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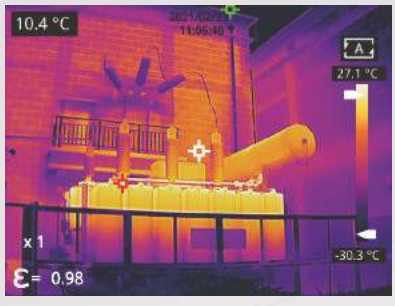

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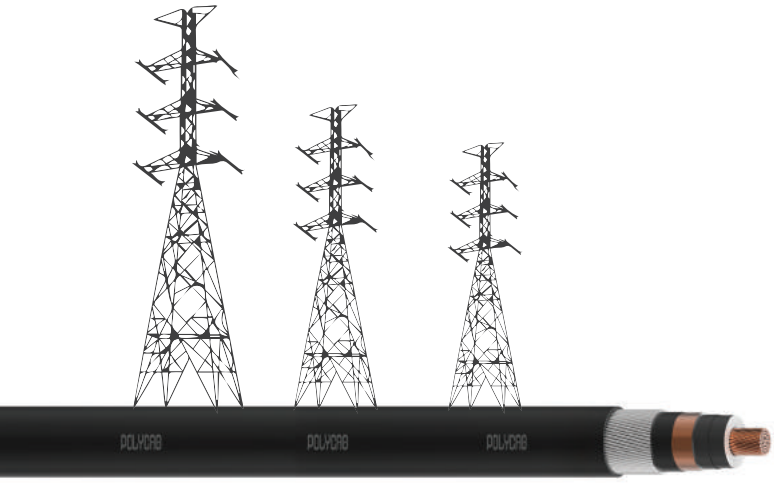

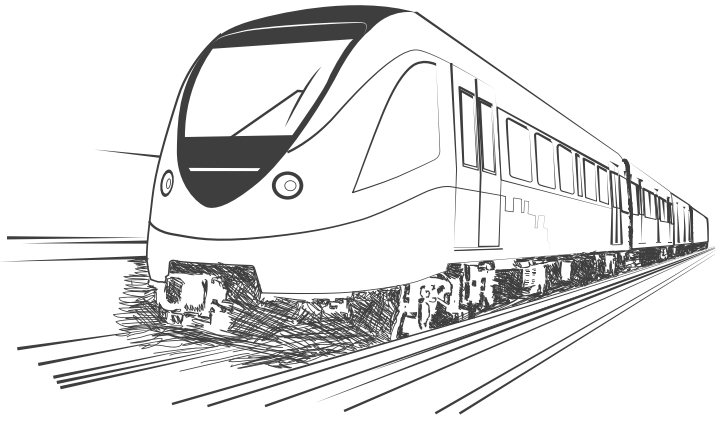

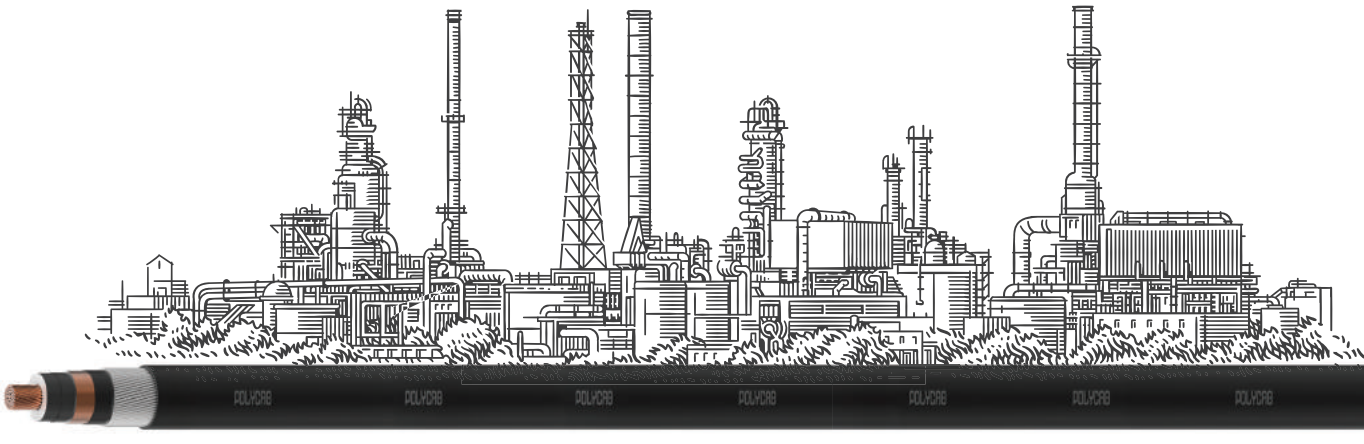

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Tata Power to set up EV charging stations at HPCL petrol pumps

The charging is enabled with the Tata Power EZ charge mobile platform which makes it a seamless experience to vehicle owners.

Tata Power has signed an agreement with Hindustan Petroleum Corporation Limited (HPCL) to provide end-to-end EV charging stations at HPCL's retail outlets (petrol pumps) in multiple cities and major highways across the country.

Tata Power is a pioneer in the EV charging space and owns an expansive network of over 500 public chargers in 100+ cities covering petrol pumps, metro stations, shopping malls, theatres and highways. The company is present across all segments of the EV eco-system – public charging, captive charging, home, workplace charging and ultra-rapid chargers for buses.

Under the agreement, Tata Power will provide state-of-the-art EV charging infrastructure at HPCL pumps for EV users who can travel within cities and intercity without any range anxiety. The charging is enabled with the Tata Power EZ charge mobile platform (an award-winning app) which makes it a seamless experience to vehicle owners.

Development and availability of electric vehicle for charging infrastructure is a key requirement for the proliferation of EVs in India. The partnership will play a strong role in encouraging EV owners to charge their electric vehicles across various petrol pumps. It is also in line with the Government of India's National Electric Mobility Mission Plan (NEMMP) which aims to develop electric vehicle charging infrastructure using the latest technological platform along with easy access to electric vehicle for charging points.

Sandeep Bangia, Head – EV Charging, Tata Power, said, "We are excited to partner with HPCL who share our vision of sustainable mobility. This strategic tie-up provides us access to a vast retail base of HPCL, especially in cities and along the key highways. The move will tremendously benefit the EV users as it will not only provide them easy access to charging points but also remove the range anxiety, resulting in wider adoption of electric vehicles in the country."

PFC in pact with NHPC for hydro projects funding

The signing of the MoU will further bolster the long-standing association between PFC and NHPC.

Power Finance Corporation Ltd (PFC) signed a Memorandum of Understanding (MoU) with NHPC Ltd to lend funds for the development of hydro projects by NHPC. PFC will also provide financial assistance for the acquisition of stressed projects.

NHPC, a Schedule-A Miniratna Category-I CPSE, is engaged in development of hydropower in India and has also diversified into solar and wind power. NHPC also provides consultancy services to hydro power and renewable energy projects.

Subir Saha, Executive Director (Projects-SR, ER&NER, CSP&C), signed the MoU on behalf of PFC while V K Maini, ED (Strategy, BD & Consultancy) signed on behalf of NHPC Ltd on 24 August 2021. The MoU was signed in the presence of P K Singh, Director (Commercial) & Addl. Charge (Projects), PFC; R R Jha, (ED-In-charge Projects); Manoj Sharma, ED (L&D); Praveen Verma, SGM (L&D) and Nitin Kumar, GM (Central Sector Unit), PFC.

The signing of the MoU will further bolster the long-standing association between PFC and NHPC and will herald a transformational opportunity between the two organisations. The association will also serve to facilitate knowledge and technology transfer, contributing to sustainable development initiatives in the country.

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TPREL commissions 100-MW solar PV project in Gujarat

With this addition of 100 MW, the total installed capacity of TPREL will be 2,797 MW with 1,865 MW of solar and 932 MW of wind.

Tata Power Renewable Energy Limited (TPREL), a wholly-owned subsidiary of Tata Power, has successfully commissioned a 100 MW solar power project at Raghanesda Solar Park, Gujarat. This project is another landmark for TPREL, as in the first year of its operation, the 100 MW plant is expected to generate 255 million units. The installation will reduce 200,000 tonnes of carbon emission every year. Raghanesda Solar Park, located in the Banaskantha district of Gujarat, is one of the biggest solar parks in the country.

This project was awarded by Gujarat Urja Vikas Nigam Ltd (GUVNL). With this addition of 100 MW, the total installed capacity of TPREL will be 2,797 MW with 1,865 MW of solar and 932 MW of wind. It has another 1,234 MW of renewable projects under implementation.

Speaking on the achievement, Dr. Praveer Sinha, CEO & MD, Tata Power said, "We are proud to announce that TPREL has commissioned the 100 MW project at one of the biggest solar parks in the country in Gujarat. We are steadfast in our conviction towards promoting the realisation of clean and green energy in the country through solar power generation."

Legrand Data Center Solutions introduces advanced fibre system

Infinium reduces overall energy consumption by up to 30 percent, which contributes to LEED points.

Legrand Data Center Solutions unveiled the Infinium Quantum Fiber System designed for advanced data center applications. Infinium Quantum is an industry leading lowest loss optical fibre system offering a 67 percent improvement over industry standard systems. With this launch, the company envisions to offer higher efficiency, flexibility, and scalability to the growing data center needs, without additional costs.

On the launch, Sanjay Motwani, Business Head of Legrand Data Center Solutions said, "As we see the exponential growth in data generation, the ability to process this data quickly, securely with architectures to support high density workload becomes crucial for data centres. As technology partners, it is critical that we help businesses navigate these challenges of scaling network capacity and connection loss issues. Infinium Quantum is the solution to improving performance with enhanced network capacity that is beyond the current industry standards. We are confident that with this product, data centres will be able to achieve the desired demands of the marketplace."

Infinium is an advanced structured cabling solution fabricated of enclosure, cassettes, trunks, patch cords and panels designed to yield the lowest performance loss in data centres to manage today's fast-moving markets. Characterised by performance, Infinium Quantum is engineered to 'Unlock Agility', enabling greater sustainability, future scalability, and the lowest total channel connection loss. Infinium also reduces overall energy consumption by up to 30 percent, which contributes to Leadership in Energy and Environmental Design (LEED) points, the most widely used green building rating system in the world.

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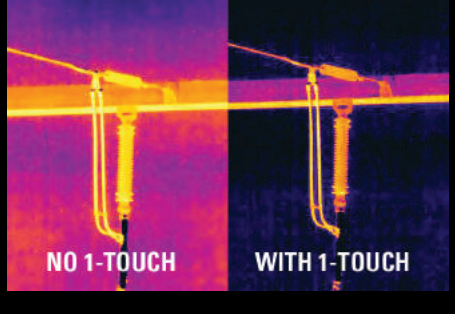

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OPEN FORUM

India's RE capacity milestone and outlook

India crossed the milestone of 100 GW installed renewable energy (RE) capacity, excluding large hydro. On this occasion, industry stakeholders share their comments on the achievement and the outlook.

Rajiv Ranjan Mishra, MD, CLP India

Congratulations to the country on crossing 100 GW of RE capacity. This certifies our position as one of the leaders in the Energy Transition of the World. This is also a testament to the power of big ambitions and ideas, and the power of leadership of the Prime Minister and this government– barely 10 years back, a 100 GW renewables number would've appeared fanciful!

Saurabh Kumar, Executive Vice Chairman, EESL

India has reinforced its position as one of the leading voices in the global climate change discourse. We have been ahead of the curve in meeting our climate commitments and the recent achievement of reaching a milestone 100 GW of installed renewable capacity is a testament to India's sharp focus on clean energy. We need to maintain this momentum and continue making concerted efforts to move towards cleaner energy sources. We, at EESL have been proud partners of India's clean energy efforts and will continue to support our nation in achieving more such milestones."

Manoj Gupta, VP-Solar and Waste to Energy Business, Fortum India

We, at Fortum India, feel great pride in India achieving 100 GW of installed renewable energy capacity (excluding large hydro). We have always believed in the potential of opportunities in India and we are greatly privileged to be a part of this journey. We have also made our chunk of contribution with 685 MW of installed capacity towards achieving this milestone. Our trust lies with the country and with the people, who are accepting green energy for a cleaner world. We are confident that the country will achieve the planned target of 450 GW by 2030.

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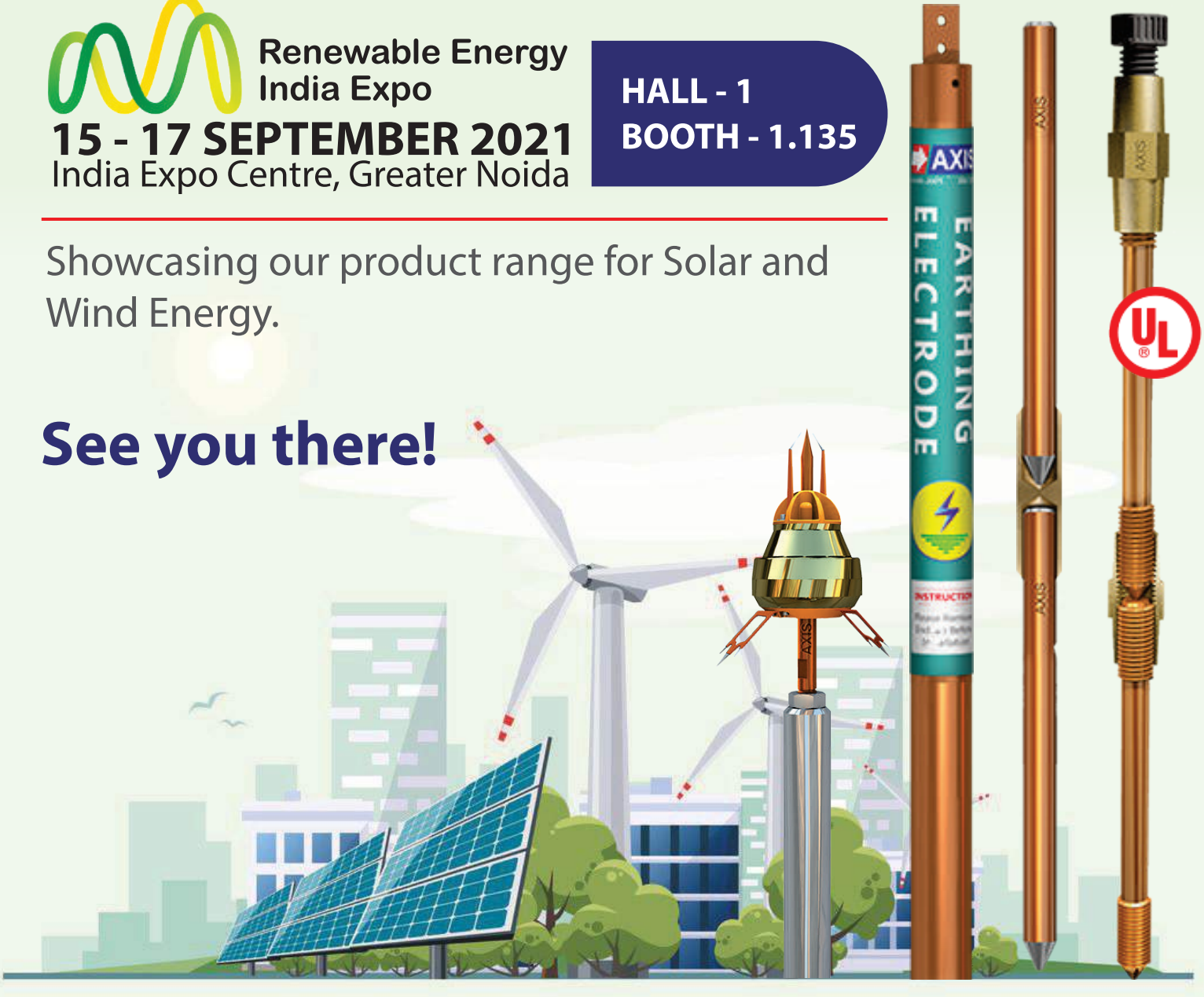

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Siddharth Gangal, CEO, The Solar Labs

We as an industry with all its stakeholders in government, industry, policy made this happen, and it is wonderful to see this major milestone achieved by India. It speaks to the depth of the conviction that India truly believes in solar. Onwards to the next 500 GW milestone!

Girishkumar Kadam, Senior VP & Co-Group Head - Corporate Ratings, ICRA Limited

The share of renewables in installed capacity is estimated to increase gradually from 25 percent as on March 2021 to about 35 percent by March 2025, with the incremental capacity addition of about 60-65 GW and investment requirement of about ₹ 3-3.5 trillion over this period. Regulatory framework for RE is also highly supportive, given the must run status and renewable purchase obligation norms for the obligated entities. Nonetheless, the sustained improvement in the financial health of state-owned distribution utilities, being the ultimate off-takers, remains a key monitorable for the entire power sector.

Kengo Akamine, Senior Representative, JICA India

JICA would like to applaud the efforts of the Ministry of New & Renewable Energy and the Ministry of Power for achieving 100 GW of renewable energy capacity. JICA has supported India in installing 12.1 GW energy capacity with 7.3 GW in the renewable sector including pumped storage. It provided Japanese ODA loans of more than 86 billion Yen (approximately □5,730 crore) to IREDA and IIFCL under which over 45 sub-projects across the wind, solar and small hydro energy sectors have been supported. JICA reaffirms its commitment to wholeheartedly support the country's effort to diversify its energy mix and realise economic growth in a sustainable manner.

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GREEN ENERGY: INDIA'S SHIFT TO RENEWABLE ENERGY

As solar and wind power segments driving India's renewable energy growth in the country, battery storage and hybrid technologies are providing a fresh impetus in the market.

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India's cumulative installed renewable energy (RE) capacity has crossed the milestone of 100 GW, as per the recent MNRE announcement. While 100 GW has been installed, 50 GW is under installation and 27 GW is under tendering. The achievement of 100 GW installed RE capacity is an important milestone in India's journey towards its target of 450 GW by 2030. Another industry report by Global Wind Energy Council and MEC Intelligence indicates that India is expected to add nearly 20.2 GW of new wind power capacity between 2021-2025. This would increase the country's 39.2 GW wind market by nearly 50 percent and is a clear signal that the market is beginning to bounce back after a slowdown in recent years. While these numbers open up new avenues of growth for renewable energy in India, the journey ahead is expected to be promising but challenging.

On a renewed growth push

With strong project pipeline of about 35 GW as on July 2021 led by the awards of the projects in utility auction route both by central intermediaries and state nodal agencies, the visibility over the incremental RE capacity addition over the medium term thus remains strong, according to Girishkumar Kadam, Senior Vice President & Co-Group Head - Corporate Ratings, ICRA. "About 11 GW of annual RE capacity addition is expected in the current FY 2022, given the execution challenges also seen in Q1 of the current fiscal amid second wave. The share of renewables in the installed capacity is thus estimated to increase gradually from 25 percent as on March 2021 to about 35 percent by March 2025, with the incremental capacity addition of about 60-65 GW and the investment of about ₹ 3-3.5 trillion over this period. Within the RE segment, solar segment will continue to occupy a dominant share, given the relatively more execution challenges persisting in wind energy segment and concentration of wind energy resource only in few states," he adds.

However, even though the capacity installations are growing, the generation is not in line with the trend. According to Ajay Devaraj, Secretary-General, Indian Wind Power Association (IWPA), although RE stands at 26 percent of India's installed energy generation capacity, the actual

generation is less than 10 percent. Speaking on the wind energy capacity additions, he adds, "Out of the 7.6 GW under construction projects, 4.8 GW are expected to be completed in FY 2021-22. Installed capacity will thus rise to 44.4 GW." According to him, the current installed capacity of wind power is 39,600 MW, under construction (SECI Tranche I-IX) is 7,631.800 MW, allotted under SECI Tranche X is 1,200 MW and tendered under SECI Tranche XI is 1,200 MW. Also, 3,600 MW capacity is likely to be tendered in FY 2021-22, while 1,500 MW of wind power in likely hybrid wind-solar bid (50 percent of 3,000 MW).

Ganesh Srinivasan, CEO, Tata Power-DDL, says, "The pandemic-induced construction delays and grid connection challenges have led to a 50 percent decrease in India's capacity additions, from 2019 to 2020. However, driven by the commissioning of delayed projects, India may set new records for renewable energy capacity expansion in 2021 and 2022, which is expected to rise three-fold to 17 GW in 2021 and to about 20 GW in 2022, according to reports."

According to Sabyasachi Majumdar, Senior Vice President and Group Head Corporate Sector ratings, ICRA the solar power segment remained the key driver of capacity addition in the RE sector, with significant capacity addition over the past five years, which in turn increased its share in the overall RE mix to 44.4 percent and has surpassed the wind power capacity for the first time in FY2021. "The RE capacity is expected to improve to ~11 GW in FY2022, mainly driven by the solar power segment," he adds.

Growth drivers

According to Girishkumar, strong policy push by Government of India as well as significantly improved tariff competitiveness for solar and wind energy, remain fundamental demand drivers for growth of RE capacity in the country. In addition, regulatory framework remains highly supportive for RE sector, as evident from must run status as well as applicability of renewable purchase obligation (RPO) norms for the obligated entities as laid out by the SERCs in majority of the states.

Ganesh is of the view that India has taken bold steps to scale up the share of RE in its power mix and the political leadership at the Centre is fully seized of the opportunity to both reduce CO_2 emissions as well as reduce the cost of the energy – particularly through solar with this transition. In addition, many companies have announced their Net Zero plans. All this is driving the market growth in RE today. The level of interest is also visible with the market valuations and investments by Private Equity and focused funds in this sector.

The RE capacity is expected to improve to ~11 GW in FY2022, mainly driven by the solar power segment.

▶ *Sabyasachi Majumdar, Senior Vice President and Group Head Corporate Sector Ratings, ICRA*

In line with its ambitious targets, India has become one of the largest renewable markets in the world.

▶ *Ganesh Srinivasan, CEO, Tata Power-DDL*

Currently,wind projects are all above 50 MW capacity and we are working on a business model for the sub-50 MW category for consideration of the Ministry.

▶ *Ajay Devaraj, Secretary-General, Indian Wind Power Association*

Solar segment will continue to occupy a dominant share, given the relatively more execution challenges persisting in wind energy segment.

▶ *Girishkumar Kadam, Senior Vice President & Co-Group Head - Corporate Ratings, ICRA*

India's battery storage market can boom any time as there are right policies in place.

▶ *Kashish Shah, Energy Finance Analyst and Research Associate, IEEFA*

Development trends

Key development trends observed both in wind and solar energy pertain to an evolving technology and efficiency improvements, besides the scale of the projects being installed, which have too led to improvement in tariff competitiveness through bidding route. Girishkumar says, "For wind energy, PLF expectation has improved significantly to about 37-40 percent for assets deployed in windy zones due to advanced technology with wind turbines having higher hub height upto 120/130 m. In case of solar PV segment, usage of higher module peak watt capacity as well as shift/preference towards relatively more efficient technology, coupled with economies of scale with respect to large-sized projects being set up at one location, has certainly enabled to improve cost competitiveness of solar energy too."

Ganesh says,"In line with its ambitious targets, India has become one of the largest renewable markets in the world." According to him,today, solar photovoltaic (PV) and wind are the major renewable power sources in India. With the latest technologies, solar and wind tariffs have reduced drastically over the past few years.

Discom trends

The financial position of state discoms remains weak in a majority of the states on account of higher level of technical and commercial (AT&C) losses compared to regulatory norms, inadequate tariffs in relation to their cost of supply and inadequate subsidy support from the respective state governments. According to Girishkumar, this remains a matter of concern for the entire power sector value chain. This is also evident from the mixed payment pattern from state distribution utilities towards the RE assets (more prominently with respect to costlier feed-in-tariff based PPAs in wind energy segment) in key states as well as build-up of overdues by state discoms towards conventional and RE Gencos/IPPs.

Ganesh adds, "Green energy is one of the ways which will have a positive impact on the discom finances provided it is managed well. While the power purchase cost for newer RE power can be lower than that of traditional conventional sources, RE power requires proactive management on a day-to-day basis."

Energy storage: evolving

Battery energy storage technology is slowly picking up in the country.Kashish Shah, Energy Finance Analyst and Research Associate, Institute for Energy Economics and Financial Analysis (IEEFA) elaborates on the trend, "We are at about 10 percent of renewable penetration in India's grid as per the aggregate annual numbers for FY2021. So, when we integrate 450 GW of renewable energy, it will form around 32 percent of the total energy generation mix by 2030. It is going to challenge the grid variability fluctuation in the frequency and also there will be capacity constrains as India's electricity demand continues to grow at around 4-6 percent."

Right now, if you compare our market with the US, Australia, China and Germany, we are very small in terms of battery storage, but India's battery storage market can boom any time as there are right policies in place.

Outlook bright

According to Ganesh,in line with India's ambitious green aspiration of 175 GW RE by 2022 and 450 GW by 2030, the Ministry of Power is gearing up to launch Green Day Ahead Market (GDAM) – a marketplace for trading of renewable power on a day-ahead basis. This will further help to increase renewable capacity addition and provide additional sale avenues to existing renewable power plants that are either facing a payment risk with the discom under the existing PPA or have surplus energy.

Sabyasachi adds,"Within the estimated capacity as of March 2025, ICRA estimates the share of renewables to increase to 34 percent against 25 percent as of March 2021 and stand at over 160 GW. Therefore, the incremental capacity addition between March 2021 and March 2025 is estimated to be 65 GW comprising 51 GW from solar, 12 GW from wind and 2 GW from other RE sources. The capacity addition would entail an investment of ₹ 3.5 trillion for the period till March 2025.

Regarding the wind power capacity expansions, Ajay adds, "On the issue of fresh projects, potential exists for around 54 GW of wind parks and Wind-solar parks across several states. MNRE has assured us that a policy on the same will be released soon.Considerable headway has been made with regard to off-shore wind. Talks are at an advanced stage for projects off the coast of Tamil Nadu. The idea is to start with a 1 GW Pilot Project and then scale up, while theoff-shore target is 30 GW. Currently,wind projects are all above 50 MW capacity and we are working on a business model for the sub-50 MW category for consideration of the Ministry. Repowering has the potential to increase wind energy capacity by a further 1.6 GW."

The renewable energy market is gaining pace after the pandemic impacting the sector last year. While solar projects are on fast track, wind power projects are gaining pace with clear policy initiatives. Though battery storage technology will take time to evolve, there are signs of rapid growth of the segment in the coming years. All in all, the renewable energy will drive the growth of Indian energy market in future, of course, with the policy support from the government.

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Latest developments in wind energy

Combating the challenging market conditions prevailing, the Indian wind power segment is looking for new areas of developments, especially offshore wind power in the coming years.

A new report jointly released by the Global Wind Energy Council (GWEC) and MEC Intelligence (MEC+) finds that India is expected to add nearly 20.2 GW of new wind power capacity between 2021-2025. This would increase the country's 39.2 GW wind market by nearly 50 percent and is a clear signal that the market is beginning to bounce back after a slow-down in recent years.

Market scenario

The wind power market had a mixed trend in the past few years. According to Ajay Devaraj, Secretary-General, Indian Wind Power Association (IWPA), the average installation over the last five years has been 2.48 GW. "Wind power capacity installation in FY 2020-21 was just 1.5 GW. Between April and July 2021, a total of 341.800 MW has been installed. According to CEA figures released recently, in January 2021, 7.6 GW of projects from SECI Tranche I to SECI Tranche IX were still under construction. Out of them, 4.8 GW are expected to be completed in FY 2021-22 (this is based on the revised scheduled commissioning dates). Accordingly, we see an increasing trend in installations this year," he adds.

Speaking on the market scenario, Surya Prakash Gajjalla, CEO, Archimedes Green Energys, says, "Overall, the market seems bright, and the future looks promising for wind turbines compared to the previous year. The renewable energy market is growing in the country, and unquestionably, wind energy also has its share in this growth. This sector will have better market and growth opportunities in the coming years."

Growth trends

Given that the wind energy has been around in India for over three decades now, there is no dearth when it comes to availability and choice of machinery and equipment, according to Ajay. An added advantage is that such machinery and equipment conform to IEGC standards and are made in India. Hence, the wind industry is not affected much by evolving international trade policies and foreign exchange fluctuations. Some of the positive trends are as follows:

- State governments such as Madhya Pradesh have come out with policies that encourage investment in wind energy. Tamil Nadu is also likely to come up with a policy.
- A policy regarding wind parks/wind-solar hybrid parks is likely to be announced by MNRE shortly.
- A policy of offshore wind is also expected soon. Denmark has pledged to open a Centre of Excellence for offshore wind in Tamil Nadu.
- With proposals in the anvil to allow Open Access sale of Green Energy, not just wind, but also all other forms RE, it augurs well for the industry as a whole.

Surya elaborates on the advantages of wind power, "Compared to solar, the equipment used in wind power has a longer life and duration of working. The equipment used can usually last to 50-60 years without any significant maintenance. So, with proper policy support and implementation, the wind power sector can thrive in the coming years."

Roof-top wind turbines

In line with the roof-top solar power, roof-top wind power is a growing concept in small scale wind power generation. Surya says, "Currently, there are not many players in India in the roof-top wind turbines market. Furthermore, the government policies on the small wind turbines and the roof-top wind turbines market are still ambiguous. If proper policy measures are implemented, there is a very high potential market for roof-top wind turbines as many high-rise buildings are coming up these days. Consequently, there can be wind turbines mounted on these high-rise buildings for wind power generation. Although these produce a comparatively lesser amount of power, they are environment-friendly, this can add to India's green initiatives in power generation."

He adds on the technology development, "We own the technology from a Korean company and, we also have a technology transfer agreement with the National Aeronautics Ltd, a Bangalore-based government organisation under the Council for Scientific and Industrial

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Research (CSIR). When a government organisation is developing this technology, then it is a clear indication that they realised the potential of the small roof-top wind turbines in India."

Speaking on the features and advantages of roof-top wind turbines, Surya adds, "The turbine that they have developed has a very low wind speed of 8 metres per second. I think it is the only wind turbine in the world that works at this speed. If you take any wind turbine available across the globe works at 12 metres per second. We can push the small wind turbines in a big way in the market, especially island locations like the Andaman & Nicobar and Lakshadweep. A recent report published by the government and PwC also asserts that small wind turbines have a major potential in the locations of small islands."

Challenges

In spite of the current growth trend in the market, wind power sector in India is facing challenges on various fronts. Some major bottlenecks highlighted by Ajay are:

- The Centre going ahead with SECI auctions for wind without assessing preparedness of states. This has resulted in severe project overruns, and in some cases, has also led to the financial viability of the project itself being in doubt.
- Delays in the execution of PPAs and PSAs
- Payment delays by DISCOMs
- Not honouring PPA terms
- Curtailment for reasons not connected with grid safety

In order to overcome these challenges, the following measures are suggested by Ajay:

- State-specific wind auctions
- Realistic timelines for execution of projects. Currently the time line is 18 months. However, in some states it takes as much as 15 months just to obtain land clearances, a pre-requisite for financial closure.
- Allow generators to exit agreements with DISCOMs and put in place clear cut norms and time bound permitting limits to enable them sell energy through Open Access or trade in the Energy Exchanges. (Note: This was written before the LPS draft was circulated by the Ministry of Power).
- Strict enforcement of PPAs
- Either making SLDCs truly independent of DISCOM / State interference or hand over dispatch responsibility to POSOCO.
- Facilitating the swapping of power between states.

Unlike onshore wind which is at best available for about 150 days in a year, offshore wind is available for at least 300 days in a year.

▶ *Ajay Devaraj, Secretary-General, Indian Wind Power Association (IWPA)*

We can push the small wind turbines in a big way in the market, especially island locations like the Andaman & Nicobar and Lakshadweep.

▶ *Surya Prakash Gajjalla, CEO, Archimedes Green Energys*

Emerging opportunities

At a hub height of 120 m, the potential for onshore wind energy is 695 GW. The current installed capacity of 39.6 GW is a mere 5.7 percent of the potential. The 2022 target of 60 GW is 8.6 percent of the potential and the 2030 target of 140 GW around 20 percent. Obviously, a lot more is possible when one considers the potential available.

In addition, Tamil Nadu and Gujarat have potential for offshore wind too. Ajay says, "Unlike onshore wind which is at best available for about 150 days in a year, offshore wind is available for at least 300 days in a year. Unlike onshore wind, the CUF of offshore wind is also higher. The combination of higher number of days and higher CUF therefore provides offshore wind economies of both scale and scope."

According to Surya, this year, a significant number of companies are showing profits in their business, and most of them have already received many orders. There is a huge potential for the wind energy sector in India. "Along with that, many opportunities are opening up for hybrid systems, i.e., the solar and wind combinations. This hybrid system is a very viable solution as it ensures continuous power availability. A hybrid system is also a great option for customers that already installed solar power generators, and want to increase the capacity but don't have the space to add any additional devices. In this case, wind energy systems can be integrated into the existing solar system. We are also working on microgrids as we combine solar, wind and existing DG sets or UPS in the house and everything can be combined to make a microgrid. Government should have exclusive initiatives for wind power and should not keep a common cost structure for solar and wind power," he adds.

Repos Energy to sell 3,200 mobile petrol pumps by FY 2022

The Pune-based energy distribution start-up, Repos Energy is working in tandem with the latest government policy which says that there is a considerable demand for HSD for stationary equipment like generator sets, earthmoving equipment, heavy machinery used in construction sites, mobile towers, etc. And these may not have the facility/resource to store HSD. There is demand from such customers for delivering HSD at their doorsteps. Inline with the 'big plans', the country's home-grown start-up is set to manufacture 3,200 mobile petrol pumps by 2022.

"There are many customers needing diesel generators, rural areas, agricultural sectors, hospitals and other commercial entities that cannot reach fuel stations for their requirement. Especially during these tough times, such people can be provided with the diesel with door-to-door diesel delivery," says Chetan Walunj, Co-founder of Repos Energy.

A traditional fuel station requires physical space where the tanker goes to a depot, collects fuel and fill the tanks in the fuel stations. The fuel is then transferred to the vehicles via pipeline. And this is where the idea of door-to-door diesel delivery changes the equation completely. Here, the fuel tanker from the depot can directly reach the consumer via Repos Mobile Fuel Pumps (RMFP).

It is a special-purpose machine built with the latest technology. Led by IoT which can safely and most conveniently deliver fuel to the end customers through a simple mobile application. It is integrated with cloud technology to get real-time updates. It has highly sensitive sensors called ATG to get accurate quality and quantity of diesel. Enabled with GPS and Geo-fencing, his mobile petrol pump can be monitored in real-time, to ensure utmost transparency.

Solar power: set to shine again

Policy push and growing awareness among the users about the benefits of solar power will push the growth of the sector in the coming years.

The Government of India awarded 27 GW of photovoltaics in central and state auctions in 2020, which is expected to drive growth in solar energy capacity this year and the next, as per industry reports. While the solar PV installation is growing in commercial level, the household solar PV installations are still sluggish. However, the government's plan to push the solar power capacity to 100 GW by 2022 is expected to create more vibes in the market.

Market developments

Solar power has evolved in the country over the years with the government pushing hard with policy support to industry and the consumers. According to ICRA, the solar power segment remained the key driver of capacity addition in the RE sector, with significant capacity addition over the past five years, which in turn increased its share in the overall RE mix to 44.4 percent and has surpassed the wind power capacity for the first time in FY2021.

"With the government schemes like UDAY where rationalisation of tariff was one of the predictions for the DISCOMs to get the financial aid from the central government, there is a positive push for solar adoption," says Amit Barve, BU Head-Solar Business, Panasonic Life Solutions India Pvt Ltd.

Solar rooftop is picking up fast and with peer-to-peer power trading, the indigenous solar markets are bound to develop further. "Solar being a more economical and affordable solution provides an opportunity to small households as well in creating distributed energy resources. Central Government is assisting in providing subsidies to small households for deploying solar. There is a need to align the state and central government's efforts for better outreach to masses," says Ganesh Srinivasan, CEO, Tata Power-DDL.

Rural push

Use of solar power has picked up momentum with the government policy support in rooftop solar for household use and in agriculture by way of solar pumps and other facilities. "In rural areas, people have started using solar power in a big way compared to early days. They are now aware of the benefits and advantages of solar power and are coming forward with options. Solar products are technologically proven and the products we supply are almost zero-maintenance products," says Sana Khan, CEO of PV, RS Corporation.

Under the Pradhan Mantri Kusum Yojana, many state governments apart from the Central Government, provide solar pumps to farmers at subsidy schemes. The scheme was launched by the Ministry of New and Renewable Energy (MNRE) in 2019. It seeks to provide subsidies on solar pumps to the farmers of our country. Under this scheme, the farmers only have to bear 40 percent of the pump's cost, while the central and state governments subsidize the remaining 60 percent for solar pumps that have a capacity of up to 10 HP. However, in states like Haryana and Madhya Pradesh, the state governments have provided additional top-up on the subsidies, which has reduced the farmer's share to 10 percent. This step has made the scheme more attractive for farmers and could contribute massively to the success of the project.

Advantage solar

According to Sumit, solar power is omnipresent and you can have a solar project wherever you are. "The biggest advantage of solar power is the distributed generation, so one needn't not rely on building a grid infrastructure to high capacity and centralised transmission. Instead, he can install a smaller system at the point of consumption and use it then and there itself," he adds. But the adoption of solar power still needs to pick up especially in rural areas. "We have to scale up the massive adoption which is lagging in the residential segment. Lack of awareness is the biggest hurdle for rapid adoption of solar in residential segment followed by ease of finance or funding of these systems. We need to effectively counter them by publicity blitz as well as awareness campaigns, about various schemes from Central and state governments," observes Sumit.

Make in India to push growth

In India, the manufacturing of solar panels is growing gradually in spite of some challenges. "The prevailing duty structure for import of raw materials is adding to the input cost which is reflected in the cost of end-product. The government needs to work towards the manufacturer requirements which can help improve the cost-effective production of solar PVs," says Sana.

Net metering in solar projects

Although, the basic framework for rooftop solar varies across all states but with the increasing need to accelerate to clean energy and technological innovations, solar rooftop will be a key growth priority in the post covid era. In Delhi's case, the net metering guidelines are very much pro-consumer and effective and discoms are supporting the same to have maximum solar rooftop installation in the state. "We have approx. 44 MW solar rooftop installed at net metering facility in our area of operations. In FY 20-21, approx. 43 MUs got injected in grid out of which 86 percent of units got adjusted in consumer bill as per consumer category tariff and 14 percent units got paid off to consumer in March as per Average Power Purchase Price. This gives an opportunity to consumer to get the ROI on solar investment within 3-4 years of installation. As mentioned earlier, we are also looking to improve this further with a peer-to-peer trading platform," says Ganesh.

With more solar capacity installations are planned in the coming years for achieving the target of 450 GW of renewable energy capacity by 2030, the future of solar power looks bright in India.

We have approx. 44 MW solar rooftop installed at net metering facility in our area of operations.

▶ *Ganesh Srinivasan, CEO, Tata Power-DDL*

The biggest advantage of solar power is the distributed generation.

▶ *Amit Barve, BU Head-Solar Business, Panasonic Life Solutions India Pvt Ltd*

The government needs to work towards the manufacturer requirements to improve the cost-effective production of solar PVs.

▶ *Sana Khan, CEO of PV, RS Corporation*

"India's ambitious targets bear testimony to its commitment to a sustainable, low carbon economy and the important role it is set to play in the global energy system in the years to come," Ganesh concludes on a positive note.

Integrated solar solutions on one platform

We have evolved over the years from a solar PV modules supplier, to a niche and a turnkey solar EPC solutions brand in the C&I segment, along with being an exporter of best-in-class and 'Made In India' PV modules.

Amit Barve, BU Head-Solar Business, Panasonic Life Solutions India Pvt Ltd

In an interview with EPR Magazine, Amit Barve, BU Head-Solar Business, Panasonic Life Solutions India Pvt Ltd, shares his thoughts on the Indian solar energy market and the company's future plans for the market.

How do you look at the recovery in the solar power after the Covid-induced lockdown impacting the market last year?

Solar was being treated as an essential service, there were no limitations from the government agencies to continue working on the solar projects during the Covid-induced lockdown. But, due to the lack of availability of skilled and unskilled workers, many large projects couldn't complete the execution on time and suffered delays. Also, due to ever evolving global scenarios during these times and the slow port operations impacted supply chain as delivery of critical components.

The industrial and commercial markets started improving after the relaxation of the lockdown. Many industries realised the need for own captive sources of power like solar for hassle-free functioning. The commercial and industrial segments continue to grow in a robust way, contrary to the image what we see outside. Utilities have already started recovering and the backlog of projects which were to be completed last year, along with the new tenders have already started happening and will together create the momentum this year.

How is the household roof-top solar segment recovering?

Earlier, the adoption of solar power in the residential segment was driven by an uncertain environment on the availability of grid power. Cost was never the primary driver, energy availability was the primary driver. But now with the government schemes like UDAY where rationalisation of tariff was one of the predictions for the DISCOMs to get the financial aid from the central government, there is a positive push for solar adoption.

In some states, residential tariffs have gone up especially those who fall under the higher bracket of the tariffs. Here, now the feasibility of solar is improving.

In fact, many state governments have also started inviting tenders to push the solar segment by giving a capital subsidy.

What is the advantage of having solar power projects?

Solar power is omnipresent and you can have a solar project wherever you are. The biggest advantage of solar power is the distributed generation, so one need not rely on building a grid infrastructure to high capacity and centralised transmission. Instead, he can install a smaller system at the point of consumption and use it then and there itself.

This is the way the other countries which are big in solar have been growing; largely because of residential adoption. Probably India is the only exception where the growth has happened with larger systems than residential and that's mainly because of the inverted tariff structure. However, going forward the residential segment is expected to pick up in big way.

Another area of growth that cannot be missed is in agriculture sector - where the use of solar pumps is being promoted; especially, in rural areas to improve cultivable land. Agri-voltaic projects are also coming up combining benefits of Energy generation as well as agricultural yield.

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What kind of support is required for the revival of roof-top solar adoption in the coming years?

We have to scale up the massive adoption which is lagging in the residential segment. Lack of awareness is the biggest hurdle for rapid adoption of solar in residential segment followed by ease of finance or funding of these systems.

We need to effectively counter them by publicity blitz as well as awareness campaigns, about various schemes from Central and state governments.

Many banks have schemes to finance roof-top residential solar units but awareness at local branch level to logical end is missing. Earlier we overcome these hurdles the faster would be adoption in residential and SOHO segment.

How is Panasonic evolving in its products and technology solutions?

We are amongst the pioneer and earliest player still actively involved in manufacturing of solar modules. Our journey in solar started in year 1975 and still counting further, while our business in India started from 2015. We have evolved over the years from a pure play distributor of imported solar modules to a total turnkey EPC contractor and then manufacturer and exporter of solar PV modules 'Made in India'. Under our EPC business, we have installed 85+ MW of projects so far, on ground as well as on the roof. The single-largest project that we have handled is of 30 MW while routinely we handle projects from 500 kW and above. Our overall installed base in India is more than 250+ MWp including our distribution as well as EPC business.

Last year onwards we also started exporting our 'Made in India' solar modules to Turkey and this year we added Philippines, Thailand, Malaysia and very soon we would start exporting to Oceanic and many more countries.

Panasonic as well as Anchor have a strong brand resonance within the residential/domestic sector and we have started the journey of introducing more solar products into the B2C segment. We first launched the solar inverter as a product category focusing on the residential segment. Also, we launched solar streetlights targeting the government business where a lot of street lighting is now shifting towards solar powered.

Our aim in the next 3-6 months is to launch a residential solar system, a kind of do it yourself (DIY) kit for residential sector where our Panasonic and Anchor brands have a strong presence. We also plan to offer customers a holistic solution of entire package of components and installation using our system integrators or local contractors.

What are your plans to integrate your products and services with solar sources?

As an organisation, we at Panasonic have many products which can be interconnected on one platform. We are the market leaders in ECM (electrical construction materials) with wires, cables, switches, switchgears, home automation, solar, storage, charging, etc. All these can be bundled together to be operated on one platform. We are looking forward to a real convergence where we can offer complete solutions integrated on one platform for the entire home.

Customers nowadays are looking for such solutions for convenience and manageability to access and control all home gadgets on single device/platform from remote locations. Our unique platforms like MirAIe and KNX will start getting merged with more and more systems and storage will come as an essential part. In next 3-4 years, we expect a combination of solar + storage to compete with the grid cost.

What is your market outlook with respect of renewable energy?

The next two-three decades, we would see generation and consumption to keep growing. Market will remain dynamic and buzzing, more receptive, adaptive and a lot of technological innovations which would get incorporated. Reaching net zero or achieving carbon neutrality has seen tremendous interest from not only corporate but even countries committing to these goals.

Digitalisation pushing boundaries of RE

Renewable energy has taken a giant leap in this year with the installed capacity growing faster. In this scenario, innovative digital solutions will further accelerate the growth.

Digitalisation has played a major role in the transformation of many industry segments. Renewable energy (RE) sector is also gaining from digitalisation in many ways. It helps in faster project developments and implementation. There are many players who offer digital solutions for various applications, what is important is using the right solution for a project.

Emerging trends

Real-time digitalisation encompassing automation, protection and control, and energy management have been in vogue for decades in the power industry, even before digitalisation entered enterprises and businesses' transaction systems. Real-time automation makes use of sophisticated sensors, actuators, controllers and software with complex mathematical algorithms, run and executed by software. According to Akilur Rahman, CTO, India, Hitachi ABB Power Grids, with more and more power electronic-based controls, and integration of diverse and distributed renewable energy resources, such digitalisation is getting more dynamic.

He adds, "On the other hand, we have non-real time IoT and cloud-based digitalisation that is providing added value to stakeholders as operational performance, better ROIs and adaption of new business models come into focus. This type of digitalisation in renewables encompasses data from assets, systems and operations available for monitoring, analytics, forecasting and recommendations/advisories for performance improvement, linking with producers, consumers, prosumers and other stakeholders. A mix of both is being applied today to advance the energy transition underway in India."

According to Siddharth Gangal, Founder & CEO, Panelstack, Inc, the renewable energy sector has witnessed a remarkable growth over the past few decades. "The major innovations in the field are driven by technologies like Artificial Intelligence software and the ones that were made using advanced techniques of machine learning. Some examples include solar technology software, virtual power plants, smart homes, and Blockchain technology. All these ensure the proper distribution and use of green energy and make it secure and efficient," he adds.

Almost all the new digitised innovations that are being introduced in the market make use of AI for optimal results and efficient project designs. These technologies play a spectacular role in guiding the common crowd to the world of green energy through convincing designs and showing optimised outputs.

Digital tools for RE projects

In project execution and maintenance, digital tools and solutions play crucial role in terms of operational efficiency and control. Digital simulation of RE assets, systems and operations with digital twins, remote engineering, remote factory acceptance and remote commissioning of automation system are some of the digital tools which are used in erection and commissioning. "During operation and maintenance, remote monitoring and Lumada Asset Performance Management (APM), Lumada Enterprise Asset Management (EAM) and Lumada Field Service Management (FSM) are there for improved and sustainable performance," adds Akilur.

RE assets like solar panels, wind turbines, and other fuel cell technologies are undergoing immense amounts of innovation and modifications themselves over the past few years as a result of digitalisation. According to Siddharth, digital tools like SAAS platforms and cloud-based software play a pivotal role in the planning and maintenance of a majority of renewable energy systems.

"Artificial Intelligence in integration with IoT opens up a plethora of opportunities regarding the maintenance of renewable energy systems. Blockchain technology is yet another eye-catching digital advancement that ensures the flow of secure and efficient green energy," he adds.

Various software has been introduced in the market with the same intention of optimising the use of such renewable energy. Another digital technology that has caused tremendous waves in the renewable energy sector are the various kinds of sensors that played a vital role in improving the durability and efficiency of several devices.

Digital solutions in storage and distribution

Energy storage and distribution need integrated forecast, control, management and market side transactions. Convergence of real-time and IoT based digitalisation is used to achieve this with integrated energy and IoT platforms.

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As power generation infrastructure gets decentralised, consumers become prosumers, the aging grid system is likely to be unable to accommodate the new transition. Parallelly, renewables are steadily increasing with the emergence of IoT, cloud and low-cost battery energy storage systems making the power system highly complex.

While this trend is contributing to sustainable energy production, helping to provide energy independence for participating stakeholders such as commercial and industrial enterprises, independent power producers, and remote communities, it poses a challenge for all stakeholders on how to adapt to this new decentralised model. The ecosystem of digital technologies enables the digitalisation of distributed energy resources.

Akilur elaborates, "Hitachi ABB Power Grids' e-mesh™ portfolio offers end-to-end distributed energy solutions, combining advanced analytics, software technology, and hardware systems. The energy storage solutions ensure the highest penetration of renewables share, increase grid stability, and provide reliable power while minimising CO_2 emissions."

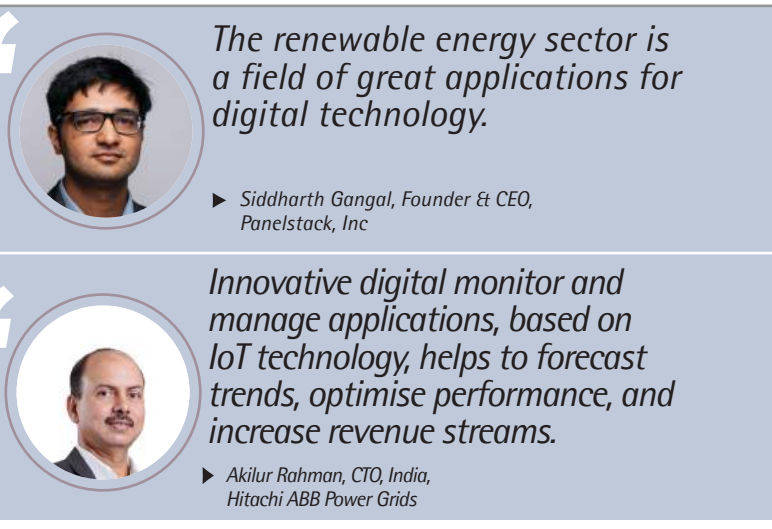
Energy storage has always been one of the major hurdles when it comes to our pursuit of green energy. Enormous amounts of renewable energy being generated are wasted because of a lack of proper storage systems. Hence, the world has put incredible emphasis on coming up with adequate energy storage solutions. Currently, lithium-ion batteries are the most popularly used storage mediums.

Prospects include flow batteries, metal-air batteries, and several other modern innovations. These are smarter and use digital technology to enhance their performance and longevity. But the opportunities of digital software are limited as they can only be used to choose the most appropriate kind of batteries for an already designed renewable energy-based project or system.

Siddharth says, "The digitalisation of the energy storage sector can help integrate variable renewables by enabling grids to better match energy demand to times when the sun is shining and the wind is blowing, making it easier for producers to store and sell surplus electricity to the grid."

Monitoring & control

Digitalisation has made fantastic enhancements in the solar and wind energy sector. According to Siddharth, solar panels have gone from bulky mediocre cells to printable organic and sleek cells with better efficiency and lower carbon footprint. "Smart solar panels that can align themselves according to the position of the sun have also come into the market. Solar software technologies like Panelstack and Helioscope create exquisite solar rooftop designs with optimal performance and maximum output," he adds.



The renewable energy sector is a field of great applications for digital technology.

▶ *Siddharth Gangal, Founder & CEO, Panelstack, Inc*

Innovative digital monitor and manage applications, based on IoT technology, helps to forecast trends, optimise performance, and increase revenue streams.

▶ *Akilur Rahman, CTO, India, Hitachi ABB Power Grids*

When it comes to wind energy systems, it has undergone an era of tremendous evolution. These innovations have cut down the carbon footprint of the above by an amazing margin. Wind turbines with various kinds of sensors making them smart and more efficient will dominate the wind energy industry in the future.

More and more solutions and control systems are being introduced in both these sectors due to the active research going on and the amount of investment that is being put into the field by energy enthusiasts across the world.

Akilur adds, "The new-age automation solution, built using Hitachi ABB Power Grids' proven SCADA and RTU platforms, is helping to monitor and control distributed energy resources. Innovative digital monitor and manage applications, based on IoT technology, helps to forecast trends, optimise performance, and increase revenue streams."

Looking ahead

According to Akilur, the trend will be towards utilisation of more and more digital technologies such as inexpensive sensors, data science, AI-ML, Software Defined Machines/ Network, Digital Twin, 5G communication, block chain, time sensitive network, and above all cyber security technologies to continuously improve performance of renewable assets, systems and operations.

"The renewable energy sector is a field of great applications for digital technology. More enhanced, sophisticated models, designs, and innovations are being introduced day by day. Hence yes, the future does look bright and shiny for the renewable energy industry," concludes Siddharth.

K-Lite wins outstanding performance and innovation awards

The National Architecture and Interior Design Excellence Awards & Conference 2021, Global Edition held recently has recognised the best efforts of K-Lite and Sharmila Kumbhat withoutstanding performance and innovation awards.

K-Lite Industries has won the award for the 'Best & Most Innovative Lighting Company of the Year 2021 (India)', under Quality Products and Premium Projects category. Sharmila Kumbhat received the award for 'Outstanding Performance & Contribution in Business Domain'.

The awards were presented in a function held at Hotel Taj West End, Bangalore, which was attended by over 100 designers and architects.

"These awards are a testament to our team and innovation efforts centred around delivering the best value for our consumers while also being conscious of our impact on the environment. With this added motivation, we will continue to work with renewed vigour towards achieving our vision of 'Unlocking the extraordinary potential of light for brighter lives and a better world," a company release said.


Sharmila Kumbhat

"It's a major boost and a stepping stone for all of us to feel proud of this significant moment as K-Lite is the only company recognised in the lighting category. Together we can make a difference and make this world more sustainable," the release added.

Solar water heater market to bounce back

We are expanding our production capacity as the demand is growing in domestic market. We are also planning to explore new export markets in future.

Vishal Kumbhardare, Director, Siddhakala Renewable Energy Systems

In an interview with EPR Magazine, Vishal Kumbhardare, Director, Siddhakala Renewable Energy Systems, shares the upcoming trends in the solar water heater market and the company's offerings and future plans.

How do you look at the solar water heater market scenario in this year?

The market across the country was severely impacted during the lockdown period last year due to restricted entry for external people like technicians at homes for installation. While the commercial and industrial sector were in complete closure due to the strict lockdown. However, with the relaxation in lockdown, things are slowly coming back to normal. We are expecting more demand for solar water heaters in the normal market conditions, once the lockdown is completely removed.

How is the demand trend for solar water heaters evolving in residential, commercial and industrial segments?

As realty sector is improving, there is a growing demand for solar water heaters in this sector. Builders are interested in solar water heaters and many more installations are happening now at various project sites. In Pune where realty market is on an upswing, more than 80 percent builders are using our solar water heaters for their hot water needs.

In the residential segment, people are now thinking of installing more solar water heaters because the price is gradually increasing. But the various benefits that solar water heaters provide like saving in electricity, environment-friendly features and long life attract people towards this product.

What are the major advantages of solar water heaters?

Solar water heaters provide hot water at reasonable price without impacting the environment. They are practically free of maintenance and continuously work with steady performance for a longer period without any technical issues. There is no need of electricity for these water heaters as they work on gravity. We have an electrical back up slot in our system which can be used when there is no sunlight at all, to produce hot water.

What are the products and services offered by the company?

We offer solar water heaters for the residential, commercial and industrial applications. These products are available in various capacities ranging from 100 litre to 500 litre in pressurised and non-pressurised versions. The Sun-Shot range of water heaters which we offer has specific advantages compared to other products available in the market. When the other products provide small tubes of size 58 mm x 1,800 mm in their water heaters, our solar water heaters have tube size of 58 mm x 2,100 mm. The bigger size tubes help in getting hot water even when the sunlight is limited.

In the construction of our water heaters, we use galvanised steel of 120 micron with epoxy coating while the other products available in the market are using 80-micron steel. We offer bigger water tanks in our solar water heaters with a tank size of 200 litre. So, our products have a water capacity of 200 litre inside the tank with extra water in tubes also. In domestic sector we have a network of around 150 dealers for our Sun-Shot water heaters.

What are your expansion plans?

Apart from supplying our products in domestic market, we are also exporting to markets in South Africa and Dubai. As per their geological conditions we design the products and supply the customers in these countries. We plan to enter other export markets as well once the market improves. We are expanding our production capacity as the demand is growing in domestic market.

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SJVN signs contract for electro mechanical works of Luhri-1 HEP

SJVN Limited has entered into a contract agreement for electro mechanical works of 210 MW Luhri Hydro Electric Project (HEP) Stage-1 with Voith Hydro (P) Ltd. The contract was signed in the benign presence of top officials from both the companies.

Speaking on the occasion, Nand Lal Sharma, Chairman & Managing Director, SJVN, apprised that the electro mechanical works amounting to ₹ 420.28 crore, have been awarded to Voith Hydro Pvt Ltd on 16th July 2021. The same are to be completed in line with the work schedule of the project, which is targeted for commissioning by 24th May 2025. Sharma informed that the civil and hydro-mechanical works have already been awarded on 24th November 2020 and construction activities on the same are in full swing.

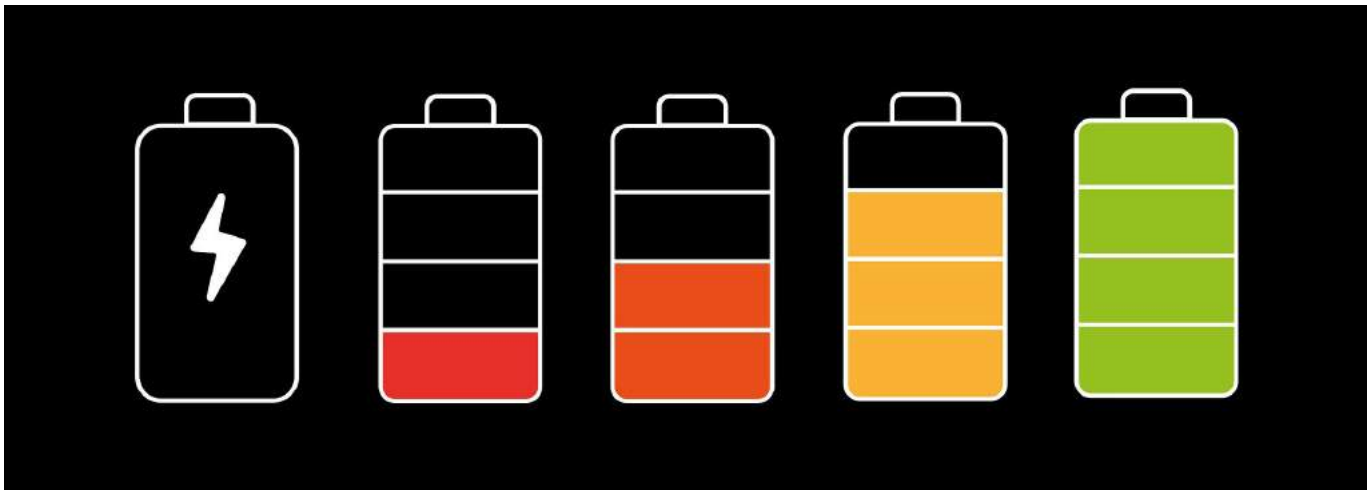
Luhri Hydro Electric Project -1 is a run-off the river scheme with diurnal storage and dam toe surface power house in Shimla and Kullu district of Himachal Pradesh. The total capacity of the project is 210 MW, having four Kaplan Turbine with twomain units of 80 MW and two auxiliary units of 25 MW each. The cost of the project is ₹ 1,810.56 crore and has the potential to generate 758 million units of electricity annually.

Currently, SJVN has portfolio of more than 9,000 MW and is executing 27 projects in hydro, thermal, solar and wind sector in India, Nepal and Bhutan. The company has also diversified in other fields of energy generation and transmission.

Voith Group is a leading global technology company with headquarters in Germany. The company is pioneer in designing, manufacturing, supply and execution of mechanical engineering products with specialisation in electro-mechanical components of power projects.

Battery storage for meeting grid power challenges

As India's growing energy demand and the growing share of renewable energy have put a challenge on India's grid infrastructure. How does India's grid respond to some of these challenges and how energy storage can be the right solution? Kashish Shah shares more.



We managed to bring down the cost of solar and wind power to effectively compete with that of coal power. In fact, they are now cheaper than thermal power in terms of variable costs in India. This kind of price economics will ensure the capacity acceleration of renewable energy. But the bigger concern is the influx of these highly intermittent and variable renewable energy. How does India's grid respond to some of these challenges?

Battery storage

Markets like Germany, South Australia and California where 30-40 percent of renewables are playing a huge role in the generation mix of grids of these state level or country level electricity sectors. We are at about 10 percent of renewable penetration in India's grid as per the aggregate annual numbers for FY2021. So, when we integrate 450 GW of renewable energy, it will form around 32 percent of the total energy generation mix by 2030. It is going to challenge the grid variability fluctuation in the frequency and also there will be capacity constrains as India's electricity demand continues to grow at around 4-6 percent. So, how this challenge is going to unfold on India's grid or how it has happened in the states like California and South Australia. In the evening peak hours, say after 4 or 5 o' clock when we do not have ultra-low cost solar available on the grid, our net load which comprise thermal, nuclear, and hydro that will have to ramp up, actually make the evening peak demand and in the absence of batteries, these are the sources right now we have to serve the rising peak demand.

We have various options including battery technologies, which are accurate and really fast to respond to some of these challenges. In terms of allowing variable renewables on the grid, sometimes the thermal power will need to back down when have abundant solar power on the grid. The maximum or minimum load coal-fired thermal power plants can reach is 10 percent of its name plate capacity. On the other hand, batteries could actually go to negative. So, it can offload the entire power in less than one second. And if the flow of battery is actually bilateral, it can absorb the power from the grid if required and also dispatch 100 percent of its capacity where it is a sort of gamechanger compared to all other technologies that are at hand. And the accuracy and speed at which the batteries could respond to grid frequency variability is just unparallel.

Cost impact

In the past one decade, the standalone battery storage cost has come down dramatically. The cost in 2010 was $1,000 per kWh which now came down to $137, but still very prohibitive for the Indian market at that pricing level. But this cost could have actually gone down further by about 55 percent to reach about $58 per kWh by end of this decade. There is also an excellent study which shows the solar + battery storage cost for India could be as low as ₹ 2.83 per kWh at the end of this decade which is 30-40 percent lower than the pithead coal power tariff that we have in India right now.

Looking at the shear size of India's electricity sector, and integration of largescale variable renewables, India's battery market could be 140-200 GW by 2040.

There are huge developments happening across the globe in terms of utility scale battery storage. Australia is one of the leaders in battery storage. The growth in South Australia is actually driven by the market economics. Because there is a

requirement of ancillary services due to high penetration of renewable energy, this is a sort of battery development across Australia and typically how these projects have been developed. All the battery storage projects are actually put next to end-of-life coal-fired power plant so that utilities that becomes a transformation path where they retire the coal power plants and the battery storage can at the same time use the land as well as the grid connection of the end-of-life coal power plant. If Australia is the prince of the battery power market, USA has become the king of the battery storage market. In the last quarter of 2020, USA installed 2 GW of battery capacity. That is a phenomenal number from looking at where they were actually in a couple of year back. The growth has come in all kinds of sectors viz, residential, non-residential, and utility scale batteries as well.

When we talk of solar + storage cost, you can see in the USA they have come down to as low as $22 per kWh. When you compare this with the lowest solar tariff of India, that would be around $27 per kWh. We have a long way to go just to integrate solar with batteries and it also provides an opportunity of the sheer scale that the battery cost can come down.

India is already on the path as we have made small steps in the right direction as there are a couple of batteries that are operating one from Tata Power-DDL and the other one coming up in Andaman and Nicobar Island which is of 8 MWh battery storage co-located with 20 MW of solar capacity. Also, there are some of the recent developments of tenders and auctions which are really encouraging for India's battery storage market, so as you all read about Tata's recent success in getting SECI auction of 50 MW of battery storage project in Leh, then SECI and NTPC have come up with 2,000 MWh and 1,000 MWh battery storage system tenders. These are all steps in the right direction.

Right now, if you compare our market with the US, Australia, China and Germany, we are very small in terms of battery storage, but India's battery storage market can boom any time as there are right policies in place.

Looking forward

The battery storage market in India can explode any time as it did in the US and Australia in the last 12-18 months. While it will take some time for the price of battery storage to come down to become cost competitive in the Indian market, there are other options that India could actively explore like pump hydro storage, operate gas in the coal power plants, flexibly during the peak hour demand period.

Expertise shared by
Kashish Shah,
Energy Finance Analyst and Research Associate,
IEEFA

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RE sector outlook stable: ICRA

ICRA's outlook for the renewable energy (RE) sector is stable, supported by the continued policy support from the Government of India, strong project pipeline and superior tariff competitiveness offered by wind and solar power projects - both in the utility and the open access segments. Further, tariff competitiveness offered by the solar and wind power projects in utility auction route continued to remain superior, with tariffs remaining below ₹ 3.0 per unit, despite the upward pressure arising from the imposition of customs duty on imported cells and modules, with effect from April 2022.

Commenting further, Girishkumar Kadam, Senior Vice President & Co-Group Head, ICRA ratings, said, "The investment prospects in the RE sector thus are expected to remain strong, given the policy impetus with a target to reach 450 GW by FY2030 and competitive tariffs. The capacity addition in the power sector over the medium term will be driven by the RE segment, led by a strong project pipeline of close to 40 GW as on date. The key challenges constraining the growth remain on execution front, mainly associated with land and transmission infrastructure as well as the slow but improving progress in signing of power purchase agreements and power sale agreements by intermediate procurers with state distribution utilities (discoms). An improving financing environment along with the softening in the interest rate for the RE projects over the last 12-18 months period has been a positive for the sector."

Further, the demand outlook for the domestic solar OEMs remains favourable, with the strong policy support through imposition of BCD on imported cells and modules, the notification of the production-linked incentive (PLI) scheme and a strong project pipeline from various schemes requiring the use of domestic modules. Also, the non-inclusion of the overseas suppliers in the Approved List of Models and Manufacturers (ALMM) so far, is likely to support the demand for domestic module OEMs in the near term. The policy push is expected to improve the cost competitiveness of domestic OEMs and has led to new capacity announcements of more than 15-GW by various OEMs and entry of new players. The timely commissioning of these new capacities remains important to meet the growing demand from the developers, given the current capacity constraints.

Advanced solar equipment for industrial and farming applications

Farmers are now eager to use solar pumps in their farming activities as these are beneficial for them in terms of continued power availability for farming, resulting in good yield of crop.

Sana Khan, CEO of PV, RS Corporation

In an interview with EPR Magazine, Sana Khan, CEO of PV, RS Corporation, elaborates on the products and services offered by the company and the market trends.

What are the products and services offered by the company?

We offer LED lights, solar water heaters and solar pumps along with after-market services. We are also dealing in solar panels, OEM services, all technical services of solar products and grid-connected inverters. We provide customised solutions in solar water heaters and solar pumps. In solar panels, we provide almost all sizes, imported as well as Indian products. In LED lights, we offer various types like solar, semi-integrated and integrated, lithium-ion etc. These lights are used by all types of customers in industry, agriculture, manufacturing, OEMs etc.

How is the business progressing? What is the market trend?

From B2B segment the response is quite good and encouraging. In the last 16 years since we started business, we have a good track record of after sales services. Customers are now more interested in solar installations in their home and businesses. Farmers are now eager to use solar pumps in their farming activities as these are beneficial for them in terms of continued power availability for farming, resulting in good yield of crop.

How do you look at the growth of solar power use in rural areas?

In rural areas, people have started using solar power in a big way compared to early days. They are now aware of the benefits and advantages of solar power and are coming forward with options. Solar products are technologically proven and the products we supply are almost zero-maintenance products.

How do you look at the solar power market currently?

The market was a bit slow during the Covid-19 impact last year. But now the market has improved with more installations and capacity additions. Usually during the rainy season, people don't buy solar products, but this year we have seen good sales. Many government authorities and industries are opting for solar power, lights and equipment. Considering this kind of responses, we expect the business to grow this year compared to last year.

How do you assess the solar PV manufacturing scenario in India?

In India, the manufacturing of solar panels is growing gradually in spite of some challenges. The prevailing duty structure for import of raw materials is adding to the input cost which is reflected in the cost of end-product. The government needs to work towards the manufacturer requirements which can help improve the cost-effective production of solar PVs.

Basically, there is single-code duty structure for the solar cell and panel. Ideally, both the products should be segregated by different codes, solar panel with duty and solar cells without duty. This will help Indian PV manufacturers do better and offer products with competitive price. Currently, the imported panels areavailable at reasonable price with higher grade compared to those manufactured in India due to the higher input cost for manufacturing here.

How do you look at the future of solar equipment market in India?

In spite of the challenges mentioned above, the future of solar market in India looks bright. If you give good service to the customers with the right products and after-market support, and if the customer belief is there, then the industry will grow faster. We plan to continue our services to our customers to the best of their satisfaction and look forward to a long-term association with our customers.

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KEY HIGHLIGHTS

- PARTICIPATION FROM MULTIPLE COUNTRIES
- TRUSTED BUSINESS PLATFORM
- BUSINESS MATCHING
- MULTIPLE CONFERENCE SESSIONS
- UK PAVILLION
- BIO PAVILLION

PARTNERS

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WAAREE — One with the Sun

SUNGROW — Clean power for all

Onsite Branding Partners

Growatt — powering tomorrow

SOLAX POWER

Exhibit Partners

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Safety measures for critical equipment in renewables

Our systems and products will allow the lightning and switching surges grounded effectively which will protect the critical system components of renewables from damages and surges

Kanderp Khandwala, Co-Founder, Chairman & Managing Director, Axis Electrical Components India Pvt. Ltd.

In an interview with EPR Magazine, Kanderp Khandwala, Co-Founder, Chairman & Managing Director, Axis Electrical Components India Pvt. Ltd. explains the market scenario of renewable energy sector in India and the safety solutions from the company for the renewables sector.

What are your views on the renewable energy growth trend in India?

This is the future of power generation in India as they are clean, green and add no biohazards to the environment. India is planning to add approx. 20 GW per year in power generation through renewable sources and the plan is to increase the renewable energy year on year and take a substantial percentage of the total power generation. Renewable energy already contributes 25 percent to the total power generation in the country.

What are your major products and solutions for power industry applications?

Axis primarily focuses on the protection side of the renewable energy which basically consists of earthing, equipotential bonding, lightning protection system and surge protection measures. These products ensure the longevity of the projects by protecting the assets from any electrical surges or lightning strikes.

How are these products suitable for renewable power applications, in solar and wind power?

The systems and products will allow the lightning and switching surges grounded effectively which will protect the critical system components from damages and surges and also help effective functioning of the system with the down time due to lightning reduced substantially.

What are the safety features associated with these products? What is the demand outlook?

These products actually are the safety measures of the renewable energy segments protecting critical equipment and ensure safe and steady working of the system and power generation. As quoted by IBEF, Indian renewable energy sector is the fourth most attractive renewable energy market in the world. India was ranked fifth in wind power. Installed renewable power generation capacity has gained pace over the past few years, posting a CAGR of 17 percent between FY16-20. This will continue to grow further aggressively.

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Gautam Solar installs solar pumps at 1,000 different locations in Haryana

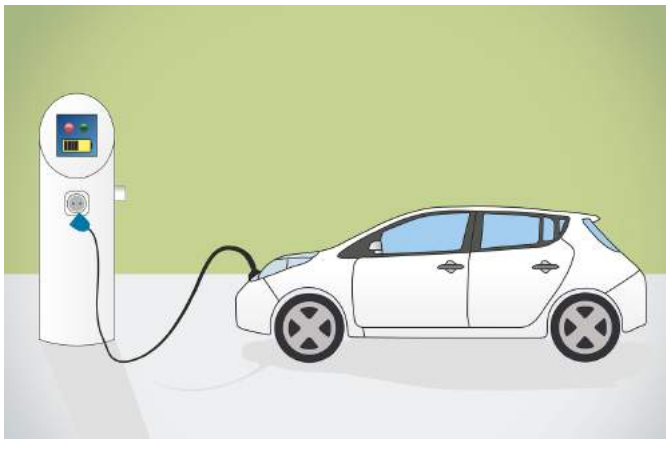
To reduce farmers' reliance on diesel-based generators and make it easier for them to access electricity, Gautam Solar, one of India's leading solar manufacturers, has installed solar pumps of 10 HP capacity at 1,000 different locations in Haryana under the Pradhan Mantri Kusum Yojana. The government has set a target of installing 15,000 standalone solar pumps in Haryana within the first year of the scheme.

Being the only solar manufacturer in the country that produces all the solar pump components in-house, Gautam Solar can maintain a steady supply as per the demand and serves as a single point of service for the farmers so they do not have to run from vendor to vendor. The management at Gautam Solar firmly believes in the idea of 'Aatmanirbhar Bharat' and seeks to reduce India's dependency on countries like China for the procurement of materials that are necessary for production.

"At Gautam Solar, we've always emphasized the importance of spreading eco-consciousness and we believe that for substantial change to occur, we need to start at the grassroots, i.e., our farmers. While farmers have been using diesel-based generators for quite some time, they've been doing so because of the lack of options. In practice, diesel-based generators not only cause pollution but are also costly in the long term. This problem will only be compounded in the future as fossil fuel sources are becoming scarce. Pradhan Mantri Kusum Yojana is a wonderful scheme that will catalyse the adoption of solar energy as the primary power source in the rural areas of the country," said Gautam Mohanka, MD, Gautam Solar.

Charging infra: Supporting the EV growth

The renewed push in the electric vehicles market has created a growing requirement of charging infrastructure facilities at convenient locations across the country.



Government is aggressively pushing for electrification in automobiles with the approval of phase-2 of FAME schemes. Automakers are creating separate EV business units to be prepared for the expected EV boom in the future. However, the surge in EV demand will create a huge need for EV batteries and charging infrastructure in future.

Growing EV market

As per reports, the Indian EV market was valued at $5 billion in 2020 and is expected to reach $47 billion by 2026, registering a CAGR of above 44 percent during the forecast period (2021-26). The electric two-wheeler market in India is emerging on account of prolonged government policies supporting battery-powered vehicles, the growing awareness towards the environment, increasing fuel prices, and poignant emission norms.

Jeetender Sharma, MD, Okinawa Autotech, says, "The Indian electric two-wheeler market is set to grow multi-fold in the coming years. The collective efforts of the established players such as Okinawa as well as the new entrants to bring in an EV revolution in the country and help India take the lead by becoming an EV manufacturing hub make the market more exciting and thriving. The industry is also gaining a lot of traction amongst end-customers as they become more aware of the adoption of EVs."

Samrath Kochar, CEO, Trontek, says, "We see a huge push in the market for electric and hybrid vehicles. As big players like Tesla coming into India and OLA announcing its electric scooter, people have become more aware of EVs. Charging a vehicle has become as simple as charging a mobile phone and use it for the whole day. Now with this concept becoming more popular, the sales will increase and the companies have already seen a tremendous rise in sales of EVs in the past few months when compared to last few years."

Policy push

With the government introducing various policy initiatives for the promotion of EVs in India, the growth is evident in the recent past. The rising fuel cost also adds up to this demand growth. From a two-wheel market perspective, Jeetender says, "We have seen increased sales in April, May, and June on account of rising fuel prices as well as the supportive policies from several state governments inducing customers to opt for electric mobility. We have been receiving more enquiries, close to a three-fold increase, from prospective customers for different scooter models in the local showrooms from pan-India after the revision of the FAME II policy."

Speaking on the overall market, he adds, "I feel that the EV sector in India is rapidly growing since the last three years as both the Central and state governments have been taking many initiatives to promote the adoption of electric vehicles. The recent amendments in the FAME II scheme have further pushed consumers to look for alternate options such as electric vehicles. People are becoming more aware of e-two wheelers and taking the foot forward to reduce the carbon footprint."

Samrath is also positive on the government's policy push as he says, "FAME has been there for the past two years but the major push came in this year with the new update giving 1.5 times the existing subsidy, which gave a major push as the vehicles are becoming affordable. Also, with the petrol prices crossing ₹ 100 per litre, and diesel prices about to reach ₹ 100 per litre, people are now looking for alternatives and electric power is emerging as a far better choice in the current market scenario. The concept of EV has evolved in India this year and will be moving ahead with more acceptance in future."

From the battery market perspective, he adds, "With the government announcing the launch of the ACC (Advanced Chemistry Cell) scheme, there is a major push for Li-ion battery market. Battery players are going to participate in this and many big companies have already signed up for this. It is going to take time for the projects to start in India. I think in 2024, we would be self-sufficient to at least have the cells for our own consumption but till then we have to import batteries. This will provide a major push for the EV market and charging infrastructure in India."

Charging infra developments

The recent news on the new charging infrastructure facilities coming up in the country indicates the kind of growth expected in the coming years in EV infrastructure developments. Many power companies and vehicle companies are joining hands for charging infrastructure across the country.

Jeetender says, "We believe that as the ecosystem evolves, the country will have adequate coverage of charging stations. With support of the government, electric vehicles have started penetrating in the Indian market. However, availability of adequate charging infrastructure is one of the key requirements for accelerating the adoption of electric vehicles in India. In this regard, the Ministry of Power has issued 'Charging Infrastructure for Electric Vehicles – Guidelines and Standards' mentioning the roles and responsibilities of various stakeholders at the Central and state level to expedite the development of public EV charging infrastructure across the country. Further, the government has delicensed the activity of setting up EV charging stations to increase private sector investments and facilitate market adoption. Thus, in the coming years, there will be sufficient availability of Public Charging Stations (PCS) for EV owners. Moreover, we at Okinawa will double down our focus on swappable batteries, as is the case with our upcoming launch, i.e., Oki90. This helps people to reduce the time that they would have spent at charging stations. Moreover, Oki90 also supports fast charging."

According to Samrath, normally two-wheeler and three-wheeler owners having detachable batteries can charge their vehicle at home and obviously use it the whole day. Now with the batteries becoming bigger in capacity, they can run more per charge. "For electric cars and other four-wheelers, charging infrastructure is needed at convenient places. So, good charging infrastructure is needed at key locations. Compared to the current population of the electric vehicles, the charging infrastructure development happening in the country is satisfactory," he adds.

Jeetender says, "Being a two-wheeler manufacturer, we think that charging infrastructure is not a major problem in the EV ecosystem, especially in the adoption of electric two-wheelers. Since the inception, we have been trying to introduce the services which are easy to use. With that thought at Okinawa, we leaped ahead of time to eliminate this challenge to some extent by providing detachable lithium-ion batteries in all our products allowing users to take out the battery and charge using any normal plug point."

According to him, the ecosystem for EVs, i.e., OEM efforts, charging infrastructure, dealership network, and retail financiers are picking pace steadily. "The projections of KPMG in the India-CII report are a testimony that the country is ready for the adoption of EVs," he adds.

Samrath is of the view, "Our government has progressively developed the EV charging infrastructure. Many companies are regularly floating the tenders. Also, as the vehicle population increases, the need for charging stations will also increase. Currently, many e-taxi companies have

Availability of adequate charging infrastructure is one of the key requirements for accelerating the adoption of electric vehicles in India.

▶ *Jeetender Sharma, MD, Okinawa Autotech*

With the government announcing the launch of the Advanced Chemistry Cell scheme, there is a major push for Li-ion battery market.

▶ *Samrath Kochar, CEO, Trontek*

their own charging infrastructure. For personal use, the charging infrastructure is coming up as per the demand. The government is active on EV charging infrastructure in the country and we're in line with the requirement."

Renewables in EV infra

With the green energy adoption is pick up pace, there is a growing requirement of utilizing renewable energy for powering the EVs at various charging infrastructure facilities.

According to Jeetender, the transport sector accounts for nearly 23 per cent of the global energy-related greenhouse gas emissions if we refer to the facts. The reason behind this would be the rapid urbanisation and growing population. In addition to this, vehicle usage in India has seen a tremendous rise, resulting in city level air pollution and India is also home to six of the top 10 most polluted cities in the world. So, definitely renewable power will play a strong role with respect to all the factors mentioned. "We are in a dire need of renewable energy-based charging stations that will require support by naturally abundant and inexpensive alternative energy sources such as wind and solar," he adds.

According to Samrath, the trend of charging stations powered with renewable energy will happen at a later stage. "Currently, the basic charging infrastructure will be powered through the grid. Powering the charging stations from renewable energy like a solar panel, will require a lot of space and cost. The existing strategy and charging from the grid are perfectly fine."

Overall, looking at the market trend, there is going to be a larger push towards EVs and charging infrastructure powered with renewable energy will play a crucial role in future.

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Work smart and networked

Testo thermal imager 872 can also be connected to the testo Thermography App. The App, available for iOS and Android, turns the user's smartphone into a second display and a remote control for the thermal imager, and serves to create compact reports quickly on site, to save them online and send them by e-mail. Apart from this, the App offers useful tools for fast analysis on site – for example for inserting additional measurement points, determining the temperature development via a line or adding comments to a thermal image. Also very useful: With the App you can transmit thermal images live to your smartphone/tablet, and can use it as a second display.

Connectivity with testo hygrometer and testo clamp meter

Testo 872 thermal imager can be additionally connected wirelessly with the thermohygrometer testo 605i and the clamp meter testo 770-3. The measurement values of both compact measuring instruments are transmitted to the imagers by Bluetooth. This allows fast and clear identification of where exactly the thermography is to be done in any given climatic condition or at what load a switching cabinet is running.

Testo India

With more than 60 years of measurement experience, Testo SE & Co. KGaA is headquartered in Titisee, Germany. Testo India Pvt. Ltd., a 100 percent subsidiary of Testo SE & Co. KGaA was established in 2006 and has shown phenomenal growth over the last 15 years with its head office in Pune, and a pan-India network.

Courtesy: Testo India Pvt. Ltd.
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Reliable fans for transformer cooling application

To ensure a reliable electricity supply, power transformers play a key role in the society and its infrastructure. This kind of system can be found in power plants and in the electricity grid in substations.

During operation of typically oil immersed transformers, losses occur in the tank and generate heat. These are concentrated in what is known as hot spots in the winding and significantly inhibit the service life of the transformer. Overheating of the winding would bring the system to a stop, which could result in a 'blackout'.

According to studies by the University of Stuttgart, the service life of a transformer is reduced by a factor of 2 if the hot spot temperature increases by just 6 K. For decades mainly, axial flow fans have proved effective for use with powerful air-cooled transformers by using radiators or oil-coolers.

On a first view, cooling seems simple. The hot oil (top oil temperature) flow by 'natural' convection in an external radiator. The radiator basically is 'naturally air cooled', which is based on convection and radiation. This type of transformer is called ONAN (Oil Natural Air Natural).

But transformers with high power density and/or high ambient temperatures, the heat dissipation will be insufficient by natural cooling methodology. The logical and simple way to improve the cooling capacity of a transformer is to increase the air flow by using fans. Doing this, we come to the most used power transformer types called ONAF (Oil Natural Air Forced).

But the cooling capacity of ONAF cooling systems depend on the local flow situations and temperatures in the radiator. Reliable cooling is a must to get the best performance from a transformer, so the reliability of the fans used is of huge importance.

An ideal fan should:

- Deliver the designed airflow
- Have high efficiency or in other words, lowest auxiliary losses
- Have high reliability, as it is a 24x7 operation
- Have long lifetime
- Be corrosion proof
- Have lowest noise

ZIEHL-ABEGG offers fans that meet all the above-mentioned criteria, by offering compact external rotor motor based axial fans both in traditional AC-technology (asynchronous motor) or state-of-the-art EC-technology (electronically commutated DC-motor).

To provide the perfect air flow, ZIEHL-ABEGG offers unique fan technology like FE2owlet and ZAplus. The FE2owlet fan is inspired by nature (Owl) which not only reduces the sound emissions to a minimum, but also improves the efficiency of the fans. ZAplus is the perfect corrosion-free housing with improved performance, wherein the air is guided in a proper fashion through the radiator.

The development and testing of these fans has been conducted in the unique TÜV and AMCA certified laboratory in Germany.

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DIN rail mounting power meter, Model KM-CPM-12D

KUSAM-MECO has added a new TRMS multifunction power meter transducer to its range of power instruments. The KM-CPM-12D is a DIN rail mounting power meter with high accuracy measurement for single-phase and three-phase system. The display is 128 x 64 dot matrix LCD display with white backlight. It is controlled by four operating keys. Input voltages are 40~400V (line to neutral); 60~600V (line to line); PT primary ratio 100~1,200kV,secondary ratio 50~500V; CT input 1A or 5A or 1/5A programmable. It can accept external current clamps which have secondary 1A or 5A or333mV output, CT primary programmable 1 to 9,999 Amps.

It measures all power parameters such as Voltage (Phase-Neutral) (Phase-Phase) and Average voltage, Current (each Phase and Average), Active Power (each Phase and Sum), Reactive Power (each Phase and Sum), Apparent Power (each Phase and Sum), Power Factor (each Phase and Average), Frequency, Active Energy (Import and Export), Total Energy, Net Energy, Reactive Energy, (Import and Export), Total and Net; THD percentage Voltage 31st THD each phase, Average; THD/Current 31st THD each phase, Average Voltage and Current Phase or diagram, Demand, Maximum Demand of Current and Power with time stamp; Min/Max values with time stamp, Data logging with recording interval can be set; 50 of 88 parameters can be recorded simultaneously. It has RS485 port to transmit data in Modbus RTU mode. It has function to calculate CO_2 (kg). For energy output, it gives pulse output. It has optional feature to record time of use data (4 seasons, 8 tariff settings per day, per year or upto five years. For DG sets, it can also record operation hour, run hour. It has a fast-sampling rate of 128 point/cycle. It can be used for 1P2W, 1P3W, 3P3W (1/2/3 CT) 3P4W balance/unbalanced load. 247 units can be connected to RS485 Modbus RTU. It has 2MB flash ROM.

True RMS digital Clampmeter, Model KM 2719

KUSAM-MECO has introduced a new clampmeter Model KM 2719 which is an upgraded version of their earlier Model KM-2718. The instrument is suitable for HVAC measurements. The new Clampmeter has 11 functions and 37 ranges. It has 4000 counts display. The measurement is True RMS measurement. It measures AC current upto 400 Amps (frequency response 50Hz-100Hz). It has AC voltage range upto 600 V (frequency response 10Hz-10KHz) with a resolution 1mV. It has DC voltage range upto 600 V with resolution 0.1mV. The resistance measuring range is 40 mega with a resolution 0.1 Ohm. The Capacitance range is upto 4.000 mF with a resolution of 0.001 nF. It also has diode andcontinuity test function. It can measure frequency upto 10MHz with resolution 0.01Hz. It also has temperature measurement function

with K-type thermocouple having range upto 1,000°C. The thermocouple supplied along with the clampmeter is suitable upto 250°C. Additionally, it has non-contact voltage detection function. The jaw opening is 28mm diameter. Overload input signal is displayed by 'OL'. If there is no operation of any function switch or any button for 15 minutes, the instrument will be automatically power off. It is light in weight (approximately 248g including batteries). The clampmeter is supplied with test lead, battery, user manual, K-type temperature probe range upto 250°C andcarrying case. Optionally, thermocouple upto 1,000°C can be supplied.

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DV690: Non-contact high voltage detector (69 kV)

The DV690 is a rugged and reliable voltage detector that can quickly and safely detect up to 69 kV in high-voltage (HV) electrical systems. This non-contact, industrial-grade tool provides an extra layer of protection for anyone who works around HV electrical systems including electric power utility, storm restoration, telecommunications, and public safety professionals. Audible and visual alarms notify users of dangerous voltage presence, helping them maintain a safe distance in hazardous locations. Also, five flexible mounting options make it easy to operate the device to get the job done efficiently.

- Detect and monitor electrical fields up to 69 kV
- Comply with NFPA 70E, OSHA 1910 Subpart S, and OSHA 1926 Subpart K
- Receive clear warning of high voltage from the 106 dB buzzer and bright red LED alarm
- Silence the loud audible buzzer with mute switch when preferred
- The self-test function ensures reliable and safe operation
- Mount the detector five different ways for hands-free or hands-on use: lanyard, clip, handheld, arm strap, or mount onto hot stick (not included)
- Universal spline allows use with hot sticks* to extend reach while remaining at a safe distance
- Designed with a textured hand grip for easy operation while wearing gloves
- Built with durable IP54 housing and drop tested to 4 ft (1.2 m) for tough jobs
- Complete with a hard carrying case, break-away lanyard, arm strap, soft pouch, universal spline adapter, and 3x AA batteries

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Ad Index

Cummins India unveils 'Made in India' 2,500-kVA diesel generator

Cummins India Limited unveiled its 'Made in India' QSK60 G23: 2,500-2,750 kVA Diesel Generator (DG) set at its 60th Annual General Meeting. The DG set which is an integrated power solution has been launched to meet the increasing power requirements by industry segments like Data Centers and largescale infrastructure projects like airports and commercial realty in India.

The QSK60 G23 genset provides best-in-class power density ensuring maximum power with minimum footprint. The new genset is engineered and designed to minimise downtime and improve total cost of ownership in an effective and innovative manner. It is capable to withstand Indian climatic conditions to deliver reliable performance.

DG sets greater than 2,250kVA hitherto were imported. With the rapid growth in segments like Data Centers, large-scale infrastructure projects etc., in India, genset is part of critical infrastructure which requires reliable power back up and up time efficiency. A locally manufactured genset allows shorter lead time giving customers greater flexibility in managing project timelines. The QSK 60 G23 is a fully integrated power generation system build to deliver performance and offer reliability and versatility for stationary, standby, prime power, and continuous duty applications.

Commenting on the product launch, Ashwath Ram, Managing Director, Cummins India Limited said, "Cummins India has again proven its ability to launch products in response to market and consumer needs. The introduction of the QSK60 - G23 entirely manufactured in India is driven by increasing demands of power in the Data Center and large-scale infrastructure segments. We continue to innovate and offer dependable power genset to ensure that they are always on and meet customers' power requirements. We believe that our well designed and engineered products will continue to provide reliable power solutions to enable a truly digital and unstoppable India!"

Mandar Deo, Vice President, Power Systems, Cummins India Limited said, "At Cummins India, it is our constant endeavour to support our customers as they transition towards newer technologies. We are delighted to introduce this diesel generator, which is one of the largest gensets ever built in India. Keeping in mind a significant shift towards increased power density and reliability, it is fully built in to the QSK60 G23."

This heavy-duty engine provides reliable power, low emissions, and quick response to load changes. The key features of genset include: PowerCommand® digital control as standard equipment offering total genset system integration including critical AmpSentry™ protection, paralleling and load dependent start/stop, advanced control methodology with various protection, communications interface and metering. Its highly reliable Stamford Series alternator is optimised for critical and heavy loads.

'Return to where we belong to'

REI 2021 being held on 15-17 September at India Expo Centre, Greater Noida will see 125+ exhibitors on the floor, a galaxy of highly acclaimed industry stalwarts, speakers, VIPs and large gathering of business visitors.

Rajneesh Khattar, Group Director, Informa Markets India Pvt Ltd

In an interview with EPR magazine, Rajneesh Khattar, Group Director, Informa Markets India Pvt Ltd shares more on the event and the overall market trends.

What are the highlights of REI 2021 when it is back in its' physical avatar this year?

The most promising highlight of this edition is our 'return to where we belong to', i.e., physical version after witnessing the most challenging year that the humanity has ever faced so far. This has been a phenomenal whirlwind of a year, throwing off plans of all stakeholders and causing unimaginable disruption by further weakening the supply chains' ecosystem.

REI 2021 being held on 15-17 September at India Expo Centre, Greater Noida is destined to showcase India Inc's ambitious vision, relentless persistence, deep urge to contribute to set the economy back on track and a great intent aiming to boost India's RE portfolio to stratospheric levels in the years to come. This is in addition to 125+ exhibitors on the floor, a galaxy of highly acclaimed industry stalwarts, speakers, VIPs and large gathering of business visitors...this being consistent hallmark of REI over the years anyway!

Which other sectors will get a limelight in this year's show?

For sure, Solar and Bio energy will continue to be the show stoppers. However, very soon Electric Vehicle (EV) sector will also embark upon its presence at REI, besides wind regaining its focus. It'd be a pleasure to witness a healthy intra-sector competition with each domain trying to grab a share for itself whilst India stands geared up for the next leap of 450 GW by the year 2030.

What precautions have been planned for organising the event amidst Covid-19 scenario?

We are very pleased to confirm that being an Exhibition and Conference organiser of global repute, we have already formalised our in-house H&S document called 'Informa AllSecure'. This is far more stringent in compliance than the H&S guidelines issued by the Federal Government of India and provides multiple additional rings of safety to all the participants alike. To begin with, REI 2021 will observe QR Code based Contactless Registration, ensuring there are no long serpentine-like queues as in the past and no crowding. Besides, we have also adopted staggered registrations in order to check visitors' density inside each hall strictly in line with government guidelines.

We are permitting by all means prefabricated booth structures only for raw scheme stalls. Each exhibitor will be provided disinfectant kit in addition to thermal scanning, sanitiser installations at multiple check points, App-based food ordering systems, thereby, encouraging digital payments practice, keeping provision of isolation room for those who report unwell at the time of entry etc, to name a few.

All attendees and exhibitors are anyway advised to maintain social distancing within the booth and switch to other contactless mode of greetings. Meeting tables to have sneeze guards and Informa COVID Ambassadors will be present on the floor to ensure compliance in totality.

What will be your renewable energy industry outlook for the year 2021?

My outlook for the year 2021 is extremely optimistic as India is fairly galloping towards its ambitious goals of 450 GW by 2030. We have recently celebrated our Century of Pride on the achievement of 100 GW of installed renewable energy capacity ranking India the 4th largest installed RE capacity worldwide. This is in addition to another 50 GW under implementation and yet another 27 GW under tendering.

The Indian electricity sector is on the cusp of a solar-powered revolution. Solar power is set for explosive growth in India, matching coal's share in the Indian power generation mix within two decades or even sooner. This dramatic turnaround is driven by India's policy ambitions, notably the ambitious target to reach 450 GW of renewable capacity by 2030, and the extraordinary cost-competitiveness of solar, which'd out-compete existing coal-fired power by 2030 even when paired with battery storage. So is the focus on off-shore wind sector and Compressed Bio Gas (CBG) that are bound to carve out a newer identity for India's RE sector in times to come.

REI Expo 2021: A powerhouse of innovations and solutions for renewable energy industry

The Renewable Energy India (REI) Expo, Asia's largest and the most influential expo in the RE space by Informa Markets in India, is back this year in its 14th epic edition in a physical format. Scheduled for 15-17 September 2021 at the India Expo Mart, Greater Noida, REI is supported by Indian Biogas Association (IBA), Cleantech Business Club (CBC), Bridge to India (BTI), National Solar Energy Federation of India (NSEFI), and Indo German Energy Forum-Support Office (IGEF-SO).

This year, the three-day event will bring together decision makers and influencers as well as technical experts and professionals from leading companies involved in the renewable energy generation, transmission and distribution.

With a bounce-back in its physical avatar, REI has been received with great enthusiasm by global stakeholders with the UK joining as 'Partner Country' and European Union (EU) as an 'International Partner'. The expo will feature industry stalwarts in Adani Solar, Goldi Solar, Premier Energies, Vikram Solar, Growatt, Solis, Waaree Energies, Sova Solar, Panasonic Life Sciences, Renesola, Longi Solar, JaksonEngg, Patanjali Renewables, HPL Electric & Power, Bergen Group and Gautam Solar, to name a few. This year too, it will have engaging features comprising power-packed knowledge sessions besides all-CEOs conclave. The event is being honoured with attendance by industry renowned experts, 120+ exhibitors, UK Pavilion by Department for International Trade, EU Pavilion, and Bio Energy Pavilion, besides new launches, product demos, free training programs, and more. The EU is spearheading two of the most foremost conference sessions i.e., Rooftop Solar: Unlocking the Potential and Offshore & Onshore Wind: Unleashing the Potential.

Speaking on the participation at and partnership with REI, Jennifer Fagan, First Secretary, Trade and Investment – Energy, UK's Department for International Trade said, "We are glad to be the Partner Country of Renewable Energy India Expo 2021 and get an opportunity via our UK pavilion to highlight UK's excellent strength in Renewable Energy technologies and at the same time network with like-minded companies. Earlier this year, the UK and Indian Prime Ministers agreed to step up UK-India collaboration on climate change and low carbon transition. This was done through a new partnership on renewables and power, including offshore wind, energy efficiency and storage and electric mobility, and to explore joint work on green hydrogen. We are confident that opportunities like these will further help us explore potential areas of collaboration."

Commenting on EU's participation at the REI Expo, Ugo Astuto, Ambassador of the EU to India said, "The European Union Delegation to India is happy to partner with the Renewable Energy India Expo, which this year focuses on the topical theme 'From Ambition to Action...Taking Giant Leaps Forward'. Both the EU and India have very ambitious renewable energy targets and are taking concrete and innovative actions to ensure that these ambitions become reality. The EU-India Clean Energy and Climate Partnership is a key priority for EU-India cooperation, focusing on energy efficiency, renewable energy, integration in the grid, finance, and climate action. The international community needs to step up efforts towards energy transition, in the run up to COP26."

Speaking on the re-start of physical expos and REI's return in its physical version, Yogesh Mudras, Managing Director, Informa Markets in India said, "The Indian renewable energy industry has significantly matured over the past 4-5 years. The country is targeting about 450 GW of installed renewable energy capacity by 2030 from which about 280 GW is expected from solar. According to recent reports, India seems to have achieved a 28 percent emission reduction over 2005 levels, against the target of 35 percent for 2030. Favourable policies and regulations to boost the clean energy sector by the government will also play a crucial part for India to move forward to scale up its targets."

REI 2021 will feature manufacturers, EPC companies, supplier & distributors from the following product categories such as PV modules, hybrid systems, inverters, charge controllers, batteries, testing and monitoring systems, component, bioenergy equipment, backsheet and system integrators. The expo will cater to the buyer category that comprises facility managers, energy consultants, real estate developers, industrial consumers, independent power producers, EPCs, distributors/dealers, system installers and integrators, utilities, project developers and planners, investors, fund managers, banks, financial consultants, and captive power buyers.

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