism in newer PPAs,” opined Vinay.

Stringent implementation of the must-run status can act as a shot in the arm for generators who already face numerous risks when financing and operating renewable projects. [Source](#)

### **Tripura Sets ₹3.31/kWh as Levelized Tariff for Decentralized Solar Projects Under KUSUM**

The Tripura State Electricity Regulatory Commission (TSERC) has set ₹3.31 (~\$0.045)/kWh as the levelized tariff for power from decentralized solar projects under component-A of Pradhan Mantri Kisan



Urja Suraksha evam Utthan Mahabhiyan (PM KUSUM) in the state. The Commission noted that all the other terms and conditions of the program would be applicable as per the Ministry of New and Renewable Energy's (MNRE) guidelines. The levelized tariff will be valid for 25 years.

The Tripura State Electricity Corporation Limited (TSECL), the state transmission and distribution licensee, filed a petition with the Commission to establish the pre-fixed levelized tariff to purchase solar power from decentralized solar and other renewable projects. These projects are owned by farmers and developers and range between 500 kW and 2 MW in capacity. These are located in the vicinity of rural grid substations under the PM KUSUM program (component-A). As per the program details, the power generated by the projects will be purchased by state distribution companies (DISCOM) at a pre-fixed tariff. The Tripura Renewable Energy Development Agency (TREDA), the state nodal agency, said it would help farmers develop the projects. It noted that DISCOMs have already conducted substation-wise assessments for renewable generation capacity that can be injected at various 33/11 kV substations in rural areas. The total renewable capacity TSECL can support stands at 5 MW as per the assessments.

In its final order, the TSERC set the tariff for the projects to be set up by farmers, farmer groups, cooperatives, Panchayats, farmer producer organizations (FPO), water user associations (WUA) in the vicinity of rural grid substations at ₹3.31 (~\$0.045)/kWh for 25 years. It also directed DISCOMs to publicize the program through print, electronic, and social media in Bengali and Kokborok to maximize reach for farmers' benefit. In January, the TREDA floated a tender for the solarization of 1,300 grid-connected agricultural water pumps in the state. The scope of work included the design, manufacture, supply, erection, testing, and commissioning of the solarization of 2 horsepower (HP) pumps in the state on a turn-key basis.

According to Mercom's India Solar Project Tracker, Tripura only has about 5 MW of solar projects in operation as of November 2020. Recently, its neighboring state of Meghalaya also floated an expression of interest for installing 10 MW of solar projects under component A of the KUSUM program. According to Mercom India Tender Tracker, 290 MW of solar tenders have been issued for decentralized solar projects under Component-A of the KUSUM program. [Source](#)

## The market for hybrid energy and storage

Efficient and economically viable energy storage, and optimal hybridization, are crucial for ensuring the expansion of renewable power generation both at the grid and micro-grid scale," says Deepak Thakur, chief executive officer for the hybrid and energy storage business of Sterling and Wilson. He has spoken to pv magazine about the accelerated proliferation of renewables-plus-storage across markets.

pv magazine: The hybrid and energy storage market is gaining traction globally. What projects has Sterling and Wilson carried out in emerging markets?

**Mr. Deepak Thakur:** The hybrid and energy storage (HES) business of Sterling and Wilson Pvt Ltd (SWPL) provides EPC [engineering, procurement and construction] solutions for hybrid power plants and energy storage worldwide. These hybridized energy and battery storage solutions can be applied across various verticals—from large, centralized fossil and renewable power plants to data centers, the commercial and industrial (C&I) segment, and remote settings such as islands.

We have executed a solar-diesel-battery hybrid project in Nigeria under the Rural Electrification Agency's Energizing Education Programme for three sites. The project comprises a 37 MWh battery energy

storage system (BESS, one of the largest in the region), 5.7 MWp [of] solar, and [a] 4.4 MVA DG set, providing 24/7 power to universities in West Africa.

We have recently signed a contract in [a] consortium partnership with French EPC company Vergnet and SNS Niger, to construct a solar-diesel-storage power plant in Agadez city [in the] West African country, Niger. This project comprises 18.9 MWp [of] solar, [a] 11.55 MWh/3.0 MVA battery energy storage system, [a] 6.54 MVA (2.18x3 MVA) diesel generator, and [a] 20 kV substation.

### ***What's the size of the global market for hybrid energy and storage?***

The future of renewable energy by all projections is optimistic. A recent report projects the global hybrid energy market, including storage, to be about \$40 billion by 2025. Efficient and economically viable storage and optimal hybridization are crucial for ensuring the expansion of green power generation both at the grid and micro-grid scale.

The challenge of mitigating [the] intermittency associated with wind or solar power plants has always been there and it is now even more pronounced as their proliferation grows exponentially. Hybrid power and battery storage have gained tremendous traction in recent years due to the inherent benefits of facilitating power predictability, serving 24/7 energy needs with [an] optimization of [the] fossil fuel-green energy mix—thereby reducing the carbon footprint.

### ***How does the installation trend vary across developed and developing economies?***

The combination of renewable generation and energy storage is seeing accelerated proliferation across developed and emerging economies as it provides a credible value proposition. Developed economies are adopting standalone stationary storage, as their intelligent grids and mature power tariff management systems facilitate the techno-commercial viability of the solution.

On the other hand, developing economies are deploying hybrid power solutions for the electrification of rural and remote locations due to their lower costs and quicker installation than building extensive transmission lines from central generating plants.

### ***What are the optimal combinations for remote areas?***

Both solar-plus-battery storage and solar-diesel-battery storage solutions have pertinent propositions for different applications. If there is curtailment due to grid issues, adding storage will help the solar asset schedule the dispatch according to demand and improve the overall return on capital employed.

If there is cost arbitrage with diesel, a solar-plus-storage solution will help improve the proportion of green energy and help make the return-on-investment (ROI) on solar and storage more attractive. This scenario is most likely with islands and difficult-to-access locations where the total cost of fuel delivered to the site, and logistics challenges, are very high.

Solar-battery-diesel power plant configuration is suitable in regions where grid power is either unavailable or highly unreliable. In that case, solar compensates for daytime power and battery stores the excess solar power generated, thereby leading to a substantial reduction in diesel consumption. This combination provides the lowest cost of electricity generation to off-grid regions or regions with unreliable grid electricity.

***Do hybrid power plants make a strong case for islands to reduce their diesel consumption? What are the other emerging trends?***

The revenue stacks possible with energy storage are vast and varied, as per local conditions and regulatory framework[s]. Many regions around the world have started to use energy storage as a primary and secondary frequency-response mechanism. There are utilities that are planning for virtual power plants using energy storage, and then there are applications being planned to help with greening the grid and generating assets.

The likelihood of energy storage following renewable energy (RE) deployment growth in geographies is being seen in a more pronounced manner now, and this trend will only accelerate further. With round-the-clock (RTC) RE power becoming the norm, we will see more front-of-the-meter deployment of energy storage solutions. Globally, for off-grid hybrid projects (solar-wind-diesel/gas-battery) or any combinations of multiple generation sources, the regions showing potential are Africa, South East Asia, island nations like the Maldives and across Oceania, [and] also Western Australia. Even the Caribbean islands and locations in South America are emerging as potential areas for hybrid solutions.

In comparison, India has a well-developed grid network. Power availability has also been reliable, relatively. The grid here is much more stable than in many of the aforementioned countries where the grid is non-existent or, if available, very unstable.

***Batteries seem to dominate as the preferred energy storage option today. How would you compare battery storage with pumped storage for utility scale PV installations?***

Pumped storage is the most convenient and most competitive source for storage. However, the challenge is building them where required, the long duration of completion, and the environmental considerations associated with building such assets. The affected population's re-settlement and associated socio-political issues, take much time for a resolution, which involves dealing with various stakeholders at the local, state, and central levels. Compared to pumped hydro, battery energy storage is modular, cheap and scalable.

***As India pursues ambitious renewable energy targets, the nation has not seen large scale storage deployment. What are the costs versus the benefits?***

India has done well in building renewable energy capacity, and maybe it is the only country globally ahead of its Paris commitment for green energy build-up. It's now imperative that, as a next step, RE emerges as a baseload generation resource by ensuring that all RE installations generate power to their full capacity and dispatch to customers (discoms [power distribution companies] and private/captive consumers).

Energy storage deployment in India is still not an attractive option as the tariffs are not competitive for a standalone integration of storage solutions into the grid. The various value stacks that create income streams for storage are still not seen in the Indian context. Until such [a] time, large scale deployments of storage will not happen. RTC tenders must ensure that load curves are met to supply firm power, which is possible only with the integration of energy storage. The challenge is that such combinations do not meet pricing benchmarks, which are established in the market for RE.

Unless structural changes are brought, we will see a slower deployment of energy storage. However, it is relevant to mention that the concerned authorities have started considering various dimensions, including RTC and hybrid-solutions-based projects. Hopefully, soon we will see more traction and larger deployments bringing in economies of scale.

Unfortunately, in India there is very little flexibility for the consumer and producer to get creative around modeling dispatches. The focus is more on the competitiveness of the hybrid power, vis-a-vis conventional power. Pure-play solar or wind power generation is competitive but combining it with battery technology, which is still evolving, impacts the delivered cost of energy. The comparatively higher price of RE-plus-storage solutions impedes their wider acceptance despite the other tangible benefits such a combination brings. [Source](#)

## DISCOM Dues to Renewable Generators Inch Up to ₹110.67 Billion in October

Overall, 229 DISCOMs owed power generators about ₹1.25 trillion in overdue payments

Distribution companies (DISCOMs) owed over ₹110.67 billion (~\$1.5 billion) to renewable energy generators (excluding disputed amounts) in overdue payments across 439 pending invoices, according to data from the Ministry of Power (MoP). This represented a slight increase from September when DISCOMs owed renewable power developers ₹106.7 billion (~\$1.43 billion) in overdue payments across 460 invoices. Outstanding payments (excluding disputed amounts) in October stood at ₹5.76 billion (~\$78.3 million), according to data from the MoP's payment ratification and analysis portal (PRAAPTI). As per the portal, 229 DISCOMs owed power generators in the country about ₹1.25 trillion (~\$16.9 billion) in overdue payments spread across 21,045 invoices at the end of October 2020. Outstanding payments at the end of the month stood at ₹124.3 billion (~\$1.69 billion).

DISCOM Dues to Power Generators					
Particulars	As of September, 2020		As of October, 2020		% Change
No. of DISCOMs	66		66		0%
No. of participating power generators	229		229		0%
No. of overdue* invoices	20,555		21,045		2%
Overdue and Outstanding	₹ in Billion	~\$ Billion	₹ in Billion	~\$ Billion	% of Change
Overdue amount at the beginning of the month	1,221.34	16.61	1,246.81	16.95	2.1%
Total amount billed to DISCOMs	147.12	2.00	153.84	2.09	4.6%
Amount paid by DISCOMs against overdue	110.9	1.51	118.34	1.61	7%
Amount paid by DISCOMs against outstanding	23.13	0.31	19.79	0.27	-14%
Overdue amount at the end of the month	1,246.81	16.95	1,257.45	17.10	1%
Outstanding amount at the end of the month	118.85	1.62	124.34	1.69	5%
<i>Overdue* invoices are those which remain fully or partly unpaid past the due date</i>					
Source: PRAAPTI			Mercom India Research		

During the month, DISCOMs paid about ₹118.3 billion (~\$1.6 billion) against their overdue payments and about ₹19.79 billion (~\$269 million) towards their outstanding dues. The total amount billed to DISCOMs stood at ₹153.8 billion (~\$2.07 billion) in October, up from ₹147.1 billion (~\$1.9 billion) in September. Rajasthan had racked up the highest amount of overdue payments at ₹383.3 billion (~\$5.2 billion), of which ₹28 billion (~\$380.6 million) has been pending for less than 60 days and the remaining ₹355.3 billion (~\$4.8 billion) pending for over 60 days.

Tamil Nadu had the second-highest dues with about ₹204.7 billion (~\$2.8 billion) of overdue payments. ₹19.5 billion (~\$265.1 million) has been pending for less than 60 days, while the remaining ₹185.2 billion (~\$2.5 billion) has been pending for over 60 days. The state was rated “medium” in terms of ease of payments by DISCOMs.

Haryana, Uttarakhand, Delhi, Rajasthan, Madhya Pradesh, Jharkhand, Chhattisgarh, Odisha, Sikkim, Nagaland, Tripura, Andhra Pradesh, Goa, Karnataka, and Kerala were rated “worst in terms of ease of payments. Uttar Pradesh, Bihar, and Telangana were rated “Good,” while Himachal Pradesh, Arunachal Pradesh, Manipur, and Mizoram were rated the “Best” in terms of ease of payments. Adani Green Energy Limited, NLC India Limited (RE), and Tata Power Company Limited remained the three non-conventional power generators that were owed the highest dues at around ₹12 billion (~\$163.1 million), ₹10.8 billion (~\$146.8 million), and ₹22.3 billion (~\$303.1 million), respectively.

Last month, DISCOMs owed over ₹106.7 billion (~\$1.43 billion) to renewable energy generators (excluding disputed amounts) in overdue payments across 460 pending invoices. Earlier this year, the Power Finance Corporation Limited approved ₹306.07 billion (~\$4.09 billion) and REC limited approved another ₹300 billion (~\$4 billion) as of July 31, 2020, as part of the ₹900 billion (~\$12.03 billion) liquidity package announced by the government for eligible DISCOMs in May.

Mercom has previously written about how privatizing struggling DISCOMs could help them out of their financial troubles and push the Indian power sector forward. Earlier today, the High Court of Punjab and Haryana issued a stay order on the Central Government’s proposal to privatize Chandigarh’s electricity distribution company (DISCOMs), calling the move ‘unjust and illegal.’ [Source](#)

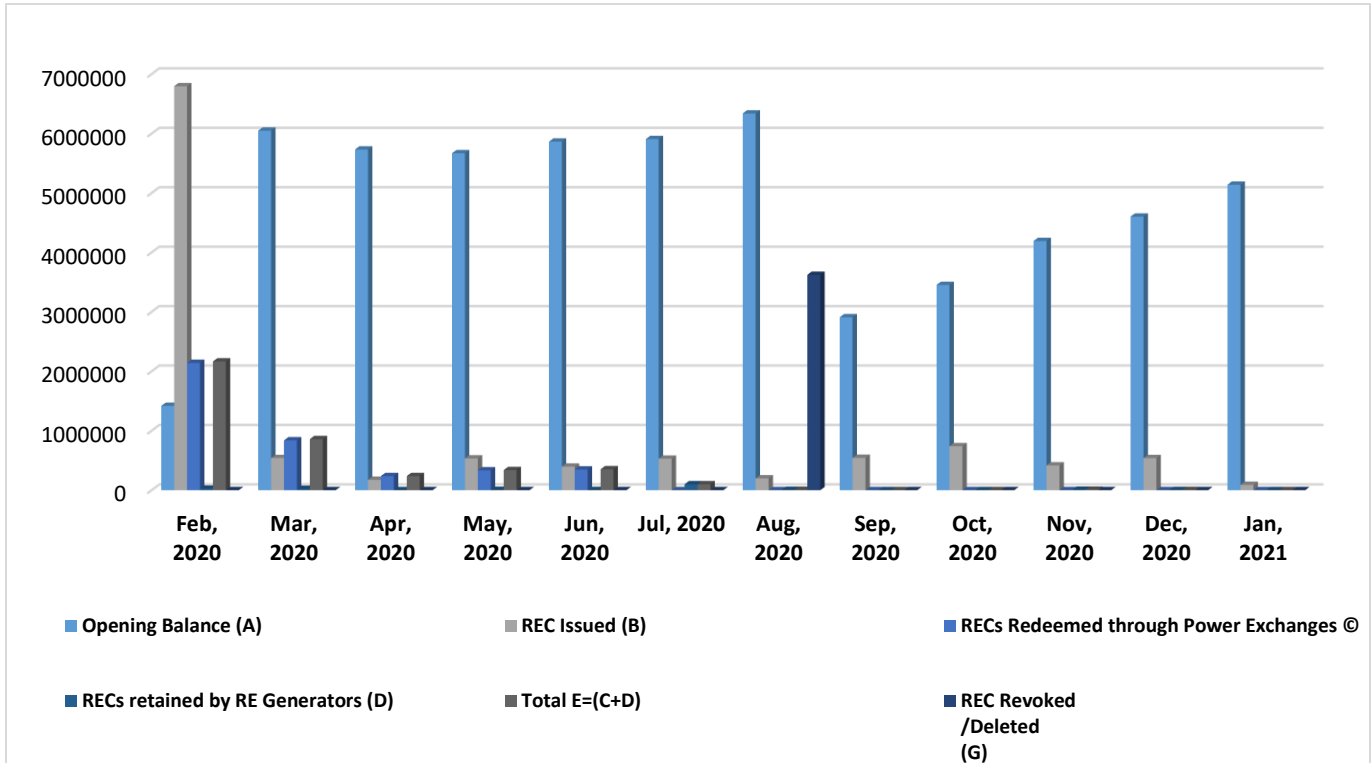
### Source wise REC break up:-

S N	Source	Accredited		Registered		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		As on date		As on date		Since Inception	Since Inception	Revoked/Deleted RECs	As on date
		Capacity	No. of Project	Capacity	No. of Project				
1	Wind	2761	536	2697	522	26950382	21953273	2135124	0
2	Urban or Municipal Waste	0	0	0	0	72892	72892	0	0
3	Solar Thermal	1	1	0	0	0	0	0	0
4	Solar PV	1011	407	989	398	10203999	9561111	119359	0
5	Small Hydro	223	34	247	36	5332481	4765341	6899	0
6	Others	4	2	3	1	25549	12755	5010	0

7	Geothermal	0	0	0	0	0	0	0	0
8	DISCOM	NA	NA	NA	NA	8513006	4628199	0	3623895
9	Biomass	477	43	408	38	10648480	9896423	156549	0
10	Bio-fuel cogeneration	826	91	385	55	9035608	8610583	5001	0
	<b>Total</b>	<b>5303</b>	<b>1114</b>	<b>4729</b>	<b>1050</b>	<b>70782397</b>	<b>59500577</b>	<b>2427942</b>	<b>3623895</b>

## REC Inventory position

Month Year	Opening Balance (A)	REC Issued (B)	No. of REC Redeemed		Total E=(C+D)	REC Revoked / Deleted (G)	Closing Balance (F=((A+B-E)-G))
			RECs Redeemed through Power Exchanges ©	RECs retained by RE Generators (D)			
Feb, 2020	1419842	6797475	2142410	24578	2166988	0	6050329
Mar, 2020	6050329	541311	838448	20233	858681	0	5732959
Apr, 2020	5732959	173854	237935	0	237935	0	5668878
May, 2020	5668878	534663	333770	4893	338663	0	5864878
Jun, 2020	5864878	396265	349056	3415	352471	0	5908672
Jul, 2020	5908672	530935	0	100471	100471	0	6339136
Aug, 2020	6339136	198726	0	4744	4744	3623895	2909223
Sep, 2020	2909223	544955	0	207	207	0	3453971
Oct, 2020	3453971	740650	0	1086	1086	0	4193535
Nov, 2020	4193535	417810	0	7833	7833	0	4603512
Dec, 2020	4603512	540794	0	3171	3171	0	5141135
Jan, 2021	5141135	88848	0	0	0	0	5229983
<b>Total:</b>		<b>70782397</b>	<b>59500577</b>	<b>2427942</b>	<b>61928519</b>	<b>3623895</b>	



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