TATA POWER

TATA

GREEN MARKET CAPSULE

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TPTCL'S E-NEWSLETTER

Tata Power Trading Company Limited (TPTCL)

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Lighting up Lives!

Power News

How will the solar sector benefit from Budget 2021: Analysis

There were a lot of hopes riding high on Union Budget 2021-22, after the year we have had. The renewable energy industry in general, and the solar industry in particular, had varied expectations - right from looking for support to recovering from the aftereffects of the pandemic induced lockdown. Incentivising solar adoption, promoting Research and Development in hardware and infrastructure, and many more areas were being keenly watched. And Budget 2021 did not fail the expectations from this sector. The allocation of additional funds to Solar Energy Corporation of India (SECI), and Indian Renewable Energy Development Agency Limited (IREDA), and additional allocation of around Rs 3.5 lakh crores to support ailing distribution companies (Discoms) were seen as great steps forward. Further, with a clear intent to provide alternatives to consumers, the Finance Minister expressed the need for a framework to establish more public and private Discoms. To support the Atmanirbhar Bharat initiative, she also announced an increase in the duty on imports of solar inverters and solar lanterns from the existing 5 percent to 20 percent and 15 percent respectively.

Key inferences from the budget announcement include:

1. Infusion of funds to SECI and IREDA would address the key challenge of availability of funds for setting up solar plants. However, drafting clear guidelines to direct the usage of these funds is the key. For instance, the Ministry of New and Renewable Energy (MNRE)'s decision last year to route rooftop solar subsidies through state Discoms has not been welcomed by solar manufacturers association due to the conflict of interest with Discoms in promoting solar energy.

2. Further, the industry looks forward to support on the Research and Development in solar module and inverter technology. SECI and IREDA should come up in a big way to fund such initiatives which could lead to the ultimate transition from imported options to indigenous superior quality hardware.

3. Similarly, allocation of funds for supporting the DISCOMs should be complimented by end user norms, and stricter rules to revamp the existing infrastructure.

4. Privatisation is also a welcome step and competition would help improve the power generation and transmission infrastructure by leaps and bounds. This would in turn necessitate low-cost power, thus boosting demand for solar parks.

5. Other announcements like lowering compliance norms for small companies would help startups in the solar space. A boost in the adoption of Electric vehicles (EVs) would also compliment the need for green energy.

6. The increase in duty on imported solar inverters and lanterns is positive as far as the Make in India mission is concerned.

It is also worthwhile to note that India has achieved only 37% of its targeted installed capacity of 100 GW by 2022. Of this the rooftop solar capacity, especially residential rooftop, is negligible. The budget should have focussed more on addressing the challenges faced in the rooftop segment. With regards to large scale projects, measures to incentivise investors as well as fixing accountability of defaulting off-takers (in power purchase arrangements) is the need of the hour. To summarise, while the Budget has announced infusion of funds in the solar and power sector, a few more targeted measures would have

worked better. If implemented effectively, the Indian solar market will stand to gain in the long run from the measures announced this year. *Source*

A net zero India in the 100th year of independence?

More than a third of the signatories to the Paris Agreement have already committed to being net-zero emissions by 2050. Some of them have committed to an even more ambitious timeline. Can India commit to an ambitious 2047 net zero goal? Can India become net zero by its 100th Independence Day? Would that not be truly remarkable?

It has been five years since the eponymous Paris Agreement was reached during the 2015 COP21 in Paris. Then came a leadership change in the US, moving it to the sidelines. The rest of the world vowed to move forward. However, the words did not translate into action. Then came Covid-19; and things seem to have changed. Now, there seems to be a near frenzy; perhaps borne by the realization that dealing with an ever-progressing climate change could be like dealing with a pandemic several times more potent and no prospect of a vaccine against it. So now, a 1.5 degrees global warming scenario, written off as a pipe dream just a couple of years ago, is taking a firm lead in this race. Quietly, under the mask of Covid-19, there is a surge in confidence and commitments. As more and more nations are taking the net zero pledge, so are the biggest corporations in the world.

What should India do? We are sitting pretty under the Paris Agreement so far. Our existing commitments are expected to result in emission reductions surpassing India's Nationally Contributions (NDCs) toward the Paris Agreement. Is that good enough? Why can we not aim for a more ambitious goal? Net Zero by 2047 is not just an ambitious goal, a goal that pitches us three years ahead of the Paris Agreement timeline, but more significantly, a sparkling gift on the 100th anniversary year of our Independence! By doing this, India will legitimately move to the driving seat of this global effort. China has taken a more cautious approach and set a 2060 date with net zero. The US, now back into the fold of the Paris Agreement, is expected to go by the book and take a 2050 commitment.

Net zero by 2047 - is it doable? If it is doable by 2050, it must be doable by 2047. Is it doable by 2050? That we must; we must find ways to do it. This is about our existence and wellbeing. If we continue our efforts in greening the grid, transitioning to electric and hydrogen mobility, and creating carbon sink through afforestation, this is within our reach.

It will not be an easy task. As a developing country of nearly 1.4 billion people, our per capita income, per capita energy consumption, and per capita automobile ownership are all very low. So is our per capita emission. But we harbor great ambitions. We are a fast-growing country. We want to see our GDP multiply. That means higher per capita income, higher per capita energy consumption, and higher per capita automobile ownership. To meet these growth imperatives, our energy demand is expected to grow. According to the World Energy Outlook, India will lead the global energy demand over the next decade. The twentieth century growth-model will point to a corresponding increase in greenhouse gas emissions. Does it have to be that way? Can there not be an alternate growth model - one where economic growth is decoupled from growth in greenhouse gas emissions? It is a question of survival; therefore, there can be only one answer to this question.

While we have an uphill task, we have many factors in our favor. We are blessed with a vast country that has great potential for solar and wind energy. We have a corporate sector with a can-do attitude. We have one of the most vibrant and productive start up ecosystems. Overall, our entrepreneurial spirit is alive and strong.

We have come out on top in the first leg of the Paris Agreement. In 2015, India submitted its Nationally Determined Contributions (NDCs), in other words, India's voluntary emission reduction targets under the Paris Agreement. The commitment is to reduce our GDP emission intensity by 33-35 percent from the 2005 level by 2030. With two massive levers- a 450-GW renewable energy commitment and a commitment to create 2.5-3 billion tons of CO2 equivalent of additional carbon sink through additional forest and tree cover- India is expected to zip through the finish line. By forming and chairing the International Solar Alliance, we have already put in our letter of intent to lead. Net Zero by 2047 will cement that intent. *Source*

India adds 3.2 GW solar capacity in 2020; lowest in 5 years: Report

NEW DELHI: India added 3,239 megawatt (MW) solar capacity in 2020, down 56 per cent from the previous year, according to a report. The adding of 3,239 MW of solar capacity was the lowest addition in five-years-time, Mercom India Research said in its report on Tuesday. "India added 3.2 GW or 3,239 MW of solar capacity in 2020, a 56 per cent decline year-over-year (YoY) compared to 7,346 MW installed in 2019," it said adding the country's total solar installed capacity was at 39 GW gigawatt (GW) as of December 2020.

The large-scale solar projects accounted for 78 per cent of installations with 2,520 MW, registering a 60 per cent year-on-year (y-o-y) decline. The addition of the remaining 719 MW rooftop installations was also down 22 per cent compared to the installation in 2019. Andhra Pradesh, Rajasthan, and Gujarat were the top three states for large-scale solar capacity additions, representing around 51 per cent of 2020 installations.

"India's solar installations in 2020 were the lowest in five years. While other top solar markets in the world have experienced positive growth, India, which had one of the most stringent lockdowns in response to the pandemic, took a while to get back up and running. However, we expect the industry to experience significant positive growth in 2021," said Raj Prabhu, Chief Executive Officer of Mercom Capital Group.
According to the report, besides COVID-19, another significant bottleneck in the market has been the difficulty facing government agencies to get distribution companies (DISCOMs) to sign power sale agreements (PSA). This has left about 17-18 GW of projects without a PSA. Other short-term challenges included the rise in module prices, increased shipping and freight charges in the range of 500 per cent-800 per cent, and a surge in raw material costs.

"As a result, the average large-scale solar project costs increased slightly by 2 per cent quarter-over-quarter (q-o-q) in Q4 (October-November) 2020. However, project costs were 2.5 per cent lower compared to the same quarter in 2019," according to the report. On its outlook for 2021, the report said it expects the industry to experience positive growth in 2021. Mercom India Research is forecasting over 10 GW of solar installations in 2021. The rooftop solar market is experiencing a turnaround, with installations improving significantly over the second half of the year. Fourth-quarter was the strongest for rooftop installations, and the report predicts momentum to continue into Q1 (January-March) 2021.
Source

West Bengal tenders for rooftop solar

West Bengal Renewable Energy Development Agency (WBREDA) has invited domestic bids to install 990 numbers of grid-connected rooftop solar PV power plants, in sizes of 10 kWp each, across West Bengal. WBREDA shall be the offtaker, and the power procured from these projects has been provisioned to be sold to various schools, institutes and organizations having grid connectivity.

The work includes design and engineering, manufacture/procurement, testing, supply installation, commissioning, and five years of comprehensive maintenance of the plants. The entire project cost is estimated at INR 40.59 crore. Only indigenously manufactured PV modules are allowed for the plants. The modules shall be based on crystalline silicon technology.
Source

Himachal focusing on hydel, solar to boost electricity access in rural areas

Shimla: The Himachal government has launched a comprehensive programme to solve the power problem in far flung areas. While electricity problems in remote areas have been solved through hydel power generation, use of solar power has been encouraged in other parts of the state, which has also reduced electricity bills.

After the constitution of Himurja in the state, the department has installed 89 small hydro units of 331.25 MW, which are of up to 5 MW. These small hydro units are contributing significantly in solving power problems faced by people. Officials said small hydro units of about 82.7 MW in Chamba district, 98.65 MW in Kangra district, 25.9 MW in Kinnaur district, 60 MW in Kullu district, 10.50 MW in Mandi district, 39 MW in Shimla district and 12 MW in Sirmaur district have been installed.

They said that Himurja has installed 41 advanced gharats (grinder), 878 advanced chulhas and 17 wind solar hybrid systems at various places in the state. Besides, 1,64,803 street lights, 69,935 lanterns, 27,713 domestic lights, off grid solar power plant of 3,152.45 KW, grid connected solar rooftop power plant of 14,425.54 KW and 20,24,000 solar water heating systems have been made available to the public by Himurja.

To ensure electricity supply, the state government has set up one kilowatt of grid solar power plants free of cost in 34 houses of Kunnu village and 40 houses of Charang village in Kinnaur district. Also, 250 watt off-grid solar power plants have been set up in the houses of 1,000 BPL families in Pangi sub-division of Chamba district to prevent problems due to breakdown. Pangi area of Chamba district is located at an altitude of 7,000 to 11,000 feet, about 461 km from Shimla. The state government has made a provision of Rs 3.83 crore in the budget to set up off-grid solar power plants in the area for people living below poverty line.

Pangi resident Ashwini Kumar said the area is covered with snow for about five-six months, due to which people face electricity problems. With the state government setting up solar power plants through Himurja, electricity problems have been resolved, he said. Killar residents Neek Ram and Subhash Singh said they had electricity for only one or two hours during the winter, due to which school children had to face a lot of difficulty in studying. Such problems will be solved now, they said.

Grid connected solar power plants have also been set up in Shimla. These solar power plants have been installed on the roofs of about 66 government offices in the city, which has reduced electricity bills in government offices. Apart from this, grid connected projects of 23.25 MW have been set up on the ground, which has provided employment to youth of Himachal. The National-level integrated rural energy programme was launched in 1981 by the Planning Commission of Government of India to solve the energy problems in rural areas. The programme was started in Himachal Pradesh by the end of the sixth five-year plan. *Source*

Solar outshines wind power in total capacity

In a significant development in the renewable space, solar power has overtaken wind power in terms of total installed capacity. A decade ago, the solar segment had a capacity of just 18 MW, while wind power's installed capacity was at 13,000 MW. As of January 31, 2021, the total installed capacity of solar power stood at 38,794 MW (including 34,561 MW of ground-mounted capacity and 4,233 MW of rooftop capacity). However, the total wind power capacity was 38,684 MW, according to data from the Union Ministry of New and Renewable Energy.

Rapid growth

While the recent decade belonged to solar power, the past five years have seen exponential growth in solar capacity addition in India, driven by supportive government policies, a favourable ecosystem and higher investments. As of March 31, 2016, the total installed capacity of wind power stood at 26,744 MW and solar power capacity was at 6,763 MW. The solar segment remains a major driver of new capacity addition in the renewable space. With the addition of 5,473 MW (including 4,116 MW of new solar capacity) during the 10-month period of this fiscal, India's total grid-connected renewable capacity stood at 92,550 MW.

"We expect annual additions of 10–12 GW of solar over the next three years. Some of the key monitorables for this capacity addition are sustained availability of debt capital and timely closure of power sale agreements for auctions concluded at tariffs above the current lowest bid prices," said Manish Gupta, Senior Director, Crisil Ratings. Meanwhile, measures announced in the latest budget along with the production-linked incentive scheme (PLI) are expected to give a further fillip to the solar industry to meet its capacity target of 100 GW of solar power by next year.

To support renewable sector growth, an additional capital infusion of ₹1,000 crore to Solar Energy Corporation India (SECI) has been provided and that will enable SECI to float 15,000 MW of tenders on a yearly basis. On a yearly basis, it will attract investment of more than ₹60,000 crore, generate employment of 45,000 job years and reduce emissions of 28.5 million tonnes of CO_2 per year. The capital infusion will also enable SECI to set up innovative projects with an investment of around ₹17,000 crore.

Additional loan facility

Also, ₹1,500 crore equity infusion to IREDA would help it extend an additional loan facility of ₹12,000 crore. The move will help improve IREDA's capital adequacy which will help it in borrowing at a lower rate of interest, thus lowering the interest rates for developers. It will also help finance around 4,500 MW of RE projects worth ₹18,000 to ₹19,000 crore.

"India is already a global leader in solar power and solar combined with batteries will play a massive part in the country's energy future. Solar power is set for explosive growth, matching coal power's share in the Indian power generation mix within two decades. But India will need a whole host of technologies and policies to chart this new path," pointed out India Energy Outlook 2021 report. The share of renewable energy (excluding large hydro) in the total electricity generation in the country was about 11 per cent during 2020-21 (up to Dec'2020). *Source*

Rajasthan: Wind power firms to lose government land for not starting projects

JAIPUR: The wind power developers who had taken government land and have not been able to execute the projects are set to lose their land. Rajasthan Renewable Energy Corporation Ltd (RRECL) has written a letter to the revenue department to expedite the process for cancellation of the land.

In the letter, RRECL said that more than 3000 bigha has been allotted to about 20 companies which has not developed projects. “The revenue land allotted to the projects in these cases was either not utilized by developers within the permissible period of excess land surrendered by developers had been recommended by RREC for cancellation as per Rajasthan Land Revenue (Allotment of Land for setting up of Power plant based on Renewable Energy Sources), 2007,” said the letter.

When TOI contacted RRECL chairman and managing director Subodh Agarwal, he said, “The state government has set a 30,000 MW target in the solar energy policy. We require land for these projects. If the developers have failed to execute projects, the land should be returned to the government and it can be used for other projects.” Even though the renewable power journey of Rajasthan started with wind in 1999 having 2 MW, focus has now shifted to solar energy due to cheaper rates developers offer. After 2016, there have been no new tenders for wind power following the scrapping of feed-in tariffs and bidding was made mandatory for wind projects like in solar.

The bidding regime discouraged developers as their margins were reduced significantly and there was no policy support to resurrect the sector. In fact, new wind power capacity addition fell to 45 MW in the past four years. “In fact, wind projects could not withstand the competition from solar ones. That’s why many people who had taken land could not develop projects. Majorly, the private sector is to blame for itself for the collapse of the sector as it did not want auction. Whereas solar became popular because of auctions as rates started coming down attracting many players. That was the main reason why the land could not be utilized,” said a wind power developer.

The letter addressed to the principal secretary, revenue department, said, “The unutilized land areas have great potential for wind or solar energy generation. You are, therefore, requested to expedite the cancellation of allotment of these huge chunks of land allotted to wind developers or power producers, under intimation to this office, so that these lands may be considered for allotment to new renewable project developers.” *Source*

National Hydrogen Mission: Leapfrogging towards India's cleaner future

"Energy transition is underway at an exceptional level and several countries are betting on hydrogen to emerge as the top clean fuel with its high energy density and versatility. Government of India’s (GOI) National Hydrogen Energy Mission (NHM) initiative will capitalise on one of the most abundant elements on earth for cleaner alternative fuel option.”

Undoubtedly, Hydrogen is the fuel of the future, however it is imperative to note that it is not the production of hydrogen which is the challenge, but the production of green hydrogen. The usage of hydrogen will not only help us in achieving our emissions goals under the Paris Agreement, but will also reduce import dependency on fossil fuels.

Hydrogen is primarily used in petrochemicals and fertiliser industry and is produced largely from natural gas, thereby emitting enormous amounts of carbon dioxide. Depending on the nature of the method of its extraction, hydrogen is categorised into three categories, namely, grey, blue and green. There is growing focus on increasing production of green and blue hydrogen due to its no carbon emission and

use of carbon offset technology, respectively. Additionally, several leading organizations are exploring technologies which can convert bio and plastic waste into hydrogen [2], thereby providing a huge scope for investment in this technology which can combat India's twin problems of waste management and energy security.

Recently, the Finance Minister in the Union budget for 2020-21 formally announced the NHM which aims for generation of hydrogen from green power resources. The Ministry of New and Renewable Energy (MNRE) has also disclosed that the draft regulations for NHM will be finalised by the end of this month and will thereafter proceed for approval of the Union Cabinet [3]. Though it is speculated that NHM will emphasize on generating green hydrogen and enabling its commercial use as a transportation fuel, however, it is yet to be seen what roadmap the government has envisioned in its draft regulations.

Asia-Pacific stance

Several countries in Asia-Pacific sub-continent, including the likes of Japan and South Korea are on the front foot in terms of hydrogen policy making. In 2017, Japan formulated the Basic Hydrogen Strategy which sets out the country's action plan till 2030, including the establishment of an international supply chain. It has also entered into memorandums agreeing to cooperation on the exchange of information and personnel and developing technology with countries like New Zealand [4]. Likewise, South Korea is operating hydrogen projects and hydrogen fuel cell production units under the auspices of its Hydrogen Economy Development and Safe Management of Hydrogen Act, 2020, but initially the country faced a lot of issues due to policy vacuum as hydrogen projects were already underway and the implementation policy was rolled out much later. Furthermore, making the first move, South Korea recently passed the Economic Promotion and Safety Control of Hydrogen Act, which deals with three key areas - hydrogen vehicles, charging stations and fuel cells. This law is intended to bring transparency to the nation's hydrogen pricing system.

Indian Context

India has a huge edge in green hydrogen production owing to its favorable geographic conditions and presence of abundant natural elements. The government has given impetus in scaling up the gas pipeline infrastructure across the length and breadth of the country, and has introduced reforms for the power grid, including the introduction of smart grids. Such steps are being taken to effectively integrate renewable energy in the present energy mix. With appropriate capacity addition to renewable power generation, storage and transmission, producing green hydrogen in India can become cost effective which will not only guarantee energy security, but also ensure self-sufficiency gradually.

Policy Challenges

One of the colossal challenges faced by the industry for using hydrogen commercially is the economic sustainability of extracting green or blue hydrogen. The technology used in production and use of hydrogen like carbon capture and storage (CCS) and hydrogen fuel cell technology are at nascent stage and is expensive which in turn increases the cost of production of hydrogen. Furthermore, the maintenance costs for fuel cells post-completion of a plant can be costly, like in South Korea.

The commercial usage of hydrogen as a fuel and in industries requires mammoth investment in R&D of such technology and infrastructure for production, storage, transportation and demand creation for hydrogen. Although, the draft regulations of NHM are expected to contain details pertaining to hydrogen technology, including storage, R&D, pilot projects, and other specification and safety standards.

Going Forward

The NHM should aim to establish appropriate physical infrastructure and legal framework for the usage of hydrogen. The industry has already revealed its hydrogen project with Indian Oil Corporation Limited (IOCL) announcing setting up of pilot hydrogen production units [7]. Energy PSU NTPC too is considering setting up a green hydrogen production facility in Andhra Pradesh, and private sector behemoth RIL too intends to replace conventional transportation fuels with hydrogen and clean electricity in a steady phase [8]. To head start the NHM and its smooth approach, there is an imminent need to plug in the policy vacuum by bringing in the regulations as soon as possible.

Currently, multiple regulatory authorities regulate hydrogen use tangentially, for instance, Ministry of Road Transport and Highways regulates vehicle's fuel carrier specification, MNRE regulates renewable energy sources, Petroleum and Natural Gas Regulatory Board regulates pipelines and Petroleum and Explosives Safety Organisation regulates explosive substances, storage and fuel station's specifications. Hydrogen being a versatile resource which can be used as a transport fuel, generate electricity, can be transported via pipelines and is highly flammable. The commercial use will require coordination among the various ministries and regulators. The NHM can also highlight the need for global cooperation and generate opportunities for exchange of technology.

The draft regulations for NHM shall have a roadmap for targets and capacity installation. Designated hydrogen hubs can be established to attract investment by providing infrastructural support like pipelines and renewable electricity for production, storage and transportation of green hydrogen. Producers and major users of hydrogen can be placed in these hubs for logistical convenience. A "Hydrogen Valley Platform" to create an integrated hydrogen ecosystem which will cover the production, storage, distribution and end-use is in the works under the Department of Science and Technology [9]. To augment the NHM, constructive synergies among leading industries from different sectors like automobiles, power generation, refining, chemicals is necessary. Countries like Germany are already using alliance which aims to put up 400 hydrogen fueling stations by 2023. Similarly, market leaders in India may consider following a similar strategy to invest in hydrogen related technologies and infrastructure. Not only it will benefit India in reducing emissions but will also benefit the companies in achieving their net emissions goals *Source*

Source wise REC break up:-

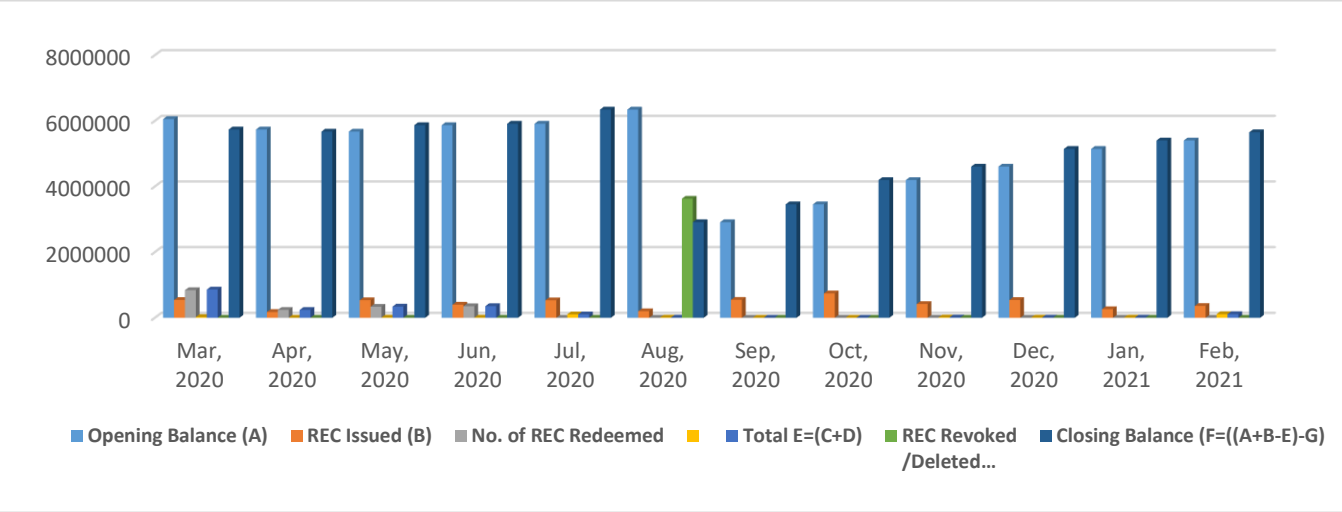
SN	Source	Accredited		Registered		RECs Issued	RECs Redeemed Through Power Exchanges	RECs Redeemed Through Self Retention	Closing Balance
		As on date		As on date		Since Inception	Since Inception	Revoked/Deleted RECs	As on date
		Capacity	No. of Project	Capacity	No. of Project				
1	Wind	2756	536	2701	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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