

GREEN MARKET CAPSULE

Issue no: 73|February' 2021

TPTCL'S E-NEWSLETTER



Tata Power Trading Company Limited (TPTCL)

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Power News

Maharashtra's New Renewable Energy Policy to attract Rs 75,000-cr investments

New Delhi, Jan 28 (PTI) Maharashtra's New Renewable Energy Policy will attract Rs 75,000-crore investments, said the state's Power and New & Renewable Energy Minister Nitin Raut on Thursday. "Nitin Raut, Minister for Power and New & Renewable Energy, Government of Maharashtra, today while highlighting the Maharashtra's New Renewable Energy Policy said that the policy aims to promote public and private sector participation and will attract an investment of Rs 75,000 crore in power and allied sectors," FICCI said in a statement on Thursday.

Addressing an interactive session with the CEOs of renewable energy and power companies organised by FICCI, Raut said the policy aims to implement 17,000 MW of renewable power projects in the next 5 years. It is expected to create direct and indirect employment for one lakh people, along with giving priority to hybrid power projects. "In line with the Paris Agreement, the Government of Maharashtra is committed to achieving 40 per cent electricity generation from renewable energy sources by 2030," Raut added, as per the statement.

Maharashtra Principal Secretary (Energy) Asim Gupta addressed various concerns of the industry related to payment security, transmission, hybrid policy, open access, rooftop solar, and tenders for greenfield renewable energy projects, phasing out old inefficient plants. He said the government is open to suggestions and looks forward to collectively work with the industry for the betterment of the sectors.

Ranjit Gupta, chair of FICCI Renewable Energy CEOs Council and CEO of Azure Power, said Maharashtra is a key state of interest for the renewable energy players, and its new renewable energy policy is a welcome move for the industry. Maharashtra has been leading in terms of renewable energy deployment with push on electric mobility where RE deployment will have greater potential in future. The industrial and commercial segments with strong base in Maharashtra will have great potential for offtake of RE.

The roundtable was attended by leading industry stakeholders from power and renewable energy sectors such as Azure Power, RP-Sanjiv Goenka Group, Adani Electricity Mumbai Ltd, AMP Energy India, and Amplus Energy Solutions. Avaada Energy, BSES Rajdhani Pvt Ltd, Enel Green Power, Jindal Power Limited, O2 Power, Power Exchange India Ltd, Rattan India, SB Energy, Sembcorp Green Infra Ltd, Senvion, Sindicatum, Sukhbir Agro Energy Ltd, and Vikram Solar and Waaree also participated in the roundtable. [Source](#)

India's Renewable Power Installations Reached 138 GW at the End of 2020

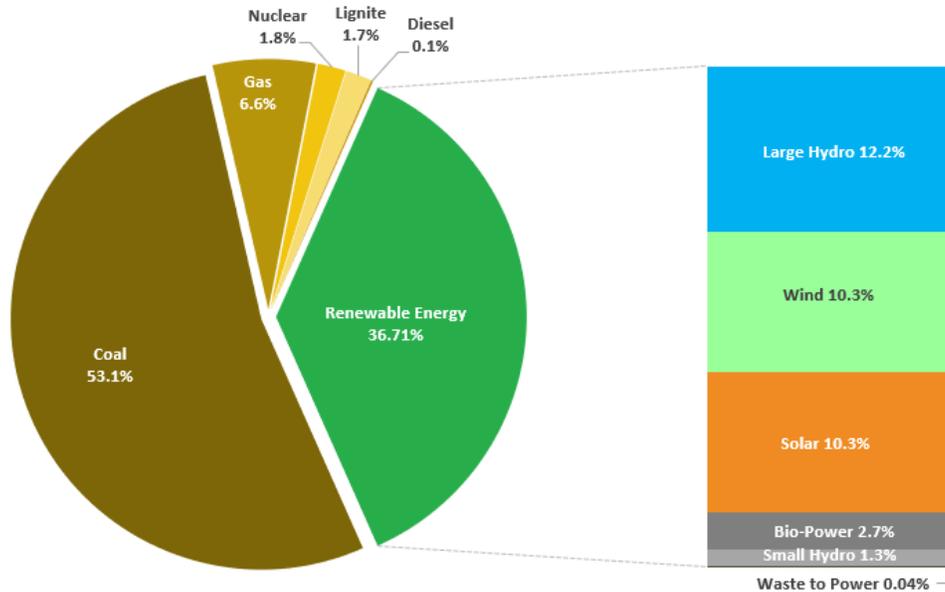
The overall share of renewable energy (excluding large hydro projects) in the country's installed power capacity mix stood at 138.27 GW, with a total share of 36.7% at the end of 2020, as per data from the Central Energy Authority (CEA), the Ministry of New and Renewable Energy (MNRE), and Mercom's India Solar Project Tracker.

The share of renewable energy was a marginal increase from the previous quarter when total renewable installations stood at 136.29 GW with a share of 36.4%. At the end of December 2019, the installed renewable energy (excluding large hydro projects) capacity stood at 133.17 GW, holding 35.9%.

India - Cumulative Installed Power Capacity Mix (%)

MERCOM
INDIA RESEARCH

Renewables (including Large Hydro) comprise ~36.71% of India's total installed capacity, with solar accounting for ~10%. Among renewables, solar accounts for ~28% of the installed capacity



Data from CEA, MNRE, Mercom India Solar Project Tracker (Installed Capacity as on 31 Dec 2020)

Source: Mercom India Research

Wind installations rose marginally and stood at 38.6 GW at the end of Q4 2020, up from 38.1 GW in the previous quarter. Meanwhile, bio-power held 2.7%, small hydropower held 1.3%, and waste-to-power projects held a 0.04% share – mostly unchanged from the previous quarter.

Conventional Energy

At the end of Q4 2020, thermal-based power sources had a cumulative installation base of 238.4 GW, dominating the power market with a 63.3% share – a small dip from the previous quarter's 63.6%. This segment included power generated from thermal-based sources, including coal (53%), gas (6.6%), nuclear (1.8%), lignite (1.7%), and diesel (0.14%).

Coal continued to hold the largest share in the country's power mix with 53.1% with nearly 199.9 GW of installations. While the overall market share for coal slipped slightly from 53.3% previously, the installed coal capacity rose slightly from 199.6 GW in the previous quarter. Large hydropower projects had the second-largest share accounting for 12.2% of the power mix with about 45.8 GW of installations. Installations of gas, nuclear, lignite, and diesel-based power projects remained stagnant from the previous quarter at 24.9 GW, 6.8 GW, 6.3 GW, and 509.7 MW, respectively. [Source](#)

Solar Power to Cost 15% to 25% Less in the Upcoming Decade: Report

The cost of solar power has declined 90% over the past two decades, and it is expected to go down another 15% to 25% in the upcoming decade, Wood Mackenzie said in a new report. At the beginning of the 21st century, it cost over \$15/W to install rooftop solar systems, with solar modules costing over \$10/W. The solar market began to grow, and its annual installation reached 5 to 10 GW by 2008-09 as several European countries, including Germany, Spain, and Italy, adopted favorable feed-in-tariff policies.

The global solar system prices decreased by over 80% in the 2000s. In 2010 alone, the spot price of polysilicon, a primary material for silicon-based solar modules, fell from about \$400/kilogram to less than \$100/kilogram as manufacturing increased, especially in China. The report said that the global utility-scale solar system price was \$0.87/W in 2020, a 70% decline from 2010. The price of utility-scale systems in the U.S. stood at \$0.94/W in 2020, a 90% decline from the beginning of the 2000s.

Solar energy will become the lowest-cost source to generate power in the United States, Canada, China, and 14 other nations by 2030, the report said. It is already the cheapest form of energy in Spain, Italy, India, and 16 states of the U.S. Wood Mackenzie anticipates that over 4 TW of solar and wind energy will come online globally over the next two decades, increasing renewables' share in the global power capacity to 30% from 10% currently. Of this new capacity, 2.6 TW will be solar energy.

The advancement of several solar technologies like bifacial modules, which can generate 15% more output than monofacial counterparts, will make solar energy more affordable in the upcoming decade. Moreover, large solar modules will provide a bigger surface area to increase the gain in power output. Solar tracker technology will also help enhance solar projects' power production by tracking the sun and changing solar panels' alignment in line with it.

The technological advancement will lead to a cost decline of solar modules from the current level of \$0.35 – \$0.40/W to \$0.13/W by 2030. The price of turnkey systems will drop by up to 35% over the same period due to better solar trackers and inverters. Moreover, the use of drones, aerial thermography, and artificial intelligence can help reduce operation and maintenance time and cost.

The report suggests that module supply chain innovation, system design, tracker technology, and automation and standardization will decrease the cost of upfront capital and the lifetime levelized cost of electricity (LCOE). Wood Mackenzie anticipates that utility solar LCOE will be between \$16/MWh and \$28/MWh in 2030, a 25% decline compared to the current LCOE, due to these technological advancements. According to the report, battery storage will become a significant part of the solar development equation as peak-price hours for electricity coincide with solar generation hours in most markets. However, utilities and developers incorporate storage in their plans to prepare for potential changes in demand.

According to Wood Mackenzie, renewable power in India is expected to be 56% cheaper than new-build coal by 2030. The report said that the Asia-Pacific region could expect to see cheaper LCOE for renewables compared to coal by 2030. Prices for utility-scale solar dropped more rapidly (about 11% per year) than onshore wind (about 5% per year) in the past five years, according to a report by Lazard, a financial advisory and asset management firm. [Source](#)

How REC trading pause will impact India's green energy aspirations

The Central Electricity Regulatory Commission (CERC) introduced the Renewable Energy Certificate (RECs) mechanism in the year 2010 with an aim to ease the purchase of renewable energy by the state utilities and obligated entities, including the states which are not well endowed with renewable energy sources. A generator can generate electricity through renewable sources in any part of the country and the REC framework seeks to create a national level market for renewable generators to recover their cost.

At the same time, obligated entities such as distribution utilities, open access consumers, and captive power plants from any part of the country can purchase these RECs to meet their Renewable Purchase Obligations (RPOs). Over the last decade, REC Market has become a key avenue through which these

entities have been able to fulfill their RPO targets in the most efficient and competitive manner. The market platform has also greatly helped in accelerating renewable energy penetration in the country's energy mix.

Over the last decade, the REC market has traded 481 lakh RECs in the solar segment and 113 lakh RECs in the non-solar segment and has registered a cumulative trade volume of 60 billion units (BU) in both segments so far. The REC market has a registered capacity of about 5,000 MW and is positioned as a market-based instrument playing a vital role in accelerating the growth of renewables allowing obligated and even voluntary entities to buy renewable energy in the form of RECs through market.

The concept of RPO as a driver for renewable penetration has been prevalent globally for a long time now. Developed countries have witnessed a significant increase in renewable energy driven by RPO. India's renewable programme is also anchored in RPO and this has helped India achieve exponential growth over the last few years. In FY10, India's renewable capacity at 16 GW representing 10% of the total installed capacity of 159 GW, increased 5.6 times to 90 GW representing 24% of the total installed capacity of 374 GW. Similarly, the renewable energy generation at approx. 24 BU in FY10 (calculated at @15% PLF) also increased 5.6 times to 138 BU in FY20. Today, renewable contribution in total energy consumption has crossed the 10% mark and is ever-growing.

Energy market & renewable targets

India aims a massive transition towards green energy, especially with the government's goal to increase renewable energy installed capacities to 175 GW by 2022 and around 450 GW by 2030. To meet these ambitious renewable energy targets under the Paris Climate Agreement 2015, a market-based approach which allows flexible, transparent, and competitive procurement to meet the targets in an agile and competitive way and help to usher in a new and sustainable energy order.

The REC, which includes all renewable and environmental attributes, allows obligated-open access consumers, distribution utilities as well as voluntary consumers to procure renewable energy without investing capital and is hence positioned as a key market instrument. With climate change emerging as a key risk confronting major economies across the globe, the transition to a sustainable energy economy becomes inevitable in the future.

REC & the niche green markets complement each other

There is still a huge gap between national RPO targets and achievements by the obligated entities. The regulators are gradually becoming strict with obligated entities regarding fulfillment of their RPOs and have also been increasing their targets over the years. With increasing targets and strict enforcement, there is a compelling need to have multiple avenues that can help the obligated as well as voluntary entities.

The newly commenced green market on the exchange platform does enable the procurement of renewable power while allowing RPO targets to be met. The market has picked up well in the initial few months with participation from state utilities and consumers. State utilities with surplus RE generation are providing decent sell-side liquidity, which is helping traded volume grow. Going forward, as the market matures, we expect the creation of green merchant capacity in the short to medium term.

The green markets and RECs complement each other and serve the requirements of the constituents in their own unique and efficient ways. For integrated energy and RPO, the green market is appropriate, and the REC market is suitable when it comes to meeting RPOs in a standalone way. Thus, the two

market segments are critical and together play an important role in realising renewable energy aspirations.

Pausing the REC trade affects green growth adversely

A seamlessly operational REC market is critical from the perspective of meeting the national green aspirations as well as the market being a critical avenue for RPO compliance for the obligated entities such as distribution utilities, open access consumers as well as captive power producers.

The trading of the REC market has been on pause since July'20 for almost over six months now basis an order from the Appellate Tribunal for Electricity (APTEL) on a petition filed by a few renewable energy associations against the CERC's order dated June 2020 regarding the correction of floor and forbearance prices of RECs.

This is not the first time that this market has suffered such a sudden halt, back in 2017 also trading of RECs was suspended on account of a Supreme Court order arising due to a dispute regarding the change in price regime by the regulator CERC. While trading in non-solar RECs was subsequently allowed for a few months, trading in solar RECs was prohibited for almost a year.

Such interruptions and trading restrictions affect the market and its participants adversely. As and when trading will resume, there will be a huge pipeline of buyers which might disturb the market equilibrium and in turn, may also impact the price discovery. An ideal way would perhaps be to continue the market trade and implement the court's orders, as and when pronounced, in a retrospective way. With the green market still at a nascent stage, the REC market is positioned as a key instrument with huge relevance in the given scheme of things and an abrupt pause is really not an ideal solution for the market as well as its stakeholders. [Source](#)

Battery storage cheaper than new coal power plants in TN: Analysis finds

A new economic viability analysis on Friday revealed that renewable energy along with battery storage in Tamil Nadu is cost competitive with new coal power plants. The report finds the levelized cost of energy for a hypothetical hybrid, solar, wind and li-ion battery storage system for the state to be Rs 4.97/kWh in 2021, which falls to Rs 3.4/kWh by 2030.

In comparison, cost of electricity produced from new coal power plants in Tamil Nadu is between Rs 4.5-6/kWh. The hybrid system is designed to cater to 1GW of solar and wind capacity in 2021 with two hours of battery backup, which increases step wise to a four-hour backup by 2030. The research further highlighted that lithium-based battery storage systems could also help reduce curtailment of renewable energy. Close to 50 per cent of solar power in Tamil Nadu was curtailed since the lockdown in March 2020.

Similarly, its curtailment of wind power in 2019 went up to 3.52hours per day from 1.87 hours per day in 2018. "Our analysis found that the cost of hybrid RE with battery storage system is at parity with new coal power plants in Tamil Nadu. Moreover, in 10-year time, incremental capacity addition would further drive down the cost by over 31 per cent," said Jyoti Gulia, founder of JMK Research and Analysis.

The analysis, released by Climate Trends and JMK Research and Analytics, tracks the system from an initial capacity of 800 MW of solar and 200 MW of wind along with 500 MWh of storage, that would cater to Tamil Nadu's average annual power demand for two hours per day from 2021-2023. Its capacity is augmented to three hours of daily backup for 2024-2026, and then four hours per day for 2027-2030. In

the last year, the hybrid system would meet 29 per cent of Tamil Nadu's average annual power demand at a competitive levelized cost of energy (LCOE) of Rs 3.4/kWh.

It also puts into perspective that Tamil Nadu has five new thermal power projects in its pipeline over the next three years. The Cheyyur ultra mega coal power plant is the biggest of these projects with a tariff of Rs 5-6/kWh, which would be 32 to 43 per cent more expensive than the system modelled in the analysis. "Tamil Nadu has got the largest installed renewable energy capacity and it leads India's energy transition efforts, yet it also has the largest coal power pipeline in the country. Since RE with battery storage works out to be cheaper than coal, perhaps TANGEDCO and other state power generation companies need to reconsider the coal pipeline," Aarti Khosla, Director, Climate Trends, told IANS.

Also, if this hypothetical, solar and wind-powered storage system were to wheel all of its energy to Delhi, even after accounting for interstate transmission system charges it could cover 100 per cent of Delhi's average yearly electricity demand by 2030 at an LCOE of Rs 4.4/kWh. "The system thus demonstrates that RE coupled with battery storage is a technically and financially viable option to building new coal capacity. At the same time, it would be a dispatchable source of power that addresses the grid integration of intermittent solar and wind power," added Jyoti. [Source](#)

Southern states to lead India's renewable energy push, says report

The south Indian states are likely to drive the renewable energy push in the country with an excess power of the order of around 23 gigawatts (GW) and 51 GW, respectively, for 2022 and 2030 in case of peak solar and wind scenario, said a report by the Center for Study of Science, Technology and Policy (CSTEP). This can be achieved with all thermal generators operating at a technical minimum.

India has an ambitious renewable energy target of 175 GW - solar: 100 GW; wind: 60 GW; biomass: 10 GW; and small hydro: 5 GW - by 2022. According to the CSTEP report, the four southern states (Karnataka, Kerala, Tamil Nadu, and united Andhra Pradesh) have 1,526 GW of solar energy potential and 1,124 GW of wind energy potential, making them the major contributors to India's renewable energy ambitions.

The report added that it requires an investment of around Rs 9,245 crore by 2030 to strengthen intra-region transmission infrastructure, in addition to the transmission network strengthening plans by the Central Electricity Authority (CEA). "To evacuate the proposed RE plant generation from the southern region under the must-run condition, the inter-regional transmission infrastructure requires significant upgrades, to transfer excess power to other regions. Resolving these can take India on to a path where RE is the mainstream electricity source," the report said.

To achieve this, the report batted for encouraging thermal generators to schedule routine maintenance in June, July, and August (monsoon season), because of high renewable energy injections into the grid. Further, it is prudent to curtail wind generation instead of solar generation, due to the lower relative cost of the latter, it said.

The report also suggested conducting grid balancing studies to examine the maximum limit of RE addition. According to the report, Tamil Nadu has the highest wind power installed capacity of 8,631 MW, while its solar power generation capacity stands at 2,228 MW. Karnataka has the highest overall renewable capacity (including biomass, co-generation, and small hydro) of 12.8 GW, with wind and solar contributing to 4,683 MW and 5,255 MW, respectively, based on 2018 data.

Andhra Pradesh also has appreciable wind (4,076 MW) and solar (2,642 MW) generation capacity. Telangana has a high solar capacity (3,410 MW), but almost negligible wind capacity (128 MW). Kerala has a comparatively low deployment of RE (138 MW solar and 52 MW wind), primarily because of limited resource potential—there is insufficient area with adequately high energy resource (solar radiation and wind speed). Puducherry has very little solar (1.73 MW) generation capacity. [Source](#)

Govt extends transmission charge waiver for solar projects facing delays

In a bid to provide relief to renewable power producers facing delays in project commissioning due to reasons beyond their control, the government has allowed solar and wind-based generation projects to avail transmission charge waivers even if they fail to set up their plants within June 30, 2023 — the deadline set for projects to receive the benefit.

The move is seen to benefit about 6,000 MW of solar projects that are currently facing delays in construction due to issues such as land availability, inadequate transmission capacity and supply disruptions due to Covid. At present, as much as 13,816 MW solar plants are being constructed through auctions conducted by the Centre.

Through its latest order issued on Tuesday, the Union power ministry said that “any renewable power project which is eligible for waiver of inter-state transmission charges and is having its scheduled date of commissioning on or before June 30, 2023, is granted extension of time from the commissioning on account of force majeure or for delay on the part of the transmission provider in providing the transmission even after having taken the requisite steps in time; or on account of delays on the part of any government agency, and the power plant is commissioned before the extended date; it will get benefit of waiver of inter-state transmission charges on the transmission of electricity generated by the power plant”.

Transmission charges add about Rs 0.20–0.50 per unit to every unit of thermal power. The policy of waiving this charge for renewables was designed to make solar and wind more attractive for cash-strapped discoms. As FE recently reported, solar projects with combined capacity of 18,000 MW are facing grim prospects with the state-run discoms developing cold feet on buying power from them, as tariffs discovered under subsequent auctions have fallen to the record low of Rs 1.99/unit, buoyed by lower interest rates, falling solar panel prices, improved technology and assured purchase of power. [Source](#)

Extension of Power Purchase Agreement for a Wind Project Denied in Rajasthan

The Rajasthan Electricity Regulatory Commission (RERC) dismissed Rajasthan Renewable Energy Corporation Limited’s (RRECL) request to extend the power purchase agreement (PPA) signed with Rajasthan Urja Vikas Nigam Limited (RUVNL). The Commission said that currently, there was no agreement for power purchase between the parties in place. When the distribution companies were not willing to purchase the power, it could not issue any directions.

RREC filed a petition with the Commission for the adjudication of disputes regarding the extension of the PPA.

Context

RRECL set up a wind power project of 2.10 MW capacity at Phalodi in Jodhpur, Rajasthan, and executed the PPA with RUVNL on November 10, 2000, for purchasing power for 15 years. The PPA was extended

from March 09, 2016, to March 31, 2019, by supplementary PPA dated September 26, 2016. After March 31, 2019, the extension PPA was declined by the DISCOM on the determined tariff by the Commission.

Later, the state DISCOM communicated that in its board meeting held on February 08, 2019, it was decided that the PPA would be extended after March 31, 2019, until the remaining useful life of the wind project. But under the condition that the tariff would be the lowest as discovered through competitive bidding and interim tariff would be ₹2.67 (~\$0.036)/kWh.

The state nodal agency, in its response, stated that the Commission under the 'determination of tariff for renewable sources, 2014' regulations had determined the tariff as ₹5.71 (~\$0.078)/kWh for the year 2019-20. It requested RUVNL to extend the tariff of ₹5.71 (~\$0.078)/kWh for 2019-20, and after that period, the tariff would be decided by the Commission.

RREC, in its submission, stated that as per terms of PPA, the entire life of the wind power project was decided to be 25 years, and the term of the agreement was for fifteen years from the commercial operation date. This agreement may be extended for ten years with mutual consent between the parties on the expiry of fifteen years. It can also be terminated earlier by either party by giving a notice of three months. RUVNL did not give any notice before termination of the PPA and should be declared encroachment of jurisdiction of Commission.

RUVNL, in its response, said that Rajasthan is an electricity surplus state, and there was no need for it to purchase energy from RRECL. The state DISCOM noted that the cost of renewable energy has substantially reduced. Considering the trends, it made no commercial sense to continue purchasing this power, that too at a cost higher than the prevailing prices.

It further added that after the PPA expiry, there was no contractual obligation to extend the PPA. The term of the PPA never envisaged up to the lifetime of the project. Further, the tariff proposed by RREC was too high to extend the PPA, whereas wind energy is available at much cheaper rates.

Commission's Analysis

The Commission noted that RREC had submitted that it has set up a wind power project and executed PPA with RUVNL initially valid up to March 31, 2016, which was further extended up to March 31, 2019. The state regulator noted that the PPA was executed initially for 15 years, and it was further extended for the next three years through a supplementary PPA. RRECL requested the Commission to issue a direction to RUVNL to extend the PPA for the project's remaining life, i.e., the next seven years at the Commission's determined tariff for such projects.

The Commission stated that presently there was no PPA between RRECL and RUVNL, and the agreement had expired long back. In the absence of an agreement, the Commission could not issue any direction to sign a PPA. There was no provision under the Electricity Act, 2003 by which this Commission may compel any person to purchase electricity or sign a contract.

"Nobody can deliver the goods not needed by the other party and demand price for the same. Once there is specific refusal to purchase electricity, RRECL could have sold the power in the market," the Commission added. The state regulator added that when the DISCOMs were unwilling to purchase the power, the Commission cannot issue any directions.

In October last year, RERC ruled in favor of the state DISCOMs in a petition demanding action against them for not achieving their renewable purchase obligation (RPO) targets. The Commission directed the

DISCOMs to assess the energy requirements more realistically in advance and sign the PPAs accordingly in the future. Earlier, we reported that the RVUNL had not renewed the PPAs it had signed with wind generators, despite RERC passing an order to ensure continuity in renewable power purchases. [Source](#)

West Bengal DISCOM's PSA with SECI for 100 MW of Solar-Wind Hybrid Power Approved

The West Bengal Electricity Regulatory Commission (WBERC) approved the power sale agreement (PSA) executed between India Power Corporation Limited (IPCL) and the Solar Energy Corporation of India (SECI) for the purchase of 100 MW solar-wind hybrid power. The PSA was approved for a tariff of ₹2.69 (~\$0.036)/kWh with a trading margin of ₹0.07 (~\$0.0009)/kWh. The Commission also directed IPCL to comply with the applicable laws regarding scheduling. It asked IPCL to ensure that any deviation should be within the acceptable limits under the deviation settlement mechanism (DSM).

IPCL filed a petition for the PSA's approval signed between IPCL and SECI for 25 years at a tariff determined through the reverse auction conducted by SECI.

Context

SECI invited bids for the setting up of 1,200 MW of interstate transmission system (ISTS) connected wind-solar hybrid power projects (Tranche II) in February 2019. SECI initiated a competitive bidding process for 600 MW of power procurement, and Adani Renewable Energy Park (Gujarat) emerged as the successful bidder. SECI agreed to sell 100 MW of hybrid power to IPCL from the pool of 600 MW hybrid power to be procured from the developer under a long-term contract for 25 years from the date of commercial operation. The PSA was signed on January 15, 2020.

As per the PSA, the tariff for the procurement of hybrid power would be ₹2.69 (~\$0.036)/kWh along with the trading margin of ₹0.07 (~\$0.0009)/kWh for the entire term of the agreement. The sale of electricity should be at a point at 220 kV or above where the power from the hybrid power project will be injected into the ISTS. For interconnection with the grid and metering, the developers should abide by the relevant CERC regulations and the central electricity authority regulations. The developer will bear all the charges and losses related to the transmission of power, and beyond the delivery point, all charges and losses will be borne by IPCL.

Keeping the above points in view, IPCL had asked the Commission to approve the PSA. IPCL is one of the leading power utilities in India started in 1919. It is an integrated power utility, headquartered in Kolkata, West Bengal with a pan-India presence.

In its submission, IPCL said that the proposal for solar and wind hybrid generation offers a higher capacity utilization factor (CUF). IPCL added that it would ensure proper scheduling so that any deviation under the DSM remains within the acceptable limit and the applicable regulations' provisions. The company also noted that the proportion of solar and wind capacity in 100 MW hybrid power quantum would be 75% solar and 25% wind in terms of project capacity.

Commission's Analysis

The Commission, in its observation, said that based on the load generation balance report, SECI would not only help IPCL to meet its balance requirement from 2021-22 onwards but also there will be a surplus during the initial two years (surplus of 31 MW in 2021-22 and 17 MW in 2022-23). The state regulator

noted that the power purchase would be beneficial for IPCL to meet its demand, as well its solar renewable purchase obligation (RPO) and non-solar RPO for the ensuing years.

The Commission stated that the tariff of ₹2.69 (~\$0.036)/kWh was discovered following the competitive bidding guidelines issued by the government of India, and it was beneficial for the end consumer. It also said that IPCL and SECI had agreed for a trading margin of ₹0.07 (~\$0.0009)/kWh over and above the price discovered in the bidding process. The regulator noted that the trading margin, as agreed by both parties, was within the limits of the trading margin allowed by CERC for short-term contracts.

Considering all the facts, the Commission approved the PSA for 25 years at a tariff of ₹2.69 (~\$0.036)/kWh with a trading margin of ₹0.07 (~\$0.0009)/kWh. In October last year, the Ministry of New and Renewable Energy (MNRE) issued tariff-based competitive bidding guidelines for power procurement from grid-connected solar-wind hybrid projects. The guidelines stated that SECI would be the nodal agency for implementing these guidelines.

Earlier, the Chhattisgarh State Electricity Regulatory Commission, in a similar order, had approved the PSA signed between the Chhattisgarh State Power Distribution Company and SECI for 400 MW of solar-wind hybrid power. [Source](#)

Jharkhand Sets ₹3.09/kWh Levelized Tariff for Solar Projects Under KUSUM

• The tariff applies to DISCOMs for power from KUSUM projects between 500 kW and 2 MW

The Jharkhand State Electricity Regulatory Commission (JSERC) has set a pre-fixed levelized tariff of ₹3.09 (~\$0.042)/kWh for power from decentralized solar and other renewable energy projects between 500 kW and 2 MW in size under Component-A of the Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (PM KUSUM) program. The tariff applies to distribution companies (DISCOMs) looking to purchase power from farmers, farmer groups, cooperatives, panchayats, farmer producer organizations, or water user associations in the vicinity of rural grid substations.

Background:

The Jharkhand Bijli Vitran Nigam Limited (JBVNL) had filed a petition with the JSERC asking it to approve a tariff of ₹3.09 (~\$0.042)/kWh for the purchase of power from renewable energy power projects constructed under the KUSUM program. It also asked the Commission to allow the changes it made while calculating the tariff. In its petition, JBVNL explained that it has considered the capital cost as (₹34 million (\$470,000)), operation and maintenance expenses of ₹450,000 (\$6,250) with an escalation of 5.73% per annum, return on equity (14%), capacity utilization factor (20%), and debt repayment period as 13 years while computing the pre-fixed levelized tariff.

Commission's Analysis and Stance:

After studying JBVNL's submission, the Commission observed that a considerable period had passed since it notified regulations for determining tariffs for power procured from solar and solar thermal power projects. It had issued these regulations on November 10, 2015, and they were to remain in effect till March 31, 2020.

The Commission declared that these regulations were not appropriate for the current market scenario since there have been changes in terms of technology and the competitive bidding process for solar

projects. After studying the pre-fixed levelized tariffs under the KUSUM program issued by other state electricity regulatory commissions, it said that the current regulations need to be revised.

The Commission allowed the tariff of ₹3.09 (~\$0.042)/kWh, stating that this was a more realistic and competitive tariff given the current market climate. However, the Commission noted that this tariff was only a ceiling tariff for carrying out competitive bidding. The final tariff must be discovered through competitive bidding. This tariff would remain in force until the Commission reviews it.

Earlier this month, the Telangana State Electricity Regulatory Commission set a levelized tariff of ₹3.13 (~\$0.043)/kWh for solar projects between 500 kW and 2 MW size under Component-A of the KUSUM program. In December 2020, the Tripura State Electricity Regulatory Commission prescribed ₹3.31 (~\$0.045)/kWh as the levelized tariff for power under the same program. [Source](#)

Solar rooftop: Only Discoms are authorised to implement the scheme, clarifies MNRE

New and Renewable Energy Ministry on Friday clarified that only State's Power Distribution Companies (DISCOMS) are authorised to implement rooftop solar scheme and empanel vendors. "The Ministry has not authorised any vendor to install a solar panel," It said in a statement. Further, it explained that the State's Power Distribution Companies issue tenders and based on that, vendors are empanelled. Accordingly, the rate is also fixed. 3rd phase of Rooftop Solar Panel Scheme is underway where Centre gives grant up to 40 per cent of the cost for a capacity of 3kW. The subsidy amount will be 20 per cent grant for capacity between 3 kW to 10 kW.

Almost all DISCOMS have published an online process for the scheme. An interested consumer can apply and get a solar panel by empanelled vendors. Consumers will pay the balance after deducting the grant, and the whole process is explained on the portal of concerned DISCOM. Ministry then transfers the grant to DISCOM. A consumer needs to take service of empanelled vendors only to avail the benefit of assistance.

This clarification has come after the Ministry received a complaint about higher charges being collected. It has advised Consumer needs to pay based on rates prescribed by DISCOM. [Source](#)

A framework for a comprehensive energy storage policy in India

India has recently announced to achieve more than 450 Gigawatt (GW) of renewables by 2030. In contrast, the current installed power capacity in the country currently stands at 370 GW, which includes about 88 GW of renewables. This implies that the 2030 target would necessitate a compound annual growth rate of over 17 per cent. This may be a tough task, especially in light of the fact that the country is likely to miss its target of 175 GW of renewables by 2022.

However, it is preceded by the technical challenge of integrating such a vast amount of renewable energy into the grid. This is especially true given the fact that the Central Electricity Authority (CEA) has suggested that India does not need any further thermal power plants, so incremental capacity must come from renewables. The states of Gujarat and Chhattisgarh have announced that they will not be adding any coal power plants in the near future, in part because most of their thermal assets are currently underutilized, even though the DISCOMS continue to pay for the fixed costs.

We are therefore at a crossroads of having to say no to new thermal capacity while at the same time massively ramping up renewable capacity. Yet, renewables' power output is neither predictable nor consistent. It also cannot be dispatched on demand, unlike coal and natural gas plants. These three

challenges were not as relevant when India's renewable capacity was restricted to a few gigawatts, but now they are.

The necessity of energy storage

This is where integrating energy storage systems is a feasible solution. In India they have been operational in different forms for a number of years, such as pumped hydro systems, albeit to the limited extent of a few megawatts (MW). However, for most applications, battery storage systems can be game changers. They operate predominantly on lithium-ion chemistries and their costs have plummeted from around \$800 per MWh in 2012 to around \$150 per MWh today. The drop has been facilitated by rapidly expanding volumes of production and growing application in electric vehicles.

Utilities in India have started incorporating lithium batteries on the grid since there is a clear financial benefit to do so. Instead of having to service a high tariff coal plant's fixed costs while excess renewable power is curtailed, the utilities can acquire cheaper renewable power and store it in the battery systems for later dispatch. The cost differential is beneficial in most cases and will only improve as the average tariffs of solar and wind power drop below the already low ceiling of roughly Rs 3 per kWh.

Developing the policy framework

Like with all new technologies, a well thought-out policy framework will be essential to structuring battery storage systems' expansion in the country. Based on their applications, the power sector can integrate them in three separate segments:

Segment 1: Generator-coupled storage systems

As the name suggests, solar and wind generators integrate some amount of storage at the source itself. This improves their generation profile to even out the intermittency due to the variation in sunlight or wind flow. This is important as rapid fluctuations in power profiles are difficult to handle and they are often passed along the transmission networks.

Secondly, generator-integrated storage systems can help shift power injection at those times when the grid needs it the most. In general, managing evening peaks with such storage systems can be very useful. Policy makers can begin to integrate such storage systems in solar and wind capacity auctions. The Solar Energy Corporation of India (SECI) is perfectly suited to do this. In fact, SECI has already awarded 1,600 MW of such capacity in two tenders, with the tariff for off-peak power at a very competitive Rs 2.88.kWh. However, any battery additions must be planned in conjunction with the local and/or national load dispatch centers. We must avoid making the same mistakes that India has done with thermal capacity addition, where a number of plants have now become surplus capacity and are running at unsustainably low PLFs.

Segment 2: Transmission-coupled storage systems

Here, storage systems are used broadly to serve ancillary services and assist the grid operator functions. India is at the cusp of announcing these regulations. Being market linked, this will serve as an important measure to incentivize such storage systems. Once again, policy makers can begin by announcing separate tenders for such systems. POSOCO or other state transmission agencies can begin with a planning exercise to identify transmission bottlenecks and carefully add storage capacity where necessary.

Segment 3: Behind-the-meter storage systems

These are smaller battery systems that are installed for consumer-level applications, such as at residences and commercial outlets. India already is one of the largest markets in the world for distributed behind-the-meter storage systems, and has so far been powered largely by lead acid-based chemistries coupled to backup inverters (also called UPSs). However, with a proliferation of net-metered rooftop solar PV systems, an opportunity exists for houses, factories and even small shops to completely go off the grid. The economics of lithium-ion based batteries is also favourable, as despite their higher purchase costs (Rs. 45,000 for a typical home inverter system vs. Rs. 15,000 for lead-acid) they offer up to 4,000 cycles compared to 600 from lead-acid batteries. Li-ion batteries can also be discharged down to 80-95% of their capacity, as opposed to 50-60% for the alternative.

The market for these systems will open up even further as feed-in tariffs and net metering schemes are wound down across India. Instead of selling to the grid, a customer will be able to store excess power and consume it during peak tariff hours, thus accruing enormous savings on utility bills.

However, energy storage systems will directly eat into the revenues of the distribution companies. This is akin to what is currently happening in decentralized energy generation through rooftop solar PV. Unfortunately, this is something that cannot be stopped and utilities will have to adapt to the new normal and fundamentally transform their business models. Any storage policy in India will thus have to consider and promote all the three segments. Each application clearly serves different needs and it is in the best interest of the stakeholders that the regulators promote each of them individually and effectively, based on the promising market opportunities available today. [Source](#)

To popularise solar energy, Bengal allows net metering for individual households

Kolkata: In a bid to popularise solar energy in the state, the West Bengal government has allowed net metering for individual household rooftop solar panels starting from 1 KW, an official said. Earlier institutional, commercial, industrial and cooperative housing were only allowed the benefit of net metering and that too for 5 KW capacity onward. The West Bengal Electricity Regulatory Commission in its recent amendments to the Cogeneration and Electricity Generation from Renewable Sources Regulations 2013 had allowed net metering for individual households from 1 KW but had restricted it to 5 KW, a top official told PTI.

"To boost renewable energy use, we have allowed net-metering of solar power installation from 1 KW to 5 KW. Now there is no restriction and anyone can install rooftop solar panel. Earlier regulations did not allow net metering for common households," a WBERC official said. However, a consumer cannot install solar panels more than its own load. That means if a household has an existing electricity load of 2 KW then his installation cannot be higher than 2 KW even if he has space and interest, a WBERC official said.

The net metering concept allows to set-off the number of units produced from the total consumption and the consumer pays electricity charges of only what he had derived from the grid or distribution company. The regulation allows set-off of up to 90 per cent of his solar power generation for any month. The new amendment mandates "gross metering" facilities for solar system installation capacities above 5 KW. The commercial benefit for a consumer is far less in case of gross-metering compared to net-metering thus making adoption less commercially attractive. The Union Power ministry in its model regulation had provided gross metering over 10 KW solar installations, the official added. [Source](#)

New net metering rule will deter rooftop solar adoption, says NSEFI

The net metering provision under the recently notified Electricity (Amendment) Rules, 2020 has left rooftop solar developers worried. The provision restricts net metering up to 10 kW capacity in India and mandate gross metering above 10 kW, which, when implemented, will have a drastic impact on the entire rooftop solar industry, say developers. Under net metering, electricity generated by the solar rooftop system is first utilized by the consumer to meet their internal/captive requirements. Excess electricity, if any, is exported to the grid. Subsequently, when the consumer imports power from the grid, the exports are adjusted against the imports, lowering the electricity bill.

Developers' body National Solar Energy Federation of India (NSEFI) says the new net metering restriction will prevent high-load industrial consumers from switching to solar and has sought the power ministry's intervention to withdraw the restriction of 10kW capacity for net metering under the Rules 2020.

Investments at stake

In a letter to the power minister, NSEFI said, "Many states have enacted net metering regulations allowing net metering for capacity above 1 kW to 1 -2 MW in most states and few states up to the sanctioned load. These regulations have been issued in compliance with the state-specific directive under Section 108 of the Electricity Act 2003... Hence, significant capacity addition in the solar rooftop segment is already under financing and under-construction phase. As per a rough estimate, investment to the tune of INR 1500-2000 crore is either under contract or under commissioning phase."

MSMEs to be adversely affected

According to the NSEFI, Micro, Small and Medium Companies (MSMEs), which have made rooftop solar a mass movement in India, are set to be adversely impacted.

"Covid-19 has already dealt a huge blow to the MSMEs and other industries, and saving energy cost is one way to strive and thrive for Indian manufacturers. Rooftop solar is one such opportunity for them to save cost and remain competitive. These new rules will not only impact the existing MSMEs, their operations and finances but also affect millions of clean energy jobs India will create in the solar rooftop segment," it stated. The provisions will not only hamper India's rooftop PV target of 40 GW (of which the nation has only installed around 4.55 GW so far) but also prevent industrial consumers from taking advantage of green energy, NSEFI said. [Source](#)

Maharashtra Announces Renewable Policy, Plans for 13 GW of Solar Projects

The Maharashtra State Cabinet has issued its 'Unconventional Energy Generation Policy' to promote non-conventional source-based energy generation. The policy is divided into two parts. In the first part of the policy, the state aims to implement 17,360 MW of transmission system-connected renewable power projects by 2025. This includes 12,930 MW of solar power projects, 2,500 MW of wind energy projects, 1,350 MW of co-generation projects, 380 MW of small hydro projects, and 200 MW of urban solid waste-based projects.

Maharashtra Renewable Energy Policy: Transmission-Connected Renewable Energy Projects (Part-1)

Energy Sources	Capacity (MW)	Authority
Solar Projects	12,930	Private Entity, Central Govt., Agencies or Relevant Departments
Wind Projects	2,500	
Co- Generations Projects based on Sugarcane Plantations/Agricultural residues	1,350	
Small Hydropower Projects	380	
Urban solid waste-based projects	200	
Total	17,360	

Source: MEDA

Mercom India Research

The 12,930 MW of solar projects include 10 GW of standalone solar power projects, 2 GW of grid-connected rooftop solar projects, 500 MW of solar-based water supply projects, 250 MW of solar generation projects for farmers, among others. The details are furnished below:

Maharashtra Solar Policy: Breakdown of Solar Energy Generation Component Under Part-1

Plan	Capacity (MW)	Authority
To Develop Solar Power Generation Projects	10,000	Private Entity
Grid Connected Rooftop Solar Projects	2,000	Central Govt.
Urban & Rural Water Supply using Solar Energy	500	Private Entity, Central Govt.
Supply of Tap Water using Solar Pumps	30	
Create a Farmer Co-operative Society/Company/Group and Provide Private Investment and Transmission system for Solar Energy Generation Projects	250	Private Entity or Agencies
For Solar/ Wind Energy based projects With Energy Storage Projects	50	
Construction of Solar powered E-Vehicle Charging Station	50	
Establishment of Solar/Wind Hybrid Projects for Transmission	50	
Total	12,930	

Source: MEDA

Mercom India Research

Under the second part of the policy, the state plans to implement over ₹780 million (\$10.5 million)/annum worth of transmission-free projects. A transmission-free project refers to power projects that are not connected to the grid. These include 100,000 agricultural solar pumps, 52,000 kW of rooftop solar systems, 2,000 solar water supply stations, the electrification of 10,000 rural homes, microgrid projects for 20 homes, 55,000 square feet of solar water/solar cooking systems, and 800 solar cold-storage projects. The details are furnished below:

Maharashtra Renewable Energy Policy 2020: Integrated Strategy for Transmission-Free Renewable Projects (Part-2)

Projects	Details	Authorities	Annual Expenditure	
			₹ in million	~\$ million
Rooftop or Ground-mounted Hybrid/Off-grid Solar Projects	52,000 kW	Private Entity, Central Govt, Agencies or Relevant Departments	-	-
Solar Agricultural Pumps	1,00,000 pumps	-	-	-
Solar Pumping Station for Water Supply	2,000 pumps	Private Entity, Central Govt., Agencies or Relevant Departments	-	-
Rural Electrification Program	10,000 homes	-	380	5.19
Micro Grid Project	20 homes	-	400	5.46
Solar Water Plants and Solar Cooking Systems	55,000 sq.ft.	Private Entity, Central Govt., Agencies or Relevant Departments	-	-
Cold Storage Based on Solar Energy	800 systems		-	-
Total			780	10.65

Source: MEDA

Mercom India Research

In December, the state cabinet had approved a draft version of the Unconventional Energy Generation Policy 2020. It hopes to address power outage issues and pollution in the state due to rapid industrialization and urbanization. According to Mercom's India Solar Project Tracker, Maharashtra has about 1.6 GW of operational solar projects and about 1.2 GW under development as of September 2020. The state ranked fourth in terms of rooftop solar installations in the country, representing 9% of the total installed capacity as of Q1 2020.

Recently, Gujarat also announced the new 'Gujarat Solar Power Policy 2021' with incentives for residential, commercial, and industrial rooftop solar developers. The policy will be valid until December 31, 2025. In July 2020, Andhra Pradesh announced its Renewable Energy Export Policy 2020 for solar, wind, and wind-solar hybrid projects. The policy aims to promote renewable energy export outside the state without any obligation of power procurement by state distribution companies. [Source](#)

SECI may reduce solar tender size due to high tariff concerns

BENGALURU: The Solar Energy Corporation of India is likely to reduce the size of its latest solar tender as well as change location specifications, sources said. The size is being brought down from 2,500MW to 1,800MW. While earlier the projects were to be located at the solar park in Koppal district of Karnataka, SECI has now identified three other spots in the same state where the projects, once they are auctioned, can be built.

SECI is the nodal agency through which the renewable energy ministry conducts wind and solar auctions. It has had second thoughts about Koppal fearing the cost of setting up projects there would be high, pushing up the tariff – to be discovered through the auction – so high that discoms might not buy the power.

The 2,500MW tender was issued on April 10, 2020, but SECI has extended the deadline for bid submission six times, according to renewable energy consultancy firm Bridge to India. "SECI will bear

the initial cost of the land required, but it still felt that the discovered tariff from the reverse auction may be too high and developers might face procurement issues," a source said, requesting anonymity. "A note has been sent to the chief minister of Karnataka with the changed conditions. Once his approval is obtained, SECI will go ahead," said the source quoted above. [Source](#)

Every hydroelectric project under obligation to release minimum water downstream: NGT

The National Green Tribunal has directed state pollution control boards to ensure the release of minimum water downstream by hydroelectric projects, saying business or commercial interests cannot override the requirement of maintaining riverine ecology. A bench headed by NGT Chairperson Justice Adarsh Kumar Goel said every hydroelectric project (HEP) irrespective of the date of its commission is under an obligation to release minimum water downstream

"This is a mandate of 'Sustainable Development' which is part of the right to life. Accordingly, the tribunal directed compliance by all the Hydro-Electric Projects (HEPs), including in States of Uttarakhand, Sikkim, Arunachal Pradesh, West Bengal (North Region), Assam and Jammu & Kashmir," the bench said. Environmental flow describes the quantity, timing, and quality of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and wellbeing that depend on these ecosystems.

The tribunal junked the submission of the National Hydroelectric Power Corporation seeking exemption from releasing water to maintain 15 per cent e-flow (the quantity and timing of water that is essential for the river to perform its ecological functions) during the lean period.

"We do not find any substance in this submission. The mandate of 'Sustainable Development' has to be complied. We do not see any hurdle in doing so. Whatever changes are required for the purpose can certainly be done. "Technical and/or commercial limitations cannot be a ground to ignore the mandate of law. No business or commercial interest can override the requirement of maintaining riverine ecology," the bench said. The green panel noted that the Ministry of Jal Shakti has not filed any report even though a period of nine months has passed since its direction. The tribunal was hearing a plea filed by Himachal Pradesh resident Vijay Kumar seeking enforcement of requirement of releasing minimum water downstream by the HEPs in the state. [Source](#)

Government clears 8 hydropower projects on Indus in Ladakh

The government has cleared eight hydropower projects of 144 MW on the Indus river and its tributaries in Ladakh, the highest so far, sources in the Jal Shakti Ministry said on Thursday. At present, there are several small projects, with a collective capacity of 113 MW on Indus in Ladakh, and the new projects will have much more capacity than those constructed so far, a senior official added.

The official said the new projects have been cleared by the Central Water Commission as well as the Indus Commissioner after a separate Union Territory of Ladakh was announced last year. These projects will come up in Kargil and Leh districts of Ladakh. Because of its topography, it is not feasible to construct big hydropower projects in the Ladakh region. Durbuk Shyok (19 MW), Shankoo (18.5 MW), Nimu Chilling (24 MW), Rongdo (12 MW), Ratan Nag (10.5 MW) hydropower projects have been cleared for Leh, while Mangdum Sangra (19 MW), Kargil Hunderman (25 MW) and Tamasha (12 MW) have been cleared for Kargil, the official added.

Many of the existing projects as small as 1 MW of capacity. The construction of the new projects will begin after other mandatory clearances are obtained, the official said. "The designs of these projects

have been certified as compliant with the Indus Waters Treaty by the Central Water Commission. The information on the design of these projects is being provided to Pakistan as per the provisions of the treaty," the official said.

"The development of projects on the Indus river has been slow, especially in the Ladakh region. Only two major projects have been constructed so far --- Chutak project of 44 MW on Suru, a tributary of the Indus, and Nimoo Bazgo of 45 MW on the Indus," the official said. Under the Indus Waters Treaty between New Delhi and Islamabad, the usage of water of Indus and its five tributaries flowing from India to Pakistan have been divided.

The treaty specifies that waters of three eastern rivers namely Ravi, Beas and Sutlej, have been reserved for India while that of western rivers, namely Indus, Chenab and Jhelum, are for Pakistan. However, India claims it has unrestricted rights to develop hydroelectric power projects on the western rivers within the specified parameters of design. Of the total 168 million acre-feet, India's share of water from Ravi, Beas and Sutlej is 33 mcf, which is nearly 20 per cent.

India uses nearly 93-94 per cent of its share under the Indus Water Treaty. The rest of the water remains unutilised and goes to Pakistan. The efforts to tap that water through a number of projects like Ujh Multipurpose project, Shahpurkandi Dam project and the second Ravi Beas Link are being made, the official added. [Source](#)

DISCOMs Dues to Renewable Generators Rise to ₹118.6 Billion in November

Distribution Companies (DISCOMs) owed renewable energy generators ₹118.6 billion (~\$1.6 billion) in overdue payments (excluding disputed amounts) across 452 invoices at the end of November 2020, according to data from the Ministry of Power (MoP). In October 2020, DISCOMs owed renewable generators ₹110.67 billion (~\$1.5 billion) in overdue payments against 439 pending invoices. Outstanding payments (excluding disputed amounts) in November stood at ₹5.2 million (~\$71,343), according to data from the MoP's payment ratification and analysis portal (PRAAPTI).

DISCOMs paid ₹15.3 billion (~\$209,914) towards their outstanding dues and ₹91.5 billion (~\$1.3 billion) towards overdue amounts during November. Outstanding amounts are payments that have been delayed by over six months. At the end of the month, 65 DISCOMs owed 230 generators ₹1.29 trillion (~\$17.7 trillion) in overdue payments against 21,977 overdue invoices. Outstanding payments stood at ₹117.5 billion (~\$1.6 billion) at the end of the month.

DISCOMs Dues to Power Generators					
Particulars	As of November, 2020		As of October, 2020		% of Change
No. of DISCOMs	65		66		-2%
No. of participating power generators	230		230		0%
No. of overdue* invoices	21,977		21,451		2%
Overdue and Outstanding	₹ in Billion	~\$ Billion	₹ in Billion	~\$ Billion	% of Change
Overdue amount at the beginning of the month	1,264.14	17.19	1,250.16	17.00	1.1%
Total amount billed to DISCOMs	131.71	1.79	156.94	2.13	-16.1%
Amount paid by DISCOMs against overdue	91.48	1.24	118.1	1.61	-22.5%
Amount paid by DISCOMs against outstanding	15.27	0.21	19.85	0.27	-23.1%
Overdue amount at the end of the month	1,298.20	17.65	1,264.46	17.19	2.7%
Outstanding amount at the end of the month	117.53	1.60	126.13	1.71	-6.8%

Overdue invoices are those which remain fully or partly unpaid past the due date*

Source: PRAAPTI Mercom India Research

Rajasthan continued to hold the highest overdue payments to generators at ₹393.8 billion (~\$5.4 billion), of which ₹367.6 billion (~\$5.04 billion) has been overdue for more than 60 days. Tamil Nadu was close behind with ₹218.3 billion (~\$2.9 billion), of which ₹196.9 billion (~\$2.7 billion) has been overdue for over 60 days. Gujarat, Haryana, Bihar, Jharkhand, West Bengal, Sikkim, Arunachal Pradesh, Nagaland, Manipur, and Mizoram were rated the “Best” in terms of ease of payments by DISCOMs in November. Uttar Pradesh, Odisha, Telangana, Assam, and Meghalaya were rated “OK,” Himachal Pradesh was rated “Bad,” while all other states were given the “Worst” rating.

The non-conventional power generators who were owed the most were Adani Green Energy Limited, NLC India Limited (RE), and Tata Power Company Limited with ₹12 billion (~\$164.6 million), ₹11.6 billion (~\$159.2), and ₹22.7 billion (~\$311.4 million) in pending dues, respectively, as of November 2020. In October, DISCOMs owed over ₹110.67 billion (~\$1.5 billion) to renewable energy generators (excluding disputed amounts) in overdue payments across 439 pending invoices.

Power producers across the country are reeling under the enormous stress of delayed payments by DISCOMs. Recently, the Association of Power Producers even complained that Tamil Nadu Generation and Distribution Corporation is forcing them to accept heavy discounts on dues payable.

The situation in Andhra Pradesh is worsening. The National Solar Energy Federation of India warning of the Indian banking system at the risk of suffering NPAs to the tune of ₹150 billion (~\$2.04 billion) to ₹180 billion (~\$2.4 billion) due to the delays in payments by the state DISCOMs to renewable power generators. The Federation has also requested the Union Power Minister for the release of payments by Power Finance Corporation and REC Limited to renewable energy developers having power purchase agreements with Andhra Pradesh distribution companies. [Source](#)

Renewable energy gets higher price realisation in green term-ahead market segment

Long term wind and solar prices are going down all the time – solar prices dipped to a wonder ₹1.99 a kWhr last month – but there is another market where the generators get a much higher price: the energy markets. If you are a wind or solar generator you could get even ₹4 a kWhr on a good day.

In December, 90 million units of electricity were sold in what is called the G-TAM (or green term-ahead market) of India’s bigger energy exchange, the IEX. In G-TAM, a buyer or seller of electricity can offer to buy or sell bids for any day in the following 11 days. (That is now, but more extended period contracts will be allowed after a legal glitch is removed.) IEX introduced G-TAM in August 2020; 549 million wind and solar electricity units have been sold and bought up till December. But here is the meat: December prices ranged between ₹3.60 and ₹4 a kWhr.

In future energy companies could be putting up merchant power plants, where the electricity could be sold on daily or short-term contracts instead of long-term power purchase agreements. Asked about this possibility, Rohit Bajaj, who heads Business Development at IEX, said, “that is 100 per cent on the cards.” Though for starters, generators who build wind and solar power plants under a long term PPA would first over-size their capacities, to be able to sell power from the extra capacity through the markets. For example, if a developer wins a project through a tender for, say, 200 MW, he could build a 225 MW plant, aiming to sell power from the additional 25 MW through the exchange at better prices.

Bajaj said that energy companies were waiting for battery prices to come down. Then, they could store the energy and sell it only when the prices are reasonable. That is when many merchant power plants could crop up.

Record high

In December, IEX recorded its highest-ever trading volume. The exchange, which has been in existence for 12 years, saw 7.26 billion units more electricity traded, 52 per cent more than in December 2019, showing an uptrend in electricity demand. “On 30 December when peak demand touched 182.9 GW, IEX electricity markets underpinning the core values such as most competitive prices, transparent as well as flexible power procurement, contributed to a significant 6.9 per cent of the peak demand met,” says a press release issued by IEX today.

Kochi-Mangalore pipeline

The 450-km Kochi-Mangalore gas pipeline positively impacts IEX, which floated a subsidiary, Indian Gas Exchange, in June last year. IGX got its formal authorisation to operate in December. With the pipeline, LNG imported at the Kochi terminal will now flow to the industrial city of Mangalore, which has energy-hungry companies like Mangalore Refineries and Petrochemicals, Mangalore Chemicals and Fertilizers and ONGC Petrochemicals Ltd, and several other small and medium industries.

“Whenever transmission infrastructure improves, consumers, move a part of their purchase from long term to short term,” Bajaj observed. As such, more people would be willing to buy gas, short term, through the IGX. [Source](#)

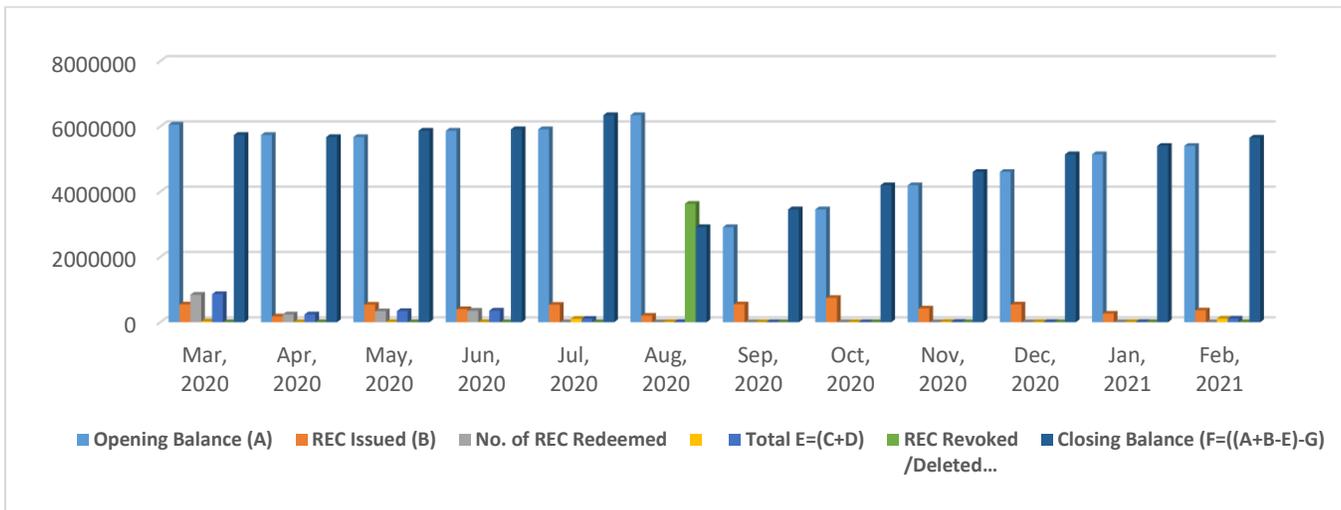
Source wise REC break up:-

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	2756	536	2701	525	27158293	21953273	2247130	0
2	Urban or Municipal Waste	0	0	0	0	72892	72892	0	0
3	Solar Thermal	0	0	0	0	0	0	0	0
4	Solar PV	1040	421	1012	409	10303753	9561111	119359	0
5	Small Hydro	220	32	220	32	5416478	4765341	6899	0
6	Others	4	2	3	1	26787	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	470	42	401	37	10729335	9896423	156549	0

10	Bio-fuel cogeneration	826	91	385	55	9092417	8610583	5001	0
	Total	5316	1124	4722	1059	71312961	59500577	2539948	3623895

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)			
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	260411	0	2612	2612	0	5398934
Feb, 2021	5398934	359001	0	109394	109394	0	5648541
Total:		71312961	59500577	2539948	62040525	3623895	



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