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Regd. No. MCE/80/2024-26  
at Mumbai Patrika Channel, Mumbai GPO, Mumbai-1,  
on 27th & 28th of Previous month. R.N.I. No. 11498 / 57  
Date of Publishing 26th of Every Previous Month

Organ of the Electrical Contractors' Association of Maharashtra (ECAM)



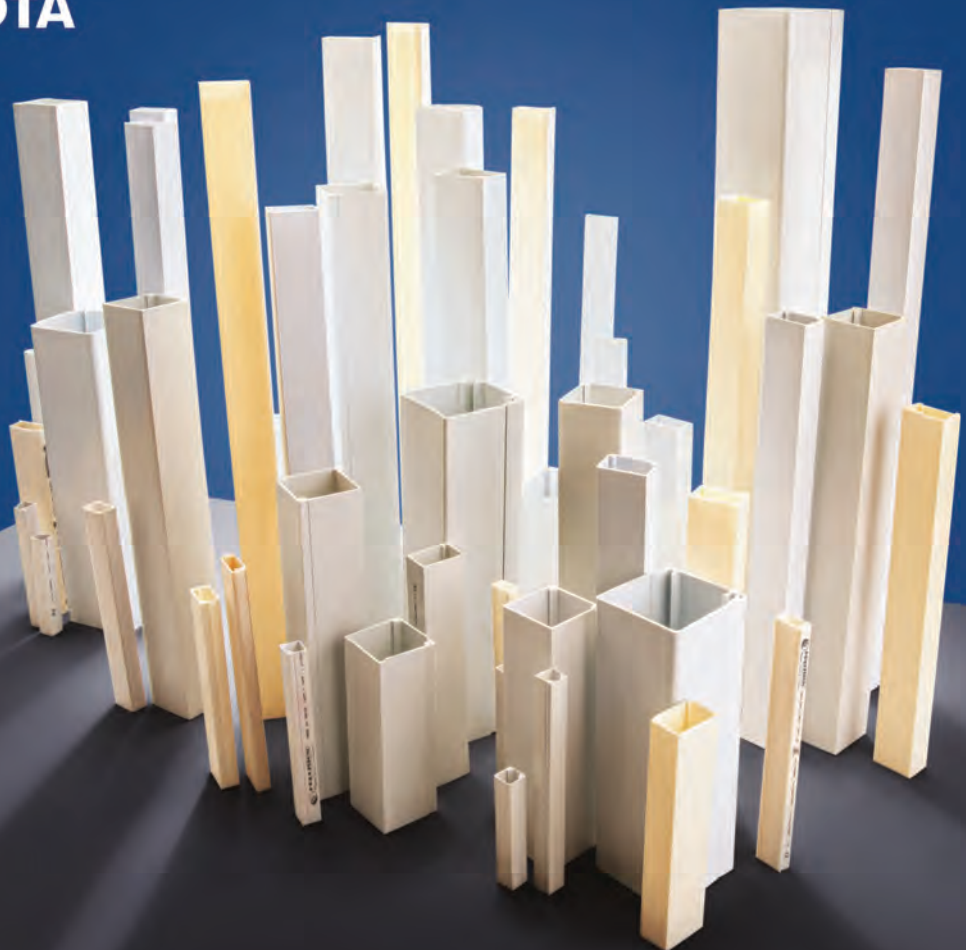
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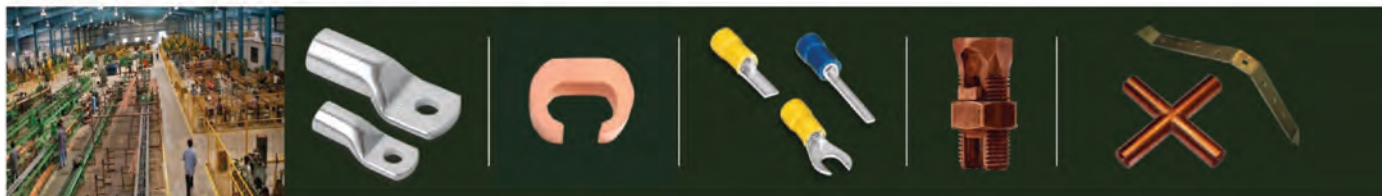
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अध्यक्ष, इकॅम

## इकॅमच्या संघटित शक्तीचा आविष्कार

नमस्कार मित्रांनो

आपल्या सर्वांच्या सहकार्यामुळे व प्रेमांमुळे इकॅम सारख्या मोठ्या संस्थेच्या अध्यक्षापदाची जबाबदारी स्विकारण्याची संधी मला मिळाली ही मोठी भाग्याची गोष्ट समजतो. आजपर्यंत अनेकजणांनी या संस्थेचा नावलौकीक वाढवण्यासाठी खूप मोठे काम केले असून सभासदांच्या अडीअडचणी, प्रश्न सोडवण्यासाठी तसेच संघटनेचा नावलौकीक वाढवण्यासाठी मी कटिबद्ध राहीन अशी ग्वाही देतो.

महावितरणमध्ये काम करताना त्यासाठी लागणारी जागा विकासकाला उपलब्ध करावी लागत होती. त्याबाबत आपल्या नाशिक विभागाचे चेअरमन श्री. सचिन फडतरे यांनी विशेष परिश्रम घेऊन MERC कडे एक याचिका दाखल केली होती. त्याबाबत मागील आठवड्यात चांगला निर्णय झाला असून नवीन इन्फ्रास्ट्रक्चर उभारणीसाठी विकासकाने जागा उपलब्ध करून देणे बंधनकारक नाही असा निर्णय झाला आहे. या निर्णयास अधीन राहून आपण संघटनेमार्फत महावितरणकडे नवीन परिपत्रक काढण्यासाठी पाठपुरावा सुरू केला आहे.

तसेच सार्वजनिक बांधकाम विभागात काम करणाऱ्या आपल्या बंधूंच्या विविध प्रश्नांसंदर्भात पुणे विभागाचे चेअरमन श्री. अनिल महाजन यांच्या नेतृत्वाखाली पुणे विभागातील पदाधिकाऱ्यांनी सार्वजनिक बांधकाम विभागाचे मंत्री मा. श्री. रविंद्रजी चव्हाण यांची प्रत्यक्ष भेट घेऊन त्यांच्याशी चर्चा करून निवेदन देण्यात आले व त्याबाबत मंत्री महोदयांनी सकारात्मक निर्णय घेण्याची ग्वाही दिली.

सभासदांच्या अडीअडचणी प्रश्नांबाबत संघटना संवेदनशील असून त्याबाबत विविध प्रकारे सक्रिय रहाते. त्या निमित्ताने सभासदांना आवाहन करतो की आपल्या अडीअडचणी प्रश्नांबाबत जागरूक रहा, आवाज उठवा व संघटनेच्या पदाधिकाऱ्यांबरोबर संपर्क करा व संघटनेप्रती आपली जागरूकता वाढवा, ही विनंती.



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## देवांग ठाकूर

महासचिव, इकॅम

नमस्कार मित्रांनो

सभासदांनी त्याचप्रमाणे आपली संघटना शक्तीशाली करून संघटनेची पाळेमुळे संपुर्ण महाराष्ट्रात पोहोचवण्यासाठी आपल्या संपर्कातील नवीन अनुज्ञासीधारक ठेकेदारांना संघटनेबद्दल माहिती देऊन नवीन सभासद जास्तीत प्रमाणात करण्याचे प्रयत्न करावेत असे मी सर्व सभासदांना आवाहन करित आहे.

आपल्या शताब्दी महोत्सवानिमित्त सन २०२५ ची दैनंदिनी आणि

# २०२५ च्या दैनंदिनीला सर्व सदस्यांनी सहकार्य करावे



दिनदर्शिका छापण्यात येणार आहे. सर्व सभासदांना या संदर्भात लवकरच परिपत्रक पाठवण्यात येईल. सर्व सभासदांना आवाहन करण्यात येत आहे की आपण दैनंदिनी तसेच दिनदर्शिका हे प्रकल्प यशस्वी करण्यासाठी जाहिरात देऊन हातभार लावावा.


सर्व सभासदांनी आपली सभासद वर्गणी इकॅमच्या कार्यालयात जमा करावी आणि GST क्रमांक घेतला असेल तर तो इकॅम कार्यालयाला कळवावा. सर्व विभागीय सभासदांना सुचित करण्यात येते की आपण आपल्या विभागीय इकॅम कार्यालयाशी संपर्क साधून आपली वर्गणी जर भरली नसेल तर त्वरीत भरावी. जे सभासद साधारण सभासद असतील त्यांनी जास्तीत जास्त संख्येने तहहयात सभासद (Life Member) व्हावे असे मी आपणास आवाहन करतो.

आपणास नम्र विनंती आहे की आपणास जर आय.ई.सी.टी. मासिक मिळत नसेल तर आपण त्वरीत इकॅम मुख्य कार्यालयाशी ईमेलद्वारे संपर्क साधून त्वरीत कळवावे व जर आपला बदललेला पत्ता असेल तर तो ही कळवावा. हा पत्ता त्वरीत आय.ई.सी.टी. मासिकाशी संपर्क साधून त्यांना पाठविला जाईल ज्या सभासदांना आपले लेख किंवा आपण केलेल्या उपक्रमांसंबंधी काही माहिती आपल्या आय.ई.सी.टी. मासिकामध्ये छापण्यास द्यायची असेल तर ती त्यांनी इकॅम कार्यालयाकडे पाठवावी.

आपल्याला आपला व्यवसाय करताना काही समस्या येत असतात त्या आपण त्वरीत इकॅम मुख्यालयाला कळवाव्यात. आपल्या सभासदांना येणाऱ्या समस्यांचे निराकरण करण्यासाठी सभासदांच्या बाजूने आम्ही कायम कटीबध्द राहू असे आम्ही आपणास आश्वासन देतो.

गणेशोत्सवाच्या सर्वांना हार्दिक शुभेच्छा ॐ







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# Applications of AI in the renewable power sector



**Satish Sinnarkar**  
Editor, IECT

AI has advanced features that can monitor the sustainable operation of the renewable sector and guide it toward a safer, environmentally friendly, and efficient future.

AI applications can use the variable nature of renewable sources and predict future forecasts more precisely. This nature would help improve plant availability, schedule repairs, and keep grid stability at high standards. Alongside this, the application of AI can help predict weather events like extreme weather events (heat waves, drought, wildfires, and storms), sea level rise (ice and glaciers melting), food insecurity, ocean acidification, outdoor air pollution and species extinction.

This leads to better organisation of the unit commitment, improved reliability, greater dispatch efficiency and reduced operating reserves needed. Power grids are used as efficiently as possible through AI applications that use vast amounts of meteorological data



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to adjust operations according to changing weather conditions.

Energy dealers and the power industry would benefit from the optimal utilisation of AI, which helps them stay out of trouble and provides cost reduction and financial return benefits. Demand-side management and economical load dispatch are two areas where AI excels. AI ensures that the electrical grid runs at optimal load, which aids grid operators in optimising energy consumption.

AI helps lower electricity costs and improves energy efficiency by analysing data from smart meters and accurately forecasting network load. Further, AI applications can be implemented in a decentralised energy trading system, which guarantees effective energy redistribution, increases trade scheduling and availability of clean electricity, forecasts energy, and lowers total cost. Apart from this, AI applications monitor optimal periods for energy storage systems to enhance system efficiency and technology lifespan.

*The technology can allow power grids to be used more efficiently, optimising vast amounts of meteorological data to adjust operations according to changing weather conditions* Energy consumption patterns can also be forecasted with the applications of AI, which assists utilities in optimising and effectively allocating their resources. Along with preventing blackouts, AI ensures uninterrupted power in the distribution network. Smart grids with AI capabilities can identify interruptions or malfunctions including equipment breakdowns.

AI applications can easily locate the problem in the power systems and reroute power within a limited span of time without interrupting the grid stability and decreasing downtime.

AI plays a critical role in managing the demand response (supply and demand) through automatic load shedding during peak hours, which helps utilities save expensive infrastructure upgrades. AI makes it possible to react instantly to changes in demand, which improves energy efficiency, lowers costs, and speeds up the switch to renewable energy sources.

Computation errors in load uncertainty can also be managed through AI applications, but the collection of large amounts of data creates security and privacy issues for the utilities. Data collection, processing, and storage for decision-making are very difficult processes.

However, with the use of AI applications, real-time data should be used for instant decision-making and providing sustainable solutions. If AI systems are to be implemented successfully, this major issue should be resolved with fairness, and transparency must be guaranteed.

AI applications should occupy high-quality data for effective operation. Data must be precise and well-organised to improve energy management and produce insightful results for the utilities.

In conclusion, energy systems combined with AI applications are essential for making successful renewable energy industry projects. Current laws and potential guidelines should be abided by the AI systems in the renewable energy industry. Through the potential application of AI, the renewable energy industry should grow at a greater pace to make a clean, green, and sustainable future. It would also keep the grid stable and reliable, and AI technologies must be safe against cyber-attacks.



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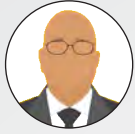
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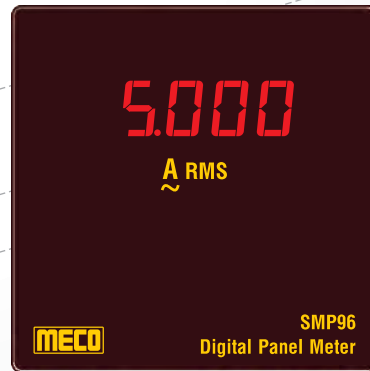
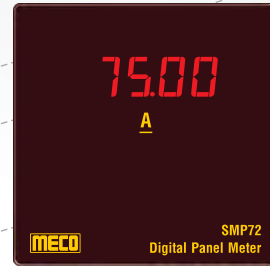
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# Control gears play a crucial role in electrical work as they ensure the safe and efficient operation of electrical systems.



Control gears protect electrical equipment and personnel from damage or injury due to overloads, short circuits, or other faults.

They regulate and control the flow of electrical energy, allowing for smooth operation and management of electrical systems.

Control gears provide monitoring capabilities, enabling real-time tracking of electrical system performance and detection of potential issues. They offer flexibility in electrical system design and operation, allowing for adjustments and modifications as needed.

Control gears help optimize electrical system efficiency, reducing energy waste and improving overall performance.

They ensure compliance with safety standards and regulations, minimizing the risk of electrical accidents and hazards.

Control gears enhance the reliability of electrical systems, reducing downtime and maintenance needs.

Common examples of control gears include: Circuit breakers, Switches, Relays, Contactors, Motor starters, Programmable logic controllers (PLCs)

## Circuit Breakers

Circuit breakers are a crucial component of electrical systems, and their importance cannot be overstated.

Circuit breakers protect people from electrical shocks, injuries, and even fatalities by interrupting the flow of electricity in case of a fault.

They prevent damage to electrical equipment, appliances, and wiring by limiting the duration of electrical faults.

Circuit breakers help prevent electrical fires by quickly interrupting the power supply in case of a short circuit or overload.

They help maintain a reliable power supply by automatically switching off the power in case of a fault,



allowing for quick identification and repair.

Circuit breakers enable safe maintenance and repair of electrical systems by providing a visible indication of which circuit is affected.

They help ensure compliance with electrical safety standards and regulations, such as those set by the National Electric Code (NEC).

Circuit breakers protect electrical circuits from damage caused by overloads, which can occur due to excessive current draw or short circuits.

They allow for selective coordination, which ensures that only the affected circuit is switched off, minimizing disruptions to the rest of the electrical system.

In summary, circuit breakers play a vital role in ensuring the safety, reliability, and efficiency of electrical systems.

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Switches play a vital role in control gears, serving as electrical control devices that regulate the flow of electrical energy.

Switches provide simple on/off control of electrical devices. They enable selection of different electrical circuits or paths. Switches allow selection of different operating modes, such as manual or automatic.

They can be used to control speed in motors or other electrical devices. Switches control the direction of motor rotation or other electrical devices.

They prevent accidental start-ups or ensure proper sequence of operations.

Switches electrically isolate circuits or devices, ensuring safe maintenance.



They enable remote control of electrical systems, enhancing convenience.

Some switches provide monitoring and feedback signals, enabling real-time monitoring.

Switches offer flexibility and scalability in control system design.

**Switches are commonly used in: -**

- Industrial automation -**
- Power distribution systems -**
- HVAC systems -**
- Lighting control systems -**
- Motor control centers -**
- Electrical panels**

In summary, switches are essential components in control gears, providing flexible and reliable control of electrical systems.

## Relays

Relays play a crucial role in electrical control systems, serving as electrically operated switches that control high-power circuits with low-power signals.

Relays amplify low-power control signals from sensors, controllers, or other devices to control high-power circuits.

They electrically isolate control circuits from high-power circuits, ensuring safe and reliable operation. Relays can switch high-power loads, such as motors, lighting, or heating elements, with minimal power loss. Some relays offer built-in overload protection,



safeguarding against excessive current or voltage.

Relays facilitate remote control of electrical systems, allowing for convenient and safe operation.

Relays can be used to implement logical control functions, such as AND, OR, and NOT operations.

They can be used for timing and sequencing control, allowing for precise control of electrical systems. Relays can provide monitoring and feedback signals, enabling real-time monitoring of electrical system status. Relays can be used for safety interlocking, preventing accidental start-ups or ensuring proper sequence of operations.

Relays offer flexibility and scalability in electrical control system design, allowing for easy modifications and expansions. In summary, relays are essential components in electrical control systems, enabling safe, reliable, and efficient control of high-power circuits with low-power signals.

## Contactors

Contactors play a crucial role in electrical work, serving as electrically controlled switches that control high-power electrical circuits. Contactors control high-power loads such as motors, lighting, and heating elements.

They facilitate switching and starting of motors, ensuring smooth and safe operation. Contactors provide overload protection, safeguarding against excessive current or voltage. They offer short-circuit protection, preventing damage from electrical faults.

Contactors electrically isolate control circuits from



high-power circuits, ensuring safe operation.

They enable remote control of electrical systems, allowing for convenient operation. Contactors can be used for reversing and forward control of motors.

They can control multiple circuits simultaneously.

Contactors can be used for voltage selection, allowing for different voltage levels.

They can be used for safety interlocking, preventing accidental start-ups or ensuring proper sequence of operations. Contactors are commonly used in: -

- Motor control centers -**
  - Power distribution systems -**
  - Industrial control systems -**
  - Building automation systems -**
  - HVAC systems**
- In summary, contactors are essential components in electrical work, enabling safe, reliable, and efficient control of high-power electrical circuits.





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## Motor Starters

Motor starters play a crucial role in electrical work, serving as protective devices for motors and ensuring safe and reliable operation.

Motor starters protect motors from overloads, short circuits, and phase imbalances.

**Starting and stopping\_:** They control the starting and stopping of motors, ensuring smooth acceleration and deceleration.

**Overload protection\_:** Motor starters prevent motor damage from excessive currents or loads.

**Short-circuit protection\_:** They protect against short circuits, preventing damage to motors and electrical systems.

**Phase protection\_:** Motor starters ensure proper phase sequence, preventing motor damage from phase imbalances.

**Voltage protection\_:** They protect motors from voltage fluctuations, ensuring stable operation.

**Current limiting\_:** Motor starters limit inrush



currents, preventing electrical system damage.

**Motor control\_:** They provide control functions, such as forward/reverse operation and speed control.

**Monitoring and diagnostics\_:** Motor starters often include monitoring and diagnostic capabilities, detecting issues and alerting operators.

**Safety interlocking\_:** They can be used for safety interlocking, preventing accidental start-ups or ensuring proper sequence of operations.

**Motor starters are commonly used in: -**

**Industrial automation -**

**HVAC systems -**

**Water treatment -**

**Material handling -**

**Power generation and distribution -**

**Oil and gas industry**

In summary, motor starters are essential components in electrical work, ensuring safe, reliable, and efficient operation of motors and electrical systems.

## PLCs



Programmable Logic Controllers (PLCs) play a vital role in electrical work, serving as the "brain" of industrial control systems.

**Control and automation\_:** PLCs control and automate industrial processes, such as manufacturing, processing, and material handling.

**Logic control\_:** They execute logical control functions, such as AND, OR, and NOT operations.

**Sequencing\_:** PLCs control sequences of events, ensuring proper order and timing.

**Monitoring and feedback\_:** They monitor inputs and provide feedback to operators or other controllers.

**Data acquisition and processing\_:** PLCs collect and process data from sensors and other sources.

**Communication\_:** They communicate with other devices, such as HMIs, computers, and other PLCs.

**Fault detection and diagnosis\_:** PLCs detect and diagnose faults, alerting operators to issues.

**Safety interlocking\_:** They implement safety interlocks, preventing accidents and ensuring proper operation.

**Energy management\_:** PLCs optimize energy consumption and monitor energy usage.

**Flexibility and scalability\_:** They offer flexibility and scalability in control system design.

**PLCs are commonly used in: -**

**Industrial automation -**

**Process control -**

**Building automation -**

**Power distribution -**

**Water treatment -**

**Transportation systems**

In summary, PLCs are essential components in electrical work, enabling efficient, safe, and reliable control of industrial processes and systems.

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- Applications: PCC, MCC, APFC, PLC, VFD, Feeder Pillar, AMF, and DG sync. panels
- Flexibility to communicate with all major protocols



**PRODUCT FEATURES**

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- Current Rating : upto 2000 A
- Short Circuit Rating: upto 25 KA for 3 Secs
- Internal Arc as per IEC 62271 : upto 25 KA for 1 Sec
- Degree of Protection : IP 42, IP 55
- Extendable on both sides
- Provision of Integral Earth Switch or Earthing Truck
- Flexibility to communicate with all major protocols



**PRODUCT FEATURES**

- IEC 61439 Certified
- Modular and Standardized Design
- Current Rating : upto 6300 A
- Short Circuit Rating: 65 KA, 100 KA
- Internal Arc as per IEC 61641 : 65 KA / 85 KA
- Forms of Design: 2B / 3B / 4B
- Degree of Protection : IP 31, IP 42, IP 54
- Applications: PCC, MCC, APFC, PLC, VFD, Feeder Pillar, AMF, and DG sync. panels
- Flexibility to communicate with all major protocols
- Globally sold across 120 countries



**PRODUCT FEATURES**

- IEC 61439 Certified
- Modular and Standardized Design
- Current Rating : upto 5000 A\*
- Short Circuit Rating: upto 70 KA for 1 Sec\*
- Internal Arc as per IEC 61641 : 70 KA
- Forms of Design: 2B / 3B / 4B
- Degree of Protection : IP 31, IP 42, IP 54
- Applications: PCC, MCC, APFC, PLC, VFD, Feeder Pillar, AMF, and DG sync. panels
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# Maharashtra signs agreements for hydro power projects worth ₹24,631 crore

**The water resources department of the Maharashtra government signed three memoranda of understanding to generate pump storage hydro power projects**

The water resources department of the Maharashtra government signed three memoranda of understanding (MOUs) to generate pump storage hydro power projects with a combined capacity of 5,630 megawatts (MW). The estimated investment for these projects is ₹24,631 crore, with the state government projecting the creation of 10,300 jobs.

The initiative aligns with the state government's decision to increase hydro power generation capacity using a pump storage system. This innovative approach involves generating hydro power from an upper reservoir, storing the water in a lower reservoir, and then pumping it back to the upper reservoir at night to generate more power during peak daytime demand.

**The water resources department, acting as the nodal agency, signed MOUs with state-owned Mahagenco, Tata Power, and Avaada Group to develop the hydro power projects.**

Devendra Fadnavis, deputy chief minister of Maharashtra, stated that these MOUs would contribute to achieving the target of generating 50% of total power through renewable sources by 2030.

Mahagenco plans to develop an 80 MW pump storage project at the Koyna left bank dam foot power house. The company already operates the Koyna foot storage hydro power project, and this new pump storage facility will enhance its power generation capacity.

Tata Power has committed to developing two pumped hydro storage projects in the state: a 1,000 MW project at Bhivpuri in Raigad district and an 1,800 MW project at Shirawata in Pune district. The company aims to commission these projects by the financial years 2027 and 2028, respectively, with a proposed capital investment of ₹13,000 crore.

Avaada Group, a company specialising in green energy, signed MOUs to develop two pumped storage projects with a combined capacity of 2,750 MW. These include the 1,500 MW Pawana-Falyan pump storage project in Pune and Raigad districts and the 1,250 MW Kumbhavade project in Kolhapur and Ratnagiri districts. Avaada plans to invest approximately ₹14,000 crore in these projects over the next five to seven years.

These agreements mark a significant step in Maharashtra's commitment to renewable energy and sustainable power generation. The pump storage hydro power projects are expected to play a crucial role in

meeting the state's growing energy demands while contributing to its renewable energy targets.

The initiative also highlights the increasing collaboration between government entities and private sector companies in developing large-scale infrastructure projects. As these projects progress, they are likely to have a substantial impact on Maharashtra's energy landscape, potentially serving as a model for other states seeking to expand their renewable energy capabilities.

## Tata Power secures LoI from PFCCL to acquire Paradeep Transmission Limited

Tata Power Limited has received a letter of intent (LOI) from PFC Consulting Limited, (PFCCL) a subsidiary of Power Finance Corporation Limited, to acquire Paradeep Transmission Limited, a project-specific special purpose vehicle.

The scope of project involves constructing 2x1500 MVA, 765/400 kV gas insulated substation (GIS) at Paradeep with associated bays at Angul and Paradeep, ~190 km of 765 kV double circuit transmission line from existing Angul substation of Power Grid Corporation of India Limited to the proposed 765 kV GIS substation at Paradeep and ~12 km of 400 kV line from existing Odisha Power Transmission Corporation Limited substation at Paradeep to the proposed 765 kV GIS substation at Paradeep. The project is set to operate for 35 years and is valued at Rs 2.56 billion.

## KPI Green secures LoI for 28.40 MW solar power plant under CPP segment

Sun Drops Energia Private Limited, a wholly owned subsidiary of KPI Green Energy Limited, has received letters of intent (LoI) for executing solar power projects with a cumulative capacity of 28.40 MW under the captive power producer (CPP) business segment of the company. The projects are scheduled to be completed in the financial year 2024-25, in various tranches as per the terms of the order.

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# Government Of India Announces Operational Guidelines For 'Model Solar Village' Initiative Under PM-Surya Ghar: Muft Bijli Yojana

The Ministry of New and Renewable Energy has officially released the guidelines for the implementation of the 'Model Solar Village' component under the PM-Surya Ghar: Muft Bijli Yojana. This initiative aims to promote solar energy adoption and enable village communities across India to become self-reliant in meeting their energy needs.

Villages must meet specific criteria to qualify. They must be revenue villages with populations exceeding 5,000 or 2,000 for special category states. The selection process is competitive, with villages assessed on their renewable energy capacity six months after being declared potential candidates by the District Level Committee (DLC).

The village in each district with the highest renewable energy capacity will receive a ₹1 crore grant as central financial assistance. The implementation of this scheme will be overseen by the State/UT Renewable Energy Development Agency under the supervision of the DLC, ensuring that selected villages transition effectively to solar-powered communities, and setting an example for others.

Approved on February 29, 2024, the PM-Surya Ghar: Muft Bijli Yojana aims to increase solar rooftop capacity and empower residential households to generate their electricity. With an outlay of ₹75,021 crore, the scheme is set to be implemented until FY 2026-27.

## Key Objectives of the 'Model Solar Village' Component:

- Solarize one village per district to promote solar rooftops in India.
- Provide clean and green energy access to village communities.
- Empower villages to become self-reliant in their energy needs, reducing reliance on utility companies.
- Develop 24x7 solar-powered villages, covering all households and public areas, to serve as models for other villages.
- Promote technologies such as solar-based home lighting systems, solar water systems, solar pumps for agriculture, and solar streetlights.

## Eligibility Criteria:

- The village must be a revenue village with a population size of more than 5,000 (2,000 for special category states).

- Villages will compete based on the total distributed renewable energy capacity installed within six months after being declared potential candidates by the DLC.


## Implementation and Monitoring:

- The scheme will be implemented by the State Renewable Energy Development Agency or another entity nominated by the State/UT Government.
- The DLC will identify candidate villages and oversee the competition to select the Model Solar Village in each district.
- Extensive mobilization and awareness campaigns will be conducted to encourage solar installations.

## Funding and Support:

Each Model Solar Village will receive a ₹1 crore grant.

Funds will be used to make the village self-sufficient in meeting its electricity needs, covering agricultural, residential, commercial, and government sectors.

The Ministry of New and Renewable Energy is committed to promoting renewable energy and ensuring the success of this initiative, which will play a crucial role in India's transition to sustainable energy sources. 

## The Energy Run by Hitachi Energy India

Hitachi Energy has always been at the forefront of key nation-building initiatives, and 2024 marks 75 years of its presence in India. This journey of powering India's energy transition wouldn't have been possible without the invaluable support and contributions from its employees, customers, and partners. You are an integral part of this journey. As part of Hitachi Energy India's ongoing initiatives around 75 years of powering India, the Company organized its first-ever Energy Run on July 21st in Bengaluru. This event, which saw the active participation of families of employees, customers, partners and other key stakeholders – a total of over 2000 people ran 3KM, 5KM or 10KM, was a celebration of the people who have been instrumental in forwarding Hitachi Energy's Energy's purpose - advancing a sustainable energy future for all.

Mr S. Selvakumar, I A S, Principal Secretary to Govt Department of Commerce and Industry Govt of Karnataka graced the occasion as the Chief Guest for the Energy Run event and felicitated all the winners. Mr N Venu, MD & CEO, India and South Asia, Hitachi Energy, flagged off the run.



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# Reliance Industries to commission first solar giga-factory in FY25

Reliance Industries Ltd, India's most valuable company, plans to commission its first solar giga-factory in the current fiscal as it pivots a green pathway to achieve net zero carbon emissions from operations by 2035. In its largest annual report, the firm said it is targeting to commission the first train of 20GW solar PV (photovoltaic) manufacturing by the end of 2024-25 fiscal (April 2024 to March 2025) and scale up to 20GW in a phased manner over 2026.

The solar giga factory will include manufacturing of PV modules, cells, wafers and ingots, polysilicon, and glass at a single location. The modules convert sunlight into electricity.

It is also targeting industrialising sodium-ion cell production at the MW level in 2025 and first 50 MWh a year lithium battery cells pilot in 2026.

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Reliance had in 2021 announced plans to invest USD 10 billion over three years to develop a new fuels business based on 100 GW of renewable power capacity by 2030. The plan involves setting up four giga factories for manufacturing renewables equipment, battery storage, fuel cells and hydrogen at Jamnagar in Gujarat.

"We have made significant progress in establishing factories that will be part of our Integrated Solar PV Manufacturing," the firm said in the annual report. "New Energy will be commissioning its first train of Module and Cell Manufacturing in FY25."

Solar panels manufactured in Jamnagar have obtained BIS certification.

"Parallely, work on renewable energy development has commenced and Reliance has been allotted land in Gujarat," it said. "We aim to become the largest renewable energy (RE) developer in India."

Besides commissioning the first train of module and cell of 20GW of solar PV manufacturing, 2024-25 may also see industrialise sodium ion cell production at a MW

level. Next year, PV factory is to be scaled to 20GW in a phased manner, and a battery giga factory starting with a 50 MWh a year lithium battery cells pilot set up.

In FY27, it plans to establish a cell-to-pack manufacturing facility of 50 GWh and will set up 100 GW of renewable energy capacity by 2030.

The 100GW target will propel the company into the front rank of renewables ambitions globally, joining the likes of Enel, Iberdrola and oil players TotalEnergies and BP in the scale of capacity additions envisaged.

Reliance said fossil fuels have historically fed India's power requirements. "Structural inefficiencies combined with rising costs of fossil fuel has resulted in expensive power for commercial and residential customers - average tariff of Rs 10 per kWh (unit)."

Therefore, it is not feasible for India to keep relying on fossil fuels for its growth, it said, adding the use of fossil fuels-based energy increases dependence on imports and results in drain of foreign exchange.

"Stable and round-the-clock cost-efficient green power is the need of the hour. India needs to solve this problem to maintain its growth trajectory and reach USD 32 trillion GDP by 2047," it said.

Reliance said over the next 12 months, its focus is to bring new energy manufacturing facilities on-stream, operate them efficiently and start developing renewable energy generation projects.

"Simultaneously, we would develop the supply chain locally for self-sufficiency and reduce the reliance on imports," it said.

The firm aims to partner leading global climate technology and product companies and develop a business model which is flexible and adaptable to different technologies and future proofed to be always lowest life cycle cost and best in class.

Reliance has snapped up multiple partnerships in the clean energy space, such as solar and electric mobility, while pursuing its oil and petrochemical plans. Jamnagar, the world's biggest single-site integrated refinery complex, has two refineries -- one domestic-focused and a newer one only for exports -- that together can process low-grade crude and switch between fuels depending on prices.





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# Nuclear fusion reactor created by school teenager successfully achieved plasma



A student has successfully developed a small nuclear fusion reactor as part of his A-Levels. The 17-year-old built the reactor to generate neutrons as part of his Extended Project Qualification (EPQ).

Notably, Cesare Mencarini's work is claimed to be the only nuclear reactor built in a school environment.

Showcased at the Cambridge Science Festival recently, the nuclear reactor achieved plasma a few months ago. It also gave Mencarini an A\* in his A-Level results, according to reports.

It wasn't easy for Mencarini to convince his teachers for the project. The faculty members even thought that the project could be dangerous and pose a significant threat.

College was initially concerned with this project

"The college was initially concerned that this project, which I have also used for my EPQ, was dangerous. However, we did full risk assessments, and the staff have been so supportive," said Mencarini.

Finally, after spending 18 months of hard work on the project, Mencarini successfully developed the small reactor.

The teen aims to apply for a degree in engineering. However, before that, he has an ambition to work at University of Bristol's Interface and Analysis Centre.

Purpose of reactor is to form conditions that are required for fusion

Mencarini maintained that the goal of the reactor is to create conditions that are required for fusion. However, the project couldn't get same pressure that's

generated by the Sun due to its own gravity.

Therefore, to make atoms hot enough, the teen used high voltage.

Describing Mencarini as "outstanding," the college's principal Dr Julian Davies claimed that the teen will make a significant impact on the energy industry in the future. He also termed Cesare's work, was built in more than a year, extremely exciting.

Mencarini has been outstanding in his work ethic

"We want to give our students the opportunity to work on projects that interest them as well as teaching them how to pass exams and to be brave in enabling them to take risks and develop projects that are applicable to real life situations," said Davies, according to Daily Mail.

"Mencarini has been outstanding in his work ethic and will no doubt make a significant impact on the energy industry in the future."


Mencarini, who hails from Italy, studied maths, chemistry, and physics at Cardiff Sixth Form College. He demonstrated the reactor's potential alongside Imperial College, Bristol, and Bangor universities.

Reactor achieved plasma in June

The reactor achieved plasma in June. "Two days ago I achieved plasma, which was brilliant and I'm massively happy about this," wrote Mencarini in a [LinkedIn post](#).

"The system is running thanks to a Leybold Trivac E2 roughing pump, which allows me to achieve a minimum pressure of  $8E-3$  Torr."

At that time, he mentioned that Pfeiffer TPH062 would be used later to achieve fusion. "This turbomolecular pump is currently isolated by a VAT Throttling Valve."

"The grid is then attached to a 30kV rated High Voltage Feedthrough connected to a 5kV Unilab power supply, which allows me to use the fusor in my school (It is limited to a 2mA output). While running the fusor I experimented with 2 grids which you can see in the images," added Mencarini in the post. 



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# How to test a power transformer?



With the development of the global economy, the requirements for the safety and reliability of the power grid operation are getting higher and higher. One of the effective devices to ensure the stable operation of the power grid is the power transformer. For the power system, the power transformer test is of great significance and plays a key role.

Daelim is a high-quality transformer supplier that only produces power transformers with 20 years of transformer export experience. There is a professional laboratory to do various experiments on the transformers before they leave the factory to ensure that the transformers received by customers have high mechanical performance and good electrical performance.

## What is power transformer testing?

The power transformer is the most important equipment in the power system. In order to ensure the safe and normal operation of the power system, the transformer must be tested with professional experimental equipment for various mechanical and electrical performances before it leaves the factory and is put into use.

## What is the temperature rise test of the transformer?

Whether the design of a transformer is reasonable and whether the cooling system is normal can be verified by the transformer temperature rise test. The temperature rise test of a distribution transformer is mainly to detect whether the temperature rise of top oil temperature and high and low voltage windings meet the requirements of relevant standards and technical agreements. The test

process is mainly divided into two stages, the total consumption stage and the rated current stage. During the application of the total wear phase, the main purpose is to measure the temperature rise of the oil top layer.

In the second stage, when the measurement of the temperature rise of the top layer is completed, the rated current can be applied for one hour, and then the power supply is quickly cut off, and the short-circuit wiring is opened to measure the resistance value of high and low voltage. Then, based on the above measurement data, the rated frequency rated voltage and rated current of the transformer, the average temperature rise of the low-voltage winding, etc., is effectively calculated.

The transformer temperature rise test is the most time-consuming test item, which takes about 12 hours to complete. Through the temperature rise experiment, the quality of the transformer can be known. Since transformers are divided into distribution transformers, substation transformers, main transformers, single transformers, dry transformers, and other types, it is necessary to select a targeted temperature rise test method, so as to ensure the efficiency of the test and the accuracy of the results.

## Transformer temperature rise test device

When using the simulated load method to carry out the temperature rise test of the dry-type transformer, it needs to be carried out in steps. The first step is to carry out the no-load test of the transformer, let the core of the transformer heat up, and then carry out the short-circuit test when the temperature is stable. After the temperature is stable, the temperature rise of the winding under the no-load test and the temperature rise of the winding under the short-circuit state of the transformer are measured respectively. Finally, according to the temperature rise of the two stages, the total temperature rise is calculated.

In the no-load temperature rise test, the thermometer is arranged at the point to be measured, and then the iron core is heated due to no-load loss until the temperature is stable. Since the winding does not generate heat during the no-load test, the heat exchange process between the iron core and the winding cannot be effectively displayed, and the measured value is only a reference value and cannot be used as an actual

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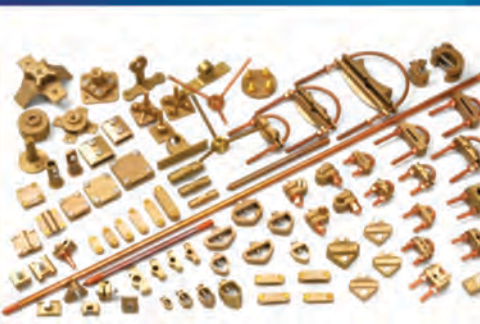
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temperature rise for assessment. When the temperature of the iron core is stable, the temperature rise of the winding is measured again.

The measured temperature rise is obtained indirectly by measuring the change in the resistivity of the windings and belongs to the average temperature rise. After the power is turned off, it will first measure a value, then measure a value every 30 seconds, ten times in a row, and then every 10 minutes. The measured value needs to be plotted using semi-logarithmic coordinates, and then the instantaneous thermal resistance value is measured according to the extrapolation method. The short-circuit temperature rise test is carried out after the no-load temperature rise test. The connection method of the short-circuit temperature rise transformer is consistent with the no-load temperature rise test. The low-voltage side is short-circuited and the high-voltage side is powered. After the testing of the test circuit is completed, the rated current is applied to the high voltage side, and the transformer heats up due to the short circuit of the windings. After the temperature rise is stable, the thermal resistance values of the high and low voltage windings are tested.

Finally, the short-circuit temperature rise of the high and low voltage windings is calculated. The test method and calculation method are the same as the no-load temperature rise test. The actual temperature rise of the winding is calculated according to the temperature rise of the high and low voltage windings measured under no-load and short-circuit conditions.

#### **What is the high voltage side of a transformer?**

On a conventional step-down transformer, the input terminal is the high-voltage side, and the output terminal is the low-voltage side.

Under normal circumstances, the role of the transformer is to reduce the voltage of the power transmitted by high voltage (saving materials and reducing losses) (there are also boosted ones, which are usually in power plant substations) to meet the normal use standards of electrical equipment.

### **Transformer high voltage test**

In order to ensure the accuracy and authenticity of the high-voltage test results of power transformers, the test content must be selected in strict accordance with relevant regulations. The contents of the power transformer high-voltage test mainly include: insulation resistance measurement, leakage current measurement, dielectric loss factor test, AC withstand voltage test, etc., which will be introduced in detail below.

#### **1. Measurement of insulation resistance**

In the high voltage test of power transformers, insulation resistance measurement is the most convenient and simple preventive test. In the measurement of the insulation resistance of the transformer, the overall dampness of the insulation, the degree of overheating and aging, and the pollution can be reflected by the size of the insulation resistance. Taking the insulation resistance measurement of a transformer with a voltage of 110 kV on the high voltage side and a capacity of 31500 kVA as an example, the absorption ratio of the insulation is closely related to the temperature change.

decrease, and the absorption ratio of damp insulation will change irregularly. Therefore, in the measurement of the insulation resistance of the transformer, the temperature of the laboratory must be reasonably controlled to ensure the authenticity of the measured value of the insulation absorption ratio.

#### **2. Measurement of leakage current**

In the measurement of leakage current of power transformers, the digital leakage current tester is mainly used for measurement, and its rated working voltage is generally below 2.5kV, which is significantly lower than the rated working voltage of the transformer. If the DC megohmmeter cannot meet the voltage requirements in the test, the test method of adding DC high voltage can be adopted to ensure the accuracy of the transformer leakage current measurement results. In the case of high voltage, if the leakage current of the transformer is significantly higher than the current in the case of low voltage, it indicates that the high voltage insulation resistance of the transformer is smaller than the low



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voltage insulation resistance, that is, the transformer itself has quality defects, and the anti-leakage function cannot meet the requirements for use.

### 3. Partial discharge test

The partial discharge test of power transformers is a common "non-destructive" test item. The main test methods are as follows:

(1) Take the power frequency to withstand voltage as the pre-excitation voltage, and reduce it to the partial discharge test voltage. Measure the amount of partial discharge;

(2) Use the overvoltage in the simulated operation as the pre-excitation voltage to reduce the partial discharge test voltage for 1 to 1.2 hours to measure the partial discharge.

The second test method can measure whether the partial discharge phenomenon occurs under the long-term working voltage of the transformer, so as to ensure the safe operation of the power transformer in the application. In addition, in the partial discharge test of the power transformer, the design of the insulation structure, the withstand field strength of the insulating medium, the surface field of the live and ground electrodes, the processing and processing of the insulating parts, etc. should be considered so that the partial discharge amount is less than the specified value, rather than The main basis is whether the main and longitudinal insulation is discharged.

In the partial discharge test of the power transformer, when the power frequency withstands voltage is used as the pre-excitation voltage, the duration of the test voltage is about 15 minutes. Properly extending the voltage duration of the partial discharge test has a certain effect on the insulation performance test. If The insulation performance of the transformer is not ideal, which may cause different degrees of destructive damage. When the overvoltage in the simulated operation is used as the pre-excitation voltage, the standard requirement for the voltage duration of the partial discharge test is 1h, and how long the transformer can withstand the pre-excitation voltage is closely related to the volt-second characteristic of the insulation structure.

In the partial discharge test of the power transformer, the partial discharge amount is usually related to the field strength on the surface of the live and grounded electrodes, but not to the frequency of the power supply. Therefore, the noise at the test site should be controlled as much as possible, and the partial discharge amount of the power supply should also be isolated.

### 4. Transformer ratio measurement

The transformation ratio measurement methods of power transformers mainly include the dual voltmeter

method, transformation ratio bridge method, etc. Among them, the transformation ratio bridge method is a commonly used method in field tests. It mainly has the following advantages: it is not affected by the stability of the power supply high accuracy and sensitivity; error can be read directly: the test voltage can be adjusted, which is relatively safe. In the transformation ratio test of power transformers, the test of continuous groups can also be completed synchronously, and the same wiring group is one of the basic conditions for the parallel operation of transformers. Therefore, judging the wiring group of power transformers is also a high-voltage test. an indispensable item. Commonly used test methods are the AC voltmeter method, phase table method, transformer ratio bridge method, DC induction method, group table method, etc. The group table is a common special instrument for testing the group, phase sequence, and polarity of power transformers.

### 5. Dielectric loss factor test

In the high-voltage test of power transformers, the dielectric loss factor test is one of the basic insulation preventive test items. The main purpose of the test is to determine the insulation performance of the transformer according to the size of the dielectric loss factor. In the normal operation of the transformer, the change of the dielectric loss factor is closely related to the size of the insulation loss. In the test process, the test personnel can grasp the overall moisture and deterioration degree of the transformer insulation through the relevant results, so as to obtain accurate test results.

In the dielectric loss factor test of power transformers, the results are significantly better than the insulation resistance measurement and leakage current test, mainly because during the test process, the correlation with factors such as the test voltage and equipment size is small, and the test personnel can accurately judge. Transformer insulation changes.

### 6. AC withstand voltage test

The AC withstands voltage test of power transformers is mainly used to identify the size of its insulation strength. The use of this test method can directly reflect the centralized performance defects of the transformer, so as to ensure the improvement of the insulation performance of the transformer and avoid serious damage caused by insulation aging. security incident. Before the AC withstands the voltage test of the power transformer, the insulation resistance, leakage current, dielectric loss factor, etc. of the voltage transformer must be carefully measured. After obtaining the relevant test results, the AC withstand voltage test can be organized. If the statistics and calculation of the relevant test results are unreasonable, it will directly affect the accuracy of the AC withstand voltage test results.







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Here, it is the speed at which you can exit the place actually matters most, since visibility maybe poor and suffocation due to smoke may

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## राज्यातील पहिले सौरग्राम मान्याचीवाडीतील सौर ऊर्जाकरणालाचे लोकार्पण



सातारा : राज्य शासनाने गेल्या अडीच वर्षांत सर्वसामान्य माणूस केंद्रबिंदू मानून वीजक्षेत्रात मोठी कामगिरी केली आहे. राज्यातील ४४ लाख शेतकऱ्यांना एप्रिलपासून पुढील पाच वर्ष मोफत वीज देण्यात येत आहे. तर मुख्यमंत्री सौर कृषिवाहिनी योजना व मागेल त्यांना सौर कृषिपंप योजनेतून दिवसा वीजपुरवठा करण्यात येणार आहे. सोबतच केंद्र शासनाच्या प्रधानमंत्री सूर्यघर मोफत वीज योजनेतून घरगुती वीजग्राहकांचे वीजबिल देखील शून्यवत होत आहे. या योजनांची प्रभावी अंमलबजावणी करून शेतकरी व घरगुती वीजग्राहकांना मोठा आर्थिक दिलासा देण्यासाठी राज्य शासन कटिबद्ध असल्याची ग्वाही मुख्यमंत्री एकनाथ शिंदे यांनी रविवारी दिली.

पाटण तालुक्यातील (जि. सातारा) मान्याचीवाडी गावामध्ये महावितरणच्या वतीने १०० टक्के सौर ऊर्जाकरण करण्यात आले आहे. राज्यातील पहिले 'सौरग्राम' झालेल्या मान्याचीवाडीचे लोकार्पण करताना मुख्यमंत्री बोलत होते. वीजक्षेत्रात राज्य शासनाने केलेल्या कामगिरीबद्दल उपमुख्यमंत्री व ऊर्जामंत्री देवेंद्र फडणवीस यांचे तसेच पहिल्या सौरग्रामचे सरपंच श्री. रवींद्र माने यांचे त्यांनी जाहीर अभिनंदन केले. या कार्यक्रमाला उपमुख्यमंत्री व ऊर्जामंत्री ना. श्री. देवेंद्र फडणवीस, पालकमंत्री ना. श्री. शंभूराज देसाई, महिला व बालविकास मंत्री ना. आदिती तटकरे, महावितरणचे अध्यक्ष व व्यवस्थापकीय संचालक श्री. लोकेश चंद्र, मान्याचीवाडीचे सरपंच श्री. रवींद्र माने आणि महावितरणचे संचालक (प्रकल्प) श्री. प्रसाद रेशमे प्रमुख उपस्थिती होती.

मुख्यमंत्री शिंदे म्हणाले की, जिल्ह्यातील मान्याचीवाडी गावाने राज्यात पहिले सौरग्राम होण्याचा मान मिळवला आहे. या गावातील प्रत्येक नागरिकाचे मी अभिनंदन करतो. सौर ऊर्जा ही प्रामुख्याने घरगुती ग्राहक व शेतकऱ्यांसाठी वरदान

ठरत आहे. प्रधानमंत्री सूर्यघर मोफत वीज योजनेतून छतावरील सौर ऊर्जा प्रकल्पाद्वारे घरगुती ग्राहकांचे वीजबिल शून्य होत आहे. तसेच राज्य शासनाने मागेल त्यांना सौर कृषिपंप योजना जाहीर केली असून खुल्या प्रवर्गातील शेतकऱ्यांना १० टक्के रकम तर अनुसूचित जाती, जमातीच्या शेतकऱ्यांना पाच टक्के रकम भरून साडेसात अश्वशक्तीपर्यंत कृषिपंप व सौर पॅनेल्स मिळणार आहे. उर्वरित रकम राज्य शासन अनुदानातून देणार असल्याची माहिती मुख्यमंत्री शिंदे यांनी दिली.

उपमुख्यमंत्री व ऊर्जामंत्री म्हणाले, प्रधानमंत्री सूर्यघर योजनेतून घरगुती ग्राहकांना मोफत वीज उपलब्ध होत आहे. तर येत्या दीड वर्षांमध्ये राज्यात सौर ऊर्जेद्वारे १२ हजार मेगावॉट विजेची निर्मिती होणार आहे. ही वीज शेतकऱ्यांना दिवसा देण्यात येणार आहे. त्यामुळे शेतकऱ्यांना सिंचनासाठी रात्री शेतात जाण्याची गरज राहणार नाही. राज्याने सौर ऊर्जेमध्ये मोठी आघाडी घेतली आहे. राज्यात पहिले सौर ग्राम म्हणून मान्याचीवाडीचे आज लोकार्पण झाले याचा आनंद आहे. या गावात पूर्वी ५ लाख २५ हजार रुपयांचे वीजबिल येत होते. ते सौर ग्राममुळे शून्य झाले आहे. आता राज्यातील १०० गावे १०० टक्के सौर ऊर्जेवर नेण्याची मोहीम सुरु असून त्यासाठी गावांची निवड झाल्याचेही फडणवीस यांनी सांगितले.



### महावितरणला कर्ज घेण्यास शासन हमी

महावितरण कंपनीस थकीत देणी देण्यासाठी सुमारे २९ हजार कोटी रुपये कर्जाची आवश्यकता असून त्यासाठी शासन हमी देण्याचा निर्णय या बैठकीत घेण्यात आला. आरईसी आणि पीएफसी या वित्तीय संस्थांकडून हे कर्ज उभारण्यात येणार आहे. एकूण २० हजार ३८८ कोटी कर्ज व ९ हजार ६७० कोटी व्याज असेल.



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# सोलर पॅनल बसविण्याचे टेन्शन संपलं आता घराची खिडकी देणार सोलर लाईट

नवी दिल्ली : अशा जगाची कल्पना करा जिथे तुमच्या खिडक्या केवळ सूर्यप्रकाशच देत नाहीत तर तुमच्या घरासाठी वीजही निर्माण करतात. पारदर्शक सोलर पॅनेलमुळे (Transparent Solar Panels) हे स्वप्न लवकरच सत्यात उतरणार आहे. शास्त्रज्ञांनी पारदर्शक सौर पॅनेल विकसित केले आहेत जे तुमच्या खिडक्यांच्या काचेच्या जागी स्थापित केले जाऊ शकतात आणि घरामध्ये वीज निर्माण करू शकतात.



सौर ऊर्जेचे भविष्य आतापर्यंत आपण पाहत असलेले सौर पॅनेल घन आणि अपारदर्शक आहेत आणि छतावर किंवा खुल्या शेतात स्थापित केले आहेत. पण आता संशोधकांनी पारदर्शक सौर पॅनेल तयार केले आहेत जे खिडक्यांमध्ये बसवता येतील. मिशिगन विद्यापीठात यावर संशोधन सुरू आहे.

तुम्ही विचार करत असाल की पारदर्शक खिडकी सूर्यप्रकाशापासून वीज कशी Special Wavelength निर्माण करू शकते. हे फलक अशा प्रकारे डिझाइन केले आहेत की ते विशिष्ट तरंगलांबीचा प्रकाश शोषून घेतात आणि दृश्यमान प्रकाश त्यामधून जाऊ देतात. हे तंत्रज्ञान पारदर्शक ल्युमिनेसेंट सोलर कॉन्सट्रटर्स (TLSC) वर आधारित आहे, जे अल्ट्राव्हायोलेट (UV) आणि इन्फ्रारेड प्रकाश शोषून घेतात आणि त्याचे विजेमध्ये रूपांतर करतात.

प्रगत तंत्रज्ञान : TLSC मिशिगन विद्यापीठातील अभियंत्यांनी विकसित केलेले TLSC तंत्रज्ञान, अदृश्य सौर विकिरण शोषून घेणारा सायनाइन डाय वापरतो. हे पॅनल्स कार्बन-आधारित IC-SAM लेयर आणि झिंक ऑक्साईड लेयरपासून बनलेले आहेत, ज्यामुळे त्यांची कार्यक्षमता वाढते आणि ते ३० वर्षांपर्यंत टिकाऊ बनतात.

विविध उपयोग आणि वैशिष्ट्ये पारदर्शक सौर पॅनेल पातळ पारदर्शक शीटमध्ये तयार केले जाऊ शकतात आणि खिडक्या, स्मार्टफोन स्क्रीन आणि कारच्या छतावर वापरले जाऊ शकतात. अष्टपैलू असणे ही त्यांची गुणवत्ता आणि वैशिष्ट्य आहे.

वास्तविक जग वापर नेदरलँड्स कंपनी PHYSEE द्वारे पारदर्शक सौर पॅनेलचा यशस्वी

वापर केला आहे. कंपनीने नेदरलँडमधील एका बँकेच्या इमारतीमध्ये ३०० चौरस फूट क्षेत्रफळावर सौरऊर्जेवर चालणाऱ्या खिडक्या बसवल्या आहेत. हे पॅनल्स सध्या संपूर्ण इमारतीच्या ऊर्जेच्या गरजा पूर्ण करू शकत नसले तरी, कंपनीचा दावा आहे की, थोडे अधिक प्रयत्न करून ते लवकरच त्यांच्या सौर खिडक्यांची व्यवहार्यता आणि वीज निर्मिती क्षमता वाढवू शकतील. जपानच्या निप्पोन शीट ग्लास कंपनीनेही आपल्या इमारतीत पहिली सौर खिडकी बसवली आहे आणि कोलोरॅडोमध्ये निर्माणाधीन व्यावसायिक इमारत पारदर्शक सौर खिडक्या बसवत आहे.

सौर पॅनेलचे भविष्य पारदर्शक सोलर पॅनेलच्या शक्यता अफाट आहेत. पुढील संशोधनासह, आम्ही लवकरच जगभरातील घरांमध्ये हे पाहू शकतो, ज्यामुळे वीज निर्मितीचा एक शाश्वत आणि कार्यक्षम मार्ग उपलब्ध होईल. हे तंत्रज्ञान पारंपारिक ऊर्जा स्रोतांवरील अवलंबित्व कमी करण्यासाठी आणि अक्षय ऊर्जा उपायांचा अवलंब करण्याच्या दिशेने एक महत्त्वपूर्ण पाऊल आहे.

## महानिर्मितीची 'सौर' क्षमता ४३८ मेगावॉटवर साक्रीतील प्रकल्पात एकूण क्षमतेच्या ४ टक्के ऊर्जा निर्मिती

मुंबई : राज्य सरकारी महानिर्मिती या वीजननिर्मिती करणाऱ्या कंपनीने शनिवारी धुळे जिल्ह्यातील साक्री येथे २५ मेगावॉट क्षमतेचा सौर ऊर्जा प्रकल्प कार्यान्वित केला आहे. यानंतर आता कंपनीची सौर ऊर्जा क्षमता ४३८ मेगावॉटवर पोहोचली आहे. मात्र हा आकडा कंपनीच्या १३ हजार मेगावॉट या एकूण स्थापित क्षमतेच्या चारच टक्के आहे. वीज क्षेत्रातील वितरण असो वा निर्मिती, या कंपन्यांनी अधिकाधिक हरित उर्जेकडे वाटचाल करावी, असे केंद्रीय ऊर्जा विभागाचे धोरण आहे. वितरण कंपन्यांना एकूण वीज खरेदीच्या किमान २५ टक्के हरित ऊर्जा (पवन, सौर, जल) खरेदीचे बंधन आहे, हे विशेष. अधिकाधिक हरित उर्जेकडे जाण्यासाठी महानिर्मितीने साक्री येथे एकूण ७० मेगावॉट वीज निर्मिती क्षमतेच्या सौर ऊर्जा प्रकल्पांच्या उभारणीचे काम हाती घेतले आहे. त्यामध्ये प्रत्येकी २५ मेगावॉट क्षमतेच्या दोन व २० मेगावॉट क्षमतेच्या एका प्रकल्पाचा समावेश आहे. यापैकी २५ मेगावॉट पहिला प्रकल्प मेसर्स गोदरेज आणि बॉयस कंपनीने अभियांत्रिकी खरेदी आणि उभारणी (ईपीसी) तत्वावर विकसित केला असून तो सुरू झाला आहे. या प्रकल्पातून वार्षिक ४५.०९ दशलक्ष युनिट वीजननिर्मिती होणार आहे. तेथील शिवाजीनगर भागात हे प्रकल्प उभे होत आहेत. या प्रकल्पातील वीज महानिर्मितीकडून खुल्या बाजारात विक्री होणार आहे. हा प्रकल्प कार्यान्वित झाल्याबद्दल ऊर्जामंत्री देवेंद्र फडणवीस व महानिर्मितीचे अध्यक्ष तथा व्यवस्थापकीय संचालक डॉ. पी. अनबलगन यांनी संचालक (प्रकल्प) अभय हरणे यांच्यासह अभियंत्यांचे अभिनंदन केले आहे

### १९५ मेगावॉट वीज

महानिर्मिती कंपनीनुसार, साक्री येथे महानिर्मितीचा १२५ मेगावॉट क्षमतेचा सौर ऊर्जा प्रकल्प मागील दहा वर्षांपासून कार्यरत आहे. त्यात या तीन प्रकल्पांची भर पडल्यानंतर एकाच ठिकाणी १९५ मेगावॉट वीज तयार होईल. यामुळे साक्री महानिर्मितीचे 'सोलर हब' म्हणून नावारूपास येणार आहे.





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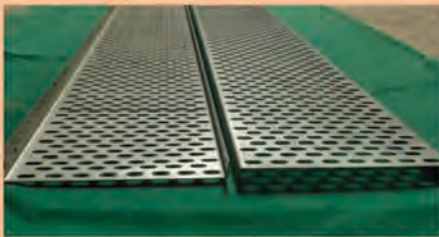
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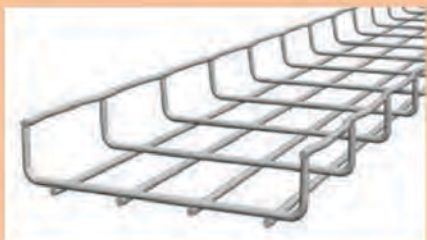
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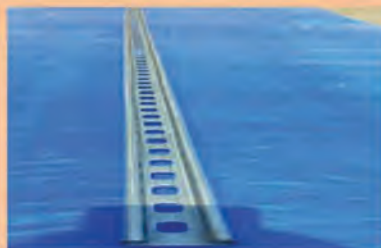
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## पनवेल तालुक्यातील 'मुंबई ऊर्जा'तून लवकरच वीजवहन होणार सुरू

पनवेल : पनवेल तालुक्यातील १६ गावांमधून मुंबई आणि उपनगरांना वीजपुरवठा करणारा मुंबई ऊर्जा प्रकल्प अंतिम टप्प्यात आहे. या बहुचर्चित प्रकल्पातून लवकरच विजेचे वहन सुरू होणार आहे. मुंबई आणि परिसराला यामुळे तब्बल दोन हजार मेगावॉट अतिरिक्त वीज मिळणार आहे, अशी माहिती प्रकल्प प्रमुखानी दिली.

मुंबई महानगर क्षेत्र झपाट्याने विकसित होत आहे. झपाट्याने वाढणारे निवासी क्षेत्र, औद्योगिक वसाहती ते अगदी वाहन इंधन क्षेत्र या साऱ्याच ठिकाणी अतिरिक्त विजेची मागणी सातत्याने होत आहे. केंद्र सरकारच्या ऊर्जा मंत्रालयाने मुंबई शहराची ही गरज ओळखून मुंबई ऊर्जा मार्ग प्रकल्प उभारला आहे. महाराष्ट्रात होणाऱ्या नव्या उद्योगांच्या निर्मितीसाठी विजेचा स्रोत महत्त्वपूर्ण भूमिका बजावणार आहे. दोन वर्षांपासून मुंबई ऊर्जा प्रकल्पाच्या माध्यमातून उंच वीजवाहक तारा टाकण्याचे काम सुरू आहे.

या प्रकल्पासाठी पनवेल तालुक्यातील १६ गावांमधील जमिनीचा वापर होणार आहे. ओवे, किरवली, आडिवली, धानसर, तुर्भे, नेवाळी, टेंभोडे, वलवली, कोलवाडी, पालीबुद्रक, हेदुटणे, चिंघण, चिंचवली, मोहदर, कांडप आदी गावांमधून ही वीजवाहिनी उभारण्यात आली आहे. या भूसंपादनाला सुरुवात झाल्यानंतर स्थानिक शेतकऱ्यांनी प्रचंड आंदोलन केले. परंतु शेतकऱ्यांची समजूत काढून प्रकल्प पूर्ण करण्यास यश आले आहे. २०२२मध्ये या प्रकल्पातील भूसंपादनासाठी धोरणनिश्चिती करून भूधारकांना मोबदला निश्चित करण्यात आला होता.

नव्याने टाकलेल्या उच्च वीजवाहिनीच्या माध्यमातून गुजरातमधून मुंबई महानगर प्राधिकरण क्षेत्रात दोन हजार मेगावॉट अतिरिक्त वीज मिळवण्याचे उद्दिष्ट समोर ठेवण्यात आले होते. त्यानुसार लवकरच मुंबई ऊर्जा मार्ग प्रकल्पातील नव्याने उभारण्यात आलेल्या उच्च वीजवाहक तारांमधून विजेचा प्रवाह सुरू होणार असल्याची माहिती प्रकल्प प्रमुख निनाद पितळे यांनी दिली.

## पिंपरी चिंचवड महानगरपालिकेचे मा. आयुक्त यांनी इकॅमच्या सुधारित अटी शर्ती लागू केल्या

सन्माननीय सभासद,

बऱ्याच वर्षांपासून पिंपरी चिंचवड महानगरपालिका क्षेत्रात काम करणाऱ्या आपल्या सभासदांना निविदा भरत असताना पिंपरी चिंचवड महानगरपालिकेच्या जाचक अटी व शर्तीना सामोरे जावे लागत होते. या विरोधात आपल्या संघटनेचे पुणे विभागाचे तत्कालीन मा.अध्यक्ष श्री अमरनाथ पाटील यांच्या अध्यक्षतेखाली ८ ऑगस्ट २०२३ रोजी सदर अटी शर्ती बदलण्याबाबत मोहीम हातात घेण्यात आली होती. आणि सांगण्यास खूप आनंद वाटतो की सतत वर्षभर आपल्या संघटनेच्या पुणे विभागाचे विद्यमान मा. अध्यक्ष श्री अनिल महाजन यांच्या अध्यक्षते खाली पाठपुरावा केल्यानंतर आज त्यास यश आले आहे. आपण मागणी केलेल्या सर्व मागण्या पिंपरी चिंचवड महानगरपालिकेचे मा. आयुक्त यांनी मान्य करून



सुधारित अटी शर्ती लागू केल्या आहेत व आपल्या संघटनेच्या मागणीनुसार सध्या प्रसिद्ध झालेल्या निवेदा नोटीस करिता शुद्धिपत्रकाद्वारे मुदतवाढ देऊन या नवीन अटी शर्ती लागू करण्यात आल्या आहेत. सदर पाठपुरावा करित असताना वेळोवेळी आवाहन करताच सर्व पिंपरी चिंचवड मधील सभासदांनी त्वरित उपस्थिती दाखविली व सर्व सभासदांच्या ऐकीमुळेच व पुणे विभागाच्या संचालक मंडळाच्या सहकार्याने हे शक्य झाले. सहकार्याबद्दल सर्वांचे आभार. भविष्यात ही ऐकी अशीच राहावी ही विनंती.

आपला,

अनिकेत देवकर प्रभारी सचिव, इकॅम पुणे विभाग.

## नामदार रवींद्र जी चव्हाण साहेब सार्वजनिक बांधकाम मंत्री यांच्या सोबत विस्तृत चर्चा



इकॅम पुणे विभाग यांच्या तर्फे माननीय नामदार रवींद्र जी चव्हाण साहेब सार्वजनिक बांधकाम मंत्री महाराष्ट्र शासन यांच्या

सोबत PWD मधील विद्युत ठेकेदारांना भेडसवणाऱ्या कंबाइन्ड टेंडर बाबत विस्तृत चर्चा करण्यात आली. इकॅम पुणे विभागाचे अध्यक्ष श्री अनिल महाजन सर यांनी याबाबत टेंडर प्रक्रिया विद्युत विभागची स्वतंत्र पद्धतीने राबविण्याबाबत आग्रहाची मागणी माननीय मंत्री महोदय यांच्या समोर मांडली.. याविषयावर सकारात्मक निर्णय करू असे आश्वासन माननीय मंत्री महोदय यांनी इकॅमच्या प्रतिनिधींना दिले. आजच्या बैठकीचे संपूर्ण नियोजन इकॅम महासमितीचे संचालक योगेश पवार व पिंपरी चिंचवड चे पदाधिकारी श्री विनोद कोठावदे, श्री अनिकेत देवकर, श्री भास्कर थोरे, श्री शरद जगदाळे यांनी केले होते. त्याबद्दल संघटनेच्या वतीने सर्वांचे विशेष आभार ..

# महाराष्ट्रातील १०० गावात आता शंभर टक्के सौर प्रकाश; ही आहे योजना:

राज्यातील १०० गावांमध्ये शंभर टक्के सौरऊर्जेचा वापर करण्याची योजना महावितरणने आणली आहे. यासाठी प्रत्येक जिल्ह्यातील दोन गावांची निवड करण्यात आली आहे. निवड झालेल्या गावांमध्ये जालना जिल्हा (पातोडा, दारेगाव), बीड जिल्हा (नानदी, आनंदवाडी), लातूर जिल्हा (नवीन आदर्श कॉलनी, मयूरबन सोसायटी), हिंगोली जिल्हा (सुलदळी गोरे, दातेगाव), नांदेड जिल्हा (हाडोळी, दवणगीर), परभणी जिल्हा (आंबेटाकळी, मुरूमखेडा), पेण मंडळ (पाडवी पठार, वडवळ), वाशी मंडळ (नेरेपाडा गाव, सिवानसाई गाव), धुळे जिल्ह्यातील (कलगाव, नाथे)चा समावेश आहे.

जळगाव जिल्हा (निंबोल, पातोडी), नंदुरबार जिल्हा (मोहिदा, ब्राह्मणपुरी), कल्याण मंडळ- १ (शिरवली कुंभारली), कल्याण मंडळ- २ (गोलभान, मोहोप), पालघर जिल्हा (अक्करपट्टी, कोलगाव), वसई मंडळ (शिवनेरी, निर्वाण), रत्नागिरी जिल्हा (फुरस, असूडजिल्हा (पारेगाव, हिवरे बाजार), मालेगाव मंडळ (वाके, निंबोळा), नाशिक मंडळ (कोनांबे, दारणा सांगवी), जिल्हा (सौंदाळा, सांगलुड), बुलढाणा जिल्हा (बजरंग नगर- सागवान एरिया, सावजी लेआऊट, सुताळा खुर्द), वाशीम जिल्हा (झकलवाडी, पारवा), जिल्हा (नवाथे, काठोरा), चंद्रपूर जिल्हा (सोमनाथ, आनंदवन), गडचिरोली जिल्हा (कोंढाणा

तुंबडी मेंढा), भंडारा जिल्हा (भोसा, दहेगाव), नागपूर ग्रामीण मंडळ (चिखली,सिंधी), नागपूर शहर मंडळ (किरमिती भारकस, कॉस्मोपोलिटन), वर्धा जिल्हा (नागझरी, नेरी मिर्जापूर), बारामती मंडळ (वांजरवाडी कुंभारकर वस्ती, गणेश रोड नानगाव), सातारा जिल्हा (मान्याची वाडी), सोलापूर जिल्हा (चिंचणी, औज), कोल्हापूर जिल्हा (शेळकेवाडी, पिराचीवाडी), सांगली जिल्हा (झुरेवाडी निमसोड), गणेशखिंड मंडळ (शिवतीर्थ नगर, सेक्टर २५ निगडी) या जिल्ह्यांचा समावेश करण्यात आला आहे. या गावात प्रधानमंत्री सूर्यघर मोफत वीज योजनेतर्गत घरगुती वीज ग्राहकांना ३ किलोवॉटपर्यंत ७८ हजार रुपयांचे अनुदान मिळणार असून पाणीपुरवठा व दिवाबत्ती योजनेच्या सौर ऊर्जाकरणासाठी शासकीय निधीतून पैसे उपलब्ध दिले जाणार आहेत.

सोबतच सर्व वाणिज्यिक व औद्योगिक ग्राहकांना या योजनेत सहभागी करण्यासाठी आवाहन केले जाणार आहे, अशी माहिती महावितरणचे उपमुख्य जनसंपर्क अधिकारी योगेश विटनकर यांनी दिली. दरम्यान केंद्राने योजना जाहिर केल्यानंतर एखाद्या राज्याकडून या योजनेच्या आधारे तब्बल शंभर गावे शंभर टक्के सौर प्रकाशावर चालवण्यासाठी योजना आखलेले महाराष्ट्र हे देशातील पहिलेच राज्य राहणार आहे, हे विशेष.



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PIIM275/1+1, PI-L63, PI-k16
- Subsidiary Switchboards (power supply for industrial equipment)  
PIIM275/3+1, 4xPI-L16, 4I-3k16
- power supply of control section  
PI-k8, PI-3k16
- power supply of sensitive section units  
PI-k16
- socket circuits power supply of electronic appliances  
ZS-1P

## Industrial Application

#### Telecommunications System - Select type of application

Analogue connection: HT-TEL  
ISDN connection: HT-ISDN  
DSL connection: DTP/ART

#### TV, CCTV (video) and SAT-select application

digital over land transmitting: KO-SP  
satellite transmitting: KO-SP  
security system: HT-C-TV  
fire-stopping system: HT-DATA

#### Data Technology - select type of technology & connection

LAN category 6: HAKELNET 4/250M K64  
LAN category 5 for server: HAKELNET 8/2 RJ45  
LAN category 5 for unit: PSK24  
LAN category 3 for server: HAKELNET 1.2 RJ45

#### Measurement and control systems

Power supply of control section: PI-AS  
Communication data transmission: DTE TNS

#### Isolation Monitoring Device

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## COMPANY PROFILE

The Company ESWARI ELECTRICALS was established in the year 1983 for the manufacturing of High Voltage switchgear Products. It is now one of the many flourishing Electrical Industries in the country. It is aimed to compete the Large Scale Industries and the Multinationals in the same field.

### THE FOUNDER:

The company was founded by Mr. N. GANESAN who had a long experience and served in the capacity of the Deputy Director in the BUREAU OF INDIAN STANDARDS formerly known as the Indian Standards Institutions. He was in charge of the implementation of quality control measures in the field of electrical engineering. He was also the Professor of Electrical Engineering in the Engineering Colleges.

### THE COMPANY:

The company is engaged in very diversified areas of business in the field of electric power industry such as Manufacturing, Consulting, EPC and Turnkey projects .The Products and services offered by the Company for the past Decade has been known for its quality and technical excellence. The products manufactured are indigenously designed, developed and produced to compete with the standards of the multinational. The same product has been tested by the various Neutral Laboratories such as THE CENTRAL POWER RESEARCH INSTITUTE, NATIONAL

TEST HOUSE, ETDC etc., it also manufacturers various types of special application fuses as a substitution to the imported material. The company has full fledge machine shop, assembly section and R & D Testing facility.

### OUR EXCELLENCE

The Products & Services are being marketed through a well establish country wide marketing network. We have a highly valuable customer base comprising of various MNC'S OEM'S, DOMESTIC Infrastructures and the STATE ELECTRICITY BOARDS. In the year 1990, the company started trading across the globe. Our products are in use in various countries and mostly in the region of Southeast Asia.

### QUALITYPOLICY

Our policy is to offer protection solution for power distribution through innovative and indigenously designed, technically superior state of the art products. We, at EEPL, shall endeavor for total customer satisfaction through our integrity and consistency in quality of products and services at a competitive Price.

### OUR STRATEGY

- Focus on core businesses.
- Continuous improvement in quality, technology, and procedure.
- Cost-orientation
- Focus on distributors, customers and construction of sales networks
- Internationalization.

### R&DEFFORTS

Keeping science and technology as a priority, investing more funds into technical reform and innovation and occupying market by means of high-tech products are essentials of our development strategy.

### CLIENTS

The company enjoys a huge client base. Its clients are spread both in India and abroad. The bulk of its products are exported to many South East Asian countries and U.S.A. At Eswari, we have created an edifice of our accomplishments by serving our valuable customers with superior quality products and world class customer services.



### LIST OF PRODUCTS

1. Vacuum Circuit Breakers (3.3 To 33KV).
2. Auto Reclosers (VAC/SF6) – Upto 33KV
3. Air / Load Break Switches (ABS/LBS)– Upto 33KV
4. Ring Main Units(RMU) Upto 33KV.
5. SF6 Ring Main Units / Breakers / Isolators – Upto 24KV
6. Unitized Secondary Substation Upto – 33KV
7. Isolators / Disconnectors – Upto 220KV (Manual / Motorized)
8. Lightning/Surge Arresters –
9. Insulators And Fuse Bases – Upto 33KV
10. Neutral Links / Isolator Solid Links (Upto 33KV)
11. Current & Voltage Transformers (Upto 33KV)
12. HRC FUSES
  - a. Medium Voltage Fuses.
  - b. Low Voltage Fuses (BS & DIN Stanndards
  - c. Semi Conductor Fuses (ANSI, BS, VDE Standards)
  - d. Expulsion Cutouts & Fuse Links(DO's) – Upto 33KV

**Note :** All Our Products are Type Tested In CPRI For necessary conformations

# NTPC Invites Bids for Sale of Carbon Credits from Wind and Solar Projects

NTPC Green Energy has floated a tender for the sale of 100,000 carbon credits of Verified Carbon Standard (VCS)-registered wind and solar projects of 610 MW capacity. The last date to submit bids is September 12, 2024, and bids will be opened on September 13.

Bidders must offer the lump sum price for the 100,000 carbon credits exclusive of the issuance fee to be paid to VERRA/VCS Board and other applicable charges and taxes. In return, NTPC will sign an Emission Reduction Purchase Agreement (ERPA) with the successful bidder.

The sale of carbon credits is open to all credible domestic companies registered and operating in India. Applicants can purchase the carbon credits generated by VCS-registered projects of NTPC Green at a price discovered during competitive bidding.

Bidders must have experience purchasing and selling carbon credits in the last three years.

They should either have an active account at the VERRA registry to facilitate the transfer of Verified Emission Reductions (VER) or furnish an undertaking for the VERs to be transferred to a third party's valid VERRA account. U.S.-based VERRA manages the Verified Carbon Standard Program, one of the most widely used

greenhouse gas crediting programs.


The average annual turnover of the bidders in the preceding three financial years should not be less than 28 million (~\$95,351). The net worth of the bidders should not be less than 100% of their paid-up share capital. Last November, the Bureau of Energy Efficiency issued the draft Detailed Procedure for Compliance Mechanism under the Carbon Credit Trading Program. Under the new procedure, the Ministry of Environment, Forest and Climate Change was to announce the greenhouse gas emission intensity targets for tons of carbon dioxide equivalent (tCO<sub>2</sub>e) per unit of equivalent product for each defined trajectory cycle applicable to obligated entities.

In February this year, NTPC Green Energy issued an engineering, procurement, and construction tender for 200 MW of inter-state transmission system-connected solar projects anywhere in India.

In April this year, NTPC Green invited bids for forecasting and scheduling a 130 MW solar project.

Subscribe to Mercom's India Solar Tender Tracker to stay on top of real-time tender activity.





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# India's wind capacity needs to grow from 2.8 GW to 9.3 GW annually to hit 2030 goal

New Delhi: India faces a significant challenge in meeting its 2030 wind energy targets, according to a new report by energy think tank Ember. India aims to build 509 GW of renewables by 2030, including 110 GW of wind, but current installation rates fall short. In 2023, India added only 2.8 GW of wind capacity, far below the required annual addition of 9.3 GW from 2024 to 2030. The global picture also reveals shortfalls. While global wind capacity is projected to double by 2030, reaching 2,157 GW, this is a 2.4 times increase from the 901 GW recorded in 2022. However, an additional 585 GW is needed to achieve the tripling target necessary to meet climate goals.

"Governments are lacking ambition on wind, and especially onshore wind," said Dr. Katy Altieri, electricity analyst at Ember. "Amidst the hype of solar, wind is not getting enough attention, even though it provides cheap electricity and complements solar." At the UN's COP28 climate change conference in December, countries agreed to triple global renewables capacity by 2030. The International Energy Agency (IEA) declared this action as the 'single most important lever' to cut emissions this decade and keep the 1.5C goal within reach. According to the IEA, wind capacity should also at least triple to meet this goal.

The report analyzed 2030 national wind targets in 70 countries plus the EU, which collectively represent 99% of current global wind capacity. The analysis suggests that global wind capacity will double, primarily due to China's expected over-delivery, while the rest of the world is on course to under-deliver. Industry forecasts indicate that China is set to triple its wind capacity by 2030, continuing to account for over half of global wind additions annually from 2024 to 2030. In contrast to India's struggles, other countries show varied progress. The US does not have an explicit target, but modeling suggests an increase in wind capacity from 142 GW in 2022 to 369 GW in 2030, requiring 32 GW of wind annually from

2024 to 2030. However, the US added only 6.4 GW in 2023, indicating a need for a substantial ramp-up.



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## LIC-Backed Power Generation Company Bags 90 MW Omkareshwar Floating Solar Project

SJVN Limited has successfully commissioned a 90 MW floating solar project at the Omkareshwar Floating Solar Park in Khandwa district, Madhya Pradesh. This achievement was realized through its wholly owned subsidiary, SJVN Green Energy Limited. With this addition, the company's total installed capacity has grown to 2,466.50 MW. Notably, this project marks SJVN's entry into the floating solar power segment, positioning it as one of the largest such projects in Central and North India.

The 90 MW Omkareshwar Floating Solar Project represents a significant investment of Rs 646.20 crores. It is projected to generate 196.5 million units of electricity in its initial year of operation and a cumulative 4,629.3 million units over 25 years. This venture is expected to contribute an additional Rs 64 crores to the company's revenue. SJVN currently boasts a substantial project portfolio of 56,802.40 MW, with a diverse focus on hydro, pumped storage, thermal, and renewable energy sectors.

Additionally, the Board of Directors will discuss a proposal to fundraise through the Securitization of Assets and divestment of a stake in its wholly-owned subsidiary, SJVN Green Energy Limited, at its meeting on Tuesday, August 13, 2024.

The company is on rapid progression to achieve its shared vision of 25,000 MW by 2030 & 50,000 MW by 2040. This shared vision has been formulated in sync with the commitment of the Government of India to generate 50 per cent of energy from non-fossil fuel-based energy resources by 2030.

SJVN, formerly known as Satluj Jal Vidyut Nigam Ltd, is an Indian public sector undertaking involved in hydroelectric power generation and transmission. It was incorporated in 1988 as Nathpa Jhakri Power Corporation, a joint venture between the Government of India and the Government of Himachal Pradesh. The company has a market cap of over Rs 60,000 crore and has been maintaining a healthy dividend payout of 65.4 per cent. The company reported positive numbers in its Quarterly Results (Q4FY24) and annual results (FY24) for the year ended March 31, 2023.

As of June 2024, the Life Insurance Corporation of India (LIC) owns 2.26 per cent while FIIs & DIIs increased their stake in June 2024 compared to March 2024. The stock gave multibagger returns of 155 per cent in just 1 year while the BSE Sensex Index is up by 21 per cent. Investors should keep an eye on this power stock.



## New Benchmark in India's solar energy sector

The Solar Energy Corporation of India's (SECI) recent tender has set a new benchmark in India's solar energy sector, unveiling a tariff of Rs 4.98 per unit for 630 MW of capacity.

This groundbreaking rate, achieved by top firms including JSW Energy and Hero Future Energies, promises a significant shift towards affordable and dispatchable green power.

According to an industry expert, the discovered tariff is the lowest so far for such SECI projects. But the prices of SECI-related projects were not comparable with other FDRE projects allocated by SJVN, NHPC and NTPC, which saw lowest tariffs of Rs 4.38 per unit, Rs 4.55 per unit, and Rs 4.69 per unit, respectively.

A senior official told ETEnergyWorld that the tender result is historic as it is a first of its kind tender to get a

tariff below Rs 5 per unit.

The tender is different from others as it will follow the demand curve as specified by the buyer. While other tenders do not supply as per demand curve. Buyer will get green power after 24 months from now for 25 years at fixed tariff, added the official on the condition of anonymity.

Power generated from this project is set to be procured by BSES Rajdhani Power and BSES Yamuna Power – 625 MW – and Gift City in Gandhinagar – 5 MW.

The capacity was awarded to Vena Energy, Hero Future Energies, Hexa Climate, JSW Energy, and Serentica Renewables. With JSW Energy bagging 230 MW capacity at Rs 4.98 per unit tariff followed by the rest of the four companies with 100-MW capacity each.





# SWREL Announces EPC Win of 400 MW ac Solar Plant In Rajasthan

Highlights : The full order value is expected to be around Rs 550 crores, to be executed by 2025-26

Domestic Renewable EPC major Sterling and Wilson Renewable Energy Limited (SWREL) has announced that it has received a major new order for the Engineering, Design, Testing & Commissioning of a 400 MW AC/633 MW DC PV plant. Besides this, the scope of work also includes Supply & Works for a 33/220 kV switchyard to be built at plant for the PV project in Rajasthan, India. The total value of works including taxes, levies and duties is approximately -INR 550+ crore.

Speaking on the order win, Amit Jain, Global CEO, Sterling and Wilson Renewable Energy Group, said, "We are thrilled to receive another large domestic order from a leading private renewable IPP in India. The Indian market continues to grow rapidly and as an established home-grown EPC player we are geared to target this high growth."

"With this order win, SWREL has now achieved around INR 900 crore of domestic order inflows in the second quarter of FY25. This is in addition to the order inflow of -INR 2,170 crore seen in the first quarter, and we remain confident of further augmenting this order momentum due to a strong domestic bid pipeline being in place", he further added.

The order continues the dawn of better days for SWREL, after enduring a tough 3 years between 2020-21 to 2022-24, during which it saw a change in promoter group as well from the Shapoorji Pallonji group to Reliance. Expectations are high for the firm to bag major EPC work from the new promoter group as well in the coming months, as Reliance accelerates its own plans for at least 20 GW of renewable energy by 2030 for internal use, towards its net zero ambitions for 2035.



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# Digitalisation Costs for Micro and Small Manufacturing Enterprises

Digitalisation requires vision, strategy, leadership, change management and investment on a continuing basis.

Micro and small manufacturing enterprises (MSMEs), that constitute approximately 98% of the total number of manufacturing enterprises (34%-35% of the Udyam registrations of all the enterprises), are proprietary and partnerships (either family or friends). As defined in 2020 with an amendment of the MSME Development Act (2006), micro manufacturing enterprises are those with an investment of Rs. 1 crore and turnover of Rs.5 crore, while those in the small category are with an investment of Rs. 10 crore and turnover of Rs.50 crore. The relationship between the investment and turnover has been retained at 1:5 ratio.

The costs can be divided in terms of hardware and software. Hardware expenses usually appear one time but with the changes in technology, even hardware becomes obsolete after five years. With banks, non-banking finance companies (NBFCs) and fin-tech moving to mobile platforms for delivery of all their products both acceptance of deposits and dispensing credit, entrepreneurs invest additionally in either tablets or smartphones, in addition to the desktop computers. Insofar as software is concerned, although they are lured into adopting cloud technologies, they weigh their options between the cost of the latter and their own data storage platforms with alternate storage space outside the system location.

Micro manufacturing enterprises with a turnover of below Rs5 crore, presuming that they reach this turnover within three to four years of establishment, require 10% of turnover for digitalisation. Right from day one, they should have a road map of their growth – when and where they would like to move, what markets they would like to cater to, which type of clients they would like to attract and when they would like to scale up to the next level.

As of now, except 0.25% of micro enterprises, others do not have this vision and strategy to scale up. The reasons can be many, including the perverse incentives that encouraged horizontal growth. For a firm with Rs5 crore turnover, spending 10% will be next to a pipe dream. Furthermore, change management is imperative



as every technology requires a different approach for its utilisation and the cost-benefit analysis requires that reduction in cost without affecting its human resources (HR) – retention instead of attrition – would be a very tough exercise. HR taking to new technologies requires re-skilling and up-skilling and scaling up remuneration comparable to the market. Unless an enterprise reaches a turnover of Rs100 crore to spend a minimum of Rs50 lakh with agility to spend up to Rs1 crore, digitalisation would make such enterprises non-performing assets (NPAs). The reasons are not far to seek, apart from the above. Where does such investment come to them?

Investment for these MSEs comes 99% from debt. Angel funds or venture capital funds or mutual funds or pension funds—even if the MSEs have all the muscle to attract—would not be able to go near them. Any investor would like to look at the vertical growth of the enterprise and the ability to mobilise equity commensurate with the growth of the firm. This is the principal reason for these enterprises to strategise, innovate and manage the change.

Counselling and mentoring play a very critical role. These should come at a very low cost to them. This will happen only when the Union and state governments invest in skilling, re-skilling, and up-skilling, and meet at least 30% of the cost of technology once in every five years or with every change in technology that the firm ventures to introduce. Debt markets will not be able to service such activities even if they have the will to with their current level of functioning as they do not have the time or resources to engage these enterprises on a continuing basis, providing credit with extension.

*(The author is a retired senior banker, economist and risk management specialist)*



## CERC notifies CERC (Deviation Settlement Mechanism and Related Matters ) Regulations, 2024

The Central Electricity Regulatory Commission (CERC) has notified the CERC (Deviation Settlement Mechanism and Related Matters) Regulations, 2024.

These regulations seek to ensure, through a commercial mechanism, that grid users do not deviate from and adhere to their schedule of drawal and injection of electricity in the interest of security and stability of the grid. As per the notification, for the secure and stable operation of the grid, every grid-connected regional entity shall adhere to its schedule as per the grid code and shall endeavour not to deviate from its schedule.

The deviation shall generally be managed through the deployment of ancillary services, and the computation, charges, and related matters in respect of such deviation shall be dealt with as per the provisions of these regulations. Further, the charges for deviation by way of injection of infirm power shall be zero if infirm power is scheduled after trial run as specified in the grid code, the charges for deviation over the scheduled infirm power shall be as applicable for a general seller or WS seller, as the case may be.



## Smart Pole 2.0

The concept of smart cities came into being as a consequential development to internet of things (IoT), digital connectivity, global warming and the compelling necessities for energy saving. More than 50 % of the world's population lives in cities, A city environment, with a closely knit street light network became a natural choice for a smart city concept, hosting sensor networks and wireless communications for traffic control, smart parking, noise and air quality monitoring, incident detection, and more. Smart city lights are not stand alone system. They have to be integrated with other systems under what is known as Internet of Things (IoT). Hence the chosen smart city light poles should be able to accommodate a full range of lighting controls compatible to remote control and integral with suitable sensors for the respective application.

In fact, the smart city pole is going to be a service platform for various services for Network redundancy, application areas such as mobile connectivity WLAN), traffic control, security camera (CCTV), information transfer, public announcement with loud speakers, smart parking, environmental monitoring and even the electric charger for electric cars etc.,

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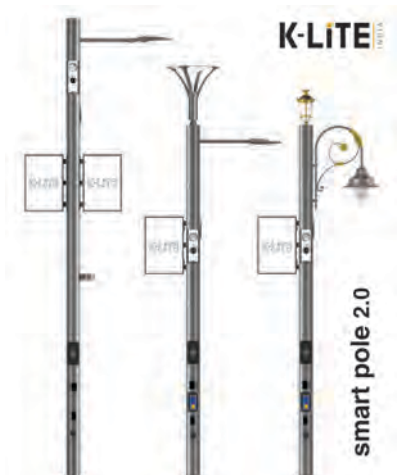
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# RBI Deputy Governor Outlines India's Path to Becoming a Developed Economy

Reserve Bank of India (RBI) Deputy Governor, Michael Debabrata Patra, highlighted the significant role of India's monetary policy in the country's journey towards becoming a developed economy during a discussion with Indian Administrative Service (IAS) officials. He stressed the importance of adopting proactive and forward-looking monetary policies to effectively tackle future challenges and seize opportunities.

Patra highlighted the essential principles of monetary policy, noting its quick deployability as a stabilising tool. It aligns aggregate demand with productive capacity, controlling inflationary pressures when demand exceeds potential and stimulating the economy during deflationary conditions.

Effective monetary policy is inherently forward-looking, anticipating future conditions due to the lag in economic data and delayed impact of policy measures. Patra also stressed the importance of focusing on a singular goal with one instrument, as per Jan Tinbergen's rule, to maintain policy effectiveness.

Transparency and clear communication of policy intentions are crucial for credibility and macroeconomic stability. Patra described India's economic journey, noting its emergence as a \$3.6 trillion economy with a per capita income of \$2,500 in 2023-24. He projected that with a 9.6% annual growth rate, India could achieve developed country status by 2047, with a per capita income of \$34,000.

In purchasing power parity (PPP) terms, India is the third-largest economy globally, aiming to become a \$5 trillion economy by 2027 and potentially overtaking the US as the second-largest in PPP terms by 2048, according to the OECD.

Patra identified positive forces shaping India's future: robust capital accumulation, macroeconomic stability, financial sector resilience, and a young, growing workforce. India's investment rate, financed mainly by domestic savings, provides a stable growth foundation. Despite external shocks, India's external sector remains robust with manageable debt levels and strong foreign exchange reserves.

Macroeconomic stability, supported by prudent financial policies and active supervision, has strengthened India's financial sector. The decline in non-performing assets and strong capital buffers support a credit upswing, aiding growth intermediation.

India's demographic dividend presents

significant growth opportunities. Efforts to re-skill the labor force, formalise employment and increase female labor participation are critical for leveraging this advantage. The digital revolution, driven by initiatives like the JAM trinity (Jan Dhan, Aadhaar and mobile connectivity) and the Unified Payment Interface (UPI), is enhancing financial inclusion and boosting economic growth.

However, challenges remain. Building high-quality infrastructure, developing a robust manufacturing base, boosting exports and managing climate change are vital for sustained growth. Infrastructure investment must be scaled up, manufacturing growth accelerated, and labor productivity enhanced to leverage the demographic dividend.

In conclusion, Michael Debabrata Patra emphasised the pivotal role of monetary policy in shaping India's economic future. By adhering to guiding principles, leveraging positive forces and addressing challenges, India can navigate its path to becoming a developed economy. The proactive and forward-looking approach of the RBI, combined with the resolve of policymakers and stakeholders, will prepare India for its ambitious journey toward economic prosperity and global leadership.



## Prime Minister Surya Ghar Scheme

Prime Minister Surya Ghar Scheme has a huge budget of Rs75000 crore to install the solar rooftops on one crore households in the country. The scheme is aimed at securing a cleaner, more resilient energy future for India. 13 Lakh applications are made by citizens. 2.5 lakh installations are completed. Considering the technological issues, the platform operations are now smoother and the fund mobilisation is quick. Govt subsidy is minimum Rs30000 to maximum Rs 78000. A family using 150 units of electricity can get a subsidy of Rs60000 and can reduce its energy expenses substantially. Govt gives the subsidy by using the direct benefit transfer system. The completed scheme will reduce the carbon emissions and decreased reliance on fossil fuels. All government buildings will be having the rooftop system, making another step towards sustainable governance. India can have a self-sufficient energy solutions.

## Balancing Financial Stability, Customer Protection and Competition Are Key Challenges in Digital Revolution: RBI Report

While digital technologies offer various opportunities for India, such as faster growth, financial inclusion and seamless fiscal transfers and cross-border payments, they also present challenges related to cybersecurity, data privacy and concentration risks, says a report from the Reserve Bank of India (RBI).

The report on currency and finance for FY23-24, is based on the theme 'India's digital revolution'. It highlights that India is at the forefront of the digital revolution, leveraging on its digital public infrastructure, a vibrant financial technology (fin-tech) ecosystem and a conducive policy environment to emerge as the fastest-growing digital economy in the world.

"Digital technologies also present challenges related to cybersecurity, data privacy, vendor and third-party risks, customer protection, upskilling and reskilling of human resources, complex financial products and business models. Balancing financial stability, customer protection, and competition while supporting an

environment congenial for innovations is the key policy challenge," it says.

In India, security incidents handled by the Indian computer emergency response team (CERTIn) have increased from 53,117 in 2017 to 1.32mn (million) from January to October 2023, the report says, adding, "Unauthorised network scanning, probing or vulnerable services account for more than 80% of all security incidents in India."

Interestingly, as against common expectations about the banking and finance sector being most vulnerable, as per the report, the automotive industry is the most vulnerable, with smart mobility application programming interfaces (APIs) and electric vehicle (EV) charging infrastructure emerging as major attack vectors.

"The banking and financial services industry (BFSI) sector, governed by well-defined regulations, is relatively protected from such attacks," it added.

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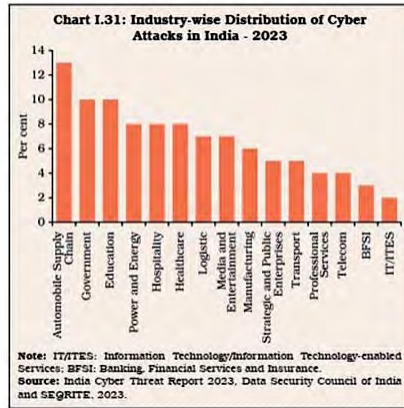
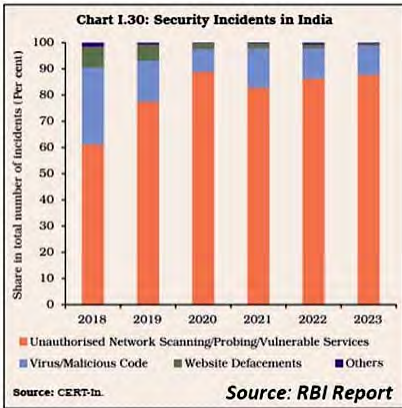
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According to the report, customers are at the epicentre of the digital economy and the success of any enterprise is intricately tied to the satisfaction and trust of its customers and thus, adopting a customer-centric approach to innovation is vital for sustainable growth.

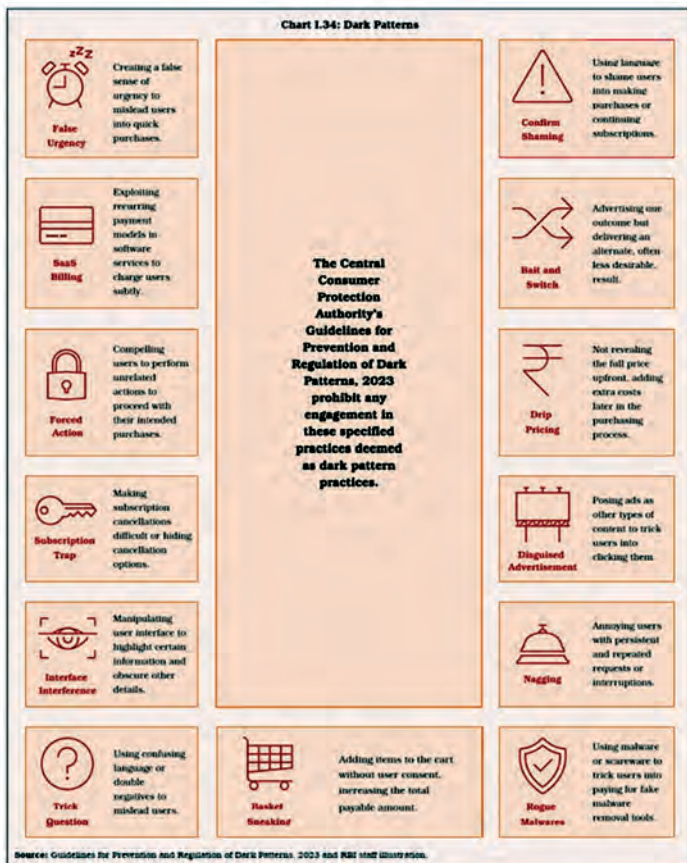
Further, while digitalisation offers enhanced convenience and accessibility, the growing complexity of financial products also introduces new challenges in ensuring customer protection, the report says. "With the increasing adoption of digital payments, the share of complaints related to mobile or electronic banking, ATM or debit cards and credit cards received in the offices of

the RBI ombudsman accounted for 47% of total complaints in FY22-23."

The report also expresses concern over the rapid increase in digital lending and the buy-now-pay-later (BNPL) module. "Illustratively, while the digital lending platforms and BNPL services bolster consumer convenience, they also entail various costs, including exorbitant charges, coercive recovery practices and hidden fees."

In India, BNPL constitutes around 3% of total e-commerce finance by value. While BNPL is projected to grow every year by 74%, making it a US\$56bn (billion) market by 2026, the model highly depends on late fees to ensure profitability which could become predatory for customers. These risks are exacerbated by the seamless nature of digital technologies, facilitating impulsive spending and debt accumulation, the report says.

According to the report, digitalisation is also giving rise to certain 'invisible risks' or 'dark patterns', whereby consumers are tricked into making decisions detrimental to their interests.



Further, the use of extensive customer data by companies raises concerns about data protection and privacy, potentially compromising customer trust and security. "In India, three-fourths of the business-to-consumer (B2C) funded FinTech applications request permission to access camera, photo, media, files, location and storage for using applications."

The report states that digital technologies are unlocking opportunities for financial inclusion, fiscal transfers, cross-border trade, and remittances.

The report also finds empirical support for the positive role of the regulatory framework in increasing the confidence of consumers in digital financial products, boosting operating and technical efficiencies of financial institutions and engendering more liquid and integrated financial markets.

Digital technology infrastructure will be India's growth engine of tomorrow. The focus is on next-generation communication technologies like 6G and satellite networks, alongside expanding the 5G network to rural and hitherto uncovered urban areas. Graduating to advanced technologies will unleash opportunities in the last mile," the report concludes.



# Solar PV flooring for residential, commercial use

Turkey-based Ankara Solar Energy launched its own brand of walkable PV flooring for residential and commercial projects. Its 30 W and 120 W square panels with anti-slip glass front covers are sold with a supportive pedestal system, and are now available for the European and U.S. markets.

Ankara Solar Energy, a Turkish module manufacturer, has launched PV Floor, a line of solar panel products that double as anti-slip glass flooring. It is targeted at residential projects and commercial applications, such as shopping centers, driveways, parking areas, terraces, decks, and pedestrian zones.

The PV Floor brand was launched in Turkey and Greece in 2022, with European and USA markets now following.

The PV Floor pedestal components are polypropylene with a central load strength of 1000 kg, with support pedestals with settings that range from 50 mm to 260 mm. Their base diameter is 200 mm with a peak diameter of 120 mm.

The PV Floor solar panel models, PVF-08-30W and PVF-08-120W, have an 8-year warranty with a 10-year linear performance warranty, standard IP65 junction boxes, and operating temperature of -40 C to 85 C. The backsheet is the same type for both, either white, black, or transparent. Both models have a maximum system voltage of 1,000 V.

PVF-08-30W is a 30 W module with 17% efficiency, an open-circuit voltage of 6.49 V, and a short-circuit current of 5.54 A, built with eight monocrystalline 10 busbar half-cut cells. The front glass is 10 mm anti-slip flooring glass. The frameless panel measures 450 mm x 450 mm x 10.5 mm and weighs in at 5.2 kg.

PVF-32-120W is a 120 W panel with an efficiency of 17.84 %. It is built with thirty-two monocrystalline 10-busbar half-cut cells. It has an open-circuit voltage of 26.19 V and a short-circuit current of 5.62 A. The front glass is 8 mm anti-slip flooring glass. The panel measures 820 mm x 820 mm x 10.5 mm and weighs in at 15 kg.

“Additionally, for grid-tied systems, you will need microinverters or on-grid inverters; for storage systems, off-grid or hybrid inverters and storage



systems are required,” said the spokesperson, adding that the products can be integrated with energy storage providers, such as Zendure, Anker, and Ecoflow.

Ankara Solar Energy produces crystalline silicon solar panels since 2013 with an annual production capacity of 750 MW. It reportedly exports to 40 countries.





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## Special Feature

# SILVER

## The Indispensable Cool in an Electric Scenario

In this exclusive feature on silver in industrial use, the author edifies significant trends in the switchgear industry to further explore reasons of the projected surge in demand for silver, enlists market trends, presents a forecast to conclude by noting key challenges and opportunities



**D**espite occasional speculation about finding replacements for silver in the electrical context – the reality is quite different. The unique nature of the switchgear industry, coupled with stringent testing requirements and limited alternative materials, reinforces silver's indispensability.

Silver finds extensive use in conducting current, such as in PCBs, connectors, and electroplating, playing a crucial role in various electrical applications. Market trends are being shaped by infrastructure development, railway signalling, defence, and the emerging green hydrogen value chain.

India's commitment to achieve net-zero emissions by 2070 is propelling the energy transition forward, with the EV industry witnessing significant growth. However, there's room for innovation and leadership in domestic manufacturing to reduce reliance on imports and address the rising demand for silver in EV components.

Stringent regulatory requirements, expanding urbanization, and India's projected economic growth underscore the need for increased silver production capacity. Technological advancements may help mitigate silver consumption while bolstering business growth.



Contd. on page 58



# Major Infrastructure Projects & Investment in Maharashtra - 2024-2041

In the next 5 years, nearly 53 major infrastructure projects are expected to become operational in Mumbai and neighbouring Mumbai Metropolitan Region (MMR) which will transforming it into a major eco-transit hub. Out of the 53 projects, nearly 45 of them which are in Mumbai and MMR should become operational by 2028.

One of them includes, Mumbai's first underground Metro Line 3 (Aqua Line). The segment between Aarey and Bandra-Kurla Complex (BKC) which is 97% complete, can become operational very soon in the near future. The line from BKC to Colaba is still under construction.

The region between Dahanu Road, Vasai-Virar, to the region between Thane-Bhiwandi-Shahapur-Kalyan-Badlapur-Asangaon and the region between Panvel-Ulwe-Taloja will become the new Transit Oriented Development (TOD) nodes or hubs.

This will take the pressure of development off Mumbai, Thane and Navi Mumbai and decongest the region by developing the hinterlands of the MMR.

With a web of major infrastructure projects like Mumbai-Ahmedabad Bullet train project, Navi Mumbai International Airport, Atal Setu (MTHL), Virar-Alibaug Multimodal corridor and Mumbai's partly underground Metro Line 3 (Aqua Line) the region is all set to become the

economic, trade and industrial power house of not just Mumbai, or Maharashtra, but also of India as well.

New 21 Transit Oriented Development (TOD) nodes/hubs in Mumbai & MMR – Kanjurmarg, Vikhroli, Thane, Kasarvadavali, Gaimukh, Bhiwandi, Kalyan, Badlapur, Shahapur, Asangaon, Kasheli, Dahanu Road, Mira Road, Virar, Vasai, Boisar, Panvel, Alibaug, Taloja, Ulwe, Navghar, Balaval and others.

Some key infrastructure & other projects that are due to be completed in the next 5 years include : Balasaheb Thackeray Rashtriya Smarak, Dr Babasaheb Ambedkar Memorial, Metro Line 3 or Aqua Line, D B Patil Navi Mumbai International Airport, Mumbai-Ahmedabad Bullet Train, Mumbai-Nagpur Samruddhi Mahamarg (partly under construction).

Mumbaigeographical area (BMC administrative area) - 437.71 square kilometres.

Mumbai Urban Region (MUR) - 603.4 square kilometres (233 square miles) including some regions such as Defence lands, Mumbai Port Trust lands, and the Borivali National Park area, which are outside the administrative jurisdiction of MCGM.

Mumbai Metropolitan Region (MMR) geographical area - 4,355 square kilometres.





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Looking ahead, India's burgeoning economy and the proliferation of EVs are poised to drive a substantial increase in silver demand. I anticipate the share of silver in industrial products to rise from 30% to potentially 55% in the next three to five years. In conclusion, as we anticipate greater demand for silver by 2030, we must ensure sufficient supply and manufacturing capacity to meet both domestic and global needs. Let's aspire to lead in innovation and development, positioning India as a global leader in meeting the demand for silver and driving sustainable growth."

## Demand of Silver in the Electrical Industry

**Dependency On Silver:** Silver is the most conductive metal, making it ideal for transmitting electrical currents with minimal resistance. Good thermal conductivity allows Silver to efficiently transfer heat which is important to maintain the stability of electrical components. In addition, Silver's resistance to corrosion ensures the longevity and reliability of electrical connections. Silver is widely used in circuit boards due to its excellent conductivity. Silver connectors provide durable and highly conductive connections in various electrical devices and systems. Silver contacts ensure reliable connections in switches, relays and other switchgears, minimising losses and wear. Silver anodes are used for plating brazed and welded contact assembly to avoid corrosion. They are also used for plating brass and copper terminals. There is beyond any doubt, no alternative for silver in all these applications. Even if we were to begin research on new material, the absence of a large number of third-party laboratories will not enable testing of all the of switchgears in the mid-term. Remember, the EU passed resolution on ROHS way back in 2006 but the electrical contacts were exempted as there were no alternatives for cadmium and also because of the magnitude of tests required to ascertain adequate performance. The exemption continued for more than 15 years.

**Factors Influencing Demand:** By 2030 India is set to become the third largest economy from its present position of fifth. IEEMA figures suggest that for every 1% growth in GDP the power requirement increases by 0.9%. Government of India has already launched the revamped distribution sector scheme (RDSS). This scheme will transform the electrical distribution sector. The outlay for this scheme is 3,03,758 Cr. The power distribution infrastructure is being strengthened across India. The energy transition journey has already begun with 2030 set as the year to achieve NET ZERO. The initial outlay for national green hydrogen mission is 19,744 Cr. 50% of electricity requirements will be met by



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## CURRENT MARKET TRENDS

- **Market forecast:**
  - India is set to become 3<sup>rd</sup> largest economy by 2030. Presently 5<sup>th</sup>.
  - 0.9% increase in power requirement for every 1% growth in GDP.
  - GOI has launched the Revamped Distribution Sector Scheme (RDSS)
  - Transforming electricity distribution sector – Outlay of 3,03,758 cr
  - Analysts forecast steady growth in the demand for silver in the electrical industry, fueled by the expansion of electric vehicles, renewable energy infrastructure, and consumer electronics.

renewables by the year 2030 (500 GW). This will add to the demand of switchgears in turn increasing demand for Silver. E-mobility and charging infrastructure is witnessing rapid growth. EV sales as % of total vehicle sales increased from 0.6% in FY19 to 5.05% in FY23. Grid scale battery storage application and its allied infrastructure will add to the increase in demand for Silver. Increase in railway and metro connectivity is also adding on to the demand for power. The estimated increase of consumers is expected to be 58% from 33 Cr consumers in March 22 to 52 Cr in March 30. Analysts forecast steady growth in the demand for silver in the electrical industry, fueled by the expansion of electric vehicles, renewable energy infrastructure, and consumer electronics.

Table 4.14: Infrastructure approved under RDSS and the infrastructure proposed by Utilities upto March 2025

Sr	Description	Unit	Total Addition During 2022-2025	Approved Under RDSS	% Approved
1	Substation Count (66/33/22 kV)	Nos	5462	409.00	7%
2	HT Feeders Length	CKM	505681	273581	54%
3	Distribution Transformer(DT) (11/0.433 KV) count	Nos	1788309	459,718	26%
4	Distribution Transformer(DT) (11/0.433 KV) capacity	MVA	84478	26,609	31%
5	LT Feeders (1-Ph & 3 Ph )	CKM	669630	5446195	81%
6	Capacitor Bank	MVAR	22737	9,021	40%
7	Smart Consumers meters	Nos		19 Crores	

## Challenges

Limited silver reserves and geopolitical tensions pose greater challenges in the supply chain. Environmental concerns pose challenges to the sustainable supply of Silver. The FTA's signed with various countries also allow switchgear to be imported at lower customs duty. The import customs duty has reached NIL with several countries under CEPA and this poses a ever increasing challenge of a lot of domestic demand being met through imports.

Purchase of Silver components are governed by price variation clause while the sale of switchgear doesn't



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## Lafit Lighting, the luxury lighting brand aims to expand its product line.

Lafit Lighting is one of India's premium lighting architectural brand with revolutionary product range to offer. Since two decades, the brand has been catering innovative lighting solutions across the country.

As the world is moving towards energy conservation, Lafit developed a remarkable feat in the world of LED lighting with the introduction of ultra-modern luminaire range like Brillo and Quick. These range are equipped with Down Lights, Panel Lights, COBs, Projector Lights, Track Lights, Rope Lights, Flood Lights, Outdoor Lights, Profiles and other categories that lessen maintenance and reduce energy use.

Lafit Lighting is trying to make a move into the untapped potential of the lighting market by adding advance products and increasing its reach across the country. "Today, we are witnessing a shift in consumers' preference towards luxurious and innovative décor solutions. Hence, we have been actively introducing new products and variants to cater to this evolving consumer preferences," said Dispal Sakaria, MD at Lafit Lighting.

The company takes pride in its state-of-the-art products that is a perfect blend of design and



functionality and the brand believes because of its extensive R&D and philosophy "To provide a better lifestyle", company has achieved so many milestones in its journey. Lafit Lighting also takes pride to associate with the top architects and lighting designers of the country and has its products present in renowned talk of the town projects.

The company has elaborate expansion plans for the near future and increasing its retail presence is a key goal, "Our goal is to become a prominent retail brand by offering lighting solutions that suits the contemporary lifestyle. Come join us and be a part of Lafit family to provide a better lifestyle and be the change and hence **be a light!**" said Dispal Sakaria, MD Lafit Lighting.

Contact :

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### CHALLENGES

Challenges in the supply chain:

- Limited silver reserves
- Geopolitical tensions
- Environmental concerns pose challenges to the sustainable supply of silver.
- Import of switchgears and Silver contacts



**SUMMARY OF DISTRIBUTION INFRASTRUCTURE PLANNED (AS ON MARCH 2022 AND MARCH 2024)**

Sr	Description	Unit	March-22	March-24	%age Increase
1	Substation Count (66/33/22 kV)	Nos	39,968	52,187	31%
2	Substation Capacity (66/33/22 kV)	MVA	45,291.0	62,438.2	29%
3	Feeders (66/33/22kV) Count	No	38,804	54,839	42%
4	Feeders (66/33/22kV) Length	KM	58,9384	77,7984	32%
5	Feeders (11kV) Nos	Nos	230979	325865	40%
6	Feeders (11kV) Length	KM	49,35,279	58,03,792	20%
7	Distribution Transformer (11/0.4kV) Count	Nos	1,46,74,201	1,99,32,115	32%
8	Distribution Transformer (DT)	MVA	8,89,192	9,47,658	30%
9	LT Feeders (1-4th & 3-Ph)	KM	79,45,158	97,74,604	23%
10	Capacitor Bank	MVAR	55,252	1,05,259	79%
11	Consumers (in Cities)	Nos	33	52	58%



have any such provision. Meaning, the increase in price of silver leads to reduction in margin of the switch and switchgear manufacturer. Silver presently at a all time high is already eating up margins of all the manufacturers in electrical industry.

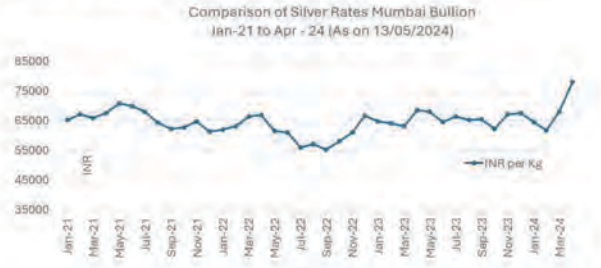
### A Silvery Outlook

Electric vehicles, renewable energy systems, and advanced electronics are expected to drive future demand for silver in the electrical industry. India's rapid economic growth will drive greater demand for power, subsequently increasing demand for Silver. Industry experts anticipate continued growth in silver demand, alongside efforts to optimize its use and explore alternative materials.



### On a Concluding Note

Silver plays a vital role in powering the electrical industry, with its unique properties enabling the efficient transmission of electricity and heat. Understanding the demand drivers, market trends, and challenges surrounding silver in the electrical sector is essential for stakeholders to navigate the evolving landscape. Encourage further research, collaboration, and innovation to ensure the sustainable and responsible use of silver in electrical applications.



The above chart shows how the average price of silver reached a high in March 2024 while the lowest rate is seen in September 2022.

### Key Takeaways

- Globally, silver faces a structural deficit due to high demand in industrial sectors like electric vehicles and electronics, necessitating incentives for holders to release physical silver. Unlike gold, silver is trading substantially below its all-time high, thereby presenting a case for investment.
- India's silver market growth hinges on industrial demand, notably in electrical contacts and solar paste, projected to grow annually at 15% for the next five years.
- Government initiatives like rural electrification and housing for all further boost silver demand. Collaboration between industry and research institutions accelerates innovation in silver-related products.
- Research institutions (such as IIT Mumbai, CSIR-National Chemical Laboratory, CSIR- National Metallurgical Laboratory) have developed innovative silver-based products and solutions and are open to industry collaboration.
- India's solar cell production is expected to grow from the current 6 GW to 60 GW by 2027-28, led by major players like Adani Solar, Tata, and Reliance. This will drive demand for silver paste. ■

**Vinay Rao**

Executive Director, Dewon Electric  
(From the excerpts of Annual Conference on Silver held at Goa recently in May 2024)



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# LIGHTNING & SURGE PROTECTION FOR PHOTOVOLTAIC (PV) SYSTEMS

The guaranteed service life of 20 years or more is offered for their system by most of the solar module manufacturers. The cost of the modules is justified by calculating this long period of operation. However PV installations are very much exposed to the lightnings and surges/transients. Not only house owners install a PV system on their rooftop but also private companies make more and more investments in shared systems, which are erected on large-surface roofs, on traffic structures or unused open areas.

Because of the big space requirements of the photovoltaic generator, PV systems are especially threatened by lightning discharges during thunderstorms. Causes for surges in PV systems are inductive or capacitive voltages deriving from lightning discharges as well as lightning surges and switching operations in the upstream power supply system. Lightning surges in the PV system can damage PV modules and inverters. This can have serious consequences for the operation of the system. It may lead to high repair costs and system failure can result in considerable profit cuts for the

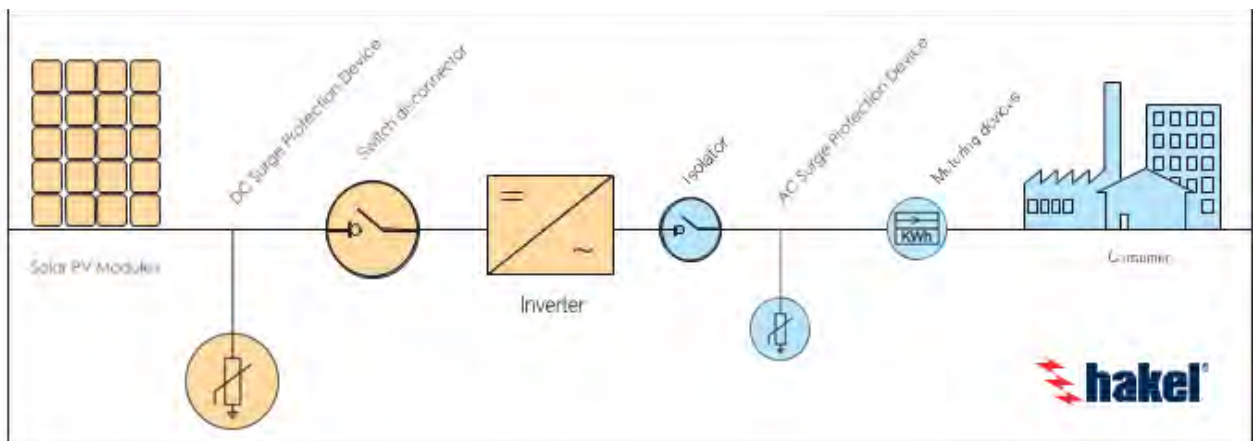


operator of the plant.

Since the surge protection device shunts the transient/ surges to the earth, a low impedance good conductivity earthing, at the same potential is critical for the surge arresters to function properly. Equipotential bonding has to be done for the protection scheme to work efficiently.

### Recommendations of Surge Protection Device (SPD):

- 1. AC SPD :** The output side of the PV inverter where the AC power supply is fed to the load. Depending upon the power supply system, Single or Three phase AC SPD is recommended.
- 2. DC SPD :** The power supply which is fed into the inverter is of DC which flows from PV modules and are exposed to the lightning & induced surges. Suitable DC SPD ratings (200, 400, 600, 800, 1000V DC, etc) is recommended.
- 3. DATALINE SPD:** Some of the PV installations are connected to the central monitoring system through the data lines (transmitters, receivers, modems, etc) which may get effected by the lightning & induced surges. Suitable DATALINE SPD is recommended.



# MECO 4 Digit Triple Range Programmable Process Indicator. Model TRPI-48

**MECO Model TRPI-48** is 4 Digit Triple Range Programmable Process Indicator, Micro Controller based having three input ranges in the same meter. It is specially Design for **“Automation & Process Industry with IP54 Protection”**. These input ranges are programmable by the user. Zero & Span Adjustment through Software and High Accuracy across the Entire Range is Key features of MECO Model TRPI-48. The display from -1999 to 9999 is also Programmable. Thus the user has a wide choice of inputs and displays which makes this meter truly flexible and versatile for applications in Process Industry, Automation, Refinery Plants, Variable Drives, Process Equipment etc.



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## Bharat Bijlee secures patents for its IE4 and IE5 motor designs

Mumbai-based electrical engineering firm Bharat Bijlee has been granted patents for the designs of its permanent magnet motors belonging to the Premium Efficiency IE4 class and the Ultra Premium Efficiency IE5 class, marketed under the brand name SynchroVERT®.

The IE4 motor design patent, obtained in January 2024, focuses on Interior Magnet Rotors with Special Geometry for Improving Efficiency of Line Start Permanent Magnet Synchronous Motors. Meanwhile, the IE5 patent, secured in March 2024, is titled Interior Magnet Rotors with Modified Magnet Configuration for Redirecting Flux and Improving Efficiency of Line Start Permanent Magnet Synchronous Motors to IE5 Level. These designs utilise internal permanent magnets within

the rotor to achieve respective efficiency levels as per IEC 60034-30 standards.

Both motor designs offer Line Start capability along with numerous advanced performance features, resulting in material and cost savings. Their higher efficiencies, achieved within standard induction motor frame sizes, facilitate straightforward replacement of older, less efficient motors.

Currently available in outputs ranging from 1.5 kW to 55 kW for IE4 motors and up to 45 kW for IE5 motors, these innovations have already found extensive application across various sectors, yielding significant energy savings for users.



## Waaree Energies Limited and Ecofy Empower Indian Homeowners with Affordable Rooftop Solar Solutions and Hassle-Free Financing Mumbai

May 08, 2024: Waaree Energies Limited, India's largest manufacturer of solar PV modules with the largest aggregate installed capacity of 12 GW, as of June 30, 2023 (Source: CRISIL Report), has established a collaboration with Ecofy, an NBFC backed by Eversource Capital, committed to providing green finance for climate-positive initiatives. Ecofy is committing Rs 100 crores into the partnership, showcasing confidence in Waaree's capabilities and the renewable energy sector's growth potential.

Complementing the government's PM Surya Ghar Yojana 2024 and leveraging favourable market conditions, this partnership is expected to contribute to India's renewable energy transition. By synergizing Waaree Energies Limited's solar expertise with Ecofy's digital financing solutions, through the initiative we aim to accelerate the solarisation of over 10,000 rooftops across households and MSMEs, as envisioned in the PM Surya Ghar Yojana 2024. Through this partnership, we intend to make clean energy more accessible and affordable for homeowners, aiding in achieving the nationwide objective of solarizing households and MSME's.

**Kailash Rathi, Head of Partnerships & Co-Lending at Ecofy,** added, "Our collaboration with Waaree signifies a milestone towards solar adoption at a time when the

industry is at an inflection point. Over the past 15 months, Ecofy has empowered over 5000 rooftop solar customers. We have invested heavily in this segment enabling penetration through product innovation and instant approvals. As the country prepares for the peak solar season, the collaboration between Ecofy and Waaree is expected to act as a catalyst, and aid in accelerating solar adoption and penetration across diverse segments of society."

**Pankaj Vassal, President of Sales at Waaree Energies Limited,** expressed enthusiasm for the collaboration, stating, "Our partnership with Ecofy represents progress towards democratizing solar power accessibility. By integrating our solar solutions with Ecofy's financing platform, we are working towards removing barriers and aiding in accelerating the adoption of solar power across households and businesses. Ultimately, this is expected to empower more people to embrace the benefits of clean energy while collectively building a greener, more environmentally-conscious India."

Waaree Energies Limited and Ecofy expect to play a significant role in achieving India's energy independence goals while assisting households in embracing a greener, more cost-effective way of living.







**COMPANY PROFILE**

**BRACO ELECTRICALS PVT. LTD.**



**Introduction**

Braco Electricals Pvt. Ltd. Was established in 1977 by a talented and visionary electrical engineer Mr. Ramesh Sobhani . It was his vision that has today shaped into a company that is renowned for its quality, consistency and trust. All these elements are found in every product of Braco, like cable glands and terminals. Braco shares its vision for the future in a brief rendezvous.

Braco Electricals (India) Pvt. Ltd. manufactures high quality cable glands and terminals that play a key role in any secured electrical grid. A product of superior raw materials and stringent quality checks, Braco provides hassle-free solutions for a safe network in any premises. The cable glands and terminals are extensively used in control panels, switch gears, transformers, circuit breakers and other applications in the field of power supply and distribution.

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Braco Electricals offers cable glands & cable terminals.

**Features:**

- Cable glands are a small part of the electrical system; but a single error and the entire electrical installation can fall apart, posing menacing risks to people’s lives. With electrical system, there’s no room for negligence and thus, managing electrical installations to perfection is imperative to a safe set-up.
- Cable glands are manufactured as per international standards. These cable glands are made in all sizes, Specifications and designs such as single compression type, weatherproof and flameproof, flange type, etc.
- The company uses brass for industry application, while uses aluminum and stainless-steel for under water cabling.

**About the company:**

In any electrical system, quality of cable products is vital. Braco products are available in brass, aluminum and copper range. The company believes in providing, superior products at economical prices, timely delivery for customers to accomplish their projects on time.

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# Adani Green Energy becomes India's first to surpass 10,000 MW renewable energy

- Operating portfolio of 10,934 MW, largest in India
- 2,000 MW solar capacity at Khavda, contributes to this milestone
- 2,848 MW renewables capacity brought on stream in FY24

**Ahmedabad, 3 April 2024** : Adani Green Energy Limited (AGEL), India's largest and one of the world's leading renewable energy (RE) companies, has surpassed 10,000 megawatts (MW) of operational portfolio, delivering reliable, affordable, and clean power to the national grid. AGEL's operational portfolio consists of 7,393 MW solar, 1,401 MW wind and 2,140 MW wind-solar hybrid capacity. The milestone is a testament to AGEL and its development partners firmly moving towards the goal of 45,000 MW renewable energy by 2030.

AGEL's 10,934 MW operational portfolio will power more than 5.8 million homes and avoid about 21 million tonnes of CO2 emissions annually.

AGEL is setting a precedent for how innovative technology, execution capabilities, digitization, a robust supply chain network, and long-term infrastructure financing, combined with sustainable practices, can drive the clean energy transition and decarbonization on a giga scale.

"We are proud to be India's first das hazari in the renewables space," said **Mr Gautam Adani, Chairman of the Adani Group**. "In less than a decade, Adani Green Energy has not just envisioned a greener future but has actualised it, growing from a mere idea to explore clean energy to achieving a phenomenal 10,000 MW in installed capacity. This achievement is a demonstration of the rapidity and scale at which the Adani Group aims to facilitate India's transition to clean, reliable and affordable energy. In our drive towards 45,000 MW by 2030, we are building the world's largest renewable energy plant in Khavda — a 30,000 MW project unparalleled on the global stage. AGEL is not just setting benchmarks for the world but redefining them."

In line with AGEL's pledge to enhance natural and social capital, the company is pursuing sustainable practices across its operations. AGEL's unwavering focus on energizing a sustainable future for all is aligned to the United Nations Sustainable Development Goals of affordable and clean energy, decent work and economic growth, industry, innovation and infrastructure, water stewardship, waste management and a circular economy,

biodiversity management and climate action. AGEL's operating portfolio is certified 'single-use plastic free', 'zero waste-to-landfill' and 'water positive for plants with more than 200 MW capacity'.

## **AGEL's over 10,000 MW contribution to India's RE goals**

- Largest greenfield expansion in India's RE sector
- Represents about 11% of India's installed utility-scale solar and wind capacity
- Contributing over 15% of India's utility-scale solar installations
- Over 3,200 direct green jobs created

AGEL is developing the world's largest renewable energy project of 30,000 MW on barren land at Khavda in Kutch, Gujarat. Built across 538 sq km, it is five times the size of Paris and almost as large as Mumbai city. AGEL has operationalized 2,000 MW cumulative solar capacity (i.e. over 6% of the planned 30,000 MW) within 12 months of commencing work. Work at Khavda continues at a fast pace, with AGEL leveraging the project execution capabilities of Adani Infra, the manufacturing expertise of Adani New Industries Limited, the operational excellence of Adani Infrastructure Management Services Ltd. and the robust supply chain of our strategic partners

## **About Adani Green Energy Limited**

Adani Green Energy Limited (AGEL) is India's largest and one of the leading renewable energy companies in the world, enabling the clean energy transition. AGEL develops, owns, and operates utility scale grid-connected solar, wind and hybrid renewable power plants. With a locked-in growth trajectory up to 21.8 Gigawatt (GW), AGEL currently has an operating renewable portfolio of over 10.9 GW, the largest in India, spread across 12 states. AGEL is credited with developing several landmark renewable energy power plants. The company has set a target of achieving 45 GW by 2030 aligned to India's decarbonization goals. AGEL is focused on leveraging technology to reduce the Levelized Cost of Energy (LCOE) in pursuit of enabling largescale adoption of affordable clean energy. AGEL's operating portfolio is certified 'water positive for plants of more than 200 MW capacity', 'single-use plastic free' and 'zero waste-to-landfill', a testament to the company's commitment of powering sustainable growth. Visit:

[www.adanigreenenergy.com](http://www.adanigreenenergy.com)



## No subsidy for solar roofs installed by unregistered vendors under Surya Ghar: KPDCL

*The list of empanelled vendors is available on National Portal of PM Surya Ghar with contact details, it said*

**Srinagar, Aug 19:** Kashmir Power Distribution Corporation Limited (KPDCL) today advised its domestic consumers to approach empanelled solar PV vendors only for installation of solar roof-tops under the PM Surya Ghar Scheme.

In a statement issued here today, KPDCL spokesperson stated that some consumers are being approached by solar vendors for SRTs who are not registered with KPDCL under the PM Surya Ghar Scheme. "The list of empanelled vendors is available on National Portal of PM Surya Ghar with contact details, which can be accessed for choosing vendors of choice," he advised.

The spokesman further clarified that those consumers who get their solar roof-tops installed by vendors who are not empanelled with KPDCL shall not be eligible for Central or UT subsidy. "KPDCL has been issuing advisories through its social media handles warning customers not to get deceived by unregistered vendors," he added.



## MoP notifies amendment in guidelines for import/export (Cross Border) of Electricity, 2018

The Ministry of Power (MoP) has issued amendments in the guidelines governing the export of electricity. According to the amendment, Indian gencos/discoms companies can export electricity generated from coal, renewable, or hydropower sources to neighboring countries with approval from the Designated Authority. For coal-based generation, export of electricity from India shall be allowed only if such electricity is generated utilising imported coal or pspot e-auction coal or coal obtained from commercial mining. Gas-based electricity exports are permitted only if the gas used is from approved sources. Further, Indian generating stations supplying electricity exclusively to neighboring countries can build dedicated transmission lines to connect with the neighboring country's system, subject to technical, strategic, and regulatory approvals. Additionally, the Government of India may allow these stations to connect to the domestic grid to facilitate local power sales if there are issues with scheduling or payment defaults.



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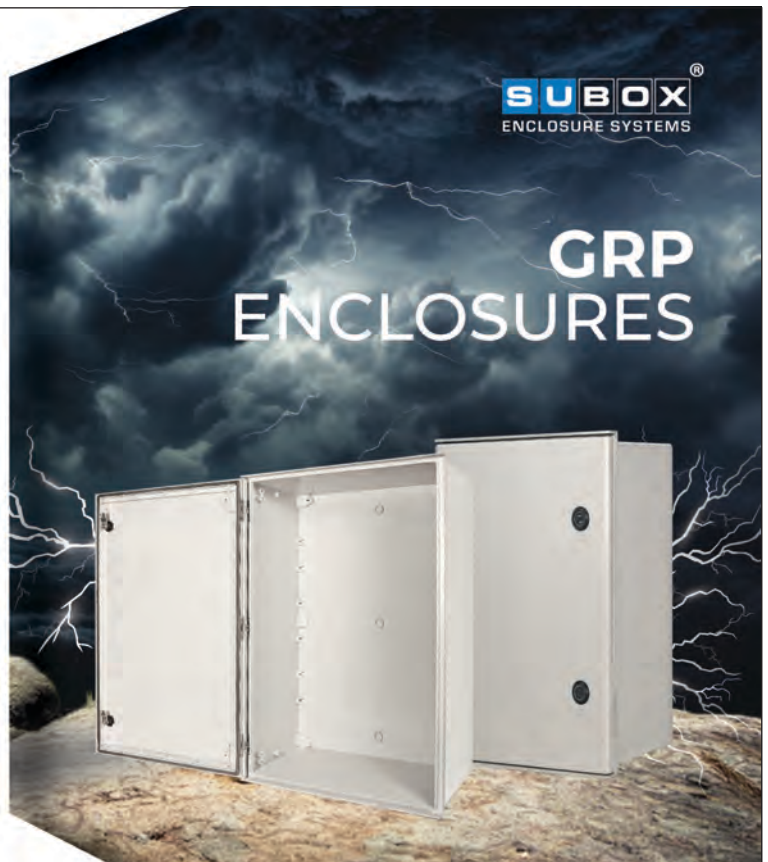
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