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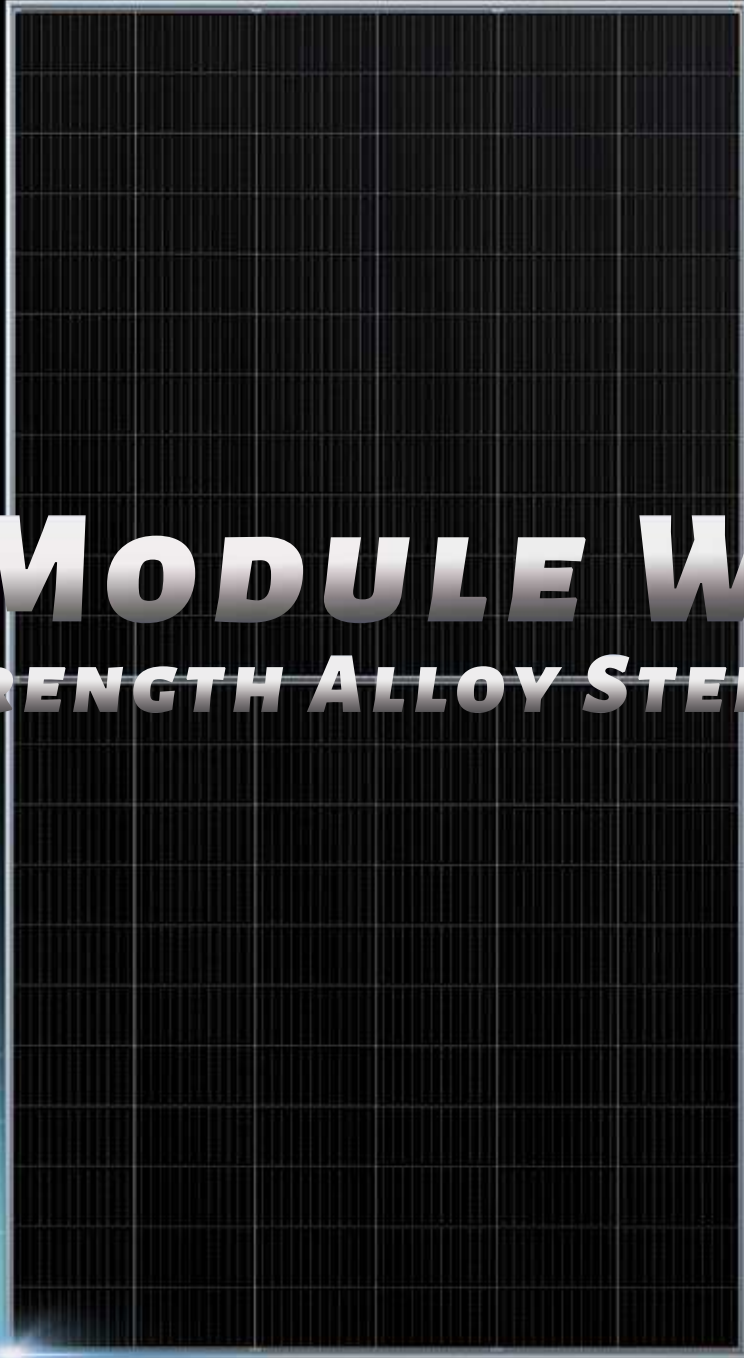
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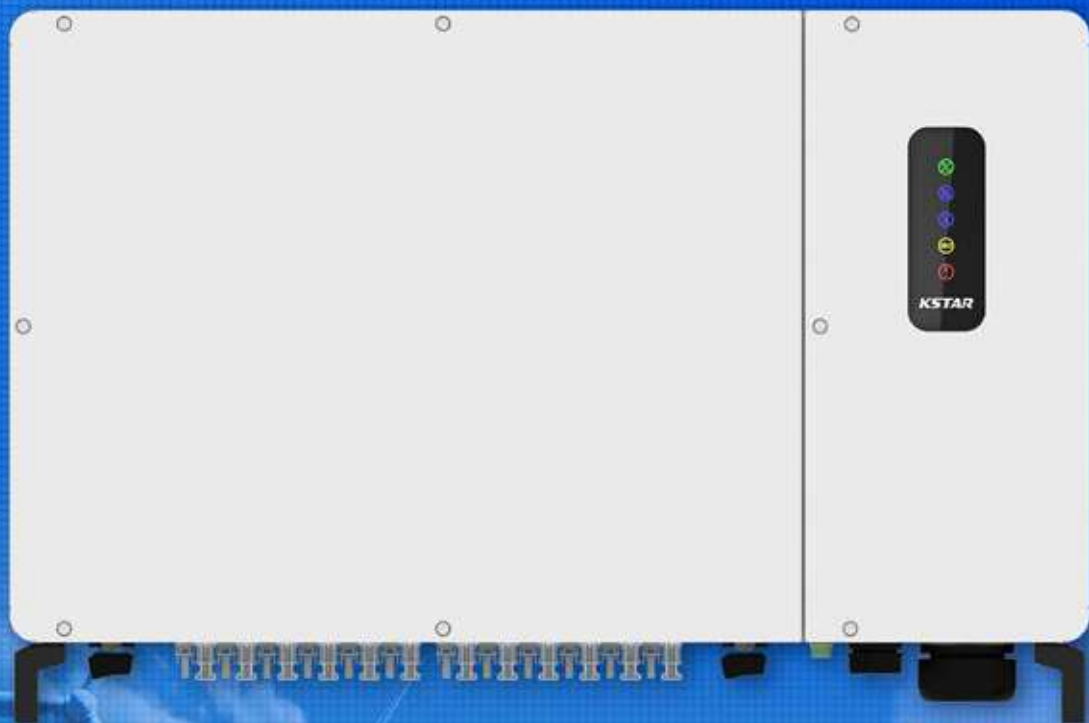
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PLACE OF PUBLICATION :
95-C, Sampat Farms, 7th Cross
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452016, Madhya Pradesh, INDIA
Tel. + 91 96441 22268
www.EQMagPro.com

EDITOR & CEO :
ANAND GUPTA
anand.gupta@EQmag.net

PUBLISHER :
ANAND GUPTA

PRINTER :
ANAND GUPTA

TRENDS & ANALYSIS
SAUMYA BANSAL GUPTA
saumya.gupta@EQmag.net

PUBLISHING COMPANY DIRECTORS:
ANIL GUPTA
ANITA GUPTA

CONSULTING EDITOR :
SURENDRA BAJPAI

HEAD SALES & MARKETING :
BHANU YADAV
sales@EQmag.net

MARKETING MANAGER:
GAZALA KHAN
hayat@EQmag.net

SR. GRAPHICS & LAYOUT DESIGNER :
RATNESH JOSHI

GRAPHICS DESIGNER :
ABHISHEK SARAI

SUBSCRIPTIONS :
RISHABH CHOUHAN
rishabh.eqmag.net@gmail.com

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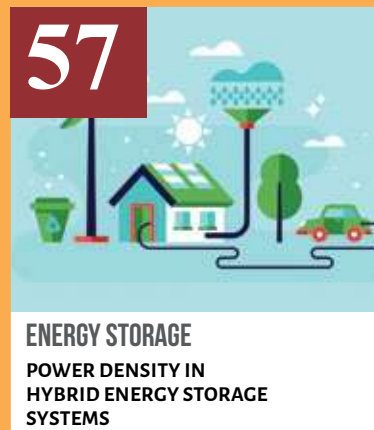
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INTERVIEW
Mr. Ankit Singhania



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Founded in 2005, **JA Solar** is a manufacturer of high-performance photovoltaic products. With 12 manufacturing bases and more than 20 branches around the world, the company's business covers silicon wafers, cells, modules and photovoltaic power stations. JA Solar products are available in over 120 countries and regions.



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Mr. Ankit Singhania

Director & Co-founder

Navitas Solar



What are your views on proposed policies and challenges on regulatory aspects like ALMM?

Ankit Singhania: Implementation of ALMM will surely encourage domestic players and help the economy to circulate within the country. However, some challenges are associated with it. The challenge with ALMM approved solar modules is that the list is yet to be published and mainly the list made is for modules of 350-450 Wp but not for the latest modules like 540-550 Wp. Every day we are diverting the whole supply chain from China to India. Of course, it will take some time to shift it entirely but with the help of ALMM, Indian made modules are expected to get a huge absorption from a private customer's end and developer's end. As of now, Mono PERC cells made in Indians not white scale but it will surely grow exponentially in the next couple of years. Another challenge is to meet 550 Wp capacity which has more demand in the market than other low capacity modules.

From April 1, 2022 the implementation of BCD will be in the scenario. Do you see any challenges with pricing going up and sales?

Ankit Singhania: Implementing BCD will definitely increase the price of importing and ultimately the price of modules in the Indian market. In addition, as of now, the industry is at least a year away from manufacturing sufficient solar cells and modules. Eventually, China has increased the cell prices by 20% to 30% with time. Until now, BCD was not implemented on the raw materials but from now onwards BCD will be implemented on finished modules as well as raw materials.

What will be the market scenario and its impact on expected pricing and availability of modules in this and next year?

Ankit Singhania: I don't think availability will be an issue because the capacity is building up exponentially. Moreover, pricing is going to be very volatile this year. A continuous fluctuation will be there in the market in terms of pricing.

What are the biggest challenges in India to develop 175 GW in 2022 and 450 GW by 2030? How much can we really achieve by the end of 2022, 2025 and 2030?

Ankit Singhania: It is expected to achieve 100 GW Solar installations by 2022. Government has already floated tenders to achieve the massive target. Target of achieving 450 GW by 2030 seems to be huge but we surely think that it can be achievable. Right now, we are running behind our target time and expectations. The world is looking up to India as International Energy Agency (IEA) has mentioned, "all the roads to successful global clean energy transitions go via India" highlighting its critical contribution to global climate action. Countries like UK, Germany has also started embracing solar power due to its cost effectiveness.

How much modules have you supplied to India till now? What are your expectations for this and next year?

Ankit Singhania: We have supplied approximately 400 MW-450 MW until now and we will touch the target of 500 MW by the end of this year. In addition, for the next year we are targeting to supply approximately 150 MW.

Kindly enlighten our reader on the performance of your modules in India in various geographical region's customers' feedback.

Ankit Singhania: Until now, in the Indian module market we have not received any recall of our modules. Our modules have been giving excellent output since last 8 years. Even after 2015, our modules are giving supreme performance than other competitors. Our modules are ideal for large scale and rooftop installations as they provide optimum generation and efficiency. We are supplying all over India successfully because of our good service and installation. All the customers from PAN India are satisfied with our service. We believe to provide the best quality modules, as we truly believe, "Quality is remembered long after the price is forgotten".

Present some noteworthy projects case of solar plants using your module.

Ankit Singhania: Two years ago, in Delhi, we have installed RESCO Projects at 9 sites in Delhi (8 schools and Rohini Jail). This was in a high security zone, so the project required much safety precautions and approvals. We are receiving good feedbacks in open access projects. We have also installed 4 MW project in Andhra Pradesh, 15 MW in Tamilnadu and 3 MW in Indore.

What are new technologies innovations in solar module logistical aspect usage of larger format module?

Ankit Singhania: We are setting up a new facility where we will manufacture Mono PERC half cut modules up to 600 Wp and we expect to begin commercial production by end of April, 2022.

Please describe in brief about your company's directors, promoters, investors and its vision and mission.

Ankit Singhania: We are four directors. Aditya Singhania, Vineet Mittal, Sunay Shah and myself. This is a 9-year-old company incorporated on 13 February, 2013. The shareholdings of the company are divided among us. As of now, this is a family owned business. Currently, we are raising some funds from few private equity players for next three to four months and then there will be outside investors on board. This is a company with a young team having all the well-educated promoters one's that helps a lot in understanding the market quickly and adapting the new changes much faster. Our Vision is to Emerge as India's Most Trusted Solar Company by 2025. Our Mission is to collaborate with the world's best solar companies to develop and deliver the most reliable and efficient solar products & services. We also aim to bring awareness & partner with like-minded institutes & individuals to stride towards a sustainable future.

What are the top 5 markets for your company in present and future?

Ankit Singhania: In terms of geography, definitely Gujarat and Maharashtra are our focus areas. In addition, Tamilnadu and Kerela are also a very big market for us along with NCR belt. Recently, we have registered in BREDA, further aiming to cover UP and Bihar market.

How much is your R&D budget as per your sales and profit?

Ankit Singhania: About 1% of the sales and about 3-5% of its profit.

Kindly highlight your product technology and company USPs, distinctive advantages.

Ankit Singhania: Our USP is a young team who can adapt the changes in technology quickly. We are focusing on new technology while improving the product continuously. Our new lines are at par with the best technology, which will be able to provide world-class multi bus bar panels. We are backed with a very strong in house QA and QC lab. We also have technically sound QA & QC team as well as R&D team that are continuously dedicated towards improving the quality. We have our in-house EVA sheet-manufacturing unit as our backward integration and we are hugely benefited from it.

What are your plans to ramp up or set up or grow your manufacturing base in India in light of the proposed BCD?

Ankit Singhania: We see the consistent demand in the market so definitely we have plans to grow in upcoming years. We have plans to expand up to 2 GW by the year 2024.

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Will the war fast track the Green Energy Transition?

Mr. Sunay Shah | Director
NAVITAS SOLAR

Europe is suddenly pushing its dependence on Russian oil and gas to the clean energy resources. The war may become one of the reasons to trigger a shift towards clean energy to achieve energy independency. Europe has been pushing nuclear and gas as their essential energy sources instead of oil and gas. Since Ukraine was invaded, suddenly the

supply of oil and gas from Russia was disturbed and that forced Europe to go for independent energy sources especially renewables. Moreover, Germany has stated to become energy independent with whatever measures they need to take. To reduce Russia's leverage, Germany accelerated its goal of 100% renewable electricity to 2035 from 2040; the European Commission is expected to target a 40% reduction in fossil fuel use by 2030. German chancellor Olaf Scholz stated, "The faster we

push ahead with the expansion of renewable energies, the better". German energy experts say that EU will have to increase the speed of its renewables rollout threefold as the renewable technology is already proving cheaper than fossil fuels, espe-

cially wind and solar. The war situation has made the countries realise their energy dependency and crisis. The countries that had set renewables as their second option are bound to consider them as their focused priority.



Patriotism may play an important role in accelerating Green Energy mobilization in the world. According to IPCC's Sixth Assessment report, the world must limit climate change catastrophe. Ukraine invasion may have sparked what years of convening, pledges about the green energy transition failed to achieve. It is believed that patriotism might succeed where science has failed in sparking green transition. Let us all work to become greener, more sustainable, and especially independent! As Europe is facing the heat of the war, India is facing the

shortage of coal, its major source of energy. In India, coal is used to generate 70% of the electricity that the country needs. Despite having the world's fourth greatest coal reserves, the country is the world's second-largest coal importer. India has realised that more than ever, now is the time to focus on renewable energy. As a result, India has witnessed rapid growth in solar rooftop system adoption. Leading rooftop solar system providing companies like NavitasSolar are providing total solutions for adopting solar rooftop systems.



40% INCREASE IN ROOFTOP SOLAR SYSTEMS IN MALWA-NIMAR IN ONE YEAR

WEST DISCOM MANAGING DIRECTOR AMIT TOMAR SAID THAT ROOFTOP SOLAR ENERGY IS THE PRIORITY OF THE CENTRAL AND THE STATE GOVERNMENTS. "CONSUMERS ARE BEING CONTINUOUSLY HELPED TO GENERATE ELECTRICITY FROM ROOFTOPS IN THE COMPANY AREA," HE ADDED.



figures are any indicator, solar panel is a new buzz in the Malwa-Nimar region. In the last year, this region has witnessed a steep hike in the installation of rooftop solar panels. As per Madhya Pradesh West Zone Electricity Distribution System, the buildings with rooftop solar panels increased by 40 per cent in last one year. Following the path of green energy, more and more people are opting for solar energy these days. West Discom is also giving a push to the solar panels with the slogan of "Meri Chhat, Meri Bijli". **West Discom managing director Amit Tomar said:** "That rooftop solar energy is the priority of the Central and the State governments. Consumers are being continuously helped to generate electricity from rooftops in the company area," he added. As on March 24, 2700 consumers of Indore city and 2900 of Indore district are using their rooftops to generate electricity. Similarly, electricity is being generated from rooftops at 566 places in Ujjain district, 188 places in Ratlam district, 170 places in Dhar district, 128 places in Khargone district. Net meters are installed at all these places.

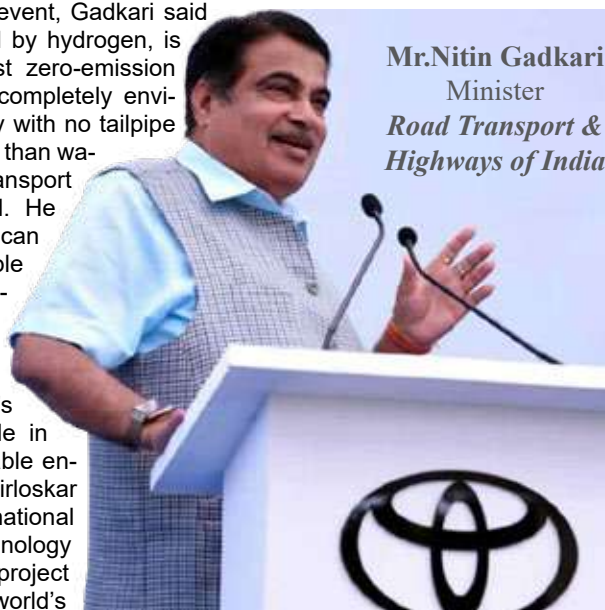
Source: PTI

NITIN GADKARI LAUNCHES GREEN HYDROGEN-BASED FUEL CELL ELECTRIC VEHICLE TOYOTA MIRAI

UNION MINISTER NITIN GADKARI LAUNCHED GREEN HYDROGEN-BASED ADVANCED FUEL CELL ELECTRIC VEHICLE (FCEV), TOYOTA MIRAI, AND SAID "THIS IS THE FIRST-OF-ITS-KIND PROJECT IN INDIA THAT AIMS TO CREATE AN ECOSYSTEM FOR SUCH VEHICLES IN THE COUNTRY"

Speaking at the event, Gadkari said FCEV, powered by hydrogen, is one of the best zero-emission solutions. It is completely environment-friendly with no tailpipe emissions other than water, the road transport

and highways minister said. He added that green hydrogen can be generated from renewable energy and abundantly available biomass. Gadkari noted that the introduction and adoption of technology to tap into the green hydrogen's potential will play a key role in securing a clean and affordable energy future for India. Toyota Kirloskar Motor, along with the International Center for Automotive Technology (ICAT), is conducting a pilot project to study and evaluate the world's most advanced FCEV Toyota Mirai, which runs on hydrogen, on Indian roads and climatic conditions. Union minister for petroleum and natural gas Hardeep Singh Puri, union power minister R K Singh and heavy industries minister Mahendra Nath Pandey were also present at the event.



Mr. Nitin Gadkari
Minister
Road Transport &
Highways of India



Source: PTI

SOLAR ENERGY GENERATION EXPECTED TO GROW BY LEAPS AND BOUNDS

AREA UNDER ROOF POWER GENERATION USING SOLAR PANELS MAY GO UP BY ANOTHER BILLION SQUARE METRE AREA BY 2030.

Pointing to the rapidly expanding area of solar energy generation in India, **Sanjay Khot, an expert in energy auditing and principal of Sharad Institute of Technology in Maharashtra**, said that “Clean and green energy generation in the country is growing by leaps and bounds. Delivering a special lecture on Energy Auditing at the National Webinar on Energy Audit and Electric Vehicle organised by the Energy Engineering and Electrical and Electronics Department at Sharnbasva University in Kalaburagi, **Dr. Khot said** “The area under roof power generation using solar panels alone is likely to increase by another billion square metre area by 2030. Energy auditing for augmenting power generation and its use is crucial. Energy audit is verification, monitoring and analysis of the use of energy. Energy auditors also provide suggestions and recommendations for energy efficiency. Energy audit will also help in arriving at cost-benefit analysis and action plan to reduce energy consumption.” Giving a brief introduction to the key aspects of energy auditing and different kinds of instruments used in energy auditing, he also stressed on the need for increasingly using LED lights and 5 star-rated appliances in houses and offices for achieving optimum energy saving. Dr. Khot also gave an insight into the concept of zero energy building, where lighting and all electricity needs of buildings are met through the use of renewable energy. He pointed out that one structure in IIT Mumbai followed the concept of zero energy building. “Those who have completed an engineering course in Mechanical, Electrical and Energy faculty are eligible for participating in the Energy Auditor examination where they have to clear four subjects to become eligible,” Dr. Khot added. V. Sandeep, another expert in Electric Vehicles and Head of the Department of Electrical Engineering at the National Institute of Technology in Andhra Pradesh, referred to a recent study and said that more than a billion electrical vehicles will be added to the existing strength in India by 2050. “Universalisation of electric vehicles in the country will open new vistas of employment opportunities for qualified engineers. As per the Automotive Mission Plan 2026 of the Union Government,



Dr. Sanjay A. Khot | Principal, Sharad Institute of Technology College of Engineering, Yadrav, Ichalkaranji | *Members*

an estimated 65 million jobs will be created in the auto mobile sector. The Union Government has already made it mandatory for automobile companies to ensure that electric vehicles will account for at least 30% of the total vehicle production by 2030. This will result in the installation of a large number of smart charging facilities for electric vehicles throughout the country paving the way for more employment opportunities,” he said. He added that the Union Government has announced its plan to install 10,000 electric vehicle charging stations across the country in the next two-three years.

Source: thehindu

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CRITICAL MATERIALS IN INDIA'S QUEST FOR SELF-RELIANCE IN SOLAR TECHNOLOGIES: SILICON

INDIA'S DESIRE TO OBTAIN SELF-SUFFICIENCY IN SOLAR ENERGY NEEDS TO BE BACKED WITH THE NECESSARY TECHNOLOGY REQUIRED TO BE ACHIEVED

MATERIAL INTENSITY OF CLEAN ENERGY

The low-carbon future that India and the rest of the world is moving towards will be far more material intensive. This is because clean energy technologies need more materials to aggregate low-quality (highly dispersed) renewable energy (RE) than technologies that extracted and moved energy dense fossil-fuels. Consequently, raw material (metals and minerals) availability is expected to be one of the biggest challenges in decarbonisation efforts and electrification of the economy. By one estimate, increase in demand for materials between 2015 and 2060 is projected to be 87,000 percent for electric vehicle batteries, 1,000 percent for wind power, and 3,000 percent for solar cells and photovoltaics (PV). Generating one terawatt of electricity from solar energy could consume 300-400 percent more materials intensive than generating electricity using natural gas or coal as fuel.

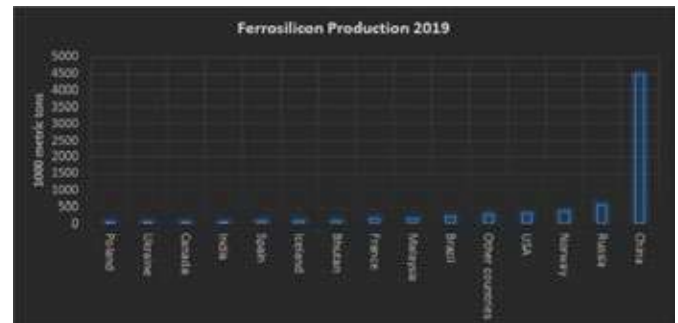
SILICON IN SOLAR CELLS

The precursor material for both electronic-grade silicon (higher level of purity) and solar-grade silicon (slightly lower grade of purity) is metallurgical-grade silicon. The basic process to convert the feedstock SiO₂ (silicon dioxide or silica) or quartz to Si (silicon) involves reduction (decrease in oxidation number, usually by gaining electrons) followed by purification of the resultant zerovalent (inert) solid, and finally recrystallizing it into forms that can be further processed. Carbothermal reduction of SiO₂, invented in the nineteenth century is overwhelmingly the dominant process for the first stage in the Si industry today. This reaction is performed with graphitic carbons as the reducing equivalents for converting lumpy quartz to zerovalent Si within electric arc furnaces. The operation of arc furnaces for metallurgical-grade Si requires roughly 12 kWh/kg (kilowatt hour per kilogram) of electricity. Significantly more energy is required for refining this Si into purer forms of crystalline or solar grade Si (polysilicon). Once solar-grade silicon is produced, the subsequent processing steps involve wafer production, solar cells manufacture and solar module production. A solar PV array consists of one or more electrically connected PV (photovoltaic) modules, each containing many individual solar cells, integrated with balance-of-system (BOS) hardware components, such as combiner boxes, inverters, transformers, racking, wiring, disconnects, and enclosures. A typical Si PV module consists of a glass sheet for mechanical support and protection, laminated encapsulation layers of ethylene vinyl acetate (EVA) for ultraviolet (UV) and moisture protection; 60 to 96 individual solar cells, a fluoropolymer back sheet for further environmental protection; and an aluminium frame for mounting. PV cells are either wafer-based or thin film. Wafer-based cells are fabricated on semiconducting wafers and can be handled without an additional substrate, although modules are typically covered with glass for mechanical stability and protection. The vast majority of commercial PV module production has been and remains silicon-based, for reasons that are both technical and historical.

RESOURCES AND PRODUCTION

Even in a scenario where the world shifts to 100 percent (RE), silicon scarcity is not anticipated. Silica found in nature as

sand, usually in the form of quartz is the second most abundant element on earth's crust after oxygen. However, the collection and manufacture of crystalline Si required for PV cells are extremely challenging. Si in nature is found only as impure, oxidized sand or silicates and the chemistries required for purification, reduction, and crystallization are complex. These processes are industrially complicated, costly, and polluting, manifesting in high energy and environmental costs for crystalline, solar-grade Si PVs. Given the complexity in the manufacture of Si, production capacity of silicon is considered a strategic asset in the solar value chain. This is in contrast to fossil fuel sector where resource endowment rather than production capacity is the most important strategic asset. Quantitative estimates of the raw material are not made as reserves in most producing countries is abundant in relation to production. In 2019, China was the leading producer of silicon metal and ferrosilicon (in terms of silicon content) with a production of 4.5 million tonnes (MT) that accounted for over 64 percent of global production of about 7 MT. Though India is among the top 15 producers, its production of 60,000 T (counting only silicon content on ferrosilicon) was less than 1 percent of global production in 2019. In 2018 Bhutan was the second largest source of India's SiO₂ imports.

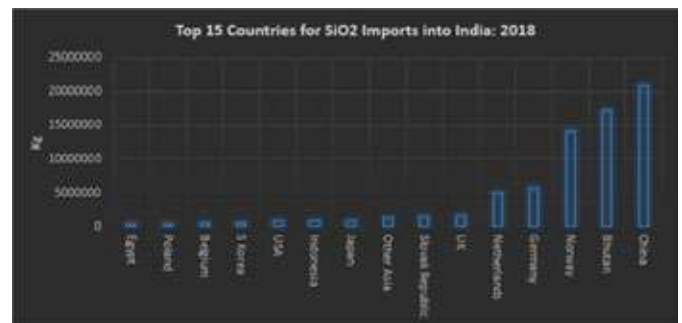


INDIA'S QUEST FOR SELF-RELIANCE

The core theme of India's post pandemic industrial policy is 'Aatmanirbhar Bharat' or a self-reliant India. In this context, becoming self-reliant in RE technologies in general and solar technologies, in particular, is an important policy goal. Currently more than 80 percent of solar panels and modules are imported, primarily from China. Cheap imported panels have contributed to India having one of the lowest solar power tariffs in the world but also raised energy security and geo-political concerns. Though India has a solar PV cell manufacturing capacity of 3 GW (gigawatt) per year and solar PV module manufacturing capacity of 10 GW per year, India has no manufacturing units for polysilicon, wafer or ingots. To decrease imports and promote local manufacturing of solar panels, the government has offered a number of incentives. In 2018, a 20-percent subsidy for capital expenditure in special economic zones (SEZs) was offered to potential manufacturers. In 2021 public procurement of solar components was mandated to be only from class I suppliers that have local content equal or more than 50 percent. Solar PV cells and modules must be sourced from domestic manufacturers for central government schemes

to promote the use of solar energy such as PM KUSUM (Pradhan Mantri Kisan Urja Suraksha Evam Utthan) for replacing electrical agricultural pumps with solar pumps and for subsidised rooftop solar projects. In addition, the government has also imposed basic customs duty (BCD) on import of solar PV cells and modules effective from April 2022. In 2021, the Indian Renewable Energy Development Agency (IREDA) released a list of 18 bidders for its production linked incentive (PLI) scheme for setting up fully integrated production of Si solar cells. Four applicants have proposed a 4 GW solar factory each that is fully integrated from polysilicon (highly pure form of crystalline silicon) production through wafer, solar cell and module manufacturing. The PLI scheme is expected to attract a direct investment of around US\$2.33 billion. Given the strong response for the PLI scheme for manufacturing solar modules, the scheme outlay has been further increased to US\$3.2 billion from US\$600 million earlier. This is expected to increase setting up of cell and module manufacturing capacity from 10 GW to 40 GW. This is not the first time India is trying to establish polysilicon manufacturing capabilities for the semiconductor and solar industries. In 2008 some of the major players announced plans to manufacture polysilicon. The plans did not materialise despite the government's offer of land and other incentives as the cost of electricity proved to be too high and the quality of supply too low. This time may be different not only because the quality of electricity supply has improved but also the market size for solar panels has increased tenfold. However, self-reliance in the production of wafers, cells and modules may not extend right up to the upstream end of the solar value chain. In 2018, India imported over 72 million tons of SiO₂ and over 28 percent was from China. Though sources of SiO₂ imports were highly diversified it would not count as secure or self-reliance. The high cost of production of silicon metal is expected to limit entry of new players. The production

of silicon metal using arc furnaces is energy intensive, which increases its cost of production. Industrial electricity is not necessarily cheap in India and this matters as a large portion of the total production cost is related to its energy consumption. Further, the cost of producing silicon metal is controlled by the prices of other components such as coal, quartz, oil, natural gas, and electrodes. Quartz mining is concentrated among few players which means India is not likely to be a member of the silicon producing and exporting countries. To ensure overall mineral security and to acquire equity assets, India has plans to set up a joint venture company namely Khanij Bidesh India Ltd. (KABIL) with the participation of three central public sector enterprises namely, National Aluminium Company Ltd. (NALCO), Hindustan Copper Ltd.(HCL) and Mineral Exploration Company Ltd. (MECL). KABIL is expected to carry out identification, acquisition, exploration, development, mining, and processing of strategic minerals overseas for commercial use and meeting country's requirement of these minerals. India's experience in acquiring oil and gas equity assets for energy security had only modest success but that experience may enrich India's quest for mineral security.



Source : orfonline

AUSPICIOUS ARRIVAL OF INDIA'S FIRST FSRU AT H-ENERGY'S JAIGARH TERMINAL

ON THE AUSPICIOUS DAY OF MAHASHIVRATI, 1ST MARCH 2022, THE HÖEGH GIANT, INDIA'S FIRST FLOATING STORAGE AND REGASIFICATION UNIT (FSRU) ARRIVED AT H-ENERGY'S JAIGARH TERMINAL IN MAHARASHTRA.

This historic moment emphasises H-Energy's commitment to be a significant contributor to the Indian LNG sector as well as its focus on sustainable and green energy solutions. With the berthing of the FSRU, it will now be gearing up towards commissioning it in the coming weeks.

said "We welcome the FSRU with immense pride to our Jaigarh terminal. This will be India's first FSRU-based LNG terminal and it marks a new chapter in India's mission for accelerated LNG infrastructure growth. We are proud to be part of India's net-zero transition road map."

The FSRU has a storage capacity of 170,000 cubic metres and has an installed re-gasification capacity of 750 million cubic feet per day (equivalent to 6 million tons annually). The Höegh Giant will deliver re-gasified LNG to the 56-km long Jaigarh-Dabhol natural gas pipeline, connecting the LNG terminal to the national gas grid. Additionally, the facility will be capable of reloading LNG onto other LNG vessels for LNG supply to other terminals as well as reloading onto small-scale LNG vessels for bunkering services. The facility will also be capable of delivering LNG through truck loading facilities in near future for onshore retail distribution. The Höegh Giant is equipped with an open loop system using seawater as heating medium and is paired with propane closed loop intermediate regasification system which is an environment friendly system and does not have any adverse effect on surrounding seawater. This system has proven to be more efficient, robust and environment friendly compared to traditional regasification systems. Commenting on the development, **Darshan Hiranandani, CEO, H-Energy**



Mr. Darshan Hiranandani | CEO | H-Energy

Source: henergy

INDIA PRODUCING 81% OF LITHIUM ION BATTERIES FOR E-VEHICLES: GOVT

"INDIA HAS BEEN PRODUCING 81 PER CENT OF LITHIUM ION BATTERIES FOR ELECTRIC VEHICLES IN THE COUNTRY, ROAD TRANSPORT AND HIGHWAY" SAYS MINISTER NITIN GADKARI

Noting that the electric vehicle is a success story, Minister Nitin Gadkari told the Rajya Sabha, in response to a question, that there has been a substantial increase in electric vehicles in India – from 24,600 in 2020, to over 49,500 now. Gadkari also said that several startups in the country are also working on alternate battery technologies. Following the line of Prime Minister Narendra Modi's idea of 'Aatmanirbhar Bharat' he told the house that the government will reduce imports and within two years, the use of clean fuel, alternative fuel, and bio-fuel will increase in the country. To CPI-M member John Brittas who asked about the Centre's model policy to promote EVs, Gadkari said that GST rate for EVs are only five percent. He also said that the alternative power sources should be focused upon. Calling "green hydrogen" the fuel for the future, he noted that it is being used across Europe. Responding to Congress lawmaker Jairam Ramesh's question if the government has a plan to phase out petrol and diesel vehicles in the country over the next few years, Gadkari said that the government has launched scrapping policy to tackle the issue. He further said the shift towards electric vehicles would be a natural choice of people because of its benefits financially as well as it being good for the environment. However, he also said that he would not commit any target towards the phase-out but the scenario will change in three years.



Source: IANS

ROOFTOP SOLAR COST DOWN BY 50 PER CENT IN LAST 7-8 YEARS: MNRE

MINISTER RK SINGH ALSO TOLD THE HOUSE THAT TO PROMOTE AND MAKE THE ROOFTOP SOLAR (RTS) SYSTEMS AFFORDABLE IN THE COUNTRY, THE GOVERNMENT HAS TAKEN VARIOUS INITIATIVES.

Overall cost of the rooftop solar system has come down by 50 per cent during the last seven-eight years, making it more competitive, Parliament was informed. "The cost of the rooftop solar systems in the country has become competitive with the reduction of cost of Solar PV panels and the overall cost of these systems has reduced by around 50 per cent during the last 7-8 years," New & Renewable Energy Minister R K Singh said in a written reply to the Rajya Sabha. Singh also told the House that to promote and make the rooftop solar (RTS) systems affordable in the country, the government has taken various initiatives that include launch of 'Grid Connected Rooftop and Small Solar Power Plants Programme' in December 2015 targeting 2100 MW RTS capacity addition by 2019-20 through Central Financial Assistance (CFA). Various efforts have resulted in achievement around six gigawatt of cumulative rooftop solar capacity in the country as of February 28, 2022. The Ministry has not made any projection of generation capacity of rooftop solar by 2030, he stated. In another reply, the minister stated that rooftop solar plants of aggregate

capacity 547 MW have been installed at 8,301 government buildings as of March 9, 2022. A total of 152.90 GW of renewable energy capacity projects (including large hydro) have been installed in the country as of February 28, 2022, which includes 50.78 GW from solar power, 40.13 GW from wind power, 10.63 GW from Bio-power, 4.84 GW from small hydro power and 46.52 GW from large hydro power, Singh told the House in another reply. Renewable energy projects of 72.61 GW capacity are under various stages of implementation. A total of 50.78 GW of solar energy capacity has been installed and 44.27 GW capacity are various stages of implementation.



PANASONIC LIFE SOLUTIONS INDIA COMMISSIONS A 6 MWP ROOFTOP SOLAR PROJECT IN RANJANGAON MAHARASHTRA

The project aims to contribute towards environmental sustainability and support India's energy transition goals. The energy produced from this plant will be utilized for in-house captive consumption. **Dinesh Aggarwal, Joint Managing Director, Panasonic Life Solutions India Pvt. Ltd.** said, "The commissioning of the prestigious 6 MWp solar plant is another major achievement for us, despite the global pandemic. Our focus remains on providing sustainable solutions to corporates with our expertise in turn-key solar installation and maintenance services. This will boost the momentum towards achieving the energy transition goals for India. Through our global proficiency in the renewable energy space, we will continue to strengthen our network and facilitate further expansion and growth in this space." The state-of-the-art designed solar rooftop project has been installed on multiple roofs within the factory premises using high efficiency 445 Wp Half cut Mono PERC Solar modules of 'Anchor by Panasonic' and high efficiency 110 kW string inverters. This plant will help generate approx. 91 lakhs kWh of solar energy annually and assist in eliminating almost 8,500 tons of CO2 emissions. Speaking about the joint initiative, **Rakesh Baweja – Senior Vice President, from FIAT** said, "We are happy to associate with Panasonic Life Solutions India in an endeavor to promote green energy shift in our manufacturing processes. Today, we have about 18% of green energy being utilized at our plant, and we intend to increase it up to 35%-40% of our total energy requirement. We aim to enhance our sustainability efforts by utilizing more green energy resources in our manufacturing operations. We commend the PLSIND team's adherence to meticulousness and best practices at each stage of the project and overall support extended to set up this 6 MWp roof-top solar plant successfully." The plant is also equipped with zero power export to ensure that no energy is injected to the grid. Thereby, utilizing 100% of the solar energy capacity within the plant premises. PLSIND will also be looking at the operations and maintenance of the plant to monitor energy generation and to ensure maximum output from the solar plant.

TO KNOW MORE ABOUT PANASONIC LIFE SOLUTIONS INDIA SOLAR BUSINESS:

At PLSIND, we have been contributing to India's solar energy business since 2015 and have installed 100+ MWp projects till date. The company delivers end-to-end solar solutions in the form of solar modules, solar inverters, and solar streetlights. Also, PLSIND's solar engineering, procurement, and construction (EPC) services include rooftop and ground-mounted solar installations. It recently installed a one-of-its kind 10 MWp, agrovoltaics, ground-mount project in association with a leading solar project developer company. Similarly, we aim at deploying our solar energy solutions across enterprises to drive the common agenda for clean energy in India. The larger goal is to contribute to the overall "Aatmanirbhar Bharat" mission and help achieve India's carbon neutrality goals.



Mr. Dinesh Aggarwal, | Joint Managing Director | *Panasonic Life Solutions India Pvt. Ltd.*



Mr. Rakesh Baweja | Senior Vice President | *FIAT*

Source : ANI

THE ECONOMICS OF WATER AND INDIA

THE TOTAL WATER DEMAND IN INDIA IS EXPECTED TO RISE BY OVER 70% BY 2025. A HUGE DEMAND-SUPPLY GAP IS EXPECTED IN THE COMING YEARS. THREE-QUARTERS OF INDIAN DISTRICTS WITH AROUND 64 CRORE PEOPLE, ARE HOTSPOTS FOR WATER-RELATED DISASTERS.

Water is a critical part of our environment but the last century saw surface and ground water quality deteriorating due to human-related activities such as mining, livestock farming, industrial, municipal and agricultural waste disposal, soil erosion and heavy metal pollution. In countries that are water-stressed this has a huge impact. India, one of the 17 countries facing the highest levels of water stress in the world has seen unprecedented strain on water resources in recent years. The reasons for this are many. The changing pattern of the Indian monsoon reflecting global climate change is one, but mismanagement of the water resources is another key factor. While India has one of the largest irrigation systems globally, it has high levels of inefficient water use. Agriculture in India that clocked a share of 20% of GDP in 2020-21 for the first time in 17 years is extremely inefficient in its use of water even as it uses up 80% of all water resources in the country. Depletion of the groundwater with extraction being more than recharge also contributes to the water stress.

The total water demand in India is expected to rise by over 70% by 2025, a huge demand-supply gap is expected in the coming years. Three-quarters of Indian districts with around 64 crore people, are hotspots for water-related disasters. To avoid this situation, it will be necessary to make significant investments in sustainable technologies to avoid climate induced economic losses. This will include investments in water infrastructure, an aspect that is neglected at present. If action is not taken now, the situation is likely to deteriorate further by 2050 with demand exceeding supply leading to a likely 6% loss in GDP. The past three decades have seen a deterioration in the canal system of irrigation accompanied by an increased reliance on groundwater. Increasing private investment in the tapping of groundwater and construction of wells in cities and small towns has led to 75% of the water economy dependant on self-supply. This is leading to pollution, contamination and decay of rivers, water bodies, wetlands and groundwater resources with resulting shrinking of per capita availability of water and water resources. Action needs to be taken immediately to strengthen the water infrastructure with strong policies and regulations accompanied by robust investments. It is only then that that gap between availability and utilization, demand and supply of water resources can be bridged.

Another aspect that can help India manage its water resources is the use of sustainable technologies such as renewable energy for power. Energy is one of the basic needs of life with the need for energy increasing day by day. The consumption of fossil fuels has resulted in serious ecological problems with climate change becoming a threat to not just natural habitats but the health of all living creatures. Tackling this with energy from renewable resources rather than fossil fuels has led to a focus on renewable energy for sustainable growth. In addition to being clean energy, solar and wind power require zero or little water use enabling India to meet its power needs without carbon emissions or consuming water. In a country with a growing population and farms and industries competing for the scarce commodity, renewable energy can help to better manage the



limited water resources. Studies show that India can reduce its water consumption intensity by more than 25 percent just through meeting its renewable energy targets¹.

Solar power is also capable of enabling access to clean water in areas without basic clean water. This has been successfully demonstrated in Indonesia, a country that owns considerable water resources but lacks safe fresh water in most of the remote areas. A small-scale water treatment system powered by solar thermal or PV comes at a low capital cost with the added benefits of ease of operation and low maintenance. With WaterAid's water quality index (WQI) ranked India at 120th among 122 countries around the world. An independent water regulatory authority must be set up that monitors water usage, treatment and recharging by industry. There is a need for more incentives at the policy level to implement and scale-up waste water treatment to save groundwater. It is hoped that the development finance institution proposed in India's recent budget will result in a visible change with innovative structuring of financing options for strengthening the water economy!

Source : PTI

SHIPPING MINISTRY INITIATES GREEN PORT PROJECT TO CUT CARBON EMISSIONS

THE USAGE OF RENEWABLE POWER WILL BE PROMOTED FOR PORT ACTIVITIES BY INSTALLATION OF SOLAR POWER PLANTS, ROOFTOP SOLAR, WIND FARMS, FLOATING SOLAR PLANTS, ETC.

The shipping ministry has initiated the green port project for reducing carbon emissions of the maritime industry that, excluding military operations, contributes to 1% of the overall transport sector emissions. In a written reply to a question in Lok Sabha, Union Minister for Ports, Shipping and Waterways, Sarbananda Sonowal said the project is aimed at making the industry fuel-efficient, and a cleaner mode of transportation. The plan involves implementation of sustainable practices in terminal design, development and operation; preparation of environment management and monitoring plan; regulation of the discharges and effluents in the harbor water and minimization through Swachh Bharat initiatives, large plantation activities around port areas etc.

The usage of renewable power will be promoted for port activities by installation of solar power plants, rooftop solar, wind farms, floating solar plants, etc. In another reply to the Lok Sabha, Sonowal said a target of 120 MMT (million metric tonne) has been set for 2024-25 under the Maritime India Vision (MIV), 2030 in order to achieve the overall target of 200 MMT on National Waterways (NWs). The estimated target set for NW-2 and NW-16 for the year 2024-25 are 0.60 MMT and 0.01 MMT respectively. The total cargo movement on NWs during the year 2020-21 was 83.61 MMT.



Comprehensive development of National Waterway-2 by Inland Waterways Authority of India has been approved by the government at a cost of Rs. 461 crore. The project includes construction of Multi-Modal Terminal at Jogighopa, alternate road connectivity to Pandu Port, ship repair facility at Pandu, fairway development, O&M of navigational aids, O&M of fixed and floating terminals, O&M of vessels, consultancy trailing and maintenance of e-portal.

Source: livemint

USE OF NUCLEAR ENERGY FOR POWER GENERATION

THE PRESENT INSTALLED NUCLEAR POWER CAPACITY IN THE COUNTRY IS 6780 MW COMPRISING OF 22 OPERATIONAL NUCLEAR POWER REACTORS. IN ADDITION, ONE REACTOR, KAPP-3 (700 MW) HAS ALSO BEEN CONNECTED TO THE GRID IN JANUARY- 2021.

India is not very rich in fossil fuel resources and considering the large and growing energy demand, all energy sources are deployed optimally. Nuclear power is a clean and environment friendly base load source of electricity generation, which is available 24X7. It also has a huge potential and can provide the country long term energy security in a sustainable manner. Expansion of nuclear power capacity will help in the country's energy transition for meeting the goal of net zero economy.

"Hon'ble Prime Minister in his statement at COP26 Summit held in Glasgow has stated that India will reach its non-fossil energy capacity to 500 GW by 2030 and India will meet 50 percent of its energy requirements from Renewable Energy by 2030."

In this regard, total of 79 no. of hydro schemes with an aggregate capacity of more than 30000 MW (comprising 11 Pumped Storage Schemes of 8700 MW) have been envisaged for capacity addition during the period 2019-2020 to 2029-30. This include 12663.5 MW of HE projects under construction for providing benefits during this period. Out of the above 79 projects, 5 hydro schemes with capacity of 1023 MW have since been commissioned. The existing nuclear power capacity of 6780 MW is going to be increased to 22480 MW by the year 2031 on progressive completion of projects under construction and accorded sanction. More nuclear power plants are also planned in future. Similarly a total capacity of 31665 MW of coal based capacity are in the various stages of construction. This information was given by Minister of State for Personnel, Public Grievances & Pensions and Prime Minister's Office, Dr. Jitendra Singh in a written reply in Rajya Sabha.

RENEWABLE ENERGY STARTUP SPAN.IO RAISES \$90 MILLION IN FUNDING

RENEWABLE ENERGY STARTUP SPAN.IO INC. WANTS TO GIVE CONSUMERS MORE CONTROL OVER HOW THEIR CARS AND HOMES ARE POWERED.

Founded in 2018, Span is best known for its smart electrical panel, which allows homeowners to use an app to monitor power consumption and optimize it by adjusting and prioritizing their electrical circuits. The San Francisco-based company has just raised \$90 million in funding, which will go in part toward continuing to build products that rest upon that technology. The company announced its first foray outside of the electrical panel market last October with Span Drive, a \$500 electrical vehicle charger that connects to the company's \$3,500 electrical panel to allow people to customize the energy source that's charging their car. The Span Drive serves as an entry into the electrical vehicle charging market that has rapidly grown as a result of increasing consumer demand and government regulations. **Arch Rao, founder and chief executive officer, said** “*Electrical vehicles will increasingly be the first point of entry for consumers shifting toward renewable energy. They are more accessible than solar panels, which aren't suitable for all houses, and are an appealing investment particularly amid rising gas prices,*” who was previously the product head for Tesla Energy. But charging electrical cars efficiently at home can require upgrades to residential electrical systems — which is where Span's smart panel and charger aim to step in. “*Customers are either having to be limited at how fast they can charge their car or spend thousands of dollars in upgrading their services,*” Rao said in an interview. “I think that's the core product functionality that's differentiated for us.”

times will become increasingly useful as consumers replace fossil fuels with electricity in powering cars and home appliances, like stoves. We as a country and frankly, as the world, need to shift to electrifying everything,” Smithies said. “Having intelligent panels in the houses potentially decreases the total amounts of billions of dollars of investments you need to put into the grid.”



Rao mentioned “*The company will invest more in research and development for products to service multifamily residential homes, in addition to single-family homes. Span will also be announcing a new set of products early next year outside of both the electrical vehicle and panel spaces. We've seen over the last 15, 20 years, the relevant role that solar has played in the industry and now subsequently electric vehicles,*” Rao said. “*We think the next most important thing is for us to electrify all of our homes. That's our North Star.*” The most recent investment round, led by Fifth Wall Climate Tech and Wellington Management Group, brings the company's total funding to \$134 million. **Greg Smithies, a managing partner at Fifth Wall, said** “*Span's smart electrical panels have already created the “brains and infrastructure” for faster car charging. Smithies said the ability to prioritize which areas of a house require the most power at various*



Mr. Arch Rao | founder and chief executive officer | **SPAN**



Mr. Greg Smithies | Managing Partner | **FIFTH WALL**

Source: Bloomberg

CAMBRIDGE POWER ACQUIRES GLASGOW BATTERY SITE

PROJECT RIGHTS INCLUDE A 40-YEAR LEASE AND A GRID CONNECTION FOR A 29MW ENERGY STORAGE FACILITY

Energy storage developer Cambridge Power has acquired a site in Glasgow, Scotland, with project rights for a 29MW battery from Savills. The deal provides for a 40-year lease with a current annual rental of £50,000 reviewed bi-annually. Savills secured a grid connection for the battery, which was then offered to a hand-picked list of 55 parties. Initial round bids were received from 11 of them. Oli King, from Savills' energy team, said: "There is an urgent need to be able to store electricity and the level of interest in the opportunity this site presented proves the point. *"We have a database of parties who are looking to acquire such sites and it is clear the transactional side of this sector is growing rapidly, although the supply of new sites is short."*



Source: renews

ADANI GROUP SIGNS DEAL FOR TWO POWER PROJECTS IN SRI LANKA

ADANI GROUP HAS SIGNED A DEAL FOR TWO LARGE POWER PROJECTS IN SRI LANKA'S NORTHERN PROVINCE, SIX MONTHS AFTER IT SECURED A STRATEGIC PORT TERMINAL PROJECT IN COLOMBO.

The agreement has not been officially announced by Sri Lanka, Adani Group or Indian authorities to jointly execute renewable power projects in Mannar, on the northwest coast of Sri Lanka, and Pooneryn, located south of the Jaffna Peninsula. However, the Ceylon Electricity Board (CEB) also signed execute renewable power projects in Mannar, on the northwest coast of Sri Lanka, and Pooneryn, located south of the Jaffna Peninsula. However, the Ceylon Electricity Board (CEB) also signed a Memorandum of Understanding (MoU) with Adani Green Energy Limited. The two renewable energy projects involving the Adani Group focus on generating a combined capacity of 500 MW at \$500 million. Both the projects are in the Northern Province, where New Delhi objected to a Chinese energy project. The agreement was signed on the same day National Thermal Power Corporation (NTPC) and CEB agreed to set up a 100 MW solar power project in Sampur, in east Trincomalee district. The development comes after Gautam Adani, Chairman of Adani Group, visited Sri Lanka and held talks with President Gotabaya Rajapaksa on possible investments in Sri Lanka. The team visited the northern Mannar district to explore the potential for wind power projects. India's involvement in Sri Lanka's renewable energy projects comes alongside the administration of Rajapaksa on cleaner energy. Sri Lanka has a daily peak demand of over 2000 MW and is currently experiencing a severe shortage of fuel and power, causing long power cuts across the country.



Source: constructionworld

URBAN INDIANS BEAT SPACE CRUNCH BY INVESTING IN DIGITAL SOLAR POWER

WITH MANY CITY-DWELLERS UNABLE TO INSTALL SOLAR PANELS, START-UPS OFFER THEM THE OPPORTUNITY TO INVEST IN SOLAR POWER PRODUCTION ELSEWHERE IN RETURN FOR GREEN ELECTRICITY CREDITS.

Suraj Vallamkonda, 29, bought a new electric scooter as a step towards reducing his carbon footprint and tackling climate change. But when he plugged it in to recharge, he realised he was using fossil fuels to power his scooter, not green energy. One solution, he knew, would be to install solar panels on his rooftop. But his home terrace, with its thriving herb garden, did not have enough space for panels, so he decided to invest instead in “solar biscuits”, or portions of panels in an existing system. Vallamkonda tapped into solar power produced miles away via a start-up business that helps meet individuals’ clean energy needs at home with power produced by solar panels mounted on big malls, schools and other sites across India. The Bengaluru resident invested in solar panels virtually, earning him credits that offset his electricity bill at home. Start-ups like Sunday Grids are making rooftop solar power accessible to urban Indians like Vallamkonda and boosting India’s ambitious renewable energy programme, which aims to move the nation away from its reliance on fossil fuels like coal.



Source : PTI

JA SOLAR TO INVEST RMB 10 BILLION FOR THIRD PHASE EXPANSION AT ITS BASE IN QUJIN

JA SOLAR’S PRODUCTION BASE IN QUJING WILL UNDERGO THIRD-PHASE EXPANSION TO RAISE ITS CELL PRODUCTION CAPACITY BY 10GW AND ITS MODULE PRODUCTION CAPACITY BY 5GW. THE INVESTMENT FRAMEWORK AGREEMENT FOR THE THIRD-PHASE EXPANSION WAS SIGNED BETWEEN THE REPRESENTATIVES FROM JA SOLAR AND THE OFFICIALS FROM THE GOVERNMENT OF QUJING ON MARCH 5 IN BEIJING.

In the third-phase expansion, JA Solar will invest RMB 10 billion to build a 10GW production facility for high-efficiency PV cells and a 5GW production facility for PV modules. They will be located near the wafer and ingot production facilities that the company is currently setting up in the city’s economic and technological development zone. Earlier in August 2020, JA Solar initiated a RMB 5.8 billion project to establish 20GW of ingot and wafer production capacity in Qujing. In a related article posted by Yicai Global on March 8, JA Solar also stated that Chinese securities regulator has greenlighted its plan to raise RMB 5 billion through the issuance of non-public shares over the next 12 months. Qujing has recently experienced a solar boom. Besides JA Solar, LONGi also announced on March 4 that it has further upgraded the plan to expand its wafer and ingot production capacity in Qujing. The company and the municipal government have signed a supplemental agreement to the investment agreement that was inked in September 2020. Instead of setting up 20GW of production capacity for mono-Si wafers in the economic and technological development zone of the city as originally envisioned, LONGi is going to add another 10GW to bring the local wafer production capacity to a total of 30GW. As for the local ingot production capacity, LONGi is sticking with the original target of 20GW.



Source: energytrend

TATA POWER SIGNS MOU WITH ENVIRO TO DEPLOY EV CHARGING POINTS IN GURUGRAM

UNDER THE AGREEMENT, TATA POWER WILL INSTALL 59 EV CHARGING POINTS AT VATIKA GROUP'S PROPERTIES SPREAD ACROSS 18 LOCATIONS

Tata Power, one of India's leading electric-vehicle charging infrastructure providers, has collaborated with Enviro – the facility management wing of the NCR-based real estate developer Vatika Group to install 59 EV charging points at its properties across Gurugram, Haryana. The EV chargers will be installed at 18 locations across the properties of Vatika Group in Gurugram. These chargers will be made available as Public Charging Stations and Semi-Public based on the nature of the premises. As a result, commuters can have easy access to the chargers, thus encouraging them to use battery-powered vehicles. This collaboration will be vital in accelerating e-mobility adoption across EV users in NC National Capital Region (NCR). On this occasion, **Mr Sandeep Bangia, Head- EV – Tata Power said** “Our collaboration with the Vatika Group to deploy electric vehicle charging stations in Gurugram is proof of our relentless support to green mobility. The millennial city will see EV adoption at a far faster rate as a result of our partnership and will set an example for other cities in terms of EV adoption.” “Latest estimate shows a need of more than 400000 EV charging stations in the country, by

2026. We at Enviro are equally excited about this collaboration with Tata Power, as this preempts the customer's ever-growing curiosity regarding the EV. This would indeed increase the acceptability among the masses and push the use case for EV as the new choice”. Mr Ajay Kumar Singh, President and CEO, Enviro. Tata Power has been rapidly setting up EV charging infrastructure across the country, helping India adopt environment-friendly mobility. The company already has a partnership with Apollo Tyres, HPCL, TVS Motors, amā Stays & Trails, Lodha Group, and others to set up and enhance the EV charging infrastructure. The company has deployed over 1300 EV charging points across different cities under the EZ Charge brand along with a digital platform to facilitate an easy & smooth customer experience. This network of public EV charging stations provides innovative and seamless EV charging experiences for EV customers across Offices, Malls, Hotels, Retail Outlets, and places of public access, enabling clean mobility and freedom from range anxiety. Enviro has been a pioneer in Delhi – NCR ever since 2019, with the concept of E-Scoters and E-Rickshaws as a means of last-mile connectivity for the residential and commercial sites managed by the group.



ADANI POWER MAHARASHTRA ASKS MSEDCL TO PAY RS 10,135 CR IN 4 WEEKS

Adani Power Maharashtra Ltd (APML) has shot off a letter to Maharashtra State Electricity Distribution Co. Ltd for payment of Rs 10,135 crore toward supply of electricity by APML following the apex court's direction to pay at least 50 per cent of the outstanding dues. Referring to the Supreme Court order on January 31, 2022, the letter reviewed by PTI said Maharashtra State Electricity Distribution Co. Ltd (MSEDCL) is required to pay 50 per cent of the outstanding amount to APML within four weeks. "We request you to kindly release Rs 10,135 crore being 50 per cent of the outstanding claimed amount on or before February 28, 2022 and comply with the Supreme Court order," the letter dated February 1, 2022, said. "This letter is without prejudices to our rights and contentions under the Power Purchase Agreements and applicable law," it said.

Taking note of the rising discoms' outstanding dues in the country which have crossed Rs 1 lakh crore, the Supreme Court noted that if state-run power distribution companies do not promptly clear dues to electricity generators, the latter will shut and there will be no electricity. The warning came from a bench comprising Chief Justice N V Ramana and Justices A S Bopanna and Hima Kohli on plea of APML which had sought at least 50 per cent payment of dues for power supplied to MSEDCL. The bench directed MSEDCL to pay 50 per cent dues to APML within four weeks. According to PRAAPTI (Payment Ratification And Analysis in Power procurement for bringing Transparency in Invoicing of generators) portal, total outstanding dues of power distribution firms are Rs 1,17,600 crore as of February 2022. As per the portal, total dues of discoms in Maharashtra are Rs 21,070 crore. APML is the largest coal-based thermal power plant in Maharashtra. The plant has a capacity to generate 3300 MW power through its 5 units of 660 MW capacity each at Tiroda in district Gondia.

Source: PTI

LOG9 PARTNERS WITH JITENDRA NEW EV FOR BATTERY TECH IN ELECTRIC SCOOTERS

LOG9 HAS PARTNERED WITH JITENDRA NEW EV TECH PVT. LTD. FOR BATTERY TECH IN ELECTRIC SCOOTERS. THE COMPANY WILL SOON ROLL OUT AN ELECTRIC SCOOTER NAMED 'JMT 1000 HS RAPID'.

Bengaluru-based advanced battery technology start-up, Log9 Materials, has joined hands with Nashik-based EV manufacturer Jitendra New EV Tech Pvt. Ltd. Both the companies have signed a Memorandum of Understanding (MOU) for a long-term collaboration which would mainly encompass rolling out an electric scooter named 'JMT 1000 HS Rapid' InstaCharged, claimed to be powered by Log9's cutting-edge InstaCharge technology. The JMT 1000 HS Rapid e-scooters, manufactured by Jitendra New EV Tech and InstaCharged by Log9's RapidX batteries, will be introduced to target the last-mile logistics and delivery segment in India. The company claims that its InstaCharge batteries will provide 9x faster charging, 9x better performance, and 9x battery life than typical e-scooters. Moreover, they are claimed to offer a maximum range of upto 82 km and upto 150 kg. payload capacity.



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Speaking about the collaboration, **Kartik Hajela, Co-Founder & COO, Log9 Materials** says, "We are pleased to partner with Jitendra New EV Tech for the integration of Log9's battery packs and InstaCharge technology into the Rapid EV 2Ws manufactured by them. As a Responsible Energy pioneer, we are confident that our InstaCharge batteries on JMT scooters will provide the much-needed Power, Performance and Peace of Mind for the B2B last-mile delivery sector and shall further help the cause of reducing operational costs as well as lowering emissions footprint for the delivery and logistics sector."



“

CA Samkit Jitendra Shah, Co-Founder, Jitendra New EV Tech says, "We are very enthusiastic about and looking forward to this alliance with Log9. Today when India has entered the electrification era, the biggest challenge is ensuring optimal EV Charging. To this end, Log9's technology will give the market huge impetus especially for the B2B segment, and will further endorse 24x7 last-mile deliveries with electric scooters. We are further happy to note that this technology will raise the bar for last-mile delivery on wheels."



Source: financialexpress

MACQUARIE ASSET MANAGEMENT CONSORTIUM AGREES TO ACQUIRE REDEN SOLAR

MACQUARIE ASSET MANAGEMENT, IN A CONSORTIUM WITH BRITISH COLUMBIA INVESTMENT MANAGEMENT CORPORATION (BCI) AND MEAG, HAS REACHED AN AGREEMENT TO ACQUIRE REDEN SOLAR FROM INFRAVIA CAPITAL PARTNERS AND EURAZED FOR AN ENTERPRISE VALUE OF €2.5 BILLION.

Reden Solar develops, finances, builds and operates solar power plants across Europe and Latin America, with a 762 MW operational portfolio and a 15 GW development pipeline. Headquartered near Toulouse, Reden Solar has an established presence in France and Spain as core markets, and has recently expanded its footprint into Greece and Italy.



Thierry Carcel, Chief Executive Officer of Reden Solar, said “We are delighted to have Macquarie, BCI and MEAG support the next phase of our growth ambitions. Our business is continually evolving from predominantly rooftop solar, into ground mounted and agrivoltaic projects. With the backing of our new shareholders, we look forward to expanding Reden Solar’s presence in existing and new markets, as well as developing our teams on the ground.” **Stéphane Brimont, Head of France, Benelux and Greece at Macquarie Asset Management, said** “Reden Solar’s geographically diverse platform provides an exceptional opportunity to scale up its development pipeline to help meet net zero targets across Europe. Their management team has a proven track record of developing projects in core as well as new European markets. We are excited to support them over the long-term as they build out their business and maximise their contributions towards the low-carbon transition.”



Lincoln Webb, Executive Vice President and Global Head of Infrastructure and Renewable Resources at BCI, said “We look forward to partnering with the management team and staff of Reden Solar in the continued growth and development of the company. In the context of stronger national climate policies and clean energy goals, we believe Reden Solar is well-positioned to continue providing market leadership in the development and operation of solar energy and contributing to global energy transition aspirations.”

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Holger Kerzel, Board of Management, MEAG

“This project fulfills our high expectations for sustainable investments and underlines our commitment to increase MEAG’s exposure in renewable energy. With this investment, we will support the future growth of one of Europe’s leading independent power producers covering the entire value chain of photovoltaic energy production. We are very pleased about this transaction and look forward to a successful partnership with Macquarie, BCI and Reden Solar.”

Macquarie Asset Management’s stake in Reden Solar will be acquired on behalf of institutional investors via Macquarie Global Infrastructure Fund and Macquarie Green Investment Group Renewable Energy Fund 2 (MGREF2). Reden Solar represents MGREF2’s fourth investment, having recently completed the acquisition of Apex Energies Group in France. Macquarie Group is a leading global renewables developer having invested or arranged around €40 billion in green energy since 2010, and with more than 50 GW of green energy projects in development, construction and operation worldwide.



Source: macquarie

ENGIE AND POSCO TARGET GREEN HYDROGEN PRODUCTION IN SUPPORT OF NET-ZERO GOALS

NEW MEMORANDUM OF UNDERSTANDING BETWEEN ENGIE AND KOREAN STEEL-MAKER POSCO TO TARGET GREEN HYDROGEN PRODUCTION IN THE MIDDLE EAST, AUSTRALIA AND LATIN AMERICA.

ENGIE, the global low carbon energy company and POSCO, the world-leading South Korean steel-manufacturer, inked a Memorandum of Understanding (MoU) to explore joint development opportunities for green hydrogen production and related infrastructure in the Middle East, Australia and Latin America. Under the MoU, ENGIE will leverage its existing industrial-scale renewable hydrogen value-chain experience to support POSCO's hydrogen production. The MoU sets to support POSCO's objective of securing a steady, competitively priced supply of green hydrogen, enabling its transition to green steel-making and to participation in green hydrogen economy. The MoU was signed by Frederic Claux, Thermal & Supply Managing Director for Asia, Middle East and Africa and Byeong-Og Yoo, Head of Green Materials & Energy Business Team and Senior Executive Vice President at POSCO. The MOU supports ENGIE's ambition to achieve net-zero carbon by 2045, and POSCO's ambition to realize a green hydrogen base in their steel business by 2050 and become a leader in the age of post-carbon hydrogen in steel-making, fostering the growth of hydrogen ecosystem across the entire value chain. Speaking at the signing of the MoU, **Frederic Claux, Managing Director, Thermal & Supply AMEA, ENGIE**, said, "As this new strategic alliance with POSCO demonstrates, the steel industry is embracing the transition to net-zero as leaders around the world seek to achieve ambitious climate goals. With growing interest in low carbon green steel solutions, we are pleased to be signing this MoU to support POSCO's ambitions. We are convinced that hydrogen is a key energy carrier to drive us forward to a carbon-neutral economy, in addition to renewable energy." Claux added, "By focusing our growth ambitions on renewable energy and green hydrogen production, we can support the most energy intensive industries such as steel production, helping them to reduce their CO2 emissions. This latest partnership is a new milestone for us at ENGIE as we seek to power the transition to the green economy." **Byeong-Og Yoo, Head of Green Materials & Energy Business Team and Senior Executive Vice President at POSCO**, said, "Steel manufacturing is undergoing significant transformation as governments and businesses increasingly embrace the shift toward carbon neutrality. At POSCO, we intend to establish a hydrogen production capacity of seven million tones by 2050 to become a top 10 producer globally in support of the transition to green steel-making." He added, "As part of our strategy to establish a global supply of hydrogen in countries focused on renewable energy and low-cost natural gas resources, ENGIE is a natural fit for our production objectives. With ENGIE's expertise in large-scale renewable hydrogen production, we look forward to working together to codevelop the green hydrogen value chain, advancing our collective net-zero agendas and supporting the wider energy transition." Both parties, will cooperatively explore the business opportunities in potential projects in connection with the production, and supply of hydrogen/ammonia and the development of related infrastructures



Mr. Frederic Claux | Managing Director | Thermal & Supply AMEA, ENGIE



Mr. Byeong-Og Yoo | Head of Green Materials & Energy Business Team & Senior Executive Vice President | POSCO

Source: engiemiddleeast

NEPAL-INDIA AGREES TO INJECT MORE INVESTMENT IN ENERGY SECTOR

DURING THE MEETING, NEPAL HAD REQUESTED FOR APPROVAL OF VARIOUS PROPOSALS SUBMITTED BY NEPAL ELECTRICITY AUTHORITY TO EXPORT ELECTRICITY TO INDIA BEFORE THE COMING RAINY SEASON.

Nepal and India have agreed to build new projects by injecting joint investment in the hydropower sector. As per the agreement reached at Nepal-India Energy Joint Meeting, a joint technical team will be formed to carry out the study as per the proposal made by India. In the meeting that started in Kathmandu, the two countries agreed to build more transmission lines, complete the transmission lines that are under construction and proposed new cross-country transmission lines, completion of Arun 3 hydropower project and energy export and import. According to a press release issued by the Ministry of Energy, Water Resources and Irrigation, Nepal and India have agreed to form a joint technical team consisting of three members from each country to construct a large hydropower project. An official who participated in the meeting said that the same committee will give necessary suggestions on the joint investment that Nepal and India can make in hydropower and transmission lines. The committee will submit a report on which hydropower projects will be jointly invested and which transmission lines will be constructed and expanded to suit them. During the meeting, Nepal had requested for approval of various proposals submitted by Nepal Electricity Authority to export electricity to India before the coming rainy season. *"There has been consensus between the two sides that India would give approval for Nepal's proposal to export power to India from various hydropower projects in Nepal at the earliest as per India's existing rules on power trade,"* the ministry said in a press statement. Nepal is currently allowed to export only 39 MW of project power to the Indian Energy Exchange market. Nepal Electricity Authority (NEA) has also proposed to allow additional 814 MW project electricity to enter the market. Exporting more power to India in the upcoming monsoon season was one of the agenda items of the joint secretary-level Joint Working Group and secretary-level Joint Steering Committee meetings between the two countries held in Kathmandu. *"Indian officials agreed that they would accelerate the approval process before the wet season to help Nepal export power to India,"* said **Chiranjeevi Chataut, joint secretary at the Ministry of Energy, Water Resources and Irrigation.** According to Nepal Electricity Authority (NEA), it has submitted to India a fresh list of hydropower projects by incorporating the projects which were submitted last year too along with a few new ones seeking export approval. The projects include Upper Tamakoshi (456MW), Upper Bhotekoshi (45MW), Kaligandaki (144MW), Marshyangdi (69 MW), Middle Marshyangdi (70MW) and Chameliya (30MW) and Likhu IV (52.4MW) where Nepal wants to export power to India. The meeting also agreed to carry out a study of the possibility of constructing a cross-country power transmission line between Nepal and the Indian state of West Bengal by a joint technical team. The meeting has decided to start using the Dhalkebar-Muzaffarpur 400 kV transmission line to import and export up to 600 MW of electricity. So far, only 350 MW of electricity has been imported from this line.

The two sides also agreed to increase the volume of power to be traded through this transmission line once the 400kV Hetauda

-Dhalkebar-Inaruwa transmission line is completed, possibly by December 2023. Currently, the Dhalkebar-Muzaffarpur Cross-Border Transmission Line is the only power line of 400kV capacity in Nepal. It has also been agreed that a new company will be constituted by April 22 to build the second cross country Butwal-Gorakhpur 400 kV transmission line. Nepal Electricity Authority (NEA) and the Government of India's Power Grid Corporation of India Limited (PowerGrid) will constitute the company for upgrading the new transmission lines. In September last year, the NEA and the Power Grid Corporation of India signed an agreement to build the Indian section of the New Butwal-Gorakhpur cross-border transmission line through joint investment. They have also agreed to implement the transmission service agreement between the NEA and the Power Grid Corporation of India alongside the establishment of the joint venture company. The meeting was chaired by Devendra Karki, Secretary, Ministry of Energy, Water Resources and Irrigation and Alok Kumar, Secretary, Ministry of Power, Government of India.



Source : ians

ENERGY GIANT SHELL, VENTURE CAPITALISTS ANKUR CAPITAL AND APVC INVEST IN OFFGRID ENERGY LABS' PATHBREAKING ENERGY STORAGE 'ZINC GEL' TECHNOLOGY

OFFGRID ENERGY LABS ANNOUNCES UNVEILING OF INNOVATIVE ZINC GEL® TECHNOLOGY FOR SUSTAINABLE & EFFICIENT BATTERIES, PROVIDING ENERGY STORAGE SOLUTIONS FOR STATIONARY & MOBILE APPLICATIONS.

Shell Ventures, Ankur Capital, APVC Singapore invest in Offgrid Energy Labs to deliver first-of-its-kind ZincGel Technology for batteries. Offgrid Energy Labs is supported by: Indian Institute of Technology – Kanpur, Department of Science & Technology, Shell E4 and AVL Austria to test, validate & pilot ZincGel® technology in, to capture a potential \$100 bn global energy storage market. Offgrid Energy Labs, a deep science, Intellectual Property led global innovator unveils its first innovation – rechargeable zinc-based battery (ZincGel®). Backed by investors including Shell Ventures, Ankur Capital, and APVC Singapore, Offgrid Energy Labs aims to disrupt the global energy storage market through new materials and design for stationary batteries. Growing demand for sustainable energy storage has highlighted three key problems with current battery technologies: imbalanced performance, environmental impact, and high prices that are commercially unviable. Offgrid Energy Labs is reimagining these vectors by incorporating unique design, using commonly available recyclable materials, and driving efficient performance through a modular battery technology platform, ZincGel®. Targeting not just the stationary storage market segment, Offgrid Energy Labs' ZincGel® technology provides modular solutions for low powered mobility applications as well. With over 15 patents, design and trademarks for its innovation, ZincGel® battery-tech with breakthrough science, aims to outperform conventional energy storage batteries in terms of power density, battery-life, and cost efficiency. Offgrid Energy Labs innovations are accelerating the shift towards democratized, sustainable, safer and efficient energy storage solutions. The company primarily focuses on renewables energy storage, microgrids, electric vehicle charging and grid applications in utilities. Offgrid Energy Labs was founded in 2018 by four clean-energy enthusiasts – Tejas Kusrkar, Brindan Tulachan, Rishi Srivastava and Ankur Agarwal who share a common vision of providing commercially viable, sustainable energy storage technology. Innovating on core chemistry with Zinc (one of the oldest materials used since the 1800s for batteries) is a vital outcome in the science of energy storage. The founding team believes ZincGel® technology is a credible alternate to lithium-ion technology in most stationary and low powered mobility applications. "This is a significant milestone for us. We have designed ZincGel® as a modular platform that can be



tweaked basis application requirements. With the ability to prioritize between charging speed, temperature stability and energy density, our innovation is focused on addressing a wide variety of stationary & low powered mobility applications," said **Tejas Kusrkar, Co-founder & CEO, Offgrid Energy Labs.** "We are here to transform the narrative from Lithium-ion battery packs to sustainable battery storage serving both the stationary as well as mobility applications. Demand for batteries

is set to skyrocket soon not just in India, but across the globe. What differentiates ZincGel® technology is innovative chemistry, design and democratized materials. We look forward to announcing further strategic pilots that solve vexing problems in the energy storage space," said **Rishi Srivastava, Co-founder, Offgrid Energy Labs.**

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Sanjay Varkey, Director, Shell Mobility, India said "By teaming up with innovative partners, Shell aims to accelerate the development of solutions that provide more and cleaner energy solutions. We are excited to be working with Offgrid Energy Lab going forward and to support their journey as they work to address the gaps in the fast-growing energy storage market." **Ritu Verma, Co-founder and Managing Partner, Ankur Capital** said; "As a deep science investor we at Ankur are very excited to be partnering with the Offgrid Team. Their novel battery chemistry opens up a



range of applications from fast charging to stationary storage solutions for the renewable power sector. The price points, sustainability of materials being used and pilot partnerships that Off-Grid has tied up with, were all reasons for us to invest. We believe the market for such solutions is growing rapidly as we shift towards more renewable energy generation and mobility across the board" With successful pilot runs for its prototype, Offgrid Energy Labs plans to commercially launch ZincGel® products in 18 months. Deploying non-toxic materials that are globally available in abundance, ZincGel® battery technology ensure its faster adoption in energy storage. The company has envisaged two major sources of revenue- through licensing the battery technology and by use of its novel electrolyte by existing battery manufacturers. "Launching out of stealth mode, Offgrid Energy Labs has worked diligently with global energy companies backing its technology and now partnered to station their solutions in relevant applications. We got a golden opportunity to showcase our innovative ideas and scalable business solutions to global investors", **Tejas Kusrkar added.** Offgrid Energy Labs relies heavily on building partnerships to take ZincGel® products to market and is also evaluating manufacturers for their products in India and around the world.



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Source: IANS

2022 MG ZS EV LAUNCHED WITH IMPROVED RANGE, BETTER FEATURES

MORRIS GARAGES HAS LAUNCHED ITS 2022 MG ZS EV SUV IN INDIA AS PROMISED. IT'S NOT AN ALL-NEW CAR BUT A MID-LIFE UPDATE. THE ELECTRIC CAR GETS SOME MINOR TWEAKS IN THE DESIGN AND SOME CRUCIAL ADDITIONS IN THE EQUIPMENT LIST.

The MG ZS EV now comes with a larger battery pack, more powerful motor, improved driving range, bigger touchscreen, and more. More than the gizmos on offer, the additional driving range is what excites most EV enthusiasts, and MG is looking forward to eliminating the range anxiety in EV adopters.

2022 MG ZS EV: FEATURES, SPECIFICATIONS

Usually, auto manufacturers launch the ICE cars and then follow them up with EV versions. But, the Chinese manufacturer MG did quite the opposite. It launched its first electric SUV, MG ZS EV, back in 2020 in India. Later in November 2021, it introduced the ICE version named MG Astor. The MG Astor came with an updated design and in comparison, the MG ZS EV started to look outdated. So, the company has finally decided to give it a makeover. The new front end is somewhat similar to the ICE MG Astor now. The headlamps are sleeker than the outgoing model and get new LED DRLs (Daytime Running Lights), and LED tail-lamps. The MG ZS EV doesn't have an air intake like Petrol/Diesel cars, hence it is devoid of a grille at the front. The charging port is now housed beside the MG logo. It gets new 17-inch Tomahawk alloy wheels, as the brand likes to call them. The highlight of the refreshed EV is the addition of a larger battery pack, which is now a 50.3kWh versus the 44.5kWh of the outgoing model. The brand claims that this SUV can run for 461km (as per ICAT) owing to the hardware update. This is 42km of more driving range than the 419km claimed previously. However, these figures may drop by about 100km in real-life usage. The new battery pack comes with an IP69K rating for water/dust resistance and can withstand high-pressure water and steam cleaning. The 2022 MG ZS EV

gets a 176hp electric motor that churns out 353Nm of torque and drives the front wheels. The bump in power is almost 33hp from the previous iteration and helps the car to catapult from 0-100 in just 8.5 seconds. In terms of creature comforts, the MG ZS EV gets a few tweaks in the interior as well. It gets an updated digital cockpit and a larger 10.1-inch infotainment display with Android Auto, Apple CarPlay, panoramic sunroof, powered driver's seat, and automatic headlamps with wipers. Safety features include six airbags, hill start/ descent control, ESP, electric parking brake with auto hold, lane change assist, blind-spot detection, and rear cross-traffic alerts. The rear passengers will appreciate all three adjustable headrests, centre armrest with cup holders, and rear aircon vents.

2022 MG ZS EV: PRICE, AVAILABILITY

The base Excite variant is priced at ₹21.99 lakh ex-showroom but will be available only in July. The Exclusive variant with all the bells and whistles will cost ₹25.88 lakh ex-showroom. While the price increment for the new models seem just ₹50k to ₹70k, one must not forget that the old MG ZS EV's prices were hiked by ₹50k at the starting of this year, 2022. The refreshed MG ZS EV is available in four exterior colourways, namely Ferris White, Currant Red, Ashen Silver, and Sable Black. MG Motors is offering five years of unlimited kilometres warranty, five years of roadside assistance, eight years/ 1.5 lakh km battery warranty, and five free labour services. MG has also introduced a 5-Way charging infrastructure, which enables you to charge the vehicle via the supplied charging cable, AC fast chargers at home/ office, DC Super-Fast chargers at MG dealerships, via RSA (Road Side Assistance), or via MG's newly introduced public charging network.



Source: onsitego

HERO EDDY ELECTRIC 2-WHEELER LAUNCHED AT RS. 72,000: FEATURES REVERSE MODEL, E-LOCK AND MORE

THE NEW HERO EDDY IS INTRODUCED IN THE INDIAN MARKET AT STICKER PRICE OF RS. 72,000. THE NEW OFFERING FROM HERO ELECTRIC LOOKS FUTURISTIC AND WILL ATTRACT NEW-AGE BUYERS.

The country's leading electric two-wheeler brand – Hero Electric, is strengthening its lineup with the introduction of the Hero Eddy in the Indian market at a price tag of Rs. 72,000. The electric scooter has a stylish design and is claimed to offer easy handling to aid consumers with a perfect balance of convenience and technological advancements during short commutes in the urban runabout to coffee shops, grocery stores and more. The Hero Eddy boasts a long equipment list, which includes features like e-lock, find my bike, reverse mode, large boot space, and follow me headlamps. All of these features enable it in offering a hassle-free riding experience. Buyers will have the option of buying the Eddy electric scooter in two colour schemes – Light Blue and Yellow. Also, it would not require any registration plate or licence to ride the Eddy. Hero claims that it is a futuristic and stylish solution for private last-mile mobility that is pollution-free as well.

“

Mr. Naveen Munjal, MD, Hero Electric, commenting on the Hero Eddy's launch, **“We at Hero are thrilled to announce our upcoming product Hero Eddy that will have an overwhelming on-road presence combining smart features and stylish looks. The scooter is designed keeping in mind individual's conscious efforts to contribute towards carbon-free future combined with a hassle-free ride experience. We are confident that Hero Eddy will make for a perfect alternate mobility choice offering comfort and necessity.”**



Powered by a consistent effort to make a clear distinction from the age-old tradition of ICE vehicles, Hero Electric is attempting to make a difference to the environment with the launch of the Eddy. Moreover, the consumers are mindful of the ever-lasting impact that their vehicles make by polluting the ecosystem. Therefore, a transition to the electric model of transportation will help in cutting down the carbon footprint of the transportation industry. Hence, Hero Electric is betting big on the Eddy to make a significant impact in the Indian market.

Source : *financialexpress*

SUMANT SINHA TAKES OVER AS ASSOCHAM PRESIDENT; AJAY SINGH AS SENIOR V-P

SINHA FOUNDED RENEW POWER IN JANUARY 2011, WITH A VISION TO TRANSFORM THE WAY ENERGY IS PRODUCED AND CONSUMED IN INDIA.

Sumant Sinha, Founder, Chairman and CEO of ReNew Power, a clean energy company, has taken over as President of the Associated Chambers of Commerce and Industry of India (ASSOCHAM). Sinha replaces Vineet Agarwal. Ajay Singh, Chairman & Managing Director of SpiceJet, India's second-largest airline by fleet size, is the new Senior Vice-President of ASSOCHAM. Sinha founded ReNew Power in January 2011, with a vision to transform the way energy is produced and consumed in India. Under his leadership, ReNew Power has grown into India's premier renewable energy company with an aggregate portfolio of more than 10 GW spread over more than 100 sites.

“

It is indeed a great honour for me to be elected as the President of ASSOCHAM, one of the great institutions with a history of over 100 years in its service to the Nation. During my Presidency, my ASSOCHAM colleagues and I will work closely with the government on fulfilling the visionary goal of Prime Minister Narendra Modi for India to become Aatmanirbhar over the Amrit Kaal of the next 25 years, culminating in the Centenary Year of our Independence.



“To achieve the national goals of Aatmanirbhar and Amrit Kaal, we will focus on key strategic priorities such as providing more support to the MSME sector, the country's export push, the energy transition and increasing energy security, and enhancing public-private cooperation, which empowers not only India Inc. but also strengthens the government's efforts to make India a global economic superpower,” said Sinha.

On his election as Senior Vice President of the chamber, Singh said, “ASSOCHAM would continue to play a pro-active role in the endeavour of nation building. We would remain an active partner of the government which requires industry feedback both on macro and sectoral trends. ASSOCHAM has been continuously engaging with the government and we would continue to pursuit this partnership.

Source : *renew power*

ELECTRIC VEHICLES TO GRAB MARKET SHARE SOON; M&M, TATA MOTORS, SONA COMSTAR AMONG TOP AUTOMAKER

THE EV MARKET SHARE IS ESTIMATED TO JUMP SHARPLY TO 10% BY FY25 ON ACCOUNT OF MORE LAUNCHES AND INCREASED CAPACITIES, ACCORDING TO NOMURA. A POTENTIAL RISE IN FUEL PRICES CAN ALSO ACCELERATE THE EV ADOPTION FURTHER.

Electric vehicles are expected to come charging soon and will likely grab a substantial market share from petrol and diesel vehicles in the next three years. Given this, the shares of companies working in the electric vehicles sector are likely to rally. Analysts at Nomura are bullish on stocks of Sona Comstar, Bharat Forge, Sansera Engineering, Motherson Sumi, M&M, Tata Motors and Ashok Leyland. The Indian auto industry has been hit by semiconductor chip shortage. Despite this, the market share of electric vehicles in the retail two-wheeler segment increased to around 3.2%. Going forward, the EV market share is estimated to jump sharply to 10% by FY25 on account of more launches and increased capacities, according to Nomura. A potential rise in fuel prices can also accelerate the EV adoption further.

EV MARKET SHARE TO JUMP SHARPLY IN NEXT 3 YEARS

EV share is estimated to jump sharply to around 4%, 8%, 10% in FY23, FY24 and FY25 respectively on account of more launches and increased capacities. A potential rise in fuel prices can also accelerate the EV adoption further. "At the same time, battery cell costs have also been rising. However, OEMs have not raised prices so far due to increased competition. This could further hurt margins if the EV mix were to rise for incumbents, in our view, Nomura said.

Rising electrification and content per vehicle will be key value drivers for suppliers, according to the brokerage. "Within our coverage, we prefer Sona Comstar, Bharat Forge, Sansera and Motherson as our key picks. Among our covered OEs, we prefer M&M, Tata Motors, and Ashok Leyland," Nomura said.

INDUSTRY OUTLOOK

Potential rise in fuel prices could increase downside risks to growth estimates...

Analysts at Nomura highlighted that recent industry and dealer interactions indicate that retail demand has remained subdued, especially in two-wheelers, while passenger vehicle sales have been improving with improvements in chip supplies. However, the demand seems to be skewed towards CNG and new launches, where supply constraints have been impacting sales." We have been concerned about the weakness in mass segments. We believe a potential rise in fuel prices in March-22 could increase downside risks to our estimates," it said.

PRICE HIKES MAY BE REQUIRED TO SUPPORT MARGINS

In terms of costs, the Commodity Cost Index has started inching up and is around 50-100bp higher for passenger vehicles and around 150-200bp higher for 2-wheelers currently vs the 3QFY22 levels. Hence, further price hikes may be required in 1QFY23F to support margins if the current trend persists,



according to Nomura analysts. Meanwhile, rising electrification and content per vehicle will be key value drivers for suppliers, in Nomura's view.

PVS: INDUSTRY WHOLESALE VOLUMES LIKELY TO BE FLAT

Industry retail volumes are likely to remain flat on-year for February 2022. The brokerage expects Maruti Suzuki's domestic PV volumes to be down 7% on-year. Overall volume is estimated to be flat on higher exports. It expects MM's tractor volumes to decline 29% on-year on a high base. Overall, PV industry volumes are expected to grow 14% for FY22F and 20% in FY23F.

TWO-WHEELERS: INDUSTRY WHOLESALE VOLUMES LIKELY TO BE DOWN 24%

Nomura estimated industry retail sales to be down around 5% on-year in Feb 2022. "We estimate ~27%/14% volume declines for Hero Motocorp/Eicher and -9%/-12% for TVS /Bajaj Auto. Given the subdued demand, we see downside risks to our estimate of -7%/11% industry volume growth in FY22/23F," it said.

Source: *financialexpress*

DVC, NTPC FORM JV FOR RENEWABLE POWER PROJECTS

DVC WILL HOLD 49 PER CENT AND NTPC RENEWABLE WILL HOLD 51 PER CENT IN THE JV COMPANY TO IMPLEMENT RENEWABLE ENERGY PARKS AND PROJECTS INCLUDING THOSE APPROVED UNDER ULTRA MEGA RENEWABLE ENERGY POWER PARKS SCHEME AND CPSU SCHEME. DVC DID NOT PROVIDE ANY FURTHER DETAILS. SOURCES SAID THIS JV WILL EXECUTE GW SIZE PROJECTS.

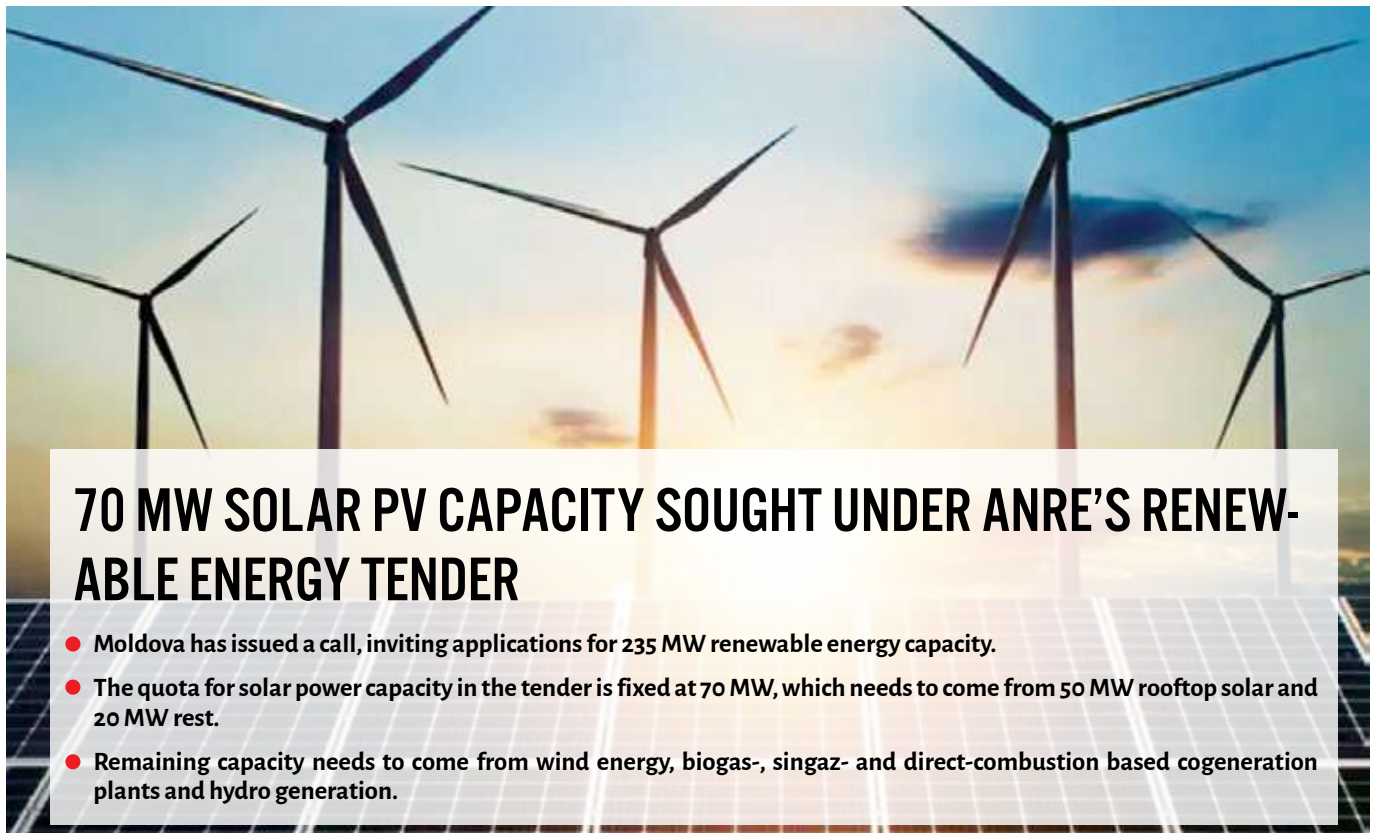
Damodar Valley Corporation (DVC) said it signed a joint venture agreement with NTPC Renewable Energy Ltd, a fully owned subsidiary of the NTPC Limited, for renewable power projects in its command area.

DVC will hold 49 per cent and NTPC Renewable will hold 51 per cent in the JV company to implement renewable energy parks and projects including those approved under Ultra Mega Renewable Energy Power Parks Scheme and CPSU scheme. DVC did not provide any further details. Sources said this JV will execute GW size projects.



The JV with NTPC was not linked to the MoU signed by DVC with another state-owned entity SJVN Limited for harnessing potential solar energy of about 2000 MW available under the DVC Command Area.

Source: PTI



70 MW SOLAR PV CAPACITY SOUGHT UNDER ANRE'S RENEWABLE ENERGY TENDER

- Moldova has issued a call, inviting applications for 235 MW renewable energy capacity.
- The quota for solar power capacity in the tender is fixed at 70 MW, which needs to come from 50 MW rooftop solar and 20 MW rest.
- Remaining capacity needs to come from wind energy, biogas-, singaz- and direct-combustion based cogeneration plants and hydro generation.

The National Agency for Energy Regulation (ANRE) in Moldova has launched a tender to procure electricity from 235 MW renewable energy capacity, comprising 70 MW to come from solar PV in the form of 50 MW rooftop solar and 20 MW from other installations. The other capacity will be sourced as 15 MW from wind energy, 100 MW biogas-based cogeneration, 15 MW singaz-based cogeneration, 30 MW of cogeneration plants using direct combustion, and 5 MW hydro installations.

For non-intermittent renewable sources of electricity generation, applications can be submitted starting from April 1, 2022, while for wind energy projects submissions can be made from April 8, 2022. The Moldavian solar tender comes close after 2 other Eastern European countries have published renewables' tenders. Romania announced a renewables tender with a capacity close to 1 GW end of March, with its Energy Minister Virgil Popescu saying that such 'investments means long-term solutions for the energy security of our country'. Energy market operator of Croatia, Hrvatski Operator Tržišta Energije (HROTE) has opened a competitive auction round to allocate a total of 622 MW of new renewable energy capacity, comprising 300 MW of solar energy projects of larger than 500 kW (see Croatia Announces 622 MW RE Auction).

Source: taiyangnews

GOLDI SOLAR POWERS SURAT'S FIRST SOLAR-POWERED TEXTILE MARKET FOR AVADH GROUP

GOLDI SOLAR, A GLOBAL SOLAR PANEL MANUFACTURER AND EPC SERVICES PROVIDER HAS SOLARIZED SURAT'S FIRST TEXTILE MARKET FOR AVADH GROUP. AVADH IS A REPUTED REAL ESTATE COMPANY WITH ULTRA MODERN RESIDENTIAL AND COMMERCIAL PROJECTS ACROSS THE COUNTRY. THE MARKET IS LOCATED IN THE HEART OF UMARWADA, SURAT DISTRICT.

The project will be completed in three phases, of which the first 100 KW has been commissioned. Goldi Solar's high-efficiency modules will generate 497,400 KWh power annually and offset 47.1 tons of CO2. Avadh Textile Market is expected to save 37.5 lakhs every year on electricity. After emerging as the leading manufacturing hub of diamond and textile industry, Surat is poised to grow into a solar hub. More than 10,000 textile markets could benefit from going solar.



Commenting on the accomplishment, Ishver Dholakiya, Founder & Managing Director, Goldi Solar said, "It feels good to be at the center of change and make a difference. We believe that this project will propel the overall development of solar as a mainstream source of energy in Surat. We are proud to support Avadh Group in their solarization journey, and urge others to adopt solar to make Surat a clean and green city."



Lavjibhai Dunganbhai Daliya, Director and President, Avadh Group said, "We chose Goldi Solar for their quality products, performance, customer centricity with an ability to partner with their customers. They are also a home-grown brand in the Indian solar space. We hope Avadh has set the precedent for other organizations to shift to solar energy for their power requirements and transition to a carbon-neutral company."



JAKSON SIGNED A PACT TO DEVELOP A 245MW PROJECT IN RAJASTHAN WITH NTPC

JAKSON, ONE OF THE LEADING ENERGY SOLUTION PROVIDERS HAS ENTERED INTO A CONTRACT AGREEMENT WITH NTPC LIMITED FOR THE EXECUTION OF THE "BALANCE OF SYSTEM (BOS) PACKAGE FOR THE DEVELOPMENT OF 245MW FOR BLOCK NO.3 OF NOKH SOLAR POWER PROJECT (735MW)" WITHIN 18 MONTHS.

NTPC will issue the modules as free issue material in the project for which tender is expected to be released by NTPC in April 2022. As part of the contract, Jakson will operate and maintain finished solar power plant for a three years and Annual Maintenance Contract (AMC) of key equipments for ten years from the date of successful completion of commissioning of the project. The scope of work of the tender includes the design, engineering, manufacturing, supply, packing, transporting, unloading, storage, installation, testing, and commissioning of solar projects. Jakson will design and construct the module mounting structures with tracker technology for SPV panels, fixing PV modules on tracker and PV modules interconnection.



INDIA ELECTRICITY SHORTAGE IN MARCH WORST SINCE OCTOBER COAL CRISIS

THE WESTERN STATE OF GUJARAT, ONE OF THE COUNTRY'S MOST INDUSTRIALIZED, HAS ORDERED A STAGGERED SHUTDOWN OF "NON-CONTINUOUS PROCESS" INDUSTRIES IN KEY CITIES NEXT WEEK, ACCORDING TO A GOVERNMENT NOTE REVIEWED BY REUTERS.

India's electricity shortage from March 1 to March 30 was its worst since October, a Reuters analysis of government data shows. A surge in power demand in March has forced India to cut coal supplies to the non-power sector and put on hold plans for some fuel auctions for utilities without supply deals due to a slump in inventories. Many northern states suffered hours-long power outages in October, when a crippling coal shortage caused the worst electricity deficit in nearly five years. Shortages in the eastern state of Jharkhand and Uttarakhand in the north surpassed those of October, the latest data showed.

The western state of Gujarat, one of the country's most industrialised, has ordered a staggered shutdown of "non-continuous process" industries in key cities next week, according to a government note reviewed by Reuters.

A Gujarat energy department official said the move was due to power shortages and to facilitate continuous power supply to farmers, adding a similar strategy was last used in 2010. He declined to comment on how long the staggered shutdown will be in place. The official declined to be named as he was not authorised to speak to the media. The southern state of Andhra Pradesh and the tourist resort state of Goa, which registered marginal shortages in October, suffered deficits several times larger in March. The deficit in March was 574 million kilowatt-hours, a measure that multiplies power level by duration, a Reuters analysis of data from federal grid regulator POSOCO showed. That amounted to 0.5% of overall demand for the period, or half the deficit of 1% in October. The northern states of Haryana, Rajasthan and Punjab and the eastern state of Bihar, some parts of which suffered widespread outages in October, accounted for most of the deficit in March, but shortfalls were lower, the data showed.

Source : Reuters

SUNGROW AND SEV STRENGTHEN COLLABORATION IN VIETNAMESE SOLAR MARKET WITH A NEW 50 MW CONTRACT

SUNGROW, THE GLOBAL LEADING INVERTER SOLUTION SUPPLIER FOR RENEWABLES, SIGNED A NEW SALES CONTRACT OF 50 MW WITH SOLAR ELECTRIC VIETNAM JOINT STOCK COMPANY (SEV). THIS CONTRACT STRENGTHENS THE COLLABORATION BETWEEN THE TWO COMPANIES AS IT UPGRADES SEV TO BE SUNGROW'S LONG-TERM STRATEGIC PARTNER IN VIETNAM.

Sungrow has continuously supplied inverters for SEV, who recently completed the Rooftop Project for the Toyota Boshoku Group in February, 2022 by using Sungrow's string inverter SG110CX. As a result of the strengthened collaboration, Sungrow will not only act as an inverter solution supplier, but will collaborate with SEV in developing more solar projects and finding new opportunities to better serve local customers. Vietnam will see more reliable renewable energy projects locally guaranteed by SEV's global-standard EPC and Sungrow's premium quality inverters. The 50MW agreement is a good starting point for this long-term strategic partnership.



“ Tien Luu, CEO of SEV Vietnam said, “SEV has been committed to join hands with the Vietnamese government and business community to achieve net zero by 2050 through implementing many solar rooftop projects for multi-national corporations. I am happy that SEV has received the support from global leading players in renewable energy such as Sungrow as this support aids in achieving these goals.”

“ Sungrow sees Vietnam as a significant market to develop. As a result, we have been seeking partnerships with locally renowned players. Our collaboration with SEV is a milestone, and we hope to provide our high-quality products and services to benefit Vietnam, said Mr. Michael Ruan, Country Head of Vietnam, Sungrow.”



MARUTI SETS UP NEW MOBILITY DIVISION TO PARTICIPATE IN EV RACE

JUST WEEKS INTO SAYING FUNDING OF RS 10,000 CRORE ON ELECTRICAL AUTOS IN INDIA, MARUTI SUZUKI, INDIA'S LARGEST AUTOMOTIVE MAKER IS PLACING IN PLACE THE CONSTRUCTING BLOCKS WITH DEVOTED GROUPS FOR EVS AND DIGITALIZATION.

ET has learnt that beginning April 1, Maruti Suzuki has restructured its organization by forming a devoted crew for Electric and linked autos referred to as as "New Mobility Division" to allow a sharper focus. This new crew will report into Shashank Srivastava, Senior ED, gross sales and advertising and marketing. Also, to speed up effort in the world of Digitalisation – a brand new division referred to as Business Transformation has been shaped.

"The project is at an implementation stage. Things have to be coordinated in a proper structure to execute the plan; hence teams are being put in place," stated an individual in the know.

The guardian Suzuki Motor will likely be investing in a full-fledged manufacturing unit together with lithium ion cell localisation in Gujarat that can name for a big funding. The growth work has already began for a undertaking codenamed YY8 deliberate for 2024-2025. Even because the R&D work occurs in the background, the organisation is being aligned from gross sales and advertising and marketing at current to put together for the entry – which can act as a crucial sound board, when the likes of Tata Motors, Mahindra & Mahindra, M G and Hyundai introduce their vary of fashions. An e-mail despatched to the corporate didn't elicit any response until press time. The automaker's transfer is akin to setting up of Truevalue enterprise, Nexa division, small industrial automobile divisions, which had been carved out as a separate vertical inside the firm for a sharper focus. And all these divisions have delivered thus far.

Experts stated the creation of a brand new vertical by Maruti Suzuki reveals that the corporate recognises the emergence of EV as a key pillar for the longer term, and if it needs to retain market management of greater than twenty years in the cleaner electrified world, it wants a sharper focus. The new division will assist India's largest automotive maker give extra concerted focus to make up for the misplaced time and regain the arrogance of core clients, which have been drifting away due to new choices of the competitors. The formation of recent vertical means the corporate will likely

be making a brand new pool of useful resource base which has specialised abilities and area consultants engaged on new rising applied sciences that may end result in decrease lead time for the corporate to reply to competitors, significantly at a time options that generate eyeballs in the primary yr of adoption. Hygiene has been for many carmakers the highest concern in the final 18-24 months, stated a fund supervisor of a home fund home. The firm has witnessed some erosion in market share in the previous couple of years due to restricted choices in the SUV section, which is rising quickly. The firm is dropping a whole lot of present clients who're upgrading to rival's SUVs.

"Kia and MG Motor have been continuously raising the bar in connected vehicles that is further weighed on market share," added a fund supervisor.

However, this case goes to be corrected in the subsequent few years with a spread of SUVs ranging from Rs 8 lakh up to Rs 20 lakh aimed toward transitioning the model in the premium finish of the market and create its personal area in Rs 10 lakh to Rs 20 lakh. This is the place its core SUV EV providing goes to be positioned. The concentrated focus by formation of recent verticals will support to cater to the demand of its buyer which has extra money in its pocket and never simply wanting on the worth proposition for getting a automotive. The firm had not too long ago launched a head up show in the newly launched Baleno which was the primary HUD in this class. This reveals the corporate is beginning to recognise the significance of recent options to appeal to new consumers. This transformation will additional enhance with the introduction of a brand new division.

Source: PTI

ISTI – ON A SKILLING MISSION TO EMPOWER & POSITIVELY IMPACT THE LIVES OF UNDERPRIVILEGED & UNEMPLOYED YOUTH!!

IN SPECIAL CONVERSATION WITH ABHILASHA GOSWAMI, CHAIRPERSON, ASTONGREENS

Launched in 2020, ISTI traces its roots back to 2013 when the parent company AstonGreens forayed into rooftop solar installations and small EPC solar projects. **Abhilasha**, who has led several roles in IT industry with TCS for 14 years, shared *“Both, my husband and I being Electrical engineers, always had conversations around how the tech sector and the boom of renewable energy both go hand in hand and that there is a lot to do in the renewables space. Taking those discussions further in 2013, our family company AstonGreens was started which soon became channel partners with MNRE and carried on several Solar PV installations for rooftop and C&I.”* She recalls that during those years, amid uncertainties and changing regulations in solar sector, AstonGreens was fighting a plethora of issues like lack of skilled and productive manpower, abundance of unprofessional players, high overhead costs associated with retention of skilled supervisors during lean phases, cost of quality due to re-works or punch points closure and safety related NCRs which led to closure of their EPC activities. She further added, *“We had realised that during the lean phase it’s very difficult to retain the manpower and finding a competitive and productive workforce is also a constant struggle as it’s very scattered also many times unskilled and inefficient.”* However, those were powerful learning experiences which fostered an idea that eventually got bolstered in 2020 amid Covid-19 situation and led to conceptualization of ISTI. Goswami stated, *“I had already quit my corporate job in 2018 and intended to take our work head-on in another direction. Hence, with a dual objective of creating jobs and a sustainable income source for the families at the bottom of the pyramid who were the most affected during Covid-19 phase, coupled with an intention to help EPC Contractors who face most of the manpower related issues, ISTI was born in 2020.”*

ACCOLADES

Abhilasha, through EQ Magazine announced, “ISTI has been selected to be a part of the India Accelerator Programme under GAN (Global Accelerator Network) in a tough competition where > 500 start-ups participated.” India Accelerator is helping start-ups realise their true potential by accelerating them into the next phase of growth. She’s currently undergoing a 6 months robust Cohort with the team iAspire which offers focussed mentorship, strategic support and peer group support with like-minded women entrepreneurs. Abhilasha expects their venture to gain further momentum with this program under the guidance of a solid team founded by her co-alumnus Mr Ashish Bhatia from NIT Kurukshetra.

QUOTE TO HIGHLIGHT:

“If you have a strong will, nothing is impossible...” Gol has set highly ambitious targets in the solar sector and we are hopeful that they will not only meet the targets but also exceed them before time And we, at ISTI, want to empower the youth of the country and be a part of this growth story through our skill training course.” Our concept of empowerment is simple – “Give a man a fish, you feed him for a day; teach the man to fish, you feed him for a lifetime.”

CHALLENGES IN DOMESTIC MARKET & ISTI’S ROLE

1. **Skilled Workforce:** She highlighted, “To meet the ever increasing demand in RE, skilled and efficient workforce is missing. This is where ISTI steps in, as we are providing productivity and quality focussed training based on Time & Motion study which ensures that the demand of productive and skilled workers is met in the workspace.”
2. **Lack of Centralised System:** The workforce is very scattered as of now, and there is a lack of centralised system to tap that. ISTI marketplace App does just that – it connects contractors to the available trained workforce at the click of a button.
3. **Retention of Workforce:** During lean business phases, there is huge pressure on margins of contractors due to high fixed costs of holding manpower. Addressing this industry need is the ISTI marketplace App which provides one click access to the contractors for manpower and machinery on pay-per-use model which ensures that they don’t have to bear the cost of holding manpower/machinery in lean times.
4. **Open Access in True Spirit:** While Gol has put in place Open Access policies in many states, they are still not implemented in true spirit and RE generators are being blocked by local Dis-Coms or regulators. This must be fully implemented across India to help end customers to gain from competitive energy tariffs that will make them globally competitive.
5. **Manufacturing Capacity:** Gol has put a lot of impetus on the ‘Make in India’ program, however investments in the end-to-end solar PV value chain have been delayed a lot. We hope that this will change in coming years and India puts up a solid manufacturing base and be the alternative to China.

SOURCE OF FINANCING

Since the institute is not charging anything upfront from the students most of whom come from the low-income strata of the society, ISTI taps into the CSR (Corporate Social Responsibility) funds and grants from Gol and International Organizations looking to create a positive impact at the bottom of pyramid. As part of India Accelerator program also, they have come to know that Gol has a lot to offer in terms of funds, resources and programmes.” We are trying to tap into CSR sources of funding through NRI/HNIs as well by providing full transparency to them in terms of the impact created through their donations.

When asked about her achievements as a leader, Abhilasha humbly declines the term leader and mentioned that the driving force for her was primarily the will to bring positive change in the lives of people from urban and rural strata. ISTI has created a team to skill people, and by training them in the best processes, systems and tools, they want to create employment opportunities for them and ushers them to financial stability. Her purpose is to create a ripple effect throughout the society until the wave of success reaches the last person. Quoting few of the achievements, she said *“ISTI marketplace App provides one click access to the contractors for machinery and manpower on Pay-per use model. In the last one year of incor*

poration we have been able to provide employment to more than 200 students. In this way we have positively impacted the lives of thousands of people. In our first year of operation, we are able to gain patronage of six large contractors and technology partnership with two European companies and one Chinese.”

IMPORTANCE OF SKILLED PROFESSIONALS IN SOLAR

As per Abhilasha, majority of contractors lose out on profitability due to two reasons: Unskilled workforce and low productivity of the workforce. She mentioned, “I think the industry is yet to recognise the power of productivity in this area. The feedback from the contractors for our workforce has been really encouraging. They have reported a 170% rise in productivity compared to the regular workforce available in the market and this directly translates to higher profits from the contractor side, due to significant reduction in the fixed cost.” Adding to it, she said, “Through our institute, as we are providing productivity and quality focussed training based on Time & Motion study which ensures that the demand of productive and skilled workers is met in the workspace. As we have a fast-moving workforce, so it is a win-win situation for both the workers as well as contractors as the workers don’t have to sit idle and contractors don’t have to hold the manpower.”

WOMEN IN SOLAR

The organisation is accredited by NSDC and firmly anchored to support PMKVY and Suryamitra schemes of GoI. We have got the privilege of working with a very professional team from NISE and Council for Green Jobs. She mentioned, “I would like to thank them for all the support and also urge them to have preferential allocation of Suryamitra batches for women led ventures like ours who have been sincerely doing their best using latest technologies. Such preferential allocation will greatly encourage other women to join this social impact space and I firmly believe that they are better placed compared to men when it comes to care and social contributions because of our social fabric in Indian culture.” Carrying forward the vision of Abhilasha is her eleven-years-old daughter who shares the same compassion and values of women empowerment. Narrating an incident, Goswami said, “While visiting our institute a few days back, my daughter saw the students getting trained and her first question was ‘Mumma, why are there no girl students in this institute’. I was taken aback by the questions and definitely it was a very valid question.” Further adding to it, she said, “Right now we do not have any female students because this is a male dominated field. Since ours is a residential training program, parents have a hitch in sending their daughters for this training. We are changing all of this soon through digitisation of our training content whereby we are hopeful of making it more accessible from any location in the country in multiple languages and then girl students would need to come to us only for practical yard training for a few days only. This is underway and expected to be completed within one year.” In her words, “Real progress in the society would be when we start seeing women not only at a higher level in the organisations, but also working for such skilling sector and at ground level as a blue-collar solar technician installing solar PV at residential roofs.”

INDIA — ANSWER TO WORLD’S SKILLED MANPOWER NEEDS IN PV SECTOR

With ~65% young population, competitive wages and dedicated efforts of GoI through its Skills Program, India can be the answer to the world’s requirement for Skilled Manpower in the fast growing PV Sector. While Indian manpower can access labour markets in the Middle East, they are still facing challenges when it comes to accessing labour markets in USA, Europe and other western world due to tough visa regimes. “We urge Ministry of Skill Development and Entrepreneurship to negotiate through International forums a better access to labour markets in western world to make a significant impact in the lives of poor people through job creation while also helping western world to provide more affordable solar tariffs to their customers by significantly reducing their soft costs,” urged Goswami.



Ms. Abhilasha Goswami | Chairperson | ASTON GREENS

USE OF AI/ML:

AI/ML is primarily aiming at two things, cost reduction and ease of doing business. These two are said to benefit all the stakeholders.

RISEN ENERGY WINS BID TO SUPPLY 210MM 650W+ PV MODULES TO SINOPEC'S GREEN HYDROGEN DEMONSTRATION PROJECT IN XINJIANG

RISEN ENERGY CO., LTD., A LEADING SOLAR MODULE MANUFACTURER IN CHINA, ANNOUNCED THAT IT HAS WON THE BID TO SUPPLY TITAN 650W PV MODULES TO SINOPEC'S GREEN HYDROGEN DEMONSTRATION PROJECT IN KUQA COUNTY, XINJIANG.

The 361 MW project, once completed, is expected to be the world's largest PV-based hydrogen production facility and is regarded as a breakthrough in promoting the transformation of China's big traditional energy producers. Given the bid's requirement for PV modules with a power output of at least 650W, the four companies that produce 210mm modules or both 210mm and 182mm modules were the only ones considered. Risen Energy ranks first by virtue of its 210mm solar modules, reflecting the increasing popularity of high-power modules amongst customers as well as the dominance of the 210mm module in the market. "Large-size PV modules are designed to increase power output and efficiency as a way

to reduce the cost and maximize the effectiveness of PV products, delivering additional power generation benefits to customers," an executive at Risen Energy recently said, while explaining the firm's strategy. The selection by Sinopec is a testament to the validity of the company's proactive mindset that focuses on large-size modules. Sinopec's participation in the building of the world's largest PV-based green hydrogen production project with a designed annual output of 20,000 tons demonstrates the firm's ongoing commitment to implementing its green, low-carbon development strategy while supporting the country's carbon peak and neutrality targets. Risen Energy plans to broaden the application of clean energy by collaborating with Sinopec to explore new approaches to PV-based hydrogen production through the utilization of its integrated competence in products and technologies.

PHONO SOLAR RELEASED DRACO SERIES MODULES

TRENDING THE COST REDUCTION AND EFFICIENCY INCREASE OF THE PHOTOVOLTAIC INDUSTRY AND LIMIT OF ACCESS TO CONVERSION EFFICIENCY OF PERC CELLS IN RECENT YEARS, IN ORDER TO SEEK TECHNOLOGICAL BREAKTHROUGHS AND LEAD THE INDUSTRY TO UPGRADE ITERATIVELY, PHONO SOLAR LAUNCHED THE DRACO SERIES MODULES IN 2022. N-TOPCON TECHNOLOGY WITH 182 MM SIZE CELLS DELIVERING BETTER AND MORE EFFICIENT POWER GENERATION PERFORMANCE WAS ADOPTED IN NEW SERIES.

EXTRAORDINARY PRODUCT PERFORMANCE

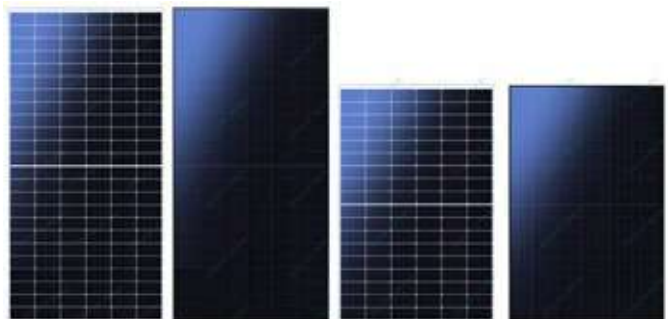
The DRACO Series Modules have broken through the technical challenges and been provided with a new and upgraded production process, sparking the photoelectric conversion efficiency to skyrocket up to 22% and the output power to hit 560W. Empowered by the new battery technology and dual-glass structure, the power generation performance of DRACO Series Modules under low light conditions has been significantly improved with additional power yield up to 30% benefited from bifacial technology and cell bifaciality up over 80%. Moreover, the new technology spike the improvement in the temperature coefficient of module, which significantly boosted product performance at high temperature.

TRUSTWORTHY QUALITY AND RELIABILITY

DRACO Series Modules, in compliance with the reliable quality of Phono Solar, and is equipped with a brand-new technology to work out the whole series Zero Light Induced Degradation (LID), and the first-year degradation is less than 1% with annual linear degradation of 0.4% for 30 years. Furthermore, POE and dual-glass packaging technologies also greatly improved its anti-PID characteristics.

WIDER APPLICATION CONDITIONS

By feat of excellent characteristics and quality of the DRACO Series Modules, wonderful performance achievements for BIPV, vertical installation, snowfield, high-humidity area, windy and dusty area are realized, offering more and better choices for customers in different climates and regions. Phono Solar, world-leading clean energy solution provider with a central enterprise background, will continue to adhere to the core value of "stability, reliability and sustainability" to present more efficient and reliable photovoltaic products and better clean energy services to global customers.



LONGI ACHIEVES NEW WORLD RECORD FOR INDIUM-FREE HJT CELL EFFICIENCY

ONLY DAYS AFTER SETTING A RECORD OF 25.47% FOR EFFICIENCY OF ITS P-TYPE HJT CELLS, LONGI HAS ANNOUNCED A NEW RECORD OF 25.40% FOR ITS INDIUM-FREE HJT CELLS.

This record, once again validated in testing carried out by the Institute for Solar Energy Research (ISFH) in Hamelin, Germany, was achieved on M6 (274.5cm²) full-size monocrystalline silicon wafers, confirming the basis for industrialisation of the low-cost technology route for HJT cells, following ongoing research by LONGi's R&D team. Advanced surface passivation technology previously developed by the team was applied to the HJT cells, using low-cost indium-free targets to prepare transparent conducting oxide films. Process innovations enabled the cells to maintain a high conversion efficiency despite being completely indium-free. The high-efficiency HJT cells will effectively reduce dependence on indium resources in mass production and result in a significant reduction in costs.



LONGi has now achieved overall leadership in a number of new high-efficiency cell technologies such as N-type and P-type TOPCon and N-type and P-type HJT, continually pushing the limits for commercial use of solar energy applications to new levels.

KSTAR'S VIETNAM PRODUCTION BASE PROJECT (PHASE I) OFFICIALLY TOP OFF

MARCH 1ST, WITH THE LAST BUCKET OF CONCRETE POURED, THE MAIN BUILDING OF THE KSTAR'S VIETNAM PRODUCTION BASE PROJECT (PHASE I) WAS SUCCESSFULLY TOPPED OFF.

The production plant will have a capacity of producing 14,000 UPS, solar inverters and other devices annually and create 200 jobs after completion, said the company. Occupying an area of 47715 square meters, KSTAR's new Manufacturing-Base is located in Haiphong City, the biggest port city of Northern Vietnam. It is being built to expand the company's global manufacturing footprint and support long-term growth in the Asia-Pacific region. The project is being carried out in two phases. Phase I, covering a construction area of 25,000 square meters is officially top off and the interior work of the building is currently underway. It will be completed in June and is expected to be put into operation after the completion of the procurement, installation and commissioning of production equipment by the end of 2022.

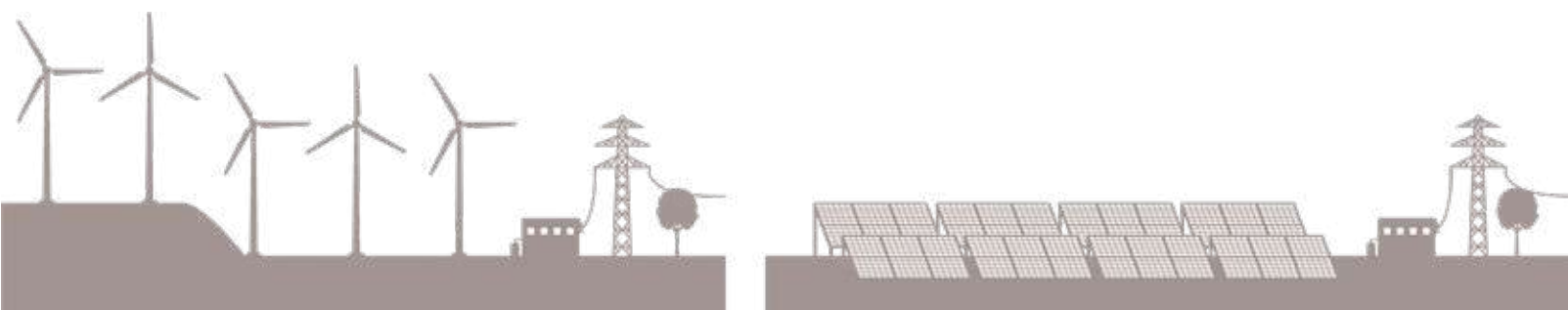
The new plant is projected to be able to produce 10,000 units of UPS, 1000 units of modular data center and 1 GW solar inverters annually. By then, 200 jobs will be available, generating important social and economic benefits during the epidemic. Construction for the second phase is expected to begin in 2024. The new plant (phase II) is mainly used to produce energy storage system and EV charging pile products.



We are happy to end the first quarter of 2022 with another milestone of KSTAR! Responding to KSTAR's rapid growth in the global market, this would be the first time we used factories in Vietnam to enhance production capacity. As one of the largest UPS manufacturers in the world, we have been working to meet our client's desire for more diverse production bases. Said Mr. Wang, the project leader of KSTAR.

According to previous statements of the company, KSTAR has been planning its Vietnam Manufacturing Plant since 2019. Upon completion, the manufacturing facility will be the company's sixth manufacturing base and the first in Vietnam.

"It will greatly meet oversea customers' delivery expectations, therefore, enhancing the company's competitive advantage in the industry." Said Mr. Wang.



TADPOLE PROJECTS ACCOMPLISHES STELLAR FEAT OF CONVERTING, FIRST MERCEDES BENZ C-CLASS FROM ICE TO EV

THE INITIATIVE UNDERLINES THE COMPANY'S COMMITMENT TO ACCELERATING THE NATIONAL VISION OF PROPELLING ELECTRIC MOBILITY ADOPTION IN INDIA. IT HAS ALSO UNDERTAKEN TO RETROFIT OTHER VEHICLES SUCH AS BUSES, CRANES, EARTH-MOVING AND OTHER CONSTRUCTION EQUIPMENT

Tadpole Projects, a pioneer in retrofitting ICE vehicles, incubated in the Innovation Labs of IITs; having a comprehensive ecosystem approach has converted the first premium car, C-180, C-Class of arguably the most sophisticated car manufacturer – Mercedes Benz. The achievement is in sync with the brand's long-term vision that retrofitting is the key to the future of mobility, and Tadpole Projects is leading the way. The revamped EV was a petrol variant car manufactured in 2003 and now comes equipped with new-age mobility features such as GPS, Geo-fencing, and remote performance assessment. It also offers a warranty of 3 years on batteries and 2 years on the EV kit. Although the car supports AC charging as of now, there is also a provision of DC charging if the requirement arises. It takes 5-6 hours to charge, depending on the power of the batteries. The car can now run at a maximum speed of up to 90 kmph and cover a range of 150 kms on one charge. The speed and range of the EV can be pushed further to beyond 150 kmph and 250 kms, respectively, as per the client's need.



On accomplishing the feat of retrofitting the premium car, **Mr. Jawaad Khan, Founder-Tadpole Projects explained,** "The latest initiative underlines our commitment to accelerating the national vision of propelling electric mobility adoption in India. Tadpole Projects follows a standard retrofitting process. It includes research on the vehicle and other elements like the dynamics, structure, wheel assembly, and transmission, among other things. Our in-house team then connects this research with the client's requirements in terms of range and speed and accordingly design the motors and rechargeable energy storage systems. The R&D and advanced testing of vehicles are supported by leading institutions like IIT Delhi, FITT, and the Centre of Automotive Research and Tribology (CART)."



Tadpole Projects also has a subsidiary brand called Trouve Motors, under which it plans to launch a range of new EVs: an advanced hyper sports bike and the first electric car, Sports Activity Coupe, that will come with a solar panel roof. Moreover, its offerings are not only limited to cars and bikes. It has also undertaken retrofitting of other vehicles like buses, cranes, earth-moving and other construction equipment. Tadpole Projects made its mark in the history of India's Automobile sector by flag bearing the first ICE Vintage car conversion to EV – Volkswagen Beetle. It is also the first in the country to retrofit premium luxury segment cars to EVs. The brand aspires to expand its network across India through franchises and retrofit ICE vehicles in the most economical way possible. It looks forward to establishing a battery swapping network to lower the cost of ownership of its kits for the commercial segment and private vehicle owners in the coming years.

SWISS SAYS IT WILL BE FIRST AIRLINE TO USE FUEL MADE FROM SUNLIGHT

SWISS INTERNATIONAL AIR LINES AND ITS PARENT LUFTHANSA GROUP (LHAG.DE) HAVE AGREED WITH SYNTHETIC FUEL GROUP SYNHELION TO USE ITS SOLAR AVIATION FUEL, THE SWISS AIRLINE SAID.

“This will make SWISS the first airline in the world to use ‘sun-to-liquid’ fuel,” it said in a statement. The process devised by Synhelion, a spinoff from the Swiss Institute of Technology, uses concentrated sunlight to produce carbon-neutral kerosene, it said. “Our next-generation carbon-neutral solar kerosene is an economically and ecologically viable substitute for fossil fuels,” Synhelion co-founder and CEO Philipp Furler said.

The commitment of SWISS and the Lufthansa Group underlines the aviation sector’s keen interest in our solar fuel.” Synhelion will build the world’s first facility for the industrial production of solar fuel in Germany this year, the statement said. SWISS is set to become the first customer for the solar kerosene in 2023. The deal calls for SWISS and the Lufthansa Group to support development of Synhelion’s planned commercial fuel production facility in Spain as well.



Source: reuters

AVAADA ENERGY PRIVATE LIMITED TO RAISE INDIA’S LARGEST AAA RATED GREEN BOND BY ANY RENEWABLE ENERGY DEVELOPER

AVAADA ENERGY PRIVATE LIMITED TO ISSUE GREEN BONDS FOR INR 1440 CR (USD 192 MILLION) AT 6.75% MAKING IT INDIA’S LARGEST AAA RATED GREEN BOND BY ANY RENEWABLE ENERGY DEVELOPER.

Avaada Energy, India’s leading solar project developer, announced that it is raising green bonds for INR 1440 Cr (USD 192 million) in the Indian capital market at 6.75% making it India’s largest AAA rated Green Bond by any renewable energy developer. The bonds are certified by Climate Bonds Standard Board of the Climate Bonds Initiatives and are also compliant with the SEBI guidelines for Green Debt Securities. The bonds will be listed on the Bombay Stock Exchange (BSE), having a tenure of 3 years. The issuance earned the highest rating by CRISIL ratings. Axis Bank and ICICI Bank are the arrangers of the issue. Avaada Energy is a leading Indian renewable energy IPP with a multi-GW portfolio. With the issuance of Green Bonds, Avaada has joined a select club of Indian firms to have raised capital through bond issuance. India is one of the fastest-growing markets for green energy globally. Hon’ble Prime Minister Shri Narendra Modi has been very categorical about his commitment to renewable energy. In the recently concluded COP26, where he also gave India’s gift ‘Panchamrit’- the five nectar elements to the world to address the climate change.” One of the major elements of ‘Panchamrit’ is the higher deployment of renewable energy. As announced by Hon’ble PM, India will meet 50% of its energy needs through renewable energy sources by 2030.



Towards this end, the country will have an installed base of 500 GW of renewable energy assets. The issue saw overwhelming interest & participation from various banks & financial institutions. Speaking on the occasion Mr. Vineet Mittal – Chair, Avaada Group said, “It is a proud moment for Avaada family and reflection of confidence shown by investors on Avaada’s impeccable execution track record and high performing assets.

ESG financing has witnessed major strides in the last few years. The response to bond issuance in the domestic market is extremely encouraging. It will help developers to raise capital domestically and avoid exposure of foreign exchange currency risk and achieve a reduction in fundraising costs.” Avaada Energy, a leading solar project developer is currently backed by PTT Group- Thailand, which is a Fortune 500 firm and one of the major oil and gas companies globally.

AZURE POWER REFINANCES ITS 600 MWS ISTS CONNECTED SOLAR PROJECT AT THE LOWEST RATE OF INTEREST IN ITS PORTFOLIO TO DATE

- It is the largest owned and operated single site solar project in India, fully commissioned in December 2021.
- The rate of interest of 7.2% p.a. – fixed for 42 months – is the lowest in terms of rupee financing for Azure Power.

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zure Power, a leading independent sustainable energy solutions provider and power producer in India, announced successful refinancing of its existing project finance facility of INR 23.50 billion (~USD 313 million) utilized towards construction of its largest project – 600 MWs Interstate Transmission System (ISTS) connected solar project implemented by Azure Power Forty Three Pvt Ltd, a Special Purpose Vehicle (SPV). The project was fully commissioned recently in December 2021. The refinancing has been completed at a rate of interest of 7.2% per annum, which is fixed for 42 months and the lowest rate of interest for any project finance facility in terms of rupee financing for the company's existing portfolio so far.

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Refinancing the original term loan was one of our highest priorities, even before the project was fully commissioned in December 2021. The facility will result in substantial savings in interest cost and will improve the project IRR significantly. We are overwhelmed with the response we get from the credit markets which basically reflects lenders' confidence in our strong corporate governance standards, operational capabilities, and credit fundamentals, said **Pawan Kumar Agrawal, Chief Financial Officer, Azure Power.**



GROWATT'S NEW C&I INVERTER IS NOW AVAILABLE ON GLOBAL MARKETS

GROWATT, THE GLOBAL TOP 5 COMMERCIAL INVERTER SUPPLIER ANNOUNCES THE AVAILABILITY OF MAX 100-125KTL3-X LV INVERTER ON GLOBAL MARKETS. SINCE ITS DEBUT LAST YEAR, THE INVERTER HAS ATTRACTED A LOT OF ATTENTION IN THE INDUSTRY WITH ITS OUTSTANDING FEATURES.

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Designed especially for C&I solar applications, the new MAX model is set with a maximum output power of 125kW, which is the highest power of string inverter with multiple MPPTs at 400Vac level, said **Lisa Zhang, Growatt Marketing Director.** With maximum DC input current reaching 32A for each MPPT and 16A for each string, this new MAX inverter matches well with high power and bi-facial modules. Its 10 MPP trackers support 20 strings connection at most, which significantly reduces the energy loss caused by shadow effect and module mismatch.



Growatt also enhances operational safety with Type II SPD on DC&AC sides, fuse-free design, integrated DC switch, IP66 protection as well as optional active arcing protection (AFCI) and built-in PID recovery to provide all-round protection for the inverter and even the whole PV system.

“Managing a large number of inverters may be a little tricky, and thus to make system management smarter and easier, we supplement various solutions of monitoring and smart energy management for C&I solar projects,” Lisa Zhang added. Growatt simplifies the management of multiple inverters with Smart Energy Manager, which can also realize export limitation and PF control of the system. In addition, the company develops ShinePhone and ShineServer for end-users to monitor system operation anytime, and OSS (Online Smart Service) system for installers and distributors to easily access online service, such as online smart IV scan and diagnosis, remote configuration and firmware upgrade, enabling 60% of issues to be solved without site visits and reducing O&M costs. “Since its recent launch in the market, this new MAX model inverter has quickly accumulated over 500MW shipments. Now we are ready to bring this outstanding C&I solution to more countries worldwide,” Lisa Zhang concluded.

Besides, MAX supports up to 150% DC/AC ratio to achieve lower LCOE for PV plants. With its wide MPPT working range from 180V to 1000V, the inverter can start working earlier in the morning and switch off later in the afternoon, realizing a longer operation time and harvesting much more solar energy.

INTELLIGENT SHUTOFF SOLUTION OF SUNGROW TO PROVIDE “DOUBLE INSURANCE” FOR POWER PLANT SAFETY

WITH THE NET-ZERO CARBON BECOMING A GLOBAL, THE RENEWABLE ENERGY INDUSTRY REPRESENTED BY PV IS BOOMING. HOWEVER, WITH THE THRIVING PHOTOVOLTAIC MARKET, SEVERAL SAFETY ACCIDENTS SPARKED HEATED DEBATE.



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According to statistics, more than 80% of fire accidents in PV power plants were caused by DC-side faults, so how to ensure the safety of power plants more effectively has become a major concern of the industry. As a dedicated pioneer in PV inverter sector, Sungrow always puts safety as the priority. Based on the customers' demand on both safety and efficiency, the research and development of a new intelligent shutoff solution can make it accurately identify various types of faults and quickly shut off, thereby ensuring the safety of the power station.

development of a new intelligent shutoff solution can make it accurately identify various types of faults and quickly shut off, thereby ensuring the safety of the power station.

SAFER WITH FAST SHUTOFF

For the safety on the DC side, the related GB and IEC standards stipulate that: In the design scheme of connecting 3 or more strings to 1 MPPT, overcurrent protection devices must be added to the PV-side strings, and no protection devices are required in the scheme of connecting 2 strings to 1 MPPT. On the basis of the design concept of connecting 2 strings to 1 MPPT, Sungrow integrated a new disconnecter through the inverter protection control algorithm and developed an intelligent shutoff solution, which can provide double insurance for the safety on the DC side. When faults such as short circuit and reverse connection occur, the system with reliable disconnecting capability can be quickly disconnected. According to the fault type, the system can be shut off within 10 ms at best, thereby realizing instantaneous protection, eliminating risks and ensuring the safety of the power station.

MORE INTELLIGENT FAULT IDENTIFICATION

The conditions of large-scale PV plants are complicated, and there are many types of PV modules and mounting systems. Under certain complicated working conditions, it could easily cause inconsistent voltage between strings and lead to the phenomenon of backfeeding. Sungrow designed a more intelligent shutoff logic based on massive database, operating and analyzing the field fault data through big data operation, distinguishing the fault types such as “backfeeding” and “reverse connection” and make accurate determinations. In addition, Sungrow's inverter adopts the design scheme of connecting 2 strings to 1 MPPT.

In certain cases of backfeeding, even if the inverter is not shut off, the corresponding modules and cables only withstand 1 times the current, which is well within their rated tolerance range, so the backfeeding will not affect the system security, and there is no need to shut off the system. It is worth noting that whether shutoff is required in certain backfeeding cases depends on whether the backfeeding causes unsafe consequences: For example, under the scheme of connecting 2 strings to 1 MPPT, shutoff is required in the case of 1 time current backfeeding. However, in the design scheme of connecting multiple strings to 1 MPPT (taking the connection of 5 strings to 1 MPPT as an example), if one of the strings is backfed by the remaining 4 strings, there will be 4 times backfeeding current, far exceeding the tolerance range of the modules and cables. Under this kind of design scheme, shutoff is required for all backfeeding cases; otherwise, it will cause fire risks. Both safety and efficiency need to be ensured for the return of investment of PV plants. Although safety can be ensured by shutoff, frequent shutoff will seriously have a series of negative effects on the project:

Affecting power generation yields: If the backfeeding occurs frequently, it will bring frequent shutoff and affect the power generation.

Increasing the workload of operation and maintenance: After shutoff, operation and maintenance personnel need to be back to the site frequently to reset the disconnecter, which increases the human resource's cost. **Affecting the life span of disconnecter:** Frequent shutoff will affect the useful life of the disconnecter, thereby affecting the safety of power plants.

Consequently, whether the disconnecter is shut off or not is not only a test of the rationality of the system design, but also a profound understanding and insight into the device, system and project operation and maintenance. The new intelligent power shutoff solution of Sungrow can realize accurate shutoff and ensure safety as well as benefits.

SUNGROW INKS 300 MW SALES DEAL WITH UTOMO SOLARUV

SUNGROW EYES AT INCREASING SALES NETWORK IN INDONES BY SIGNING 300 MW SALES DEAL; JINKOSOLAR SHOWS SIGNIFICANT GROWTH IN 2021; HUAXIANG & TBEA LAUNCH RMB 100 MILLION JV; POLYSILICON PRICES CONTINUE TO RISE.

Sungrow inks 300 MW sales deal with Utomo SolaRUV: At Solartech Indonesia 2022, China's Sungrow signed a 300 MW strategic partnership agreement with its channel agent Utomo SolaRUV. This has been done with a view to increase its sales network in the Indonesian market. Recently, Sungrow announced scaling up its India production capacity to 10 GW annually.

Huaxiang & TBEA launch JV for PV projects: Large-scale equipment manufacturer Huaxiang Group announced progress on the establishment of a joint venture photovoltaic power generation company with solar PV inverter maker TBEA Xinjiang New Energy in Hongdong County. The new company, Shanxi Huate New Energy Technology Co., Ltd., has a registered capital of RMB 100 million (\$1.57 million), of which Huaxiang has contributed RMB 49 million (\$7.69 million) in cash, accounting for 49% of the registered capital. The JV is being established to build a 1 GW PV power generation project and a supportive production project in Hongdong County.



Polysilicon prices up: The price of polysilicon continued to show a slight increase. This is because the production of silicon materials from Tongwei, GCL, Xinte, Asia Silicon have not been released as expected, leading to insufficient materials in the market. This week, the price range of China's monocrystal re-feeding material is between RMB 242,000-253,000/ton (\$37985 – 39711/ton), and the average transaction price has risen to 248,200 RMB/ton (\$389583/ton), a week-on-week increase of 0.16%, according to China Silicon Industry.

Source: taiyangnews

BEST POWER EQUIPMENTS (BPE) LAUNCHES NRGX 5000 UPS WITH LI-ION BATTERY EXL SERIES (ESS – ENERGY STORAGE SOLUTION)

INDIA'S LEADING POWER MANUFACTURING BRAND, BEST POWER EQUIPMENTS (BPE) ADDS YET ANOTHER REVOLUTIONARY PRODUCT IN ITS SLEW OF OFFERINGS.

The company has launched model Nrgx 5000 UPS with Li-ion Battery (ESS) for both home & small businesses. The power solutions giant has come up with a robust UPS that covers all aspects of home, office & small businesses power needs. Nrgx 5000 UPS is ideal for homes, retail shops and small business. This product is called ESS, (Energy Storage Solution) launching 5KV solutions upto Megawatt. The products will be catering to the requirements of Tier 1,2,3 cities and towns across India.

FEATURES

- Nrgx 5000 UPS, ESS category
- 5-year warranty
- High energy on wheels (5kVA UPS, Li-ion battery, 1 hour back-up)
- Full LCD display with power flow diagram
- High efficiency UPS (On-line mode 94%, ECO mode 99%)
- Plug & play unit, Easy installation
- Fast charging, 0-100% within 2-hrs, Parallel expansion up to 20kVA
- wide input voltage range (110V-300V AC)
- 3 units can be connected & configured as 3:3 Phase



Speaking on the launch, **Amitansu Satpathy, Managing Director – BPE** commented, “We aim to address the varied needs of our customers by making best in class products. Our new addition will be a great option for small businesses or home. With a product that revolves around seamless electrical management of your entire household, we are strategically moving towards building products catering to different categories. The products are available Pan-India through their distributors IRIS Computers and Ingram.



SINENG ELECTRIC POWERING A 200MW PV PLANT IN RAGHANESDA SOLAR PARK, INDIA

GUJARAT, A STATE OF INDIA, WHERE SOLAR ENERGY IS A FAST EXPANDING INDUSTRY GIVEN THAT THE LARGE STATE IS MOSTLY ARID. IN FACT, IT WAS ONE OF THE FIRST STATES TO DEVELOP SOLAR GENERATION CAPACITY IN INDIA.

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s of January 2022, the total installed capacity of solar energy in Gujarat reaches 6.3GW. In the meantime, the Centre has given Gujarat a target of 8.024 GW by 2022 in sync with the National Solar Mission's goal. The Raghnesda Solar Park in Banaskantha District of Gujarat is one of the biggest solar parks in the country, where a 200MWac/302MWdc project powered by Sineng Electric has been supplying clean power steadily for more than half a year. The project was completed in 14 months strictly according to the environmental standards of ADB Safeguard Principle and Equator Principle with 1.5 million+ safe man hours by over 800 workers. After being put into operation, the plant is expected to generate approximately 546GWh of electricity while reducing 387,056 tons of carbon dioxide emissions annually.

Sineng Electric flagship 3.125MW central inverter solution is adopted in this project. As a reliable inverter solution tailored for 1500V PV plant, it features the following merits:

1. Advanced heat exchange technology, no derating up to 50°C
2. Outdoor IP65 protection, adaptable to harsh environments
3. High power density with small footprint, lower LCOE
4. Maximum efficiency 99%, more power generation



Located in the seismic zone with a high water table, the company's resilient inverters maintain a smooth working condition thanks to the outdoor IP65 protection, which assures the inverters adaptable to various harsh environments. In the future, Sineng will keep working relentlessly to provide the world with green energy and advanced products. As a global leading PV inverter solutions provider, Sineng Electric aims to embrace a cleaner future, making solar energy affordable and truly benefit our customers worldwide.

SOLARSPACE ENTERED INTO A GLOBAL PARTNERSHIP WITH EVERSOLA FOR SOLAR PV MODULES

ZHONGRUN SOLAR ENERGY GROUP ("SOLARSPACE"), ONE OF THE LARGEST SUPPLIERS OF SOLAR CELLS & MODULES GLOBALLY HAS ANNOUNCED THAT IT HAS ENTERED INTO A GLOBAL PARTNERSHIP WITH EVERSOLA, ONE OF THE LEADING AND PREMIUM SOLAR PV MODULE MANUFACTURERS. THE MAIN OBJECTIVE OF THE PARTNERSHIP IS TO JOINTLY DEVELOP THE HIGH QUALITY & HIGH-EFFICIENCY SOLAR PV MODULES & COMMERCIALIZATION OF NEW AND EMERGING SPV TECHNOLOGIES.

The management at Solarspace quoted, "we at Solarspace are delighted by this partnership with Eversola; that's a company with bankable solar expertise globally. Our goals are so similar, and we believe that together we can achieve new heights worldwide and benefit the global communities with our best quality products. We will proceed for the relevant formalities like co-certifications of IECs while some of the regional co-certifications are already in place like BIS for India etc."

The management at Eversola Holding CO., Ltd also released a statement stating, "we are really excited to join hands with Solarspace and this is a significant step towards the realization of our goal to benefit the global communities with the commercialization of the latest SPV technologies. Solarspace is a name of reputation in the SPV market globally and we believe that this partnership will add value to our product offerings worldwide."

DISTRIBUTED SOLAR POWER ASSOCIATION APPROACHES DELHI HIGH COURT OVER MNRE ORDER ON USING ALMM APPROVED MODULES FOR OPEN ACCESS & NET METERING PROJECTS

HONOURABLE DELHI HIGH-COURT SOUGHT CLARIFICATION FROM MNRE AS TO WHAT PROVISIONS THEY HAVE MADE TO SAFEGUARD THE ONGOING PROJECTS AT VARIOUS STAGES WHICH WILL GET ADVERSELY IMPACTED DUE TO SUDDEN EXTENSION OF THE ALMM ON PROJECTS UNDER NET METERING AND OPEN ACCESS ALSO FOR WHICH MNRE HAD NO ANSWER AND THEY SOUGHT TIME TO REPLY.

The petition was filed by DISTRIBUTED SOLAR POWER ASSOCIATION which is a registered and prominent association of renewable energy developers and IPPs operating in the field of renewable energy from solar, wind and wind solar hybrid for C&I segment and has been actively working on the development of these segments and playing a constructive role in working with various ministries, policy makers and regulatory bodies for the growth of this sector. Reportedly, MNRE on 13th January 2022 issued an amendment in the office memorandum on “Approved List of Models and Manufactures” [ALMM] where projects under open access and net metering were also included for using ALMM approved solar modules applicable within a period of just 2 and a half month.

Various developers and developer and industry associations approached MNRE to provide clarity whether the same will also be applied on private projects developed for C&I consumers where there is no government subsidy / CFA is provided and to adequate time to be provided for the implementation of such amendment so that the ongoing projects are not impacted. Upon no response and confirmation in this matter from the ministry the developers were constrained to explore legal remedy and approach the Honourable Delhi High Court to seek relief. Surprisingly, the counsel appearing on behalf of MNRE also had no answer or instruction as to how the ongoing projects will be protected from such order. The private developers operating in field of C&I segment installations are already suffering from shortage & delay in supplies and over and above this such sudden amendments have caused artificial increase in the solar modules prices due to issues like cartelization and demand and supply gap within the country, on top of it from 1st of April the duty on the solar modules from Zero will straight raise to 40% which will be highly deterrent to the sector.



Before, making such orders / amendments the MNRE has not done any consultation meeting or has taken inputs from developers and consumers and just on the recommendations of only a few modules manufacturers who also have control on cells have made these amendments in hurry, without going deep and in detailing of the various associated aspects; on of the developer said. Developers are still hopeful that MNRE which understands the seriousness of the situation will come out with some concrete solution for the resolution of this problem in the larger interest of the development of renewable energy and sector at large and till such time will extend the amendment for minimum 1 year so that the ongoing projects do not land in crisis.

The next date of hearing is on 29th of March 2022 when the Honourable HC will hear the matter and decide.

INDIAN SOLAR MANUFACTURERS EXPRESSED GRATITUDE TO HON'BLE FM FOR THE IMPLEMENTATION OF 40% BCD

PRESIDENT OF NORTH INDIA MODULE MANUFACTURERS ASSOCIATION MANISH GUPTA, ARPIT AGARWAL, VINEET MITTAL, PRESIDENT OF ALL INDIA SOLAR INDUSTRIES ASSOCIATION ASHWINI SEHGAL, DELEGATION OF INDIAN SOLAR MANUFACTURERS ASSOCIATION AND MP RAMCHARANBOHRA (JAIPUR) MET NIRMALASITHARAMAN, UNION FINANCE MINISTER IN DELHI

The representatives of all the associations expressed their gratitude to the Hon'ble Finance Minister for the implementation of 40% Basic Custom Duty on the import of solar panels and 25% Basic Custom Duty on solar cells by the Ministry of Finance, from 1st April 2022. The delegation assured the Hon'ble FM that very soon the manufacturers would expand their current capacity and India would become self-sufficient in the sector and would also start exporting to other countries.



This meeting took place in the office of the Finance Minister in Parliament House.

RISEN ENERGY LAUNCHES ULTRA-LOW-CARBON BIPV AND HJT PRODUCTS

RISEN ENERGY CO., LTD., A LEADING SOLAR MODULE MANUFACTURER IN CHINA, JUST CONCLUDED ITS PRESS CONFERENCE IN NINGHAI, ZHEJIANG PROVINCE, FOR THE LAUNCH OF THE LATEST LINEUP OF BUILDING-INTEGRATED PHOTOVOLTAIC (BIPV) PRODUCTS, WHICH INCLUDED SUPER TOP, SUPER TILE ALONGSIDE ITS LATEST HETEROJUNCTION (HJT) OFFERING, HYPER-ION. THE ENTIRE LINEUP BOASTS FURTHER REDUCTION IN CARBON USE AND IMPROVED POWER GENERATION PERFORMANCE, VASTLY WIDENING THE OPPORTUNITIES FOR THE DEVELOPMENT AND IMPLEMENTATION OF BIPV AND HJT PRODUCTS.

SUPER BIPV LEADS IN DELIVERING “GREEN” ROOFS

Every industry in China has jumped on the carbon reduction bandwagon in light of the Chinese government setting carbon peaking and carbon neutrality goals. In 2021, the government rolled out a series of carbon reduction policies specifically targeting the building and construction sector, to encourage the construction of greener and low-carbon buildings and environments and to prepare the sector for the arrival of the carbon peak and carbon neutrality era. In response to the policies, Risen Energy, in its role as a leader and pioneer in all things photovoltaic, launched two key products, the Super Top for the roofs of industrial and commercial buildings and the Super Tile for residential rooftops. The two products hit all the high notes in terms of being a proponent of the drive to populate China with green and environmentally-responsible housing stock: they are safe, reliable, economical, diverse in the applicability, easy to install and aesthetically pleasing in appearance.

Super Top's unique feature is a new assembly method for the steel plate and the PV module so that the modules seamlessly blend in with the colors usually adopted by the steel industry and can be fully integrated into the construction process rather than bolted on after the fact. The module boasts new double-glass frame-free modules with 210mm wafers. The 210+ double-glass ensures high power generation capacity, the edgeless frame prevents the collection of dust on top of the unit, and the 210+HJT cell delivers a 7 per cent power generation gain. The module is 740W and comes equipped with 360-degree upright locking, is waterproof and exhibits no shading loss, notching the power generation gain up another 1.5%.

Turning to the module's aesthetics, Super Top comes with optional aluminum-zinc- magnesium or color coated steel plates and customized colors to satisfy end-user preferences. The installation is simple and fast and can be completed by one person, while operation and maintenance post-installation is minimized. The corrosion resistance design of the product itself and excellent wind and fire resistance mean longer periods between each maintenance check, delivering a safe and worry-free experience. The 1817mm*420mm Super Tile comes in a variety of colors and shapes that perfectly match household roof systems. The module has a maximum power of 120 watts and a dust-free design that enhances power generation efficiency by 5%. Like Super Top, installation is easy and fast and can be completed by one person, leading to a saving of 30% in construction costs.

Super Tile comes in two formats, “stacked” and “tile” to meet diverse end-user preferences. The cost is basically equivalent to that of a household distributed system and the roof tiles that would have taken up the same space. With effectively no change in cost compared to older solutions, the low-carbon Super Tile better meets current market demand.

HYPER-ION BOOSTS THE GREEN VALUE OF HJT PRODUCTS

Keeping costs under control has always been a challenging problem that, to date, has stood in the way of HJT technology going mainstream. Based on leading technologies in semiconductor physics, semiconductor packaging, basic materials and equipment design, after thousands of iterations, Risen Energy finally launched a product that it can be proud of. The new product— Hyper-ion cell uses 210 HJT half-cut 120 micron and microcrystalline technology, achieving a super high efficiency exceeding 25.2%. Basing the calculation on a 100MW project in Hainan province, the long-term power generation of an HJT solution has the advantage of reducing LCOE by more than 10% and possibly even more when comparing both the one-time investment costs and ongoing overhead associated with traditional processes. Relying on advances in passivation technology, the unit comes with an open voltage above 750mV and ultra-thin wafers that are quite a bit less thick than TOPCon and PERC, as well as HJT thin cells with carbon value nearly 30% lower than that of PERC. Using a high strength alloy steel frame, Hyper-ion's carbon footprint score is reduced from more than 570 per kw to less than 400 without the application of special silicon materials, and can be notched down even further, to nearly 300 when special silicon materials are used. These are highly enviable benchmarks in the ultra-low carbon sector.

Risen Energy's HJT modules perform at 5 times the norm required by the IEC test specifications, while the carbon footprint score certified by a third party standing at less than 400. When applying the carbon footprint approach, the potential premium for Hyper-ion can reach 0.01 yuan per watt based on the current price of European carbon emission rights at around 80 euros per ton. Risen Energy plans to focus mainly on research into low-carbon series products, including further R&D into BIPV, steel frame and HJT technologies, with the goal of launching more low-carbon products, further building out the photovoltaic “low-carbon universe”, facilitating green and sustainable development, and accelerating the transition to a zero-carbon era.



COMCAST MARKS STEP TOWARD CARBON NEUTRAL GOAL WITH 250 MW SOLAR AGREEMENT

COMCAST ANNOUNCED AN AGREEMENT TO PURCHASE 250 MEGAWATTS (MW) OF SOLAR ELECTRICITY FROM CONSTELLATION THAT WILL POWER APPROXIMATELY 12 PERCENT OF ITS U.S. OPERATIONS AND THE VAST MAJORITY OF ITS MID-ATLANTIC OPERATIONS WITH CLEAN, RENEWABLE ENERGY.

The agreement will support construction of the Blue Sky Solar Project, currently being developed by Scout Clean Energy in Illinois, creating local jobs and bringing additional clean electricity to the U.S. power grid. Sourcing clean, renewable energy is the top priority for meeting our goal to be carbon neutral by 2035. PETER KIRIACOULACOS – Executive Vice President and Chief Procurement Officer at Comcast



This marks the first of many major green investments that are already underway or on the immediate horizon which demonstrate our commitment to sustainable, responsible business. said **Peter Kiriacoulacos, Executive Vice President and Chief Procurement Officer at Comcast.**

Comcast is committed to being carbon neutral by 2035 for Scope 1 and 2 emissions, or the direct and indirect emissions it owns and controls, across its global operations. With purchased electricity accounting for the majority of these emissions, sourcing renewable energy is critical to meeting this goal. Comcast's renewable energy strategy will prioritize securing green tariffs, direct power purchase agreements (PPAs), and virtual PPAs through contracts that bring new renewable capacity to the grid. It will also include building onsite renewable energy capacity and supplementing electricity needs with purchases from existing clean energy projects or renewable energy certificates (RECs).



We commend Comcast on its carbon neutral commitment and are pleased that our offsite renewable solution will serve as a significant steppingstone toward achieving that goal, said **Jim McHugh, Chief Commercial Officer, Constellation.**

“As our nation transitions to a clean energy future, Constellation is dedicated to offering the products, services and expertise that help our customers strategically manage their energy use and reduce their carbon footprints.”

PROJECT HIGHLIGHTS:

- Comcast will source 250 MW of carbon-free solar electricity from the 300 MW Blue Sky project – a majority share of the project's total output. Blue Sky is one of the largest solar projects approved to date in the PJM power grid, which spans the U.S. Mid-Atlantic region and portions of the Midwest, and Comcast is currently the sole customer.
- The agreement will allow Comcast to reduce the carbon dioxide emissions associated with its energy use by nearly 360,000 metric tons annually – equivalent to avoiding the emissions from more than 65,000 homes' electricity use for a year.
- The project will create up to 400 construction jobs and 20 new local long-term jobs, and generate \$36.3 million in tax revenue over the life of the project, including \$25.4 million slated to go directly to local schools.
- Blue Sky is expected to reach commercial operation by December 2024. Comcast has signed a corresponding 15-year agreement with Constellation beginning in 2025 to receive energy and RECs from Blue Sky as part of its retail electric supply contract.



We are pleased to work with Comcast and Constellation to deliver carbon-free solar energy and invest \$400 million into the local community, creating new sustained jobs and tax revenue for local schools, **Michael Rucker, founder and CEO of Scout Clean Energy.** “Comcast's commitment made this possible.”

Source: comcast

HITACHI ENERGY LAUNCHES OCEANIQ™ – INNOVATIVE SOLUTIONS FOR THE OFFSHORE ENVIRONMENT

THE COMPANY'S RECENTLY LAUNCHED TRANSFORMERS FOR FLOATING APPLICATIONS ARE THE FIRST ENTRY INTO THE OCEANIQ™ PORTFOLIO OF SOLUTIONS THAT ADDRESS THE UNIQUE CHALLENGES OF THE OFFSHORE ENVIRONMENT.

Hitachi Energy launched its OceaniQ™ portfolio for the offshore energy environment, which will be showcased this week at the annual WindEurope event in Bilbao, Spain. The global technology and market leader in power grids, which has a proven track record² in pioneering solutions for offshore, has created OceaniQ to help accelerate the clean energy transition. OceaniQ will result in greater volumes of wind power being efficiently harvested and integrated into the world's energy system.

Combining cross-industry competence from the power and marine sectors, OceaniQ addresses applications for fixed platforms, floating structures and sub-sea power systems for wind, marine and other offshore operators. Hitachi Energy rigorously designs its OceaniQ products, services and solutions in collaboration with customers and partners, which are designed to solve the specific needs of offshore energy operators. Key characteristics of OceaniQ solutions feature a modular design to enable timely installation and the ability to quickly connect energy assets to onshore. OceaniQ solutions take advantage of digitalization, enabling safe and secure remote monitoring and other services such as predictive maintenance. Designs are also ruggedized to withstand harsh marine conditions, minimizing the need for physical service over their lifetime. OceaniQ solutions also embody the rigorous application of lifecycle thinking.

OCEANIQ™ TRANSFORMERS FOR OFFSHORE FLOATING APPLICATIONS

The first products to be announced as part of the OceaniQ portfolio are Hitachi Energy's recently announced transformers for offshore floating applications. Since the first commercial projects in the early 1990s, offshore wind electricity generation has grown enormously, with more than 35 gigawatts³ capacity currently worldwide. Yet building offshore brings great challenges beyond the harsh salt-water environment and only a small fraction of the full potential has been exploited. This is because many offshore areas do not have a suitable seabed and beyond 60-meter depths are not optimal for fixed structures. OceaniQ™ transformers and shunt reactors are key equipment in the grid infrastructure that enables the transmission of electricity generated in offshore wind farms. This full and qualified range of equipment has been developed in partnership with the forefront floating offshore developers. It brings in world-leading experience to meet requirements, featuring a lightweight, compact, and modular design that comprises of specially-designed transformer active part, tank, and components.

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In OceaniQ, our world-class engineers take pride in pioneering solutions that overcome harsh offshore conditions and ultimately, help society move towards a carbon-neutral future,” said **Bruno Melles, Managing Director of Hitachi Energy's Transformers business.**

Bruno added, “Floating electrical systems are an important development in the evolution of the offshore renewable industry that will open up tremendous opportunities and unlock new business models that are built on clean power. OceaniQ is fully in the spirit of Hitachi Energy's Purpose, which is focused on advancing a sustainable energy future for all.”

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Alfredo Parres⁴, Head of Renewables at Hitachi Energy commented, “Wind power is one of Earth's bountiful and free-giving natural resources and through the OceaniQ offshore portfolio, customers will be able to harness and integrate it more efficiently. Alfredo continued, “Through OceaniQ, we are building a more sustainable, flexible and secure energy system by bringing together our experts in offshore applications and wind farm connections to develop and build the solutions needed for a more integrated, interconnected and high-quality power grid. I am excited to be discussing OceaniQ with customers at WindEurope this week and how together, we can continue to pioneer technologies that maximize the full potential of offshore wind.”

This latest portfolio development from Hitachi Energy continues to demonstrate the company's commitment to pushing the boundaries of innovation for sustainable offshore energy environment solutions, adding to an already extensive offering. The company expects to announce new additions to the OceaniQ portfolio in the coming months. The launch of OceaniQ follows the company's recent launches of IdentiQ™ – its digital twin solutions for HVDC and power quality – and EconiQ™ – its portfolio of solutions which are proven to deliver an exceptional environmental performance resulting in significant reductions in carbon footprint.

Three examples of Hitachi Energy's proven track record in offshore wind:

- Dogger Bank – connecting the world's largest offshore wind farm (located off the North East coast of England, UK)
- WindSTAR transformers for offshore wind turbines for major renewable projects in Taiwan
- First-of-its-kind High-voltage hybrid switchgear for offshore wind enabling the reduction of carbon emissions



NEW 'HUMAN-CENTERED' EV CHARGING STATIONS AIM TO IMPROVE USER EXPERIENCE

VOLKSWAGEN-OWNED ELECTRIFY AMERICA PLANS TO MAKE ITS NEW CHARGING STATIONS MORE USER-FRIENDLY WITH SOLAR PANEL AWNINGS AND WAITING LOUNGES.

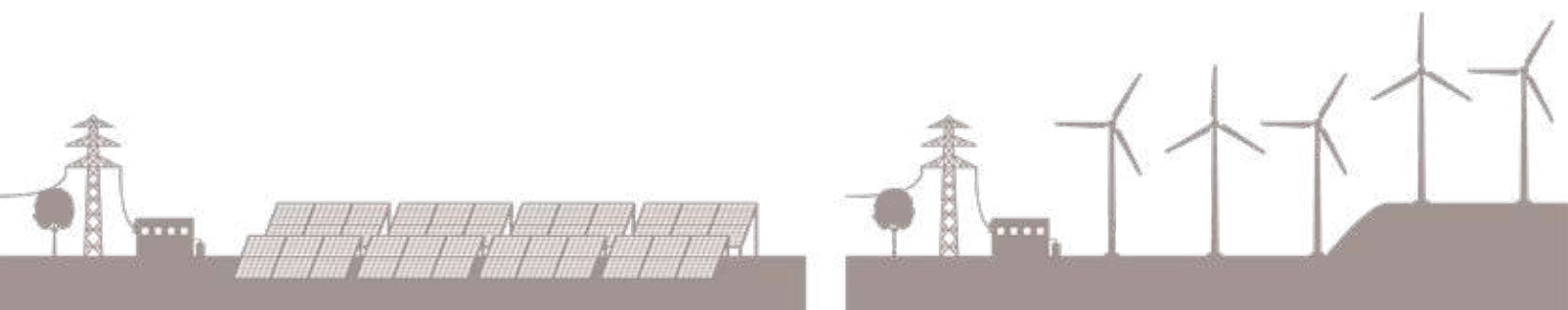
“Charging an electric car isn’t as straightforward as refilling a gas tank. Recharging times can vary depending on the vehicle type and power source. Battery experts claim that charging times will eventually shrink to around 10 minutes, but not for years to come.”

To improve the experience, writes Andrew J. Hawkins in *The Verge*, Volkswagen’s Electrify America charging company “aims to make charging as comfortable and seamless as possible” by installing “human-centered stations” in several California cities and New York. The stations will feature awnings with solar panels and a waiting area.

“The company’s new stations are organized around comfort, security, and amenities, with a nod toward the length of time it takes to recharge an EV,” according to Hawkins. “The most notable change for Electrify America’s current design is the inclusion of solar panel awnings, which have the dual effect of sheltering customers from the sun and inclement weather while also supplying power for the station’s operations.”

As Hawkins writes, “The charging experience in the US is extremely fragmented, especially for people who don’t own a Tesla. While Tesla’s Supercharger network has been praised for its seamless user experience and fast charging ability, the opposite appears to be true for pretty much everyone else.” But EV proponents see hope in the Biden administration’s \$5 billion investment in EV chargers. “Experts in urban policy and electrification have said that the money authorized for a nationwide network of EV chargers would have a measurable impact on Americans’ car-buying choices,” making it possible for more Americans to make the switch.

Source: planetizen



NORWEGIAN CLEANTECH SKYFRI ACQUIRES AVI SOLAR TO AUTOMATE SOLAR ASSET MANAGEMENT

SKYFRI GROUP, A CLEANTECH COMPANY HEADQUARTERED IN OSLO, NORWAY, HAS ACQUIRED INDIA'S THIRD LARGEST O&M PROVIDER AVI SOLAR. SKYFRI, BACKED BY LEADING CLIMATE INVESTORS SPEEDINVEST, SINGULARITY AND LINK VENTURE CAPITAL, IS ONE OF THE FASTEST GROWING CLEAN TECHNOLOGY FIRMS GLOBALLY, ACCELERATING GROWTH THROUGH TARGETED ACQUISITIONS AND DEPLOYMENT OF TECHNOLOGY TO FULLY AUTOMATE SOLAR ASSET MANAGEMENT.

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The acquisition of Avi Solar is part of a strategy to consolidate the O&M industry globally and automate most of the tasks that are manual today. Our ambition is to become the largest and most trusted technology platform for solar asset management worldwide. The plan is to streamline, automate and put a layer of quality on solar asset operations for asset owners. We do this through our proprietary technology, operational staff, domain expertise and best practises from Europe, says **CEO of Skyfri, Pratik Ghoshal**.



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Taking care of solar assets is today mostly done in separate tasks, by separate companies. For example, billing and invoices are done by one software, while another does monitor, and reporting and a third company does the actual O&M onsite. Skyfri integrates all these verticals into one single source of truth, and one complete digital platform. The scalability of our technology makes it available for several clients, at a reasonable rate, so that everyone, regardless of size can optimize their production, says **CTO of Skyfri, Aslan Shamsutdin**.

The acquisition will bring over 500 MW of additional solar power plants for some of the largest and most reputed renewable asset investors and owners, such as KKR, Cleantech, Bosch and Honda, onto the Skyfri platform, called Skyfri Intelligence.

Source: skyfri

POWER GRID CORPORATION OF INDIA APPROVES INVESTMENTS IN 5 PROJECTS ACROSS INDIA

POWER GRID CORPORATION OF INDIA ANNOUNCED THAT ITS BOARD HAS APPROVED INVESTMENTS ON FIVE PROJECTS WORTH RS 821.29 CRORE, ACROSS INDIA.

The first project involves the transmission system strengthening beyond Kolhapur (Maharashtra) for export of power from solar & wind energy zones in southern region for an estimated cost of Rs 129.28 crore scheduled to be commissioned by February 2023. The second project entails

the transmission system strengthening for Srinagar-Leh (Jammu & Kashmir) transmission system for an estimated cost of Rs 288.71 crore scheduled to be commissioned by December 2024. The third project is on the augmentation of transformation capacity in southern region for an estimated cost of Rs 176.22 crore scheduled to be commissioned by 20 March 2023.

The fourth project covers the augmentation of transformation capacity at Kurukshetra (Haryana) & Patiala (Punjab) substations for an estimated cost of Rs 106.99 crore scheduled to be commissioned by 15 February 2023 for ICT at Kurukshetra SIS and by May 2023 for ICT at Patiala SIS. The last project entails the evacuation of RE in Tirunelveli and Tuticorin (both in Tamil Nadu) Wind Energy Zone 500 MW for an estimated cost of Rs 120.09 crore scheduled to be commissioned by March 2023.

Power Grid Corporation of India has been established by the Government of India (GoI) as the central transmission utility of India. As of 31 December 2021, the Government of India owned 51.34% stake in the company. Power Grid Corporation of India reported a 2.2% decline in consolidated net profit to Rs 3,292.97 crore in Q3 FY22 from Rs 3,367.7 crore posted in Q3 FY21. Shares of Power Grid Corporation of India were trading at 0.75% lower at Rs 210.65 on BSE.

Source : capital marks

SOLAR-PLUS-STORAGE ENERGY PROJECTS JOIN NEXAMP COMMUNITY FARMS

NEXAMP AND BORREGO HAVE ACTIVATED TWO SOLAR-PLUS-STORAGE ENERGY PROJECTS WITHIN ISO NEW ENGLAND TERRITORY, NAMELY THE NEXAMP COMMUNITY SOLAR FARMS IN MASSACHUSETTS, USA. THEY AIM TO BUILD MOMENTUM FOR A CLEANER AND MORE RESILIENT REGIONAL POWER GRID.



The projects were completed by Nexamp, which provides solutions for the deployment and operation of solar energy assets, in partnership with Borrego, a developer, EPC and O&M provider that delivers solar and energy storage projects in the U.S. Co-located in the Nexamp community solar farms, each project combines solar generation and storage.

Brockelman Road is a solar+plus+storage project capable of generating 1.7MW of solar energy alongside 1MW/2MWh of battery storage. On the other end, Clark Road is a solar+plus+storage project with 7.1MW of solar capacity and 3 MW/6.1MWh of storage. Both participate in the Solar Massachusetts Renewable Target (SMART) Program, which provides incentives for co-located solar and storage projects. The projects will provide critical frequency regulation services for the ISO New England market alongside grid functions.

Each participates in the Massachusetts Clean Peak Energy Standard program as well as ISO New England's capacity and frequency regulation markets. The Clean Peak Energy Standard program provides incentives to clean energy technologies that supply electricity or reduce demand during times of peak power usage. The capacity and frequency regulation markets fulfill reliability functions for the regional power market, deploying resources to avoid outages and ensure that sufficient supply is online to support the power grid.

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Mark Frigo, Vice President of Energy Storage, Nexamp, commented on the projects in a statement, “Energy storage is critical for our ability to deploy renewable energy to broadly resolve issues of energy security and climate change.”



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Brendan Neagle, Borrego EVP of Project Finance, also commented on the partnership, “Our companies leveraged our experiences as early adopters of storage and solar-plus-storage systems in the Commonwealth to bring these projects to fruition, working in close cooperation with all project stakeholders.”



Source: smart-energy

GOGORO UNVEILS WORLD'S FIRST SWAPPABLE SOLID STATE BATTERY PROTOTYPE FOR ELECTRIC VEHICLES

A GLOBAL TECHNOLOGY LEADER IN BATTERY SWAPPING ECOSYSTEMS THAT ENABLE SUSTAINABLE MOBILITY SOLUTIONS FOR CITIES, ANNOUNCED THE WORLD'S FIRST SOLID-STATE LITHIUM CERAMIC BATTERY PROTOTYPE FOR TWO-WHEEL BATTERY SWAPPING. JOINTLY DEVELOPED BY GOGORO AND PROLOGIUM TECHNOLOGY, A GLOBAL LEADER IN SOLID-STATE BATTERY TECHNOLOGY, THE NEW GOGORO SOLID-STATE BATTERY PROTOTYPE INTEGRATES WITH GOGORO'S EXISTING VEHICLES AND SWAPPING NETWORK.

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Gogoro is unveiling the world's first solid-state battery for two-wheel battery swapping because it's imperative we take advantage of the latest battery innovations to introduce a new era of electric transportation growth and adoption in our cities, said **Horace Luke, founder, chairman, and chief executive officer of Gogoro**. “We partnered with ProLogium Technology, a global leader in solid-state battery innovation, to jointly develop this new battery that delivers higher energy density for better range, improved stability and safety, and is reverse compatible with all existing Gogoro-powered vehicles.”



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As leading global battery innovators, Gogoro and ProLogium have partnered to jointly design solid-state battery prototypes that integrate with Gogoro's battery swapping network and two-wheel vehicles, said **Vincent Yang, founder and CEO of ProLogium Technology**. “Solid-state battery technologies present a new phase in the future of electric vehicles, and we look forward to advancing this Gogoro prototype battery into a commercial offering in the future.”



Source : gogoro

CATL ANNOUNCES DIFFICULTY IN SOLID STATE BATTERY MASS PRODUCTION IN LIGHT OF TECHNICAL CHALLENGES

IN STARK CONTRAST TO THE LIQUID-BASED ELECTROLYTES FOUND IN TRADITION LI-ION BATTERIES, THE NEXT GENERATION OF SOLID STATE BATTERIES LIKELY REPRESENT SAFER OPERATING ENVIRONMENTS. CATL UNVEILED SAMPLES OF SOLID STATE BATTERIES MANUFACTURED IN-HOUSE IN 2021, ALTHOUGH COMMERCIALIZATION REMAINS A DISTANT POSSIBILITY.

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Recently, however, a string of bad news emerged regarding technical barriers involved in solid state battery development, thereby impacting CATL's mass production goals. In 2021, CATL garnered much attention for its private placement fundraising efforts. The activities, undertaken for the sake of capacity expansion, aimed at RMB¥58.2 billion (about NT\$252.7 billion), which set a record at the time but was later revised down to RMB¥45 billion (about NT\$195.3 billion) due to controversy. According to some sources, in order to ensure a feasible pathway, SZSE demanded CATL explain its technology roadmaps for solid state batteries, NIB, and hydrogen fuel cells, in addition to potential risks involved in the operation and production of these aforementioned batteries. In response, CATL claimed that, despite technical advantages and characteristics, solid state batteries and hydrogen fuel cells still contain various unsolved technical barriers and mass production challenges.



ENERGY STORAGE A HIT AMONG TWITTER INFLUENCERS

THE GROWING ADOPTION OF ELECTRIC VEHICLES IS FUELING DISCUSSIONS ON VARIOUS ENERGY STORAGE SYSTEMS AMONG THE TWITTER INFLUENCERS.

Energy storage has emerged as a global priority as the focus has shifted towards the adoption of clean energy to not only meet the increasing energy demand but also to achieve net-zero. In line with this, the growing adoption of electric vehicles is fueling discussions on various energy storage systems among the Twitter influencers, finds GlobalData. GlobalData's latest report, '#Influencerviews on Energy Storage', reveals the top trending topics among Twitter influencers between October 2021 and January 2022 by analyzing the concepts, company names, and hashtags based on Buzz Index Score and volume of posts. Buzz Index Score is GlobalData's proprietary metric, which is used to calculate the uniqueness of any trend on a scale 0-1. The score closer to 1 is the more recent and popular mentions are for a trend. A score of 1 indicates that a trend is not discussed prior to a selected time period.

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Smitarani Tripathy, Social Media Analyst at GlobalData, comments: "Influencer conversations tracked by GlobalData's Social Media analytics platform reveals 50% jump in discussions on 'energy storage' during October 2021 to January 2022, compared to the previous four months. Lithium iron phosphate (LFP) batteries, battery swaps and Tesla's powerwall backup were some of the most discussed topics around energy storage among the influencers."

Most of the influencers are of the opinion that LFP technology is better than traditional Lithium-ion batteries in terms of the expected life, environmental damage, compact size, and weather resistance.

Tripathy explains: "Battery swaps have become popular amongst the influencers, backed by the greater adoption of battery-powered vehicles in recent years. Influencers have shared updates around how swaps were implemented around the world and other ideas that can reduce downtime for charging."

Below are a few most popular tweets captured by GlobalData's Social Media Analytics Platform:

Henry Sanderson, Executive Editor at Benchmark Mineral Intelligence, says:

"Tesla and VW and others have pledged to use cheaper LFP batteries, with no nickel and cobalt. LFP will also be key for energy storage facilities, needed for wind and solar. Yet over 90% of LFP production capacity is in China. Read @benchmarkmin analysis"

Euan McTurk, Technologist, Creator of Plug Life Television, on battery swap shared:

"Here's an electric mining truck that can swap its battery in a very short space of time. Noise reduction, no combustion, no exhaust emissions, better reliability, cheaper running costs and no downtime compromises vs ICE or fuel cell. Huge positive impact on the mining sector."

LS ENERGY SOLUTIONS DEPLOYS FIRST ALL-IN-ONE AiON-ESS WITH V20 ENERGY

LS ENERGY SOLUTIONS ("LS-ES"), A LEADING PROVIDER OF GRID-CONNECTED ENERGY STORAGE SOLUTIONS, ANNOUNCES IT HAS DELIVERED ITS FIRST ALL-IN-ONE AiON ENERGY STORAGE SYSTEM (AiON-ESS) TO V20 ENERGY, A NEW JERSEY-BASED STORAGE PROJECT DEVELOPER. LS-ES WILL PROVIDE 14.6 MW/13.7 MWH OF ENERGY STORAGE FROM 17 AiON-ESS CONTAINERS. THE PROJECT IS BEING COMMISSIONED AND IS EXPECTED TO BE INTERCONNECTED TO THE GRID IN Q2 IN NEW JERSEY.

The company's latest product launched in late 2021, AiON-ESS is a flexible, modular AC energy storage solution available in two models for 1-hour and 2- to 4-hour applications. The AiON-ESS offers a variety of configurations to address a range of power and energy use cases, from one-megawatt to multi-hundred-megawatt utility-scale applications. The configuration for V20 Energy is the AiON-ESS Power Series, which includes Tier-1 lithium-ion batteries combined with LS-ES's string inverter platform in a single, scalable, modular format. Its all-in-one design and AC output facilitate ease of installation, operation and maintenance. To ensure compliance with the highest safety standards, the Power Series has received

a UL9540 certification. As part of the PJM Interconnection, the world's largest wholesale electricity market, the project will contribute to its expanding energy storage portfolio and will enable V20 Energy to participate in the PJM ancillary services markets.

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We are thrilled to provide our latest, newly certified all-in-one AiON-ESS storage system to V20 for this project," said Steve Fludder, CEO of LS Energy Solutions. "Our design incorporates features which reduce on-site work and material by incorporating these functions in a stable and repeatable factory environment. We are leading a transition from executing bespoke projects to delivering standardized products.

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Paul Matinho, who leads V20 Energy said, "The LS Energy Solutions team has been great to work with on our first major energy storage project. We value the relationship, their industry experience, and the ability to creatively solve a couple of first project challenges together. We look forward to announcing our next storage project with LS Energy Solutions' AiON-ESS very soon."

AiON-ESS systems have passed the rigorous UL9540 approval process, including a multi-point performance test, to meet the highest safety standards for energy storage products. In addition, the certification verifies that all 76 key components in the system are of high quality and UL-approved. Risk is minimized and costly redesigns are avoided by identifying design issues early, as well as ensuring product conformity to meet international regulatory standards.

POWER DENSITY IN HYBRID ENERGY STORAGE SYSTEMS

THIS ARTICLE WILL COVER NEW TYPES OF HYBRID ENERGY STORAGE SYSTEMS (HESS) WITH HIGH POWER DENSITY AND HIGH ENERGY DENSITY, AS WELL AS GOOD POWER REGULATION METHODS.

What is a hybrid energy storage system?

Comparisons made between A-CAES and PTES systems for energy storage.

Fossil fuels, along with worries about protecting our fragile environment, are strongly driving efforts toward renewable-energy solutions like wind and solar energy. The problem is that these systems are unpredictable and intermittent, which will lead to the inability of meeting load demands of business industries and domestic customers.

We're currently seeing a marked increase in penetration of renewable-energy sources, such as solar energy and wind, into the power grid. However, electrical energy storage (EES) systems also are receiving a great deal of attention by researchers. Some of these EES systems include adiabatic compressed air energy storage (A-CAES) and pumped thermal energy storage (PTES) systems, as well as power energy storage for weak power distribution grids with high-density distributed generation integration.

HYBRID ENERGY STORAGE SYSTEMS (HESS)

"More Electric Aircraft" High-Power-Density Optimal Configuration for HESS

The More Electric Aircraft (MEA) can use a HESS to minimize weight by applying the wavelet transform to configure HESS capacity.¹ We will use the concept of equivalent time (CET) to build the relationship between the load power and storage cells to select an optimum storage type and cell.

Weight in an aircraft in flight will cause faster fuel consumption as well as emissions, on the order of 2%, out of all man-made CO₂ emissions into the air.

More electrical devices, such as an electromechanical actuator (EMA), electro-hydrostatic actuator (EHA), de-icing devices, and an engine starter/generator, can be installed in the aircraft to enable more reliable and higher performance in energy conversion. Using such devices, in lieu of heavy mechanical options, will reduce the weight and volume of the aircraft. Aircraft power fluctuations, caused by electrical devices, will exhibit randomness and intermittency while connected to the aircraft dc bus. For this reason, the wavelet transform is used to distribute load power that will have non-stability characteristics. To maintain the stability of the dc bus voltage, the HESS has been chosen to smooth out any power fluctuations. Equivalent time (ET) is the ratio of energy to power (see figure). The ET of a battery, which will respond in a short time with a low amplitude energy output, is large. But, the ET of a supercapacitor, which has the capability of instantaneous and high amplitude power output, is much smaller.

Now we can select the best energy storage device when its ET matches the load power's ET—when the load power's ET is known. It doesn't matter if a battery pack or supercapacitor pack is chosen. All are made of the same cells configured in a series and parallel combination, and the combined ET is the same as the cell's ET. In the figure, A and B represent the minimum and maximum values of the ET of supercapacitors. The minimum and maximum values of the ET of the batteries are expressed by C and D. Selecting the supercapacitor, as a single energy storage system, occurs when the load power's ET is located in the area of "a" in the graph. In the same way, when in the "b" area, we choose the battery. However, when the load power's ET is located in the area of "c" between B and C, we should choose the HESS, which consists of a combination of supercapacitors and batteries. This approach will not only realize a high-power-density configuration of the HESS, but also may be used to optimize an energy storage system for micro-grid and electric vehicles, as well as the parameters for the design of a flywheel energy storage system.

A-CAES AND PTES POWER-DENSITY SOLUTIONS

Adiabatic compressed air energy storage (A-CAES) extracts thermal energy generated when it's compressed, then stores that energy prior to the storage of compressed air in either an underground cavern or underwater bags. During discharge, the air is heated from the thermal storage and expanded in a turbine. Pumped thermal energy storage (PTES) functions as a heat pump during charging, pumping the heat from a cold reservoir to a hot reservoir. This process is reversed during discharge and works as a heat engine that converts stored thermal energy back into electricity. PTES is more sensitive to any loss than is A-CAES. The thermo-economic performance of A-CAES is enhanced via the use of isobaric (underwater) air reservoirs or hybrid thermal energy storage (TES). However, the PTES can be improved by utilizing system pressurization, switchable compressors/expanders, and non-conventional working fluids.² Heat recuperation can be used for A-CAES to enhance its power density and energy density.

Under pressure, PTES variants can be almost as cheap as the underground A-CAES, but the PTES variants tend to have an efficiency of 50% to 60%, while the efficiency A-CAES variants tends to be 70% to 80%. However, PTES has a higher energy density (meaning a smaller plant footprint) and more freedom in siting. Smaller plant footprint can lead to better power density.

Source: *electronicdesign*

CPP INVESTMENTS SUPPORTS RENEWABLE POWER CAPITAL'S NEW INVESTMENTS IN EUROPEAN ONSHORE RENEWABLES

- RENEWABLE POWER CAPITAL (RPC) ENTERING THE SWEDISH MARKET WITH 100% ACQUISITION OF ONSHORE WIND FARM FROM OX2
- CPP INVESTMENTS IS COMMITTING APPROX. €260 MILLION TO SUPPORT RPC'S GROWTH STRATEGY
- RPC FORMS A CORE PART OF CPP INVESTMENTS' MULTI-BILLION SUSTAINABLE ENERGIES INVESTMENT STRATEGY AND INVESTS IN SOLAR, ONSHORE WIND AND BATTERY STORAGE ACROSS EUROPE

Canada Pension Plan Investment Board (CPP Investments) has committed a further €260 million to Renewable Power Capital Limited (RPC), in support of RPC's ongoing investment strategy, including its initial investment in Swedish onshore wind and recent investments in Spanish solar projects. RPC, CPP Investments' U.K. based onshore renewables platform, has recently committed to acquire the Klevberget onshore wind farm, with a capacity of 146 MW, in their first Swedish deal. OX2, a leading developer and constructor of large-scale onshore wind power in Europe, is constructing the wind farm under their construction & asset transfer agreement. Once commissioned, OX2 will be responsible for the technical and commercial management of the wind farm. It will provide clean energy equivalent to the consumption of approximately 46,000 households. Bruce Hogg, Managing Director, Head of Sustainable Energies, CPP Investments, said: "RPC has significantly expanded its footprint across European renewables with this entry into the Swedish market. We continue to support the business with additional long-term capital to invest in attractive renewables opportunities across our target markets. RPC is partnering with OX2, delivering additional energy capacity which will compete without subsidies in the Nordic region. The deal builds on the ongoing relationship between RPC and OX2. In 2021, RPC acquired a 171MW portfolio of Finnish onshore wind projects from OX2. RPC was launched by CPP Investments in December 2020.



Source : cppinvestments

CHINA TO FOCUS ON GOBI DESERT FOR NEW SOLAR, WIND POWER BASES

APART FROM THESE DESERT PROJECTS, IT WILL ALSO WORK TO IMPROVE RURAL GRID TRANSMISSION AND ALLOW VILLAGE COLLECTIVES TO INVEST IN RENEWABLE POWER AND SHARE THE PROFITS.

China's new renewable energy plans will focus on the Gobi and other desert regions, as it speeds up the construction of huge new wind and solar power bases and boosts its transmission capabilities, regulators said in a new policy document. To meet its climate targets, China - the world's biggest greenhouse gas emitter - is drawing up policies that will allow the "green and low-carbon transformation" of its energy system, which has traditionally been dominated by coal. Beijing aims to bring total wind and solar capacity to 1,200 gigawatts (GW) by the end of 2030, almost double the current level, and will gradually phase down fossil fuel use in a bid to become carbon neutral by around 2060. But the National Energy Administration (NEA) said in guidelines published, that new policies and institutional mechanisms were required in order for China to take full advantage of green energy. It said by 2030, China would create a system allowing all new energy demand to be met by non-fossil fuel sources, as NEA plans to diversify the financing channels for renewables and improve incentives and market mechanisms, including a "green product certification" system encouraging consumers. Apart from these desert projects, it will also work to improve rural grid transmission and allow village collectives to invest in renewable power

and share the profits. Though it wants renewables to meet the bulk of new energy demand, China still expects coal consumption to rise until at least 2025. Researchers with the State Grid Corporation forecast that another 150 GW of coal-fired power could be built over 2021-2025. The new guidelines said China would make clean coal consumption a priority and further eliminate small and inefficient mines, power plants and heating systems, while providing more support for carbon capture and storage at thermal plants.



TATA POWER AND SOCIAL ALPHA ANNOUNCE 'NET-ZERO INDUSTRY ACCELERATOR' FOR CLEAN ENERGY TRANSITION

- Programme will support the lab-to-market process of innovative climate-tech breakthroughs.
- Initiative in line with India's COP26 commitments.

Tata Power, one of India's largest integrated power companies, and Social Alpha have joined hands to build a unique innovation curation and venture development program 'Net-Zero Industry Accelerator' focused on industrial use cases of clean energy transition and industrial decarbonization contributing towards India's net-zero targets. The Net-Zero Industry Accelerator will prioritize industries with the highest carbon footprints and will co-create the innovation ecosystem in partnership with some of the leading industry players in India along with technologies that abate and address air pollution from industrial sources and encourage energy decarbonization, carbon capture, and storage. Effective energy decarbonization includes shifting the energy mix away from fossil fuels and toward non carbon electricity and other energy carriers such as hydrogen; increasing energy efficiency, improving the energy density of storage while reducing cost, and managing demand for energy. 'Net-Zero Industry Accelerator' will identify disruptive, innovative, and impactful technology solutions in sustainable energy and incubate them in the market journey. In the later stages 'Net-Zero Industry Accelerator' will also focus on investment decision-making and prioritize funding and resources for promising innovations impacting multiple industries.

Reaching net-zero and enabling a green and resilient future requires not only the rapid deployment of currently available solutions but also encourages innovation in breakthrough technologies. At a time, when countries are seeking to reach climate change objectives and re-ignite economic growth in the post-COVID era, integrating low-carbon innovation support will be of the utmost importance. 'Net-Zero Industry Accelerator' has been conceived to fast-track India's journey towards the net-zero goal, and to assure a robust ecosystem to support a new generation of entrepreneurs as they take disruptive climate-tech innovations from the lab to market.

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Commenting on the initiative, Dr. Praveer Sinha, CEO & MD, Tata Power said, “The Net Zero Industry Accelerator is a one-of-a-kind initiative that will assist Indian companies in seizing new opportunities as the world moves toward a greener economy through disruptive climate-tech solutions. It would also enhance India's clean energy ecosystem, generating momentum for the country's transition to a low-carbon economy and making a significant contribution to the COP26 pledge.”



'Net-Zero Industry Accelerator' will also create a platform for various industry players to sponsor open innovations challenges for decarbonization and accelerate India's journey to net-zero by reducing Green House Gas (GHG) emissions significantly. It will encourage innovations that will create new value propositions and business models to replace carbon-intensive ways of doing business and lay the groundwork for the path to net-zero emissions.

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Speaking of the collaboration, Mr. Manoj Kumar, Founder & CEO, of Social Alpha, said, “Technology and innovation are major building blocks in achieving the deep cuts in carbon emissions that are needed in enabling the transition to a net-zero carbon world. At Social Alpha, we believe that the ongoing climate crisis also presents a massive opportunity for entrepreneurs and investors to create social and economic value as they respond to the biggest threat that humankind is facing today. To accelerate our journey to Net-Zero, and decarbonize every sector of the economy, we must support breakthrough, scalable innovations while reducing the green premiums simultaneously.”



One of India's most progressive green energy companies, Tata Power is driving its #DoGreen mission of leading green innovations and has collaborated with Social Alpha and the Government of India under Mission Innovation to build a Clean Energy International Incubation Centre (CEIIC) in Delhi in 2018. CEIIC, which is Social Alpha's Energy Lab, is a joint initiative of Tata Trusts and the Government of India supported by the Department of Biotechnology, BIRAC, Tata Power, and Tata Power – Delhi Distribution Limited. CEIIC has been set up for promoting innovations in the energy space and has become the first International Incubator in India under Mission Innovation. CEIIC's mandate is to look for start-ups involved in innovative solutions across the entire energy value chain in India, with a strong focus on affordability, accessibility, and user experience, and has already incubated more than 35 start-ups in this sector and currently helping them with market validations and scale-up. 'Net-Zero Industry Accelerator' will build upon the success of CEIIC and will focus on market access and deployment readiness across a wide range of industrial decarbonization use cases.

SOLAR'S FIRST TRILLION WATTS ARRIVES DURING A WARTIME ENERGY TRANSITION

THAT'S ONE CONSEQUENCE OF THE RUSSIAN INVASION OF UKRAINE. IF WAR IS A FORCE THAT GIVES US MEANING, THIS ONE IS REDEFINING THE GLOBAL ENERGY SYSTEM. WHAT HAD UNTIL RECENTLY BEEN EUROPE'S DECADES-LONG PURSUIT OF A GREEN AGENDA TO REPLACE COAL AND NATURAL GAS WITH WIND TURBINES AND BATTERIES HAS BECOME A MATTER OF WARTIME URGENCY. LEADERS IN BRUSSELS, BERLIN, PARIS, AND WARSAW WOKE UP TO A NEW REALITY IN WHICH SPENDING UP TO \$1 BILLION PER DAY ON RUSSIAN FOSSIL FUELS MEANT FINANCING THE MISSILES EXPLODING IN KYIV. SO THE TRANSITION ACCELERATES.

Efforts to fight climate change often adopt the language of war. It's aspirational, in a dark way. Scientific warnings and extreme weather haven't yet spurred the global economy to fully mobilize against greenhouse gas. So those who want more urgency resort to combat metaphors. Now an actual war might turn, in part, on curbing or even embargoing one of the biggest sources of fossil fuels.

Clean energy isn't waiting for a geopolitical shift. The world stands on the verge of installing its one-thousandth gigawatt of solar electricity. The road to that milestone — the first solar terawatt — started with the invention of primitive panels in the 1950s. The second terawatt will come in less than four years, according to BloombergNEF. It's possible that India, with a new net-zero goal, will play a China-size role in the next stage.

The growing markets for renewables haven't escaped the inequities that shape the fossil economy. Microfinance businesses bringing solar rigs to rural Africa end up turning off the lights on villagers and refugees when the payments stop, and microgrids already built in Indonesia are shutting off for lack of funding. The planet's cheapest energy source is, somehow, still unaffordable for those who need it most.

Source: Bloomberg

HINDUSTAN ZINC ENTERS INTO LONG-TERM CAPTIVE RENEWABLE POWER DEVELOPMENT PLAN, WITH A CAPACITY OF 200MW

IN LINE WITH PRIME MINISTER NARENDRA MODI'S VISION OF MAKING INDIA 'NET ZERO', HINDUSTAN ZINC HAS JOINED THE GLOBAL MOVEMENT OF LEADING COMPANIES THAT ARE ALIGNING THEIR BUSINESS TO LIMIT GLOBAL TEMPERATURE RISE TO 1.5C ABOVE PREINDUSTRIAL LEVELS AND REACH NET-ZERO VALUE CHAIN EMISSIONS BY NO LATER THAN 2050.

Hindustan Zinc has set an ambitious target for a 40% reduction in carbon footprint by 2030 and achieving Carbon Neutrality by 2050 by transitioning towards renewable energy. Towards this goal, Hindustan Zinc is happy to announce that the company has approved the proposal for entering a long-term group captive Renewable Power development plan up to a capacity of 200MW.

This project will be built under Group Captive norms and Build Own Operate (BOO) basis under a Special Purpose Vehicle (SPV), in which the Company will own 26% of the equity with contributions up to Rs 350 crore. This SPV is expected to start delivering the power within 24 months of the signing of the Power Delivery Agreement (PDA).

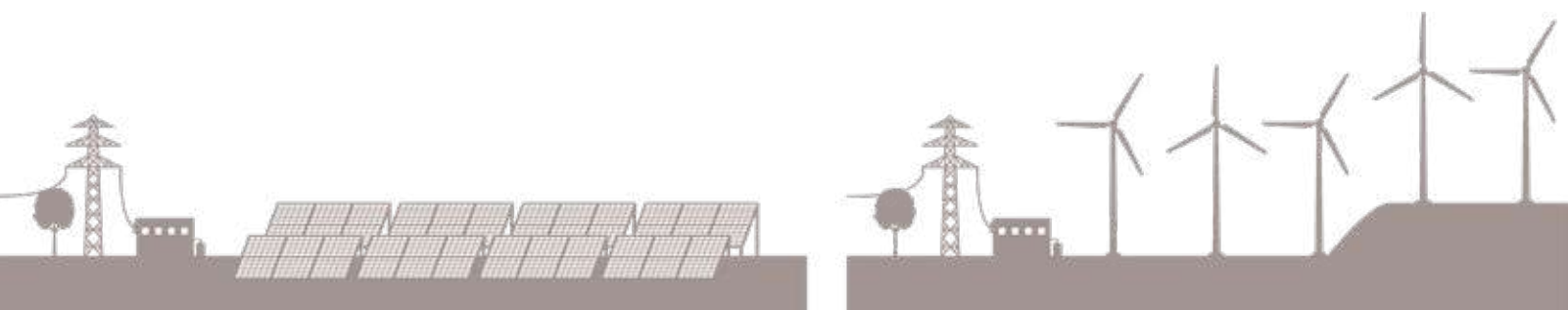
It is in line with Hindustan Zinc's strategic objective of reducing dependence on conventional sources of energy & transitioning from thermal power to Renewable power, thereby reducing GHG emissions of its operations. This reaffirms the company's proactive approach to sustainability which will go a long way toward maintaining the leadership position in Dow Jones Sustainability Index.

“

Commenting on the development, **Mr Arun Misra, CEO** said, “I am elated that we are marching ahead in our ESG roadmap for the development of renewable power supply up to 200 MW. Hindustan Zinc stands committed to decarbonising its operations and transitioning to the production of Green Products of zinc and lead. We remain proactive towards investing in our climate change initiatives & thereby progress on our journey of net zero by 2050.”



Source: PTI



STUDY EXPLORES HOW TO PRODUCE FUEL FROM RENEWABLE SOURCES AND REDUCE CARBON EMISSIONS

ACCORDING TO RESEARCHERS AT THE TECHNICAL UNIVERSITY OF MUNICH (TUM), A CONSIDERABLE REDUCTION IN CO2 EMISSIONS IS REQUIRED TO LIMIT THE CONSEQUENCES OF CLIMATE CHANGE. PRODUCING FUEL FROM RENEWABLE SOURCES SUCH AS WASTE WOOD AND STRAW OR RENEWABLE ELECTRICITY WOULD BE ONE WAY TO REDUCE CARBON EMISSIONS FROM THE AREA OF TRANSPORTATION.

The study was published in the journal, 'Frontiers in Energy Research'.

Ethanol is usually produced through the fermentation of sugars from starchy raw materials such as corn, or from lignocellulosic biomass, such as wood or straw. It is an established fuel that decarbonizes the transportation sector and can be a building block to reduce emissions of CO₂ over the long term. Researchers of the TUM have developed a new process for the production of ethanol. In this context, off-cut materials from the area of forestry are used together with hydrogen. The hydrogen is produced by separating water into hydrogen and oxygen with the use of electricity — in other words, with the use of water electrolysis. In the future, this will allow the excess electricity to be used for the production of ethanol.

“

The overall process mainly consists of technically mature sub-processes. However, the composition of the process steps and the final step — the hydrogenation of acetic acid to produce ethanol — are new, explained Daniel Kluh, a doctoral student at the Professorship of Renewable Energy Systems at the TUM Straubing Campus.

The researchers have also assessed the economic feasibility.

“The prices we have calculated are based on assumptions for raw materials and energy. We are not using any current market prices. The calculation basis of our prices for the components in the chemical system is the year 2020,” explained Kluh. The lowest cost for ethanol in the modelling was 0.65 euros per litre, with biomass costs of 20 euros per megawatt-hour, electricity costs of 45 euros per megawatt-hour, and a production volume of approximately 42 kilotons of ethanol per year.

“

With the current lignocellulosic ethanol production options, the costs are therefore competitive. The price of ethanol is very sensitive to the costs of electricity, and fluctuates between 0.56 and 0.74 euros per litre, explained Assistant Professor Kristian Melin of LUT in Finland.

One reason for the high profitability is that the ethanol yield is much higher compared to the traditional fermentation-based bio-ethanol process from straw or wood.

This process produces 1,350 to 1,410 litres of ethanol, compared to only 200 to 300 litres of ethanol for the traditional process per dry ton of biomass. Part of the study was focusing on the variable geographical positioning of production sites, which would enable a degree of independence from suppliers to be achieved.

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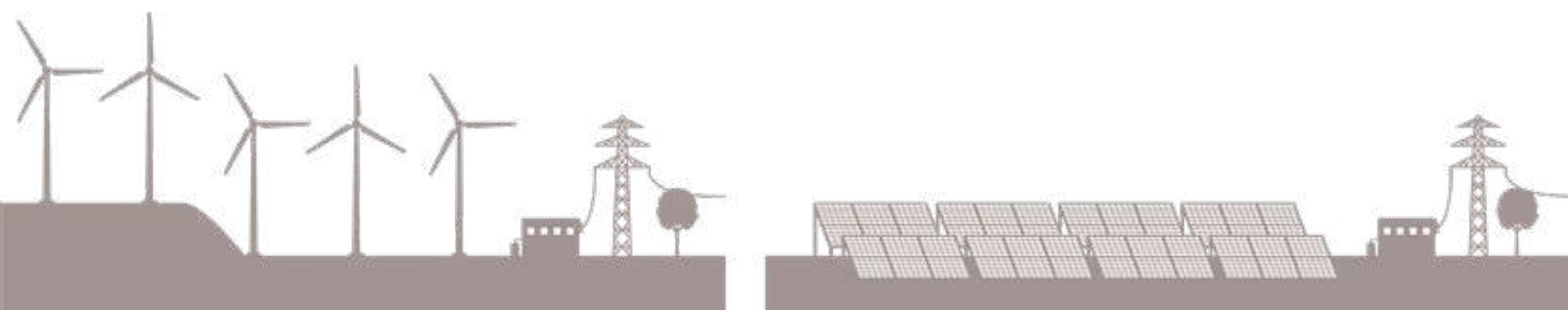
Countries with a high potential for waste wood and green electricity, such as Finland or even Canada, can serve as producers of acetic acid, which, in the final process step, is hydrogenated to produce ethanol, explained Prof. Tuomas Koironen of LUT.

“In the future, countries like Germany will hopefully have a green electricity mix and will be able to carry out the hydrogenation of acetic acid to ethanol at a domestic level. However, Germany does not have the waste wood potential for large-scale biomass gasification which is required for the synthesis of acetic acid,” added Prof. Matthias Gaderer, Professor of Renewable Energy Systems at TUM.

With the use of green electricity to power the electrolysis, this process can produce a low CO₂ fuel that has a greenhouse gas reduction potential of 75 per cent in comparison with a fossil fuel such as gasoline. Ethanol is established as a fuel. It can be used in the form of both E-10 gasoline, with 10 per cent ethanol in the fuel mixture for regular automobiles, as is already the case, or as ED95, which is 95 per cent ethanol, as a diesel substitute for heavy goods transportation.

With their process simulation, the scientists have demonstrated the competitiveness of the process. “To commercialize this product, it is necessary to further improve the degree of technological maturity. The next steps could entail further catalyst developments, a reactor design and the construction and operation of a pilot system,” said Prof. Gaderer.

Source: ANI



JSW NEO ENERGY TO SET UP HYDRO PUMPED STORAGE PROJECT IN CHHATTISGARH

JSW ENERGY ARM JSW NEO ENERGY HAS INKED A PACT WITH THE CHHATTISGARH GOVERNMENT FOR SETTING UP A 1,000 MW CAPACITY HYDRO PUMPED STORAGE PROJECT.

With rapid addition of renewable energy capacity in the country, development of energy storage solutions such as hydro pumped storage projects (PSPs) become essential due to intermittent power supply from renewables, the company said in a statement. Hydro pumped storage is a well-established technology that provides adequate peaking power reserves, reliable grid operation, and energy balancing and storage capacity, it added.

“JSW Energy Limited, through its wholly owned subsidiary, JSW Neo Energy, has entered into a Memorandum of Understanding with the Government of Chhattisgarh for setting up a 1,000 MW capacity of Hydro Pumped Storage Project viz. Hasdev Bango Pumped Storage Project...,” the statement said.

JSW Energy through its green growth vehicle JSW Neo Energy has been expeditiously securing key resources for hydro PSPs in various resource-rich states for projects with a targeted capacity totalling up to 10 GW, it stated. Earlier in FY22, the company signed a pact with the Government of Maharashtra for 1,500 MW and a Letter of Intent with the Government of Rajasthan for 1,000 MW Hydro PSPs.



Prashant Jain, joint managing director and CEO of JSW Energy, said, “By integrating Hydro PSPs with our solar and wind power plants in the near future, we can provide firm despatchable renewable power. This will enable us to enter energy services play in the country.” JSW Energy said it has set an ambitious target for 50 per cent reduction in carbon footprint by 2030 and achieving carbon neutrality by 2050 by transitioning towards renewable energy.



The company aims to reach 20 GW capacity by 2030, with the share of renewable energy increasing to 85 per cent.

Source: PTI



HIGH SCHOOLS IN ODISHA'S GANJAM TO BE ILLUMINATED WITH RENEWABLE ENERGY

ALL GOVERNMENT-RUN HIGH SCHOOLS IN ODISHA'S GANJAM DISTRICT WILL SOON BE ILLUMINATED WITH ELECTRICITY GENERATED FROM RENEWABLE ENERGY.

The district administration has taken an initiative to make the high schools energy-independent by installing solar panels, Ganjam Collector Vijay Kulange said. The installation is set to be done by a Noida-based firm and likely to be completed in the next six months. There are 535 government high schools in the district, officials said. Around Rs 9 crore will be spent under the project and expenditure will be met through the corporate social responsibility funds of different firms and contribution of the ‘Mo School’ (my school), an initiative to revamp the government and state-aided schools in Odisha. The solar units will provide 2 kW and 4 kW of energy in small and big high schools respectively, according to the sources.

They claimed that Ganjam might be the first district in the country to have all government high schools covered under renewable energy when the project is complete. The solar panel will help the schools in getting uninterrupted power supply and reducing the expenditure on electricity bills, District Rural Development Agency project director Shinde Dattatraya Bhausaheb said. The power bills have gone up due to the use of interactive panels in smart classes and computers in the e-libraries in all the high schools that have been transformed under a scheme. The solar panels can withstand a wind speed of 100 km per hour during a cyclone. It is also easy to dismantle within 10 minutes if needed, Bhausaheb said. The project will also create awareness among students on the use of renewable energy, the district collector added.

Source: tribuneindia

TORRENT POWER ANNOUNCED FORMAL TAKEOVER OF POWER DISTRIBUTION OPERATIONS IN THE UNION TERRITORY OF DADRA & NAGAR HAVELI, DAMAN AND DIU

TORRENT POWER ANNOUNCED FORMAL TAKEOVER OF THE POWER DISTRIBUTION OPERATIONS IN THE UNION TERRITORY OF DADRA & NAGAR HAVELI, DAMAN AND DIU. DADRA & NAGAR HAVELI, DAMAN AND DIU IS THE FIRST UNION TERRITORY TO BE PRIVATIZED UNDER THE GOVERNMENT OF INDIA'S AMBITIOUS PROGRAM TO PRIVATIZE THE DISTRIBUTION NETWORK IN UNION TERRITORIES THROUGH A COMPETITIVE BIDDING PROCESS.

The 1.5 Lacs customers in the Union Territory will now be served by Torrent Power, through the newly formed company – Dadra and Nagar Haveli and Daman and Diu Power Distribution Corporation Limited (DNHDD Power Distribution Company); where Torrent Power will own 51% stake and Hon'ble Administrator of the Union Territory of Dadra & Nagar Haveli, Daman and Diu will own the balance 49% stake. DNHDD Power Distribution Company will have a customer base of 1.5 lacs, annual sales of 9 billion units of power and annual revenue of about Rs. 4,500 crores. Torrent Power in the past has acquired and successfully led turnaround of distribution network in the cities of Ahmedabad, Gandhinagar and Surat in Gujarat; Bhiwandi, Shil, Mumbra and Kalwa in Maharashtra and Agra in Uttar Pradesh. Torrent Power has significantly improved power availability and reliability and reduced AT&C losses through investments in technology and improved operational efficiencies.

Torrent Power is also the first and only Power Distribution Company in India to win the prestigious 5 Star Rating for Environmental Sustainability, as well as the Sword of Honour for Occupational Health and Safety from the British Safety Council UK. Besides, Torrent Power is also one of the few power utilities to have implemented Integrated Management System covering ISO 9001:2015 – Quality Management System, 140001:2015-Environment Management System., 45001:2018- Occupational Health and Safety Management System, 50001:2018- Energy Management System and 55001:2014-Asset Management System.



Speaking on the occasion, **Mr. Varun Mehta, Executive Director – Distribution of Torrent Power** said “We are pleased to have the opportunity to serve the people of Dadra & Nagar Haveli, Daman and Diu and to bring to them the high standards of reliability and service that Torrent Power stands for.

Over the course of the coming months, Torrent Power will strive to bring in a significantly better customer experience through improved reliability, operational efficiency and customer service.

With the addition of Dadra & Nagar Haveli, Daman and Diu, Torrent Power has significantly strengthened its leadership position in the Power Distribution sector.”

With the takingover of operations in Dadra & Nagar Haveli, Daman and Diu, Torrent Power will now have a total customer base of 3.8 million across 12 cities and annual sales of 24 billion units of power and a peak demand of 5000 MW across its Licensed and Franchised areas in Gujarat, Maharashtra, Uttar Pradesh and Dadra & Nagar Haveli, Daman and Diu.

EDPR WINS FLOATING PV GRID CONNECTION

EDPR HAS BEEN AWARDED WITH A GRID CONNECTION IN A FLOATING SOLAR AUCTION IN PORTUGAL.

The company has secured 70MVA of grid connection capacity at Alqueva for a period of 15 years, which is expected to allow it to install up to 154MW of renewable capacity. The grid connection capacity is expected to allow EDPR to install up to 154MW of renewable capacity, including 70MW of floating solar PV under the contracts for difference it has been awarded. It also allows for 14MW of solar overcapacity and 70MW of hybrid wind capacity, both excluded from the CfD. The project is estimated to be operational in 2025. This strategy combines the optimisation of grid connection and hybridisation of renewable technologies to promote the acceleration of the energy transition, EDPR said.



Source : renews

WHY DO ELECTRIC VEHICLES CATCH FIRE? HOW TO AVOID EV BATTERY FIRE?

- The Ola S1 Pro is in the news for catching fire while parked, blowing up in flames instantaneously.
- There have been other incidents of electric scooters catching fire across the country, leaving customers and others shocked.
- But should you be worried? And what can you do? Here's a primer on the matter.

Electric scooters have never been more popular in India than they are now. With petrol prices rising almost every day, many two-wheeler riders across the country are probably looking at buying an electric scooter to escape the petrol price hikes. But the recent spate of electric scooters catching fire has put some of them in a bind, leaving them worried and confused. Most recently, a parked Ola S1 Pro scooter caught fire without any specific intervention from anyone, raising an alarm and concerns about the safety of the electric scooter. Ola issued a statement, saying it is looking into the matter. In the meantime, the central government has deputed a team of independent experts to investigate the incident.

"We're in constant touch with the customer, who is absolutely fine. Vehicle safety is of paramount importance at Ola and we are committed to the highest quality standards in our products. We take this incident seriously and will take appropriate action and share more in the coming days," the company added in its statement.

WHY ARE ELECTRIC SCOOTERS CATCHING FIRE IN INDIA?

Electric scooters are powered by batteries – lithium-ion being the most common technology in use. Further, these lithium-ion batteries come in two variants – LFP and NMC. LFP (lithium ferrophosphate), is relatively more stable than NMC (nickel manganese cobalt), with a much higher threshold for thermal runaway at 270 degrees celsius versus 150 degrees celsius, respectively. NMC batteries are denser and therefore, offer a longer range than LFP batteries. However, their lower thermal runaway threshold means that the risk of these batteries malfunctioning is higher. This gets worse in the Indian climate, where the temperatures inch close to 50 degrees celsius in certain parts of the country in the summer.

WHAT IS THERMAL RUNAWAY?

Thermal runaway is a process wherein the temperature of the battery increases, releases energy, which in turn increases the temperature, ending up in a vicious cycle of temperature increase and eventually leading to a fire.

IF YOU OWN AN ELECTRIC SCOOTER, SHOULD YOU BE WORRIED?

According to a report by RISE, a Sweden-based research institute, there can be several reasons for thermal runaway.

This can be triggered by even a short circuit in the battery pack, caused due to a circuit malfunction or accidents damaging the battery pack. With the adoption of electric vehicles increasing in India, reports of these sorts of incidents are also bound to surface more. This is simply a result of an increase in the number of electric vehicles in the market, but consumer safety remains of paramount importance nonetheless.

WHAT CAN YOU DO TO REDUCE THE CHANCES OF YOUR ELECTRIC VEHICLE CATCHING FIRE?

While it is not completely possible to reduce the risk of these accidents to zero, consumers can follow certain dos and don'ts to ensure they minimise the risk.

"There is no denying that EVs are accompanied by new risks, but there is no evidence that points at EVs being less safe than conventional vehicles," RISE added in its report.

With that in mind, let's look at some important dos and don'ts:

- Read the vehicle booklet carefully – many of us are new to electric vehicles, so it is important that you understand how your electric vehicle works to make sure you operate it properly.
- Don't expose the vehicle's batteries to direct sunlight.
- Try to keep your electric vehicle at room temperature.
- Don't leave the electric vehicle unattended while charging.
- Don't leave the electric vehicle on charging overnight.
- Make sure you keep a tab on battery health. Your vehicle's battery management system will alert you in case of any abnormalities.
- Make sure you get your electric vehicle serviced on time to ensure everything is functioning normally.

Source: PTI

PANASONIC JOINS THE ELECTRIC VEHICLE MARKET; PLANS TO INVEST \$4.9 BILLION IN EV BATTERIES AND SUPPLY CHAIN SOFTWARE

PANASONIC IS JOINING THE HIGH-GROWTH ELECTRIC VEHICLES MARKET, WITH PLANS TO INVEST NEARLY \$4.9 BILLION IN AUTOMOTIVE BATTERIES, SUPPLY CHAIN SOFTWARE AND CYBER PHYSICAL SYSTEMS, AMONG OTHERS.

The Japanese company said to achieve its future goals, the group is to invest 400 billion yen (nearly \$3.26 billion) in “growth areas” and 200 billion yen (about \$1.63 billion) in “technology pillars” respectively in three years, from fiscal 2023 to 2025. As part of the company’s medium and long-term growth strategy, it will invest in automotive battery area, supply chain software area, air quality and air conditioning area, hydrogen energy and CPS (cyber physical system), it said in a statement.

“While maintaining financial discipline, the group is to make group-wide strategic investments with the cash generated through enhancement of competitiveness, as well as the investments made by each operating company,” the company added.

It is also targeting an accumulated operating profit of 1.5 trillion yen over the period. The group aims to reduce the impact of over 300 million tonnes of CO₂, which are equal to approximately 1 per cent of total global emissions by 2050. Last year, the company closed a \$7 billion acquisition deal with supply chain AI software provider Blue Yonder. Earlier, Panasonic formed a joint venture with Toyota that specialises in automotive batteries.

Source: IANS

ELECTRIC VEHICLES AND CHARGING STATIONS

THE NUMBER OF ELECTRIC VEHICLES IN THE COUNTRY, AS PER VAHAN 4 DATA, AS ON 25-03-2022, IS 10,76,420 AND A TOTAL OF 1,742 PUBLIC CHARGING STATIONS (PCS), AS PER THE BUREAU OF ENERGY EFFICIENCY (BEE), ARE OPERATIONAL IN THE COUNTRY, AS ON 21-03-2022.

Ministry of Power has issued “Charging Infrastructure for Electric Vehicles – the revised consolidated Guidelines and Standards” on 14.01.2022 to accelerate the E-Mobility transition in the country. Under the Scheme for Faster Adoption and Manufacturing of Electric Vehicles in India Phase-II (FAME India Phase II) of the Ministry of Heavy Industries, 2877 public EV charging stations have been sanctioned in 68 cities.

Action Plans have been prepared by Bureau of Energy Efficiency (BEE) for 8 cities with 4 million plus population (Mumbai, Delhi, Bangalore, Ahmedabad, Chennai, Kolkata, Surat, and Pune). Under these Action Plans, scenario wise targets have been prepared for Business as Usual (BAU), Moderate and Aggressive Scenarios for installation of chargers in these cities. Ministry of Heavy Industries (MHI) had invited proposals from any Govt. Organization/ Public Sector Undertaking (PSU) (State/Central)/Govt. DISCOM/ Oil Public Sector Undertaking and similar other Public/Private entities to build and operate Public EV charging infrastructure on Expressways and National Highways under FAME India Scheme Phase-II for Highways & Expressways, wherein PSU Energy Efficiency Services Limited (EESL), in consortium with Convergence Energy Services Ltd. (subsidiary of EESL), has been awarded the work for setting up of EV charging stations along 16 NH/Expressways.



In order to facilitate EESL in the above prospect, NHAI has signed an MOU with EESL. As per this MoU, NHAI shall provide space/land near toll plazas and its buildings for installation of Electric Vehicle Charging Stations, based on revenue sharing model, subject to an agreeable amount to NHAI and EESL. As part of the Wayside Amenities (WSAs), National Highways Authority of India (NHAI) has also awarded 39 such facilities for development. This reply was given by the Union Minister of Road Transport and Highways, Shri Nitin Gadkari in a written statement to a starred question in Lok Sabha.

INDIA'S BIGGEST EV RALLY HELD IN PUNE TO PROMOTE ELECTRIC VEHICLES

MINISTER OF TRANSPORT & PARLIAMENTARY AFFAIRS, GOVT. OF MAHARASHTRA, ANIL PARAB FLAGGED OFF THE EV RALLY, ONE OF ITS KIND ACROSS INDIA, ORGANISED AT SINCHAN NAGAR (NEAR RANGE HILLS)

Pune Police Commissioner Amitabh Gupta, MCCIA Director General Prashant Girbane, and MIDC GM Marketing Abhijit Ghorpade were present during the flag-off ceremony. The rally saw participation from 350 two-wheelers, 35 three-wheelers and around 40 four-wheelers, along with e-cycles, and e-buses, which included 1 PMPML bus and 1 Hydro fuel bus (from Sentinent Labs), and e-auto rickshaws. The rally covered 28 kilometres. The EV rally started from Sinchan Nagar ground and headed towards Empress Garden for its first pit stop. Pune Police Commissioner Amitabh Gupta, MCCIA Director General Prashant Girbane, and MIDC GM Marketing Abhijit Ghorpade were present during the flag-off ceremony. The rally saw participation from 350 two-wheelers, 35 three-wheelers and around 40 four-wheelers, along with e-cycles, and e-buses, which included 1 PMPML bus and 1 Hydro fuel bus (from Sentinent Labs), and e-auto rickshaws. The rally covered 28 kilometres. The EV rally started from Sinchan Nagar ground and headed towards Empress Garden for its first pit stop.



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In his speech, minister Parab said, “On the backdrop of climate change, the Government of Maharashtra has brought out the green mobility and e-vehicles policy. The transition from traditional ICE vehicles to EVs is not easy. All stakeholders in society need to cooperate and participate to create awareness about the advantages of e-vehicles. EV rally is a part of this initiative and through such events, awareness about EVs will reach all citizens. The Government of Maharashtra is taking necessary steps to build infrastructure for EVs and I am confident that Maharashtra will lead the way in green mobility and e-mobility.”

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Police Commissioner Amitabh Gupta said, “India is leapfrogging in EV adoption. We are at a critical mass and simultaneously the charging and battery technology is evolving. I am confident that if we can achieve a range of 700 kilometres in a single charge, then ICE vehicles will be a thing of the past.”

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MIDC GM Marketing Abhijit Ghorpade said, “Climate Change is undoubtedly the greatest challenge faced by mankind in the 21st century. Of all the factors responsible for climate change, vehicular emission is one of the largest contributors to carbon emission. As a part of the Government of Maharashtra’s initiative toward green mobility, MIDC, MPCB in association with MCCIA has organised the EV exhibition. Participation of 350 plus e-vehicles in this rally will virtually bring electric mobility to the doorstep of Pune-kars. Though the rally was 28 kms long, it will go a long way to build public awareness regarding the environment, climate change and e-mobility.”

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MCCIA DG Prashant Girbane said, “Pune is a city well-known for its auto industry. As the auto industry is going through a paradigm shift, the Pune AFC could help shape this transition. The EV rally is a very important component of Pune AFC, as it would create awareness of the alternate fuel vehicles among the masses. We are so glad to see hundreds of participants in this rally.”

The EV exhibition at Sinchan Nagar will remain open from 11 am to 8 pm for all citizens on April 3, 4 and 5.

Source: punekarnews

ANALYSIS OF ELECTRIC VEHICLE (EV) IN INDIA

OUR MOTIVATION TO WRITE THIS ANALYSIS ON EV IN INDIA HAS BEEN ON TWO FOLDS. WE HAVE OBSERVED THAT THE RATE OF PETROL AND DIESEL, SPECIFICALLY IN INDIA HAS HAD A STEEP RISE. SPECIFICALLY, IT IS NOTICED THAT THEIR PRICES HAVE ALMOST DOUBLED DURING THIS PANDEMIC PERIOD. ALSO, WITH THE PRESENT CONFLICT OF THE WAR SITUATION BETWEEN RUSSIA AND UKRAINE MIGHT FURTHER HAVE A DIVERSE IMPACT ON FUEL PRICES.

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According to the World Bank, the transportation sector accounts for over 64% of worldwide oil consumption and 23% of energy-related CO₂ emissions. The necessity for an alternate technology with similar output characteristics has grown as a result of the high emissions number. Electric vehicles, sometimes known as EV, are currently the most viable and

popular succedent. Electric vehicles were originally presented in the 19th century, but they remained unpopular due to the ease and comfort of internal combustion engines (ICE). However, the move from internal combustion engines to electric vehicles has been difficult. According to the IEA's (International Energy Agency) sustainable development scenario, it is 30%. (excluding two-wheelers). At the moment (2020), the global market share is 2.6 per cent (estimated 3 per cent at the end of 2020).

REVIEW OF EXISTING LITERATURE

The two most important aspects of automotive development in the globe are energy conservation and environmental management. These two requirements are addressed by electric vehicles, which provide a clean and green atmosphere. EVs have a strong chance of altering the transportation sector's future, reducing global warming caused by traditional vehicle motors that rely on dwindling fossil fuels .

Between 2013 and 2018, the global supply of electric passenger vehicles increased at a breakneck speed, surpassing 5 million in 2018, a 63 percent increase over the previous year. The rise of Internal Combustion Engine technology will continue to be in demand if we examine the development, execution of government regulations, purchasing concerns of Indian people, and their responses to new technology. However, due to the high cost of hybrid fuels, their use will be restricted .

EVOLUTION

Before Independence, India did not have an automobile industry in the traditional sense. Only the imported parts were used for assembly. In 1928, General Motors (India) Ltd. opened a factory in Mumbai to assemble trucks and vehicles. Then in 1930, Ford Motor Co. (India) Ltd. began assembling automobiles and trucks in Chennai, and in 1931, in Mumbai. With the foundation of Premier Automobiles Ltd. in Kurla (Mumbai) in 1947 and Hindustan Motors Ltd. in Uttarpara (Kolkata) in 1948, the industry began to take off.

INDIAN MARKET

The Indian Electric Vehicle Market was valued at USD 5 billion in 2020, and it is expected to increase to USD 47 billion by 2026, with a CAGR of more than 44%. (2021-2026). As a consequence of continued lockdowns and travel restrictions across the nation, the COVID-19 outbreak has had an impact on the Indian electric car sector, creating supply chain disruptions and the shutdown of production plants. The electric vehicle (EV) industry in India, on the other hand, is still in its infancy. It is expected to grow at a much faster rate throughout the projected period as a result of many government programmes and initiatives.

GOVERNMENT INITIATIVES

In light of the aforementioned factors, the Indian government has taken action and declared the National Mission for Electric Mobility (NMEM 2020). It's its two intertwined main goals.

- National Energy Survey
- Growth of domestic manufacturing capabilities in the full range of electric vehicle technologies.

EV30@30 CAMPAIGN

The EV30@30 Campaign was introduced at the 2017 CEM (Clean Energy Ministerial) summit to encourage the adoption of electric vehicles. It sets a collective aspirational aim for all signatory countries to achieve a 30 per cent sales share for EVs (excluding two/three-wheelers) by 2030. This is the benchmark against which EVI members' progress will be judged. The initiative has been approved by 14 countries namely Canada, Chile, China, Finland, France, Germany, India, Japan, Mexico, the Netherlands, Norway, Portugal, Sweden, and the United Kingdom.

DRIVE TO ZERO CAMPAIGN

The Global Commercial Vehicle Drive to Zero Campaign, which is part of the EVI, was introduced at the 2020 CEM summit. The campaign, which is run by CALSTART, a no-profit organization dedicated to clean transportation, intends to bring governments and key industry stakeholders together to develop laws, programmes, and actions that will promote the fast manufacture and deployment of zero-emission commercial cars. More than 100 commitment partners have joined Drive to Zero, including nine national governments (as of April 2020) as well as major state, provincial, and regional governments and agencies from around the world.

OLA SCOOTER

CEO of Ola Electric, Bhavish Aggarwal announced that he is going to launch an electric scooter in the Indian market. Ola Electric scooters will be available in ten different colours, and the company may opt for a direct-to-consumer sales strategy, which would eliminate the need to build and maintain a dedicated dealer network.

In an attempt to break the budget barrier for electric two-wheelers in value-conscious India, Ola Electric Mobility Pvt Ltd priced its electric scooter at 99,999 rupees. According to the corporation, the final price will vary depending on the incentives granted by each state government. Deliveries will begin in over 1,000 cities in October, with exports to Asia, Latin America, and Europe to follow in the coming months.

DIRECT SALES

Unlike other automakers, Tesla sells directly to customers instead than via franchised dealerships. It has built a global network of company-owned showrooms and galleries, the majority of which are in major global cities. Tesla plans to launch in India by the end of the first quarter of the fiscal year 2021-22. Tesla India Motors and Energy Private Limited has already been registered, with its headquarters in Bengaluru, Karnataka. The company is now looking for locations in three major cities — New Delhi, Mumbai, and Bengaluru — to open showrooms and service centres. Each outlet will be between 20,000 and 30,000 square feet in size [5].

HOWDEN WINS TWO AWARDS AT THE HYDROGEN FUTURE AWARDS



LEADING GLOBAL PROVIDER OF MISSION CRITICAL AIR AND GAS HANDLING PRODUCTS, TECHNOLOGIES AND SERVICES, HOWDEN, HAS WON TWO AWARDS IN THE ANNUAL HYDROGEN FUTURE AWARDS: HYDROGEN RISING STAR COMPANY OF THE YEAR AND HYDROGEN TRANSPORT OF THE YEAR.

The awards were presented at Connecting Green Hydrogen MENA 2022 on 30 March. The Hydrogen Rising Star Company of the Year award honours Howden's role over the past year in providing reliable hydrogen compression solutions to a number of global projects. These major milestone developments are supporting key industries reduce their consumption and reliance on fossil fuels, including the world's first green steel plant, the world's first eFuels plant, Europe's largest bio-fuels refinery, and one of the world's first green oil refineries. A number of the projects were developed with the highest levels of safety considerations and are already in operation, working to reduce carbon emissions. The Hydrogen Transport of the Year award recognises the solutions Howden provided to the world's largest hydrogen refuelling station (HRS) for HyPower: the Beijing Daxing HRS in China.

The installation, which was completed safely in January 2021, has enabled the HRS to compress 4.8 tonnes per day of hydrogen and refuel up to 600 hydrogen fuel cell vehicles, including large vehicles such as trucks and buses. This flagship facility is a crucial part of the Beijing International Hydrogen Energy Demonstration Zone, an innovative ecosystem that integrates research & development, test and production related to hydrogen energy. Howden's role for the HRS project confirms the company's position as a leading provider of cost effective, reliable and safe hydrogen compression solutions in direct support of projects that address climate change.

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Salah Mahdy, Global Director, Renewable Hydrogen at Howden, comments: “This is a proud moment for our hydrogen team as we receive global recognition for our achievements and for the investments we have made in innovation to support the energy transition. Our efforts in R&D are bearing fruit as we support the development and use of hydrogen and fuel cells into commercially viable technologies.

“At Howden, we consider every operator experience as unique and for Howden, the technology deployed is just as important as the way it is applied. Of particular importance to us has been the safe and efficient application of technology, enabling us to demonstrate our skills as a market leader in the sector.”

The Howden team in China responded to a short lead time requirement for the project and worked closely with HyPower to provide the solution necessary to keep this important HRS running. Howden has a long history and strong presence in China with over 1,000 employees operating in offices and service centres across seven cities and a large manufacturing centre that serves customers across the country.

Howden recently announced its target to be carbon Net Zero by 2035 through the purchase of renewable energy and carbon free energy; efficiency gains from energy conservation measures; and by renewable energy projects at its manufacturing facilities. The largest impact the business will have on global sustainability will be through its partnership with customers to supply equipment that will make a major impact on their carbon emissions and sustainability.

Connecting Green Hydrogen MENA 2022 (CGHM2022) is the premium conference and exhibition committed to expediting the development of green hydrogen in Middle East and North Africa, gathering international policymakers, power producers, investors, suppliers and technical service providers together to build business partnership. The Hydrogen Future Awards 2022 provide an annual opportunity to recognise excellence and achievement across the hydrogen sector.

INDIAN OIL, L&T AND RENEW TO FORM JV FOR DEVELOPMENT OF GREEN HYDROGEN BUSINESS

In a bid to enable India's decarbonization push, Indian Oil Corporation Ltd., (IndianOil), the country's top refiner and fuel retailer, Larsen & Toubro (L&T), India's premier engineering & construction conglomerate, and ReNew Power ("ReNew") (NASDAQ: RNW) (NASDAQ: RNWWW), India's leading renewable energy company, announced signing of binding term sheet for the formation of a Joint Venture (JV) company to develop the nascent green hydrogen sector in India.

The tripartite venture is a synergistic alliance that brings together the strong credentials of L&T in designing, executing, and delivering EPC projects, IndianOil's established expertise in petroleum refining along with its presence across the energy spectrum, and the expertise of ReNew in offering and developing utility-scale renewable energy solutions. Additionally, IndianOil and L&T have signed a binding term sheet to form a JV with equity participation to manufacture and sell Electrolyzers used in the production of Green Hydrogen.

“

Speaking about the joint venture, **Mr. SN Subrahmanyam, CEO & MD, L&T**, said, "India plans to rapidly march ahead in its decarbonization efforts and production of Green Hydrogen is key in this endeavour. The IndianOil-L&T-ReNew JV will focus on developing Green Hydrogen projects in a time-bound manner to supply Green Hydrogen at an industrial scale. While L&T will bring its strong EPC credentials to the table, IOC being India's premier oil refiner with extensive capabilities in chemical processes and refining has established deep R&D capabilities in many aspects of green hydrogen value chain, and ReNew Power has in a short time established itself as a leading renewable energy supplier and has built itself a very strong reputation. We consider this partnership as a significant step in India's quest for alternative energy."



Addressing another gap in the Green Hydrogen manufacturing chain, IndianOil-L&T JV will focus on production and sale of Electrolyzer."

"Both these JVs aim to enable the nation's 'Aatmanirbhar Bharat' mission to rapidly build, expand and bring in economies of scale to make green hydrogen a cost-effective energy carrier and a chemical feedstock for many sectors."

“

Commenting on the occasion, **Mr. Shrikant Madhav Vaidya, Chairman, IndianOil**, said, "Being the Energy of India, we are committed to powering India's drive towards carbon neutrality by leveraging the power of green hydrogen. IndianOil is forging this alliance to realise India's green hydrogen aspirations, which is in sync with the Hon'ble Prime Minister's vision of making India a Green Hydrogen generation and export hub. To start with, this partnership will focus on green hydrogen projects at our Mathura and Panipat refineries. Alongside, other green hydrogen projects in India will also be evaluated. While the usage of hydrogen in the mobility sector will take its due time, however the refineries will be the pivot around which India's green hydrogen revolution will materialize in a substantial way."



"The partnership forged today will thus catalyse the greening of India's energy basket."

“

Mr. Sumant Sinha, Chairman and CEO of ReNew Power said, "In alignment with the government's broader strategic climate goals for 2030 and 2070 set by honourable Prime Minister Narendra Modi, ReNew looks forward to working with L&T and IndianOil to build the green hydrogen business in India. ReNew, as a leader in intelligent energy solutions and with advanced capability across renewable energy technologies, is well poised to complement the capabilities of our partners."



NITIN GADKARI SUPPORTS GREEN HYDROGEN; VISITS PARLIAMENT IN HYDROGEN-POWERED CAR

GADKARI ASSURED THAT GREEN HYDROGEN WILL BE MANUFACTURED IN INDIA, GREEN HYDROGEN REFUELING STATIONS WILL BE ESTABLISHED GENERATING SUSTAINABLE EMPLOYMENT OPPORTUNITIES IN THE COUNTRY.

Union Minister for Road Transport and Highways Shri Nitin Gadkari visited Parliament House by Hydrogen-based Fuel Cell Electric Vehicle (FCEV). Demonstrating the car powered by 'Green Hydrogen', Shri Gadkari emphasised the need to spread awareness about Hydrogen, FCEV technology, and its benefits to support a hydrogen-based society for India. Shri Gadkari assured that Green Hydrogen will be manufactured in India, Green Hydrogen refueling stations will be established generating sustainable employment opportunities in the country. He said India will soon become Green Hydrogen exporting country. The Minister said in line with Prime Minister Shri Narendra Modi's vision of clean and cutting-edge mobility in India, our government, through the 'National Hydrogen Mission' is committed to focus on green and clean energy.



Source: psuconnect

NICKEL CELLS SELL MORE-AFFORDABLE HYDROGEN POWER

NEW FUEL CELL EFFICIENTLY GENERATES ELECTRICITY WITHOUT COSTLY PRECIOUS-METAL CATALYSTS

Conventional hydrogen fuel cells hold great promise as clean, efficient sources of energy for vehicles and other applications, but they rely on precious-metal catalysts that drive up their cost. Now scientists have created a precious-metal-free hydrogen fuel cell with a record-high performance and durability and virtually negligible catalyst costs. Hydrogen, the most common element in the universe, has long been touted as a clean and abundant energy alternative to fossil fuels—or at least as an ample storage medium for renewable-generated power to portably run big machinery like trains, planes, and trucks. When hydrogen reacts with oxygen in fuel cells to generate electricity, instead of yielding pollutants as fossil fuels do, the result is simply water. Standard hydrogen fuel cells rely on acidic chemicals and catalysts made of precious metals such as platinum to drive the reactions between hydrogen and oxygen that generate electricity. In contrast, alkaline polymer electrolyte fuel cells rely on alkaline chemicals and can use earth-abundant metals as catalysts, eliminating the need for precious metals. However, these latter fuel cells still fall short on performance and durability compared to conventional fuel cells. Now scientists have developed a precious-metal-free alkaline polymer electrolyte fuel cell with a record-high peak power density of 210 milliwatts per square centimeter, more than five times as much power as its previous counterparts. The new device relies on a catalyst made of a solid nickel core surrounded by a shell 2 nanometers thick made of carbon doped with nitrogen. This catalyst is located at the anode, where the hydrogen is oxidized, or loses electrons, and is paired with a cobalt-manganese catalyst at the cathode, where oxygen is reduced, or gains electrons. The carbon layers on the new anode catalyst help boost the rate at which hydrogen is oxidized, and the nitrogen in these carbon layers can serve as sites to spur oxidation, altogether boosting fuel cell performance. In addition, the anode catalyst's shell prevents the nickel from oxidizing to form

nickel oxides that can both dramatically slow hydrogen oxidation and lead the catalyst to deteriorate. The new catalyst also proved dramatically more tolerant to carbon monoxide than platinum. Commercial production of hydrogen gas often results in trace amounts of carbon monoxide, so a high tolerance to carbon monoxide is key to practical hydrogen fuel cell applications. The scientists found their new fuel cell could operate in a stable manner for more than 100 hours. In comparison, another precious-metal-free fuel cell using nickel nanoparticles essentially stopped operating within 5 hours. The scientists do note that a conventional fuel cell with precious-metal catalysts operating under acidic conditions can deliver about 1.2 to 1.5 watts per square centimeter, roughly five to seven times as much as the new fuel cell. Still, "one has to keep in mind that acidic fuel cells have been under development for decades, while alkaline ones have been for less than 10 years," says study coauthor Héctor Abruña, an electrochemist at Cornell University in Ithaca, New York. "We feel confident that with further developments and some optimization, we could reach 1 watt per square centimeter within two to three years, which would be a major and enabling breakthrough." Future research might boost the fuel cell's durability by improving the support membranes within the device, Abruña says. "While these results are very promising, a significant amount of work remains before these devices can be broadly deployed," he notes.



Source: spectrum

SIX RENEWABLE ENERGY COMPANIES FLOAT GREEN HYDROGEN ADVOCACY GROUP

SIX RENEWABLE ENERGY COMPANIES INCLUDING ACME GROUP, AZURE POWER AND FORTUM INDIA HAVE FORMED AN INDEPENDENT ADVOCACY GROUP FOR GREEN HYDROGEN, PEOPLE AWARE OF THE MATTER SAID.

The Independent Green Hydrogen Association (IGHPA) aims to engage with the government and other stakeholders to achieve India's objective of becoming a green hydrogen and ammonia producing country and an export hub, they said. The other companies in the association are SunEdison Infrastructure (Refex Group), O2 Power and Sprng Energy. IGHPA will provide technical, economic and regulatory inputs for development of policy framework and its implementation. The association has appointed former bureaucrat Shashi Shekhar as director general. Shekhar was secretary in the ministry of water resources, river development and Ganga rejuvenation. India has announced plans to produce five million tonnes of green hydrogen by 2030 and unveiled a policy that will enable manufacturers to source renewable energy to produce hydrogen or ammonia without paying transmission charges for 25 years. Reliance Industries (RIL), Larsen & Toubro, JSW Steel, Jindal Steel, NTPC, BPCL and Indian Oil Corp, among others, have announced plans to set up green hydrogen units.



Source: PTI

INDIA-NORWAY JV TO DEVELOP GREEN HYDROGEN MEGA PROJECT IN OMAN

TWO RENEWABLE ENERGY COMPANIES HAVE JOINED FORCES TO BUILD A \$2.5BN GREEN HYDROGEN AND AMMONIA PROJECT IN OMAN.

The 50:50 joint venture between Norway's Scatec and India's Acme Group will design and build the plant in the Duqm Special Economic Zone, about 400km south of Muscat. The first phase is expected to produce 100,000 tonnes of green ammonia a year, to be expanded over time to 1.2 million tonnes, powered by some 500MW of solar capacity. **Raymond Carlsen, the chief executive of Scatec, commented in a press statement:** "Oman has excellent solar resources and a strategic location for production of green ammonia. Acme Group has been in the forefront of green ammonia production with this project, and in Scatec we can capitalise on our expertise in renewables, project structuring and financing, execution and operation to accelerate the decarbonisation of the world." In its press statement, **Acme quoted chairman Manoj Upadhyay as saying** his company was partnering with Scatec to develop "one of the largest and earliest green ammonia projects in the world". The company added that the schedule for the project was "under development". Acme has appointed US project finance company Synergy Consulting as financial and transaction adviser for the scheme.



Mr. Raymond Carlsen | The Chief Executive | SCATEC

Source: globalconstructionreview

NETHERLANDS EXPANDS SDE++ 2022 TO INCLUDE SOLAR/WIND POWERED GREEN HYDROGEN PROJECTS

- NETHERLANDS HAS ANNOUNCED JUNE 28, 2022 AS THE DATE WHEN IT WILL LAUNCH SDE++ 2022 SUBSIDY ROUND
- ALONG WITH RENEWABLE ENERGY PROJECTS, THIS ROUND WILL BE OPEN TO NEW CATEGORIES INCLUDING GREEN HYDROGEN
- THE €13 BILLION BUDGET FOR THIS ROUND IS THE HIGHEST COMPARED TO ANY PREVIOUS ROUND

The Dutch Ministry of Economic Affairs and Climate Policy has announced June 28, 2022 as the day it will launch another round of its SDE++ scheme which will be open to renewable energy, and carbon reduction technologies, and a new category of green hydrogen facilities, all for a budget of €13 billion. Green hydrogen facilities need to be powered by either wind or a solar park. Another new category is electrification in industry through hybrid glass furnaces. Among renewable energy technologies, solar, wind, geothermal and CO2 Capture and Storage (CCS) facilities are included. *“The added categories can be further refined in the coming year, based on the experience gained during the current opening, so that a good contribution can be made to achieving the objectives of the Climate Agreement,”* said **Minister for Climate and Energy Policy, Rob Jetten**. The budget of Sustainable Energy Production and Climate Transition Incentive Scheme (SDE++) this year is highest under the program so far, according to Netherlands Enterprise Agency (RVO). In SDE++ 2021 subsidy round, the government received subsidy request for €12 billion from 4.16 GW renewable capacity comprising 4.13 GW of solar.



Mr. Rob Jetten | Energy Policy | Minister for Climate

Source: taiyangnews

TOYOTA MIRAI, INDIA'S FIRST HYDROGEN FCEV LAUNCHED – HERE'S ALL YOU NEED TO KNOW

TOYOTA HAS LAUNCHED INDIA'S FIRST ALL-HYDROGEN ELECTRIC VEHICLE, MIRAI, IN INDIA. THE CAR WAS LAUNCHED AS PART OF THE BRAND'S PILOT PROJECT WITH THE INTERNATIONAL CENTER FOR AUTOMOTIVE TECHNOLOGY (ICAT). THE MIRAI IS ONE OF THE FEW FCEVs IN THE WORLD AND PURELY RUNS ON HYDROGEN GENERATED ELECTRICITY.

The second-generation iteration of the car will be manufactured at Toyota's plant in Karnataka. The car was originally introduced globally last year. It will return a range of 646km on a single tank and will take about 5 minutes for refuelling. The pilot project comes as a part of Government's push to promote greener and cleaner fuel solutions for the country's vehicle fleet. The Mirai comes equipped with a high-pressure hydrogen fuel tank and an electric motor. The powertrain essentially breaks the hydrogen into water and oxygen and generates energy from it. Unlike traditional ICes a hydrogen fuel cell powertrain emits water from the tailpipe. *“Green Hydrogen can be generated from renewable energy and abundantly available biomass. Introduction and adoption of technology to tap into the Green hydrogen's potential will play a key role in securing a clean and affordable energy future for India,”* said **Nitin Gadkari on Twitter**.



Mr. Nitin Gadkari | Minister | Road Transport & Highways of India

Source: PTI

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A Brief Profile of Star Energy Systems Along with the Promoter Profile

Star Energy Systems was established in 1999. It is one of the leading suppliers of Solar Systems in the state of Gujarat with the brand name “STAR-TECH” ®. In a period, Star Energy Systems has grown from ONE MAN ARMY to a 20 –employee company, We have expanded our operations to different states like Gujarat, Maharashtra, Rajasthan, Chhattisgarh in India. We at Star Energy Systems - design, manufacture, supply, installs, commission, take operation & maintenance of solar Photo-voltaic Grid Connected Power Plant, Solar PV Off-Grid Power Packs, and thermal Heating Systems catering to both domestic and industrial needs. The technical team at Star Energy is an expert in assessment study, preparation of proposals, design of the systems, integration with a retro filling of SPV & thermal Systems, In-process Heating, Space Heating, Heat Exchanger Based Systems, and other areas relevant to heating in the industries.

Star Energy Systems is an MNRE Channel Partner manufacturing company off-the-grid, Grid Connect Solar Power Plants, Solar Lighting Applications & Solar Water Heating & cooking Applications. Our products are registered with CSPO, GEDA, MEDA, State Road & Building Department, ONGC, IOCL & many more. Along while we are also an ISO 9001-2008 certified company for “Design, Manufacture, Supply, Installation, and Servicing of Solar Lighting Systems” from BSCIC an internationally accredited certifying body.

Mr. Sachin R Shah the promoter of the Company has also been considered among top-ranking Solar Leaders, environmentalists, and technocrats known for his social as well as environmental concerns. A long while, when he started his career as Sr. Engineer with Suzlon Energy Limited. During 1 year of tenure, he had gained overall experience in the Manufacturing & Operation, and also Maintenance of WTC.

Joined Mamata Energy Private Limited as Director Technical, he was responsible for R&D activities. He was the key person in developing India’s First Solar Thermal Air Conditioning System of 25 Tr Capacity. The plant was inaugurated by the Chief Minister of Gujarat Mr. Narendra Modi on 21st April 2005.

From 2008 to 2013, He served Electrothermal India Limited, A public listed company with having turnover of 2200 Cr. as the Director & Business Head for the Solar Division. Continuing, he was also responsible for the concept of commissioning of “Electra” Brand Solar Water Heating Systems.

Challenges and the way forward.....
While we've developed strong credibility to be littered with competition within the solar segment, the market has seen the entry of the many players lacking in core capabilities and creating unhealthy price battle. We pander to this issue by restricting our services to only creditworthy clients searching for long-term quality power supply. To sum up, we are an approach to reworking into a distributed energy company that gives a scheme and related services seem to be rightly placed during a segment that's begging to witness a convergence of of these services



Mr. Sachin Shah is socially active and well connected with various organizations like Member of Lions Club International (Ahmedabad Manav mandir)& DC Solar Power - Lions Clubs International 323B, Life Member with Indian Red Cross Society, Board Member for SVVP, Member of Energy Committee , Gujarat Chamber of Commerce and Industry, General Secretary of Federation of Solar Manufacturers & Intermediaries (FEDSMI) , Member of GEZIA and many more.....

EXPERIENCES

Star energy systems have Received Award of Solar Roofs Series Excellence Award on 14th June 2019. They have also received the best solar EPC award for 1920, by the hands of the State Energy Minister, and a list of further awards. Star Energy Systems come a long way over the years, not just in terms of achieving scale but also in terms of applying our experience to improvise operations and venture into new segments. Star Energy has been executed 5000 plus Solar Roof Top Projects to date and also 10 MW+ per solar installation.

Few of our landmark projects of the solar grid-connected systems are 460 kW OI DC, Diu & Daman, 161.7 kW Gujarat Foundry, Ahmedabad, 70KW Cosmos School, 25 kW (Total) Lighthouse, 25kw Medical and dev trust charisma, Jamnagar, 45 kW Hi-Tech (Engg) Gujarat Pvt Ltd, Ahmedabad, 67.5 kW Shree Satsangi Saketdham Ram Ashram Engineering, Vadasma, Mehsana, 54 kW Lions Karnavati Eye Hospital, Ahmedabad,

80 kw U N Mehta hospital, Ahmedabad, 20 kW Ahmedabad Medical Association, Ahmedabad, 72 kW (Total) Bhavan’s college, Ahmedabad, 49.5 kw thermal Tech Limited, Ahmedabad, 80 kW AIMS hospital, Modasa, Gujarat, 60 kW (Total) Krunal construction, Pune, Maharashtra (Total) Krunal construction, Pune, Maharastra Our first major achievement of 1249 solar off-grid systems at Gram Panchayat of Nagor, Bhilvada, Ajmer, and Tunk with REIL (Rajasthan Electronics Instruments Limited) is another major achievement is Solar Energy Park at Birla Institute of Technology, Pilani, Rajasthan, and Tribhuvan das Foundation, Anand, Gujarat. We have also executed Solar thermal Water Heating Projects. Out of these few of our projects are 29500 LPD(Single LocationProject) At Gujarat National Law University, Gandhinagar, 14500 LPD Raipur with Chhattisgarh Renewable Energy Development Agency. 18800 LPD at Dudh Sagar Dairy, Mehsana, 6000 LPD Sardar Sarovar Kevadia colony, Rajpipala, 28250 LPD under Gujarat Energy Development Agency

VISION

Vision is to produce top quality and cost-effective sustainable energy solutions across all the markets, reducing carbon footprint, paving way for sustainable energy thereby improving the standard of present and future human life

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