

GREEN MARKET CAPSULE

Issue no: 78|July' 2021

TPTCL'S E-NEWSLETTER



Tata Power Trading Company Limited (TPTCL)

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Power News

New renewables cheaper than legacy coal or gas for almost half the world's population

The latest report into electricity generation costs compiled by analyst Bloomberg NEF has claimed 46% of the world's population – including power users in China, India, Germany, France, Italy, Spain, Portugal and Greece – can have lower bills from newly installed solar and wind farms than from already-running coal and gas-fired facilities.

That was just one of the headline-grabbing insights in a 1H 2021 Update which posited the carbon price in China will rise to around \$50 per ton in mid-century; stated solar became cheaper than coal in Vietnam and Thailand in the first half of the year; that receding solar panel glass costs are mitigating a rising polysilicon price; and cited rapid solar wafer manufacturing build-out as the main cause of the rampant poly price, rather than more high-profile events such as factory explosions.

The advent of bigger solar projects – up to an average 50 MW this year – and bigger, more powerful and more costly modules is helping prevent rising solar manufacturer material costs from having a big effect on the levelized cost of energy (LCOE) from solar during 2021, according to the analyst.

BNEF has calculated a 5.2% rise in the average solar module cost this year, to \$0.23/W – thanks to more hefty price tags for bigger panels and a rise in the cost of aluminum frames – will translate into a global, average solar LCOE of \$48/MWh for fixed-axis panels and \$38/MWh for sites featuring single-axis trackers. Those two figures would represent rises of 1% and 4% on last year's numbers, respectively, according to the analyst, which also stated the fixed-axis cost can be as low as \$26/MWh in India this year and \$35 in China, and as high as \$125 in Japan. In the U.S. market, the analyst reported, single-axis tracker PV now undercuts combined-cycle gas turbines, with an LCOE of \$39.80/MWh.

The report noted, however, panel price rises of around 7% in China since the second half of last year, and of 10% in India.

Average

With BNEF expecting the monocrystalline solar panels which accounted for 85% of last year's global market to offer an average 20.5% conversion efficiency this year – against 17.6% for cheaper, multicrystalline products – the analyst has forecast the average PV project this year will feature 400-550 W-rated panels offering an average conversion efficiency of 20.1%.

The lowest LCOE figures recorded this year are in the \$22-29/MWh range in Chile, India, the UAE, China, Brazil and Spain, said BloombergNEF in a report subtitled: Rising commodity prices start biting to perhaps also reflect inflationary effects on other clean energy technologies, such as the knock-on effect of steel costs on wind turbine makers.

Despite such input pressures on solar manufacturers, BNEF noted the capital cost of PV projects in Chile and Brazil has fallen 5% this year, to \$680,000 and \$760,000/MW, with the former figure now on a par with the set-up costs in mature European solar markets. As far as solar auctions are concerned, BNEF recorded 42 GW of capacity had solar electricity tariffs set by such procurement rounds last year with solar and wind projects set to come online next year and in 2023 commissioned on the back of bids ranging from \$17-70/MWh.

The expected LCOE for solar compares favorably with the analyst's estimates for new, carbon capture and storage (CCS)-equipped coal power plants (\$133-449/MWh) and gas projects (\$156-336/MWh), although the study notes unabated coal-fired power still rules on price in Japan, South Korea, Indonesia, Malaysia and the Philippines this year. Green hydrogen-fueled gas plants would carry a hefty LCOE of \$293-535/MWh, according to the report, although that figure could come in to \$82-134 in Europe, India and Japan by mid century if renewables-powered hydrogen can be produced for less than \$1/kg.

Poly price surge

The document, published on Wednesday, reported a polysilicon price up 198% since May last year, to \$21.70/kg but added, each \$4/kg rise in the cost of the solar panel feedstock typically only raises module prices one cent per Watt.

Examining the role carbon prices will have on the levelized cost of energy, BNEF has estimated an unambitious charge of \$3 per ton of carbon emitted in China, in 2030, will rise to \$40/ton in 2040 and \$50 in mid century, if a carbon market concerned with 14% of global CO2 emissions is to help achieve carbon neutrality in the nation by 2060. [Source](#)

Decentralised renewable energy is the key to fuelling India's socio-economic growth

Energy access is critical to driving the sustainable socio-economic growth of any country. Several indicators of progress like employment, education, female empowerment, health, and even mental wellness are linked to universal access to affordable, reliable and clean energy services. Despite achieving rapid growth in clean energy development in recent years, India's global energy leadership will be determined by how quickly it transitions to future technologies like renewable energy. Decentralised renewable energy (DRE) sources like rooftop solar panels, micro or mini-grids and rechargeable batteries have shown promise in securing sustainable and equitable energy access. Solar photovoltaic technology, a popular DRE technology, has already replaced more than half of diesel-run systems in rural India. However, despite this success, the potential of DRE to turbocharge India's socio-economic growth remains unfulfilled.

Breaking the vicious circle of energy poverty

A large percentage of Indians face significant issues accessing electricity, often due to financial reasons. Unable to pay for services, they choose to stay outside the centralised grid. Those with financial means are reluctant to connect to an unreliable electricity grid with long and frequent power outages. Others do not have energy access simply because geographical necessitate high capital investment costs. This lack of demand undermines investment in rural electrification, creating a vicious cycle.

DRE is often seen as a stopgap measure until the centralised grid is updated and reformed. But it has proven itself to be a viable alternative to centralised grids, especially with the extent to which it improves energy access, even in remote areas. Mini-grids have emerged as one of the lowest cost options of new electricity connections that can be built to meet energy needs. One 50 kW off-grid system usually offers basic lighting, mobile phone charging, and television for 500 households. According to one study by Smart Power India, mini-grid users can enjoy uninterrupted electricity supply during peak evening hours, whereas grid-connected users often face disruptions of around three hours.

Turbocharging DRE adoption

Though large-scale utility solar energy has seen steady growth in the country, DRE has not been able to match the same pace. The total installed capacity of renewable energy stands at around 90 GW, only 5% of which is DRE, which is only 1% of India's total installed electricity capacity. The situation for DRE has only got worse after COVID-19 as global markets for DRE products like pump sets, solar lanterns, and mini-grids took a hit. Many DRE projects were suspended as access to finance and supply chains faced severe bottlenecks. According to the International Energy Agency, distributed PV capacity additions have more than halved compared to 2019 and are not expected to exceed those levels before 2022.

One way to address this through private sector participation in the DRE sector. Though private players have been allowed to participate in a limited capacity in the power sector, barring a few territories like Delhi and Odisha, the distribution of electricity has remained in the hands of state-owned power utilities. Many of these utilities often face power theft, and transmission and distribution (T&D) losses, particularly in rural areas, slowing the pace of electrification.

One of the recent microgrid players TP Microgrids has announced plans to invest \$1 billion by 2026 in India. The company plans to deploy up to 10,000 mini-grids providing clean energy to 5 million households. It took just about 10 months to commission its first 100 microgrids and is aiming to commission the second hundred in less than four months. Considered to be the world's largest microgrid player, the TP Microgrids is expected to support 100,000 rural enterprises, create 10,000 green jobs, and deliver irrigation to 400,000 farmers.

There is a huge opportunity for the private sector players to offer DRE services in the untapped parts of rural India and create employment opportunities. Currently, rural India meets its 41% employment needs from Agriculture. Solar irrigation alone is estimated to be a US \$60 billion opportunity in the hinterland of our country.

The PPP model in power distribution has demonstrated a win-win situation for all. Uninterrupted supply and upgraded electricity network with better services like speedy connections, accurate billing, improved grievance redressal, reduction in Aggregate Technical and Commercial (AT&C) losses and overall efficiency in distribution are the common benefits Delhi and Orissa have reaped. With regulation and policies in place, a PPP model in DRE will effectively create a market-oriented framework, better access to finance, and development of livelihood applications.

The Possibilities of the Future

There are immense opportunities to encourage entrepreneurship in biomass powered or solar powered DRE Livelihood applications. These applications can power machines, micro-enterprises such as the local 'atta chakki' wheat flour milling and rice hulling, lathes, sewing machines, potter's wheel, power looms, cold storages, solar dryer/chiller and so many others. A McKinsey Global Institute in a report titled 'India's Turning Point' said last year that 90 million workers are expected to join India's non-farm jobs by 2030.

However, we need to focus on applications that can be scaled up without large investments and create enormous potential for eco-socio development of communities. Our studies have shown that mini-grids create new business opportunities, and expand existing business with increased income. Micro-enterprises have reported a 12% to 15% increase in monthly revenues. So, increased access to essential services like health and education are direct co-benefits of electrification through DRE applications. As it

is a concurrent subject, the union and state governments need to work together to roll out a reform agenda and implement it in the next 12-18 months to push growth. This agenda should be accompanied by measures that create awareness amongst people about the potential benefits of DRE products and after-sales services. A clear roadmap can create a robust DRE ecosystem that will wipe out energy poverty and encourage inclusive development of communities, green entrepreneurship and green jobs-paving the way for a self-reliant or Atmanirbhar India.

Rising solar module prices may lower returns of projects by 200 basis points: Crisil

Mumbai: Rising module prices may diminish returns for 12 GW of bid out solar projects by 200 basis points and inflate tariffs of future bids by 10 to 15 paise per unit, according to Crisil Ratings. Solar modules form over 50 per cent of total project cost and bulk of them are imported. Thus material variations in their price and exchange rates from expectations at the time of bidding can pose viability risks on the projects. Developers typically buy the modules 9 to 12 months after they win the auction.

This wide gap exposes projects to risk of fluctuations in solar panel prices and currency exchange rates. More so because these variables remain unhedged and are also not a pass-through as per agreements. Crisil estimates 12 GW of projects were bid at low tariffs of less than Rs 2.50 per unit since March 2020. These projects had factored in the price trend of solar modules which had fallen by more than 10 per cent compounded on-year over the five-year period ending March 2020.

However, as these projects are nearing the module procurement phase, a reverse price trend is visible with module prices spiking to USD 0.24 per watt in June -- a 10 per cent increase since January. Remaining components of project cost being land and other electrical equipment have been fairly stable. Ankit Hakhu, Director at Crisil Ratings, said although some support has come from a stronger rupee (assuming no further strengthening of rupee against dollar) at USD 0.25 per watt, landed cost of solar modules will be higher by over 10 per cent in rupee terms and project costs by 6 to 7 per cent in this calendar year.

"This will ultimately squeeze equity returns by 200 basis points, down from a typical range of 10 to 12 per cent for bid out solar projects having lower tariffs," he said. Module price rise is driven by an increase in cost of critical raw materials such as polysilicon, aluminum and copper, together forming more than 50 per cent of the module cost.

While prices for these commodities are cyclical, presently they are showing firmness (having increased by 2 to 25 per cent since January) given the strong demand of these commodities from other industries like auto, construction and electronics. Varun Marwaha, Associate Director at Crisil Ratings, said if module prices remain high at over USD 0.25 per watt, future solar bids are also likely to become relatively expensive compared to the low tariffs of around Rs 2 per unit seen around January.

Rise in tariffs may disincentivise distribution companies to sign offtake agreements given they have been wary in the past of signing such agreements where tariffs have been relatively higher. This may add on to an already high pipeline of capacities bid out but not finding a buyer or even cancellations. [Source](#)

Open access RE projects have regulatory headwinds: ICRA

The renewable energy sector Independent Power Producers, selling power in the open access route, are faced with increasing regulatory constraints in the form of upward revision of open access charges, denial of open access approvals and tightening of energy banking norms. With improving tariff competitiveness of solar and wind power segments, the renewable power policies in several States have been amended

over the last 3-4 year period. States have either completely withdrawn or reduced the concessions and incentives on open access charges, in respect of procuring power from solar and wind power projects under the open access route.

Girish kumar Kadam, Senior Vice-President & Co-Group Head- Corporate ratings, ICRA, said, “The overall open access charges for third party based IPPs vary widely across the key states ranging between ₹2-5 per unit and have shown an increasing trend over the period, given the limited progress in tariff rationalisation for the grid tariffs set by the SERCs for the state-owned Discoms.

“In most cases State Discoms show a passive resistance, due to apprehensions of losing cross-subsidising high tariff paying commercial and industrial customers. This poses regulatory headwinds for capacity addition in open access segment for the renewables over the medium-term. As per ICRA, the tariff competitiveness for group captive projects is relatively superior due to non-applicability of cross-subsidy surcharge and additional surcharge (except in Maharashtra) as against third party sale under open access.

Vikram V, Vice-President & Sector Head - Corporate Ratings, ICRA, adds, “Despite these challenges, the credit profile of renewable projects in the open access segment remains supported by a mix of factors such as relatively better tariff expectations as against the tariff discovered in the utility segment.”

Notwithstanding the regulatory headwinds in the open access segment, the outlook on the renewable energy sector remains stable. This is given the improved tariff competitiveness of renewables, must-run status availability in regulatory framework leading to satisfactory operating track record, a dominant share of capacity addition expected to continue in the utility segment as well as availability of liquidity buffer for the issuers rated. [Source](#)

IEEFA: Why India’s solar power tariffs are climbing after hitting record lows last year

Solar tariffs are deflationary. Prices have fallen by 75% in seven years in India, and in 2020 solar tariffs hit record lows. From 2019 to the first quarter of 2020, most of India’s newly-auctioned solar projects saw tariffs in the range of Rs2.5-2.87/kilowatt hour (kWh). Then in February 2020, the Ministry of New and Renewable Energy (MNRE) removed ceiling tariffs for all new solar and wind tenders to hasten tender activity and capacity allocation. From Quarter 2 of 2020, prices were in the range of Rs1.99-2.97/kWh, with bids thereby hitting the new record low tariff.

The reasons for such low tariffs were access to low-cost financing (cheaper interest rates) by international developers based out of Saudi Arabia (Aljomaih Energy and Water Co.) and Singapore (Sembcorp) as well as government entities like NTPC which can secure debt at a rate of 7-7.5%. And since they can source funds at lower rates, their return on equity expectation is also lower. Also, these tenders are likely to be exempted from the Safeguard Duty (SGD) and Basic Customs Duty (BCD) on solar cell and module imports. Another key factor was power purchase assurance for the developers, for example, the power sale agreement (PSA) between the intermediary procurer, Solar Energy Corporation of India (SECI), and the buying entity, Rajasthan power distribution company (Discom) Rajasthan Urja Vikas Nigam Ltd. (RUVNL). The other tender was issued by Gujarat Discom, Gujarat Urja Vikas Nigam Ltd. (GUVNL). In 2021, however, solar tariffs saw an upward trend. In January and February, the lowest tariffs discovered in auctions were Rs2.22/kWh and Rs2.25/kWh, by Torrent Power Ltd. (TPL) and NTPC Ltd. The tariff increases could be attributed to lack of participation by international developers like Aljomaih Energy and Water Co. and Sembcorp. Moreover, module prices increased from US\$0.20/Wp in July 2020 to US\$0.22-0.23/Wp in January 2021, causing solar prices to increase. Further, module suppliers are

now selling modules at FOB (free on Board) prices instead of CIF (cost, insurance, and freight) prices, which is also impacting solar prices in India.

Then in March, the Government of India announced it will impose a 40% basic customs duty (BCD) on solar modules and 25% on solar cells from 1 April 2022 in a move to promote domestic manufacturing. The imposition of BCD is likely to increase solar tariffs by approximately 25%. The lowest tariff delivered in the first solar auction result after the BCD announcement – GUVNL's 500MW auction in Gujarat – was Rs2.22/kWh, a 21 paise (12%) increase per kWh from the previous GUVNL tender under the same conditions.

Lower prices are favourable for renewable energy growth. However, aggressive tariffs come with risks, and developers need to properly factor these risks into their bids. With improved module technology, generation will increase. Another factor that will pull down solar prices is access to low cost financing. On the other hand, a rise in module costs due to various global demand and supply factors and floating interest rates that change in line with Reserve Bank of India (RBI) guidelines could push prices upwards.

[Source](#)

Govt to make green hydrogen purchase mandatory for certain sectors: R K Singh

Purchase of green hydrogen will be made mandatory for certain sectors on the pattern of renewable purchase obligation, New & Renewable Energy Minister R K Singh said on Tuesday. Hydrogen purchase obligations would be in place for fertilizers/ refineries involving private sector. Under Renewable Purchase Obligation (RPO), bulk purchasers like discoms, open access consumers and captive users are required to buy a certain proportion of renewable energy out of their total consumption of electricity. They can also buy RE certificates from renewable energy producers to meet the RPO norms. A long road to 2030 for India's import-heavy solar power sector

Interacting with the media in a virtual curtain raiser press conference on 'India's role as a Global Champion for the Energy Transition theme at the UN High Level Dialogue on Energy 2021', Singh said just like RPO, hydrogen purchase obligation would ensure that product sells. "We are going to include green hydrogen obligation on the lines of RPO," the minister said.

Later in the day, Union Power Secretary Alok Kumar said in a tweet, "India has launched an ambitious National Hydrogen Mission to introduce hydrogen purchase obligations for fertilizers/ refineries involving private sector in transparent & competitive manner to produce green hydrogen." Green hydrogen is produced using RE and electrolysis to split water and is distinct from grey hydrogen, which is produced from methane and releases greenhouse gases into the atmosphere, and blue hydrogen, which captures those emissions and stores them underground to prevent them causing climate change.

The minister also expressed dismay over under-achievement of RPO targets by states. "Most states have not achieved their RPO(targets). In 2030, total installed power generation capacity of the country would be 821 GW including 450 GW of renewables. (So RPO is required to be met by states)," the minister said.

He noted that there would be a penalty for states for not meeting the RPO targets. Explaining about the high or unviable price of green hydrogen, he said the price will come down with an increase in volumes (sales and production) as was seen in the case of solar and wind energy. In case of solar, the tariff had dipped to less than Rs 2 per unit in auctions for projects last year in December. On concerns regarding dumping of cheap solar equipment in the country he said the domestic manufacturing capacity would be scaled up to 70 GW by December 2022.

On meeting the ambitious target of 175 GW of renewables by 2022, he admitted that the lockdown and other such restriction induced by COVID-19 have affected renewable projects in the country. "We have to give (deadline) extension to RE projects. We had to extend the bids (for RE projects). This has caused disruption because lockdown was imposed." According to a presentation in the press conference, India has already achieved 141 GW of RE (including large hydro projects) while 80 GW is under various stages of implementation and tendering. Later in a statement issued by the Ministry of New and Renewable Energy, Singh said India's energy access and energy transition stories have multiple lessons and learnings, which can benefit other countries in advancing their energy goals and undertaking effective climate action. The UN High level Dialogue on Energy 2021 presents India with an opportunity to share these experiences with the entire world.

Singh said with just about ten years left for achieving the global target for ensuring access to affordable, reliable, sustainable and modern energy for all (Sustainable Development Goal (SDG-7), there is a need for strong political commitments, and innovative ways of expanding energy access and promoting RE. The minister called on all other countries, especially those in positions of privilege, to work ambitiously to support a global energy transition that is just, inclusive, and equitable.

Singh informed that India will finalize its 'Energy Compacts' going forward based on its target of 450 GW renewable energy capacity by 2030, focusing on solar, wind and bio-energy; storage systems, green hydrogen and international cooperation through the International Solar Alliance. He gave an overview of the nature of the Energy Compacts being prepared by India. One of the key outcomes of the High Level Dialogue on Energy 2021 will be Energy Compacts. Energy Compacts are voluntary commitments from Member States and non-state actors like companies, regional/local governments, Non-Governmental Organizations and others. These stakeholders commit to an Energy Compact that includes the specific actions they commit to take to support progress on SDG-7.

Welcoming the convening of the dialogue by the UN Secretary General in September 2021 in New York , the minister gave an overview of the activities already undertaken by India in its role of a global champion and the activities planned for the future, as part of its global advocacy efforts to promote the Energy Transition theme for the Dialogue. As part of the preparatory process for the Dialogue in September, India is part of some key events.

India will co-host the Ministerial Thematic Forum for Energy Transition on June 23, 2021 along with other global champions for the theme, among other events. Transition on June 23, 2021 along with other global champions for the theme, among other events. [Source](#)

India working on a 'green tariff' policy

NEW DELHI: In what will reinforce India's green energy credentials, the union government is working on a 'green tariff' policy that will help electricity distribution companies (discoms) supply electricity generated from clean energy projects at a cheaper rate as compared to power from conventional fuel sources such as coal. This was announced by power and new and renewable energy minister Raj Kumar Singh on Tuesday who said the government was in the process of formulating a set of rules and guidelines to enable such a mechanism.

In the event of a large corporate looking to procure only green power, the available option is to contract such power from a clean energy developer as has been the case in the commercial and industrial (C&I) segment, with distributed renewable energy generation attracting strong investor interest. Presently, discoms purchase renewable energy as part the renewable purchase obligations (RPO).

Once the mechanism is in place, discoms can exclusively buy green electricity and supply it at 'green tariff', which will be the weighted average tariff of green energy that the consumer will pay, Singh said. This comes in the backdrop of India's solar and wind power tariffs hitting an all-time low of ₹1.99 per unit and ₹2.43 per unit respectively. India is running the world's largest clean energy programme to achieve 175 gigawatt (GW) of renewable capacity, including 100GW of solar power by 2022.

Singh said this 'green tariff' will be slightly lower than the tariff from conventional fuel sources and added that the new regulations will help ensure that if an industry wants only green power from a developer, the open access applications will have to be approved within a fortnight.

Open access allows large users of energy, typically those who consume over 1 megawatt of power, to buy it from the open market, instead of depending on a more expensive grid. However, state discoms have not been allowing clean energy developers to use their power transmission and distribution networks to supply electricity to third-party and captive consumers.

Ensuring open access will also attract large green electricity consumers setting up their own captive green energy plants. "The rules are coming out," Singh said at a curtain raiser press conference on 'India's role as global champion for the Energy Transition theme of the UN High Level Dialogue on Energy 2021.'

The union government is also working on a raft of measures, including ethanol blending with fossil fuels, green mobility, battery storage and green hydrogen, to help reduce pollution and facilitate commitments made at COP-21, the UN Climate Change Conference held in France in 2015. According to the government, "India is the only major economy with actions in line to keep global warming below 2°C of pre-industrial levels."

Singh said India's per capita emission is well below the world average, with 67-75% of carbon space occupied by developed nations. However, the Green Climate Fund (GCF) set up to provide developing nations \$100 billion annually by 2020 to counter climate change has seen lukewarm response. "The Minister called on all other countries, especially those in positions of privilege to work ambitiously to support a global energy transition that is just, inclusive, and equitable," the government said in a statement.

As part of its energy transition efforts, India is working towards electrification of economy by developing action plans for greening of electricity. According to the Central Electricity Authority, by 2030, the country's power requirement would be 817GW, more than half of which would be clean energy.

Singh also said the union power ministry will soon come out with a policy to promote hydro pump storage schemes with around 96 GW identified as a potential capacity for the same. The idea is to use cheap green power during off-peak hours to raise water to a height and then release it into a lower reservoir to generate electricity. Pump storage helps the national power grid withstand fluctuations caused by intermittent supplies from solar and wind. Also, in such a scenario, storage holds the key to providing on-demand electricity from wind and solar projects, with India increasingly looking at hydro pump storage schemes for utility-scale projects to solve its energy storage problems.

Indian green energy projects have been facing myriad problems. The latest case in point being the concern about the impact caused by electricity transmission lines that are being laid down for green energy projects, which happen to bypass the habitat of the endangered Great Indian Bustard. With the Supreme Court mandating that overhead power transmission links be brought underground to help prevent the heavy bird, which lacks frontal vision, from colliding with the cables, developers in Rajasthan and Gujarat have flagged concerns about the impact on financial viability of their projects.

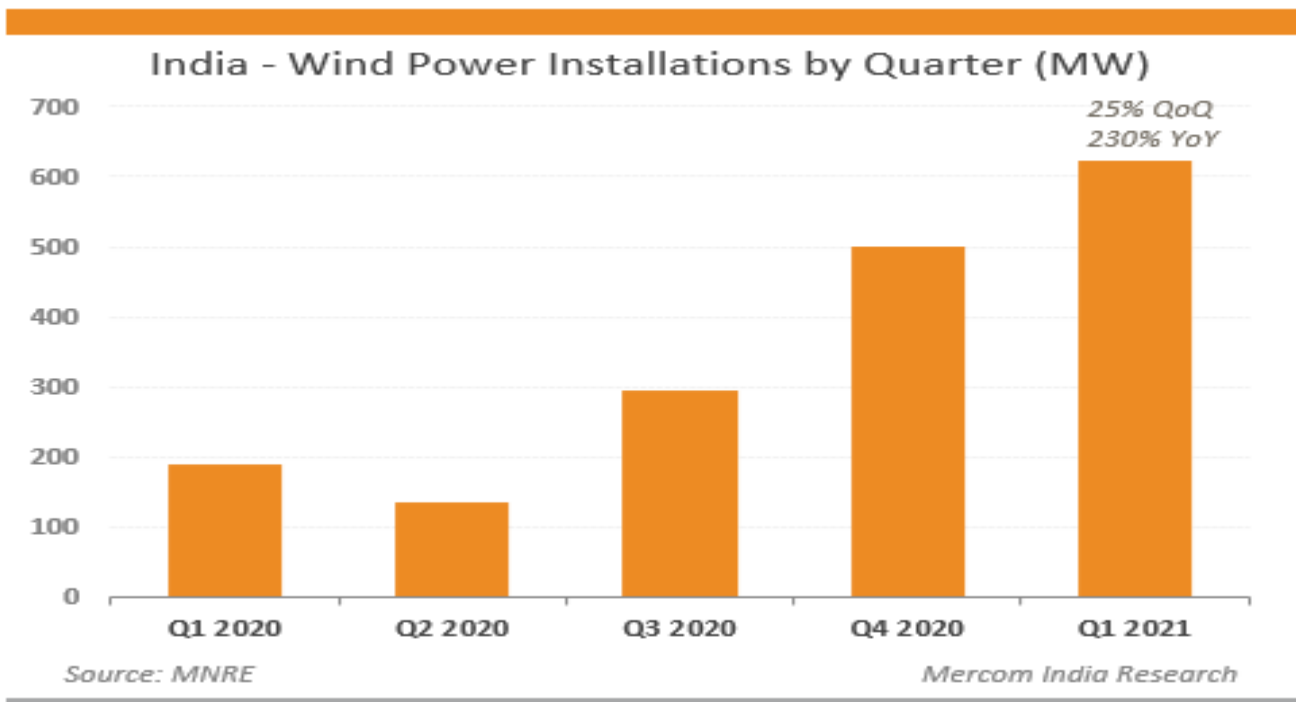
Singh said the government is studying the apex court's order, which is not a "peremptory order," with the court saying that it has to be examined whether a particular transmission line poses danger. Singh added that it has already been made clear that very high-tension power transmission lines can't be brought underground, and only 33 kV and below can be brought underground. [Source](#)

India increases its wind power capacity by 25% in the first quarter of 2021

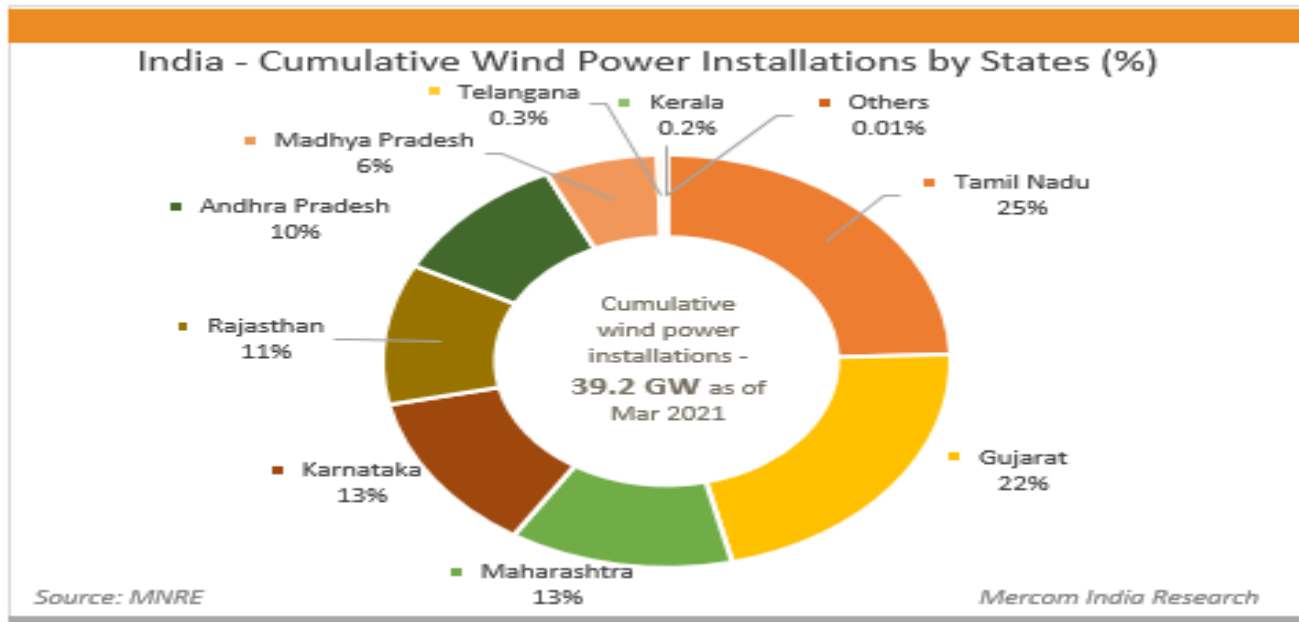
The 623 MW of wind energy additions in Q1 2021 were spread across Tamil Nadu, Gujarat, Karnataka, and Rajasthan. Wind installations in India in the first quarter of 2021 (Q1 2021) were up by 25% quarter-over-quarter (QoQ), with 623 MW added compared to 500 MW installed in the previous quarter. Meanwhile, year-over-year (YoY) installations saw a 230% jump, as only 189 MW was installed during the same period last year. Cumulative installations at the end of Q1 2021 stood at 39.2 GW. Installations during the quarter came from four states – Tamil Nadu, Gujarat, Karnataka, and Andhra Pradesh.

Gujarat added the most wind capacity during the quarter, with 369.3 MW of installations. The state had a 22% market share and ranked second in cumulative wind capacity in the country with 8.5 GW of installations. Tamil Nadu added 179 MW in Q1 2021 and had an overall market share of about 25%. It continued to be the leader in cumulative installations with about 9.6 GW of wind projects to date.

Meanwhile, Karnataka installed 69.8 MW of wind projects during the quarter and held a 13% market share. Its cumulative wind installations stood at 4.9 GW, with the state ranking fourth overall. Maharashtra – ranked third in terms of cumulative installations – did not make any wind capacity additions during the quarter and had a wind portfolio of 5 GW in the state. It held a 13% market share.



Rajasthan also had no wind installations during the quarter but had an 11% share thanks to its cumulative installations at 4.3 GW, ranking fifth overall. Andhra Pradesh added 4.2 MW of installations in the quarter and had a 10% share. With cumulative installations of 4.09 GW, the state ranked sixth overall.



The Global Wind Energy Council (GWEC) and MEC Intelligence (MEC+) have jointly released the 'India Wind Energy Market Outlook 2025' report, which predicts that the world's fourth-largest wind power market will add nearly 20.2 GW new wind power capacity between 2021-2025. The capacity addition would increase India's existing 39.2 GW wind market by 50%, paving the way for growth after recent years of slowdown. Last year the GWEC had raised doubts about India meeting its offshore and onshore wind energy targets by 2022. [Source](#)

Only 9% of renewables announced since 2018 currently being installed: Report

Among the 84,408 mega-watt (MW) of large-scale renewable energy projects announced since the beginning of 2018, only 8,039 MW are currently under-construction and the remaining capacities are still under various stages of implementation, a report jointly released by Ficci and Ernst & Young pointed.

The report, which tracked the development of 332 renewable energy projects of 84,408 MW capacity announced since 2018, found out that tariffs have already been discovered through auctions for 57,154 MW renewable energy projects, but these are under various stages of signing power purchase agreement (PPA), getting approvals from regulators, completing financial closure, land acquisition and seeking permission for grid interconnection.

Currently the installed renewable energy capacity in the country is 95,656 MW, and the report says that cumulative capacity addition in 2021 and 2022 is expected to be 17,100 MW. This pace makes it impossible to achieve the target of 1,75,000 MW of renewable energy capacity by 2022-end. As FE reported earlier, of the 1,43,000 MW of tenders floated for building solar capacities since FY17, around 78,000 MW have been cancelled. Discoms had developed cold feet on buying power from these projects at tariffs discovered under auctions after much lower prices discovered under subsequent auctions.

In the hope of finding better tariffs, Uttar Pradesh has recently cancelled the February, 2020 auction for 184 MW of solar power plants, joining the list of Gujarat and Andhra Pradesh that have taken similar steps. "Our analysis of the utility scale RE power project pipeline indicates that projects with around 20 GW of contracted capacity from auctions held in the years 2018, 2019 and first half of 2020 remain

stranded without PPAs,” the report said, adding that the average tariff discovered for all the stranded projects are 12% higher than those for which PPAs are executed.

To help these projects find buyers, the report suggested that the central off-takers (SECI, NTPC) “can explore a tariff rediscovery mechanism for stranded projects in consultation with the project promoters”, which can “turn around many stranded projects with better deals to the state-run power distribution companies, already stressed with high power purchase cost”.

The 84,408 MW green power projects in pipeline would need around Rs 4.25 lakh crore of capital infusion for operationalisation, translating into Rs 1.27 lakh crore of equity infusion and Rs 2.97 lakh crore of debt. Much of this capital infusion is expected from the private sector increasingly backed by private equity investors, sovereign wealth funds and other specialised institutional investors, the report pointed. [Source](#)

Market-based model in the works for renewable energy

The government is examining a radical shift in its renewable energy programme by moving to a market-based mechanism where generators will sell their contracted capacity every day in power exchanges and distribution companies will settle the differential. Future renewable bids are proposed to be based on the 'renewable contracts' mechanism followed widely across the globe, while the existing renewable contracts will have an option to shift, a senior government official said.

As per the proposal, selected developers in an auction will start selling renewable energy on day-ahead markets of power exchange to recover market price. The differential will be settled on a monthly basis by the agency which calls the bids.



Renewed Efforts
MARKET-BASED MECHANISM TO ENSURE PRICE SECURITY

- 15-yr renewable energy (RE) auctions** to be held by discoms/traders
- L1 bidders** to be selected
- Winner to sell** RE on day-ahead market
- Differential to be adjusted monthly**
- No validity period, floor and forbearance price** for RECs
- RECs only for obligated entities** buying beyond obligations

Mkt-based Model in the Works for Renewable Energy The proposal aims at bringing in competition in green energy space while ensuring investment security, promoting new technologies, and giving access

to willing renewable energy consumers, the official said. "The market design shall balance interests of discoms and developers and also foster technological innovations in bringing renewable energy to market," the official said.

The rapid pace of renewable energy development and falling tariffs is increasingly making discoms averse to signing long-term PPAs with renewable energy generators for want of more market-based mechanisms, he said. [Source](#)

New financial instruments will offer power offtake certainty for renewable investors: IEEFA

The introduction of derivatives to India's short-term power market will make it easier for renewable project developers to enter into offtake arrangements with the state-owned discoms, according to a latest report by the Institute for Energy Economics and Financial Analysis (IEEFA). "The launch of new financial instruments will enable developers to hedge their offtaker risk without requiring the signing of long-term contracts with discoms for the financial closure of projects," said author Vibhuti Garg, energy economist, lead India, IEEFA.

Long-term contracts between power producers and discoms comprise 88 per cent of electricity transactions in India. The report said that PPAs provide investors with certainty of offtake of power over a long duration and de-risk them from price volatility. However, the Solar Energy Corporation of India currently has 15-16 gigawatts of auctioned capacity waiting to be signed by discoms, and this backlog of unsigned PPAs is now impacting the development of new renewable energy projects.

According to the report, discoms are struggling with huge financial losses and have become increasingly reluctant to enter long-term PPAs with renewable energy developers due to the discovery of record low renewable tariffs – a very positive deflationary trend which saw solar tariffs in India dip to a new low of Rs 1.99 per unit at the end of 2020.

"The sale of power in the futures market will provide flexibility and certainty of supply for both discoms and developers. It will also help develop the price signal needed to incentivise supply into peak demand periods, which is the key to enabling battery deployments and demand response management," said Garg. Under the proposed structure, physical delivery of electricity will be separated from financial settlement. The physical and financial electricity markets will complement each other, according to Garg. [Source](#)

India to revamp renewable energy certificate mechanism to boost green economy

New Delhi: India is looking to revamp the tradable renewable energy certificate (RECs) mechanism to boost its green economy, through measures like making such RECs perpetual, and promoting new technologies. As part of the plan in works, the union power ministry has circulated a discussion paper for redesigning the REC mechanism, that presently calls for renewable purchase obligations or RPOs to provide incentives to green energy sources.

"Discussion paper on the requirement of redesigning the REC Mechanism has been prepared in order to align it with the emerging changes in power scenario and to promote new renewable technology," power ministry said in a statement on Monday. The Central Electricity Regulatory Commission, India's apex power sector regulator, operationalized the RPO mechanism with the move being supplemented by tradable RECs. In the event of a state being unable to match its RPOs, it buys RECs from a power exchange.

Some of the proposed features are; "The REC validity period may be removed. Thus, the validity of REC would be perpetual ie till it is sold." Such a mechanism provides a safety net for renewable power developers by guaranteeing the purchase of electricity, making these projects much more bankable.

"As RECs are perpetually valid then the floor and forbearance prices are not required to be specified as RECs holders would have the complete freedom to decide the timings to sell," the proposal said. "CERC will be required to have monitoring and the surveillance mechanism to ensure that there is no hoarding of the RECs and creation of artificial price rise in the REC market. CERC may intervene if such case of malpractices is observed in the REC trading."

India is running the world's largest clean energy programme to achieve 175 GW of renewable capacity, including 100GW of solar power and 60 GW of wind power by 2022. A lot is riding on these projects to help India meet its climate change commitments. "The RE generator who are eligible for REC, will be eligible for issuance of RECs for 15 years from the date of commissioning of the projects. The existing RE project that are eligible for REC would continue to get RECs for 25 years," the statement said and added, "Promotion of new and high-cost technologies in RE and the provision of multiplier for issuance of RECs."

India has set a target of 450GW renewable energy capacity by 2030. It currently has an installed renewable energy capacity of 89.63GW, with 49.59GW under execution. Also, ₹4.7 trillion has been invested in the country's renewable energy space in the past six years, with an expected ₹1 trillion investment opportunity annually till 2030.

"A technology multiplier can be introduced for promotion of new and high priced RE technologies, which can be allocated in various baskets specific to technologies depending on maturity. The multiplier would also take care of vintage depending on the date of commissioning of the project," the statement said.

[Source](#)

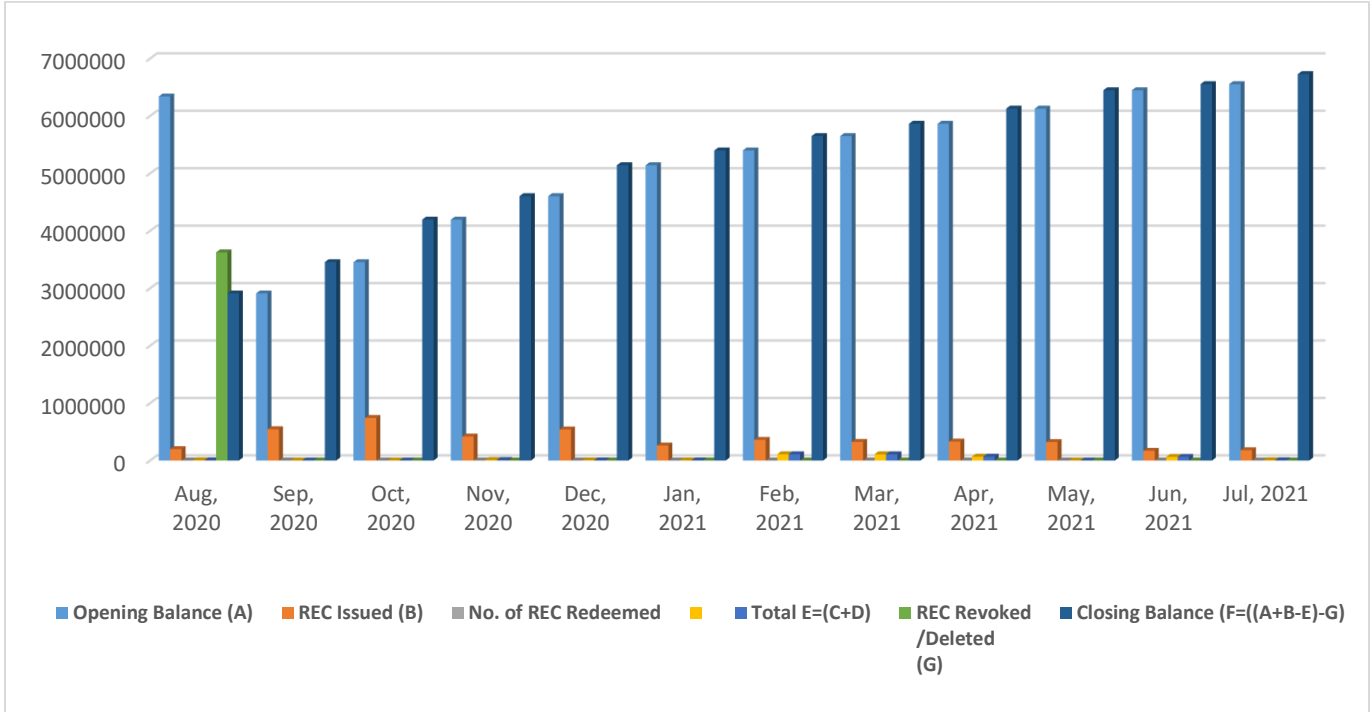
Source wise REC break up:-

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	2682	522	2644	520	27709989	21953273	2489171	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	962	419	929	408	10506782	9561111	121743	0

5	Small Hydro	192	30	192	30	5524678	4765341	6899	0
6	Others	4	2	3	1	28159	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	434	40	401	37	10953322	9896423	156549	0
10	Bio-fuel cogeneration	810	88	369	52	9328495	8610583	5001	0
	Total	5084	1101	4538	1048	72637323	59500577	2784373	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)			
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
Mar, 2021	5648541	324035	0	109141	109141	0	5863435
Apr, 2021	5863435	330267	0	66899	66899	0	6126803
May, 2021	6126803	321455	0	1206	1206	0	6447052
Jun, 2021	6447052	169616	0	63604	63604	0	6553064
Jul, 2021	6553064	178989	0	3575	3575	0	6728478
Total:		72637323	59500577	2784373	62284950	3623895	



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