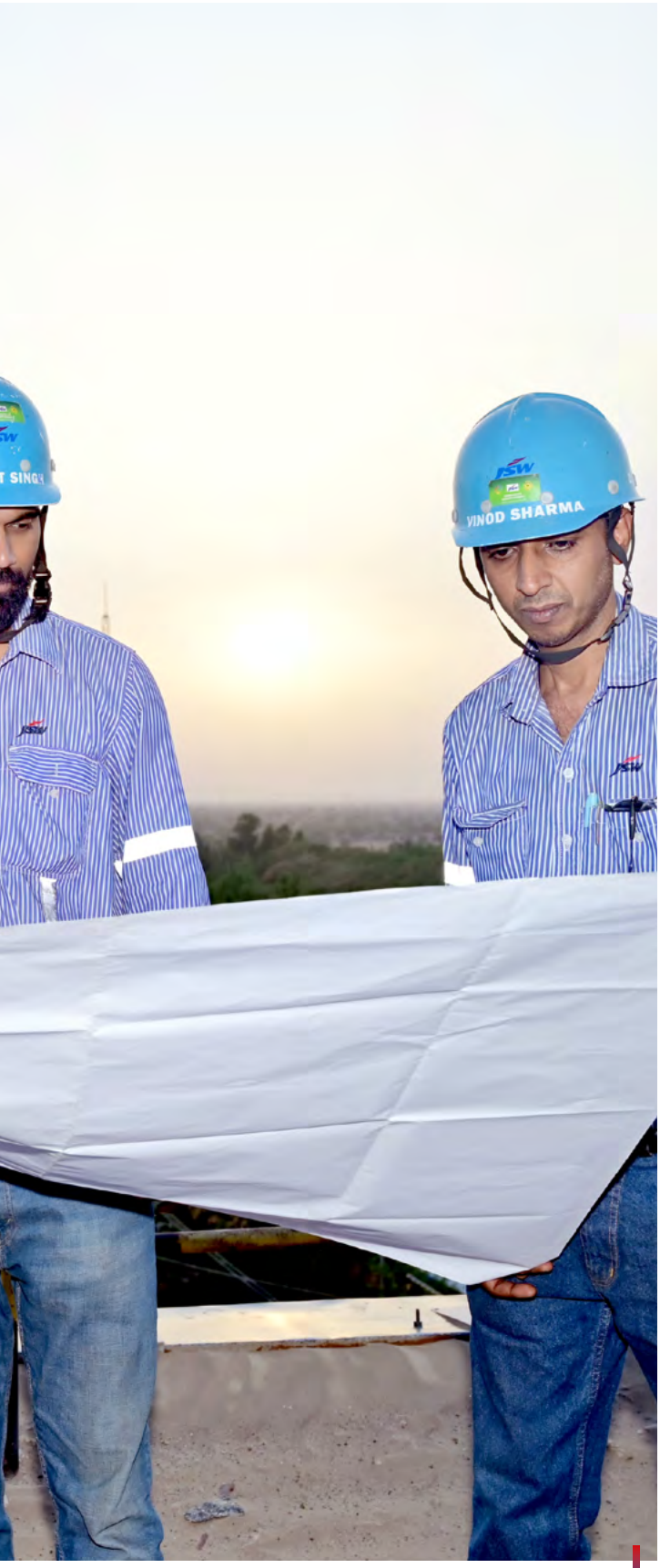
INTELLECTUAL CAPITAL

Our intangible assets including the skilled digital workforce, the digital ecosystem, IT support system and our knowledge, skills and experience form the key pillars of our intellectual capital at JSW Energy. We leverage this capital to drive innovation and efficiency across the organisation. Our cutting-edge innovation is a key pillar in minimising environmental impact and moving ahead to become a Net Zero company.



Ratnagiri Plant

Description

Intellectual capital is a tangible form of our capital and consists of all our domain expertise and intellectual property, including our knowledge, skills and experience. It includes our tacit knowledge, systems and procedures. This capital contributes towards adapting to a changing environment, in staying competitive and in achieving long-term sustainability.

Management Approach

Our rigorous IP management practices support us in safeguarding our innovations and from unauthorised use or infringement. An environment of collaboration and knowledge sharing leads us to expand our digital capabilities and improve our competitive positioning in the market.

Significant Aspects

Our intangible, knowledge-based assets include disruptive technologies and business models. This helps us measure the return on knowledge management and enable us to become a modern and innovative power company.

Key Performance Indicators

- R&D spend
- Strength of IT Team
- Revenue from emerging businesses

Material Topics

- Data security, privacy, cyber security
- Business ethics
- Brand management
- Talent management
- Project delivery
- Governance

Strategy Linkage

S01, S02, S05, S06

SDGs impacted

₹61.55 Crore
Investment towards technological upgradation

₹42.13 Crore
Investment in digitalisation

Key certifications received:

ISO 27001:2022
certification in the field of Information Technology

Protecting our IP Assets

- Proprietary software algorithms
- Digital platforms
- Patented technologies
- Critical information
- Infrastructure assets
- Trademarked brand identities

Our intellectual capital consists of how we adapt to newer technologies, explore digitalisation to promote energy efficiency and work towards developing new products and services. The disruptive technologies being implemented within our processes and systems facilitate us in becoming a tech-enabled company and in contributing towards electrification of the economy.

Technology – a vital performance marker

Technology is also our key enabler in achieving industry's strategic goals and attaining cost leadership. It steers us towards implementation of innovative enhancements by inculcating process improvements, system updating as well as IT system and infrastructure upgradation. It has also helped us in deploying multiple digitalisation projects that have significantly impacted the Company.

In collaboration with our technology and research partners, we strive to innovate and adapt to continuous change and cater to the evolving customer needs. We shall continue working towards enhancing our production processes, maintaining cost competitiveness, and improving environmental performance with the highest standards of safety.

Protecting IP to build an even better future

IP is a cornerstone of our digital and IT investment strategy, underpinning our commitment

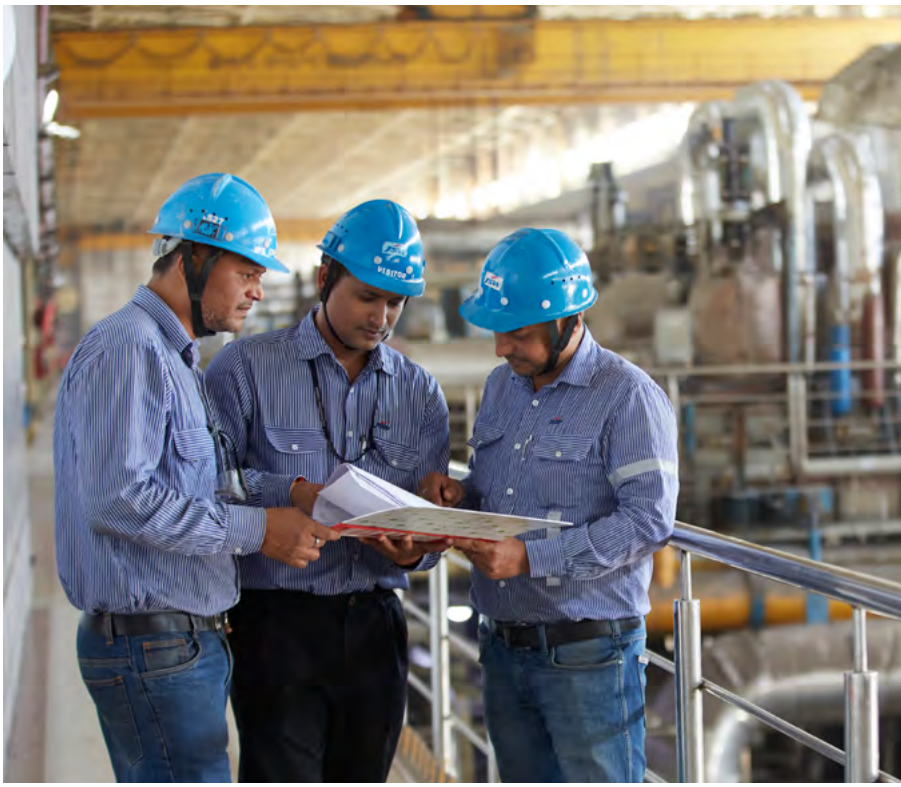
to innovation, competitiveness, and value creation. By prioritising IP protection and management, we safeguard our investments, foster growth, and deliver sustainable long-term value to our stakeholders.

Committed to innovation

Going forward, we remain committed to keep making the right investments in innovation and enabling protection to our intellectual property assets. While navigating the evolving digital landscape further, we not only maintain our leadership position in digital and IT domain, we also continue seeking the growing opportunities and leveraging them optimally by staying attuned to the emerging trends, technologies, and regulatory developments.

Key Upgradations:

- Upgrading infrastructure
- Cyber security enhancement



Driving transformation through emerging Technology Initiatives

1. Transforming Renewable Asset Management

JSW Energy IDCC (Integrated Digital Command Centre) Platform

As the Company rapidly expanded its renewable portfolio, the geographically dispersed and heterogenous nature of wind and solar sites created operational silos, delayed fault responses, and limited proactive asset management. To address these challenges, the Company developed real-time renewable energy assets monitoring IDCC application, with the below primary goals:

- Enable real-time, centralised asset monitoring
- Establish advanced analytics and condition-based maintenance
- Integrate OT with IT systems
- Enhance asset reliability and availability
- Seamlessly connect with ERP system for CMS, CMMS and long-term planning

The Company implemented the IDCC solution across 46 renewable energy sites (solar and wind) nationwide, and enabled 2.13 GW through the Central Command Center at Hyderabad. The strategic initiative aimed to unify and optimise asset monitoring, diagnostics, analytics, and planning through a centralised digital operations layer. This marks a significant milestone in the evolution of renewable asset management, setting a benchmark for real-time monitoring, predictive maintenance, and business integration.

Strategic Outcomes

- **Holistic Operations View:** Decision-makers can now access asset health, dispatch, maintenance, and energy forecasting by way of a single digital layer.
- **Proactive O&M:** Predictive algorithms enable early interventions, minimising unplanned outages.
- **Scalability:** Cloud-ready architecture enables easy integration of upcoming assets and microgrids.
- **Regulatory Compliance:** Streamlined reporting helps ensure adherence to CEA guidelines.

Barmer Plant

2. Real-time operational excellence through JSWE PI Platform

A flagship initiative has been the deployment and evolution of JSWE PI Platform, a cutting-edge real-time data infrastructure enabling actionable insights and performance excellence across power generation assets. Since its inception in 2015 at Vijayanagar, the platform has rapidly expanded spanning 6 power plants across 5.5-GW integrated thermal and hydro capacity, enhancing productivity, enabling predictive maintenance, and supporting data-driven decision-making.

Key Outcomes

~35 kcal/kWh
Heat Rate Savings

~2 MUs
Auxiliary Power Consumption Reduction

50+
Users actively leveraging platform

150+
Anomalies identified

200+
Dashboards developed across enterprise, station, unit, and equipment levels

3. Augmented Reality and Virtual Reality for Safety: Reimagining Workforce Training with AR/VR

The Company leverages Augmented Reality (AR) and Virtual Reality (VR) technologies to enhance safety protocols across its power plants. The plant at Ratnagiri has taken a major step forward by introducing immersive training through AR and VR. In the past year, the plant has seen development and deployment of ten custom-built AR/VR training modules, designed specifically to reflect our on-ground realities and standard procedures. As a result, trainees enter virtual environments that closely replicate our plant's physical conditions, perform tasks hands-on, face virtual hazards, and repeat procedures until they gain full confidence — all in a safe, controlled setting.

Tangible benefits of immersive training

- Safer learning
- Faster onboarding
- Standardised content
- Deeper engagement
- Greater flexibility

4. Powering reliability: Reimagining condition monitoring with predictive intelligence by IIOT vibration sensors

The Company was looking for a systematic way to predict failures in advance, prioritise maintenance interventions and optimise asset utilisation, and also to dramatically cut unplanned downtime and related production losses, while lowering maintenance spend and extending equipment life. Through a pilot project at Vijayanagar thermal power plant, high-fidelity vibration sensors were installed on critical assets such as pumps and motors, capturing real-time data on vibration, temperature, and equipment conditions. This data was streamed into cloud-based analytics IIOT platform, which applied machine learning algorithms to detect early signs of equipment stress such as imbalance, misalignment and bearing wear. The Company deployed this to three more sites, including Barmer and Ratnagiri.

830+
critical nodes for 320 + assets monitored on real time basis

Impact of predictive maintenance

- Reduction in unplanned downtime
- Recovery in lost production capacity
- Lower reactive maintenance costs
- Increase in asset life
- Significant cut in manual inspection hours
- Positive environmental and safety impact

5. JSW Energy Management System

The JSW Energy Management System (EMS) was deployed to oversee the monitoring of 1,092+ energy meters in Vijayanagar, Ratnagiri and Barmer. This powerful interface streamlined operations, supported data-driven decisions, and ensured optimised energy performance across facilities through seamless, scalable, and actionable power data integration.

Functional benefits of EMS system:

- Energy efficiency and optimisation
- Models and trends energy use to identify inefficiencies
- Prevents penalties through power factor and peak demand control
- Supports demand response programs and internal accountability

Key outcomes

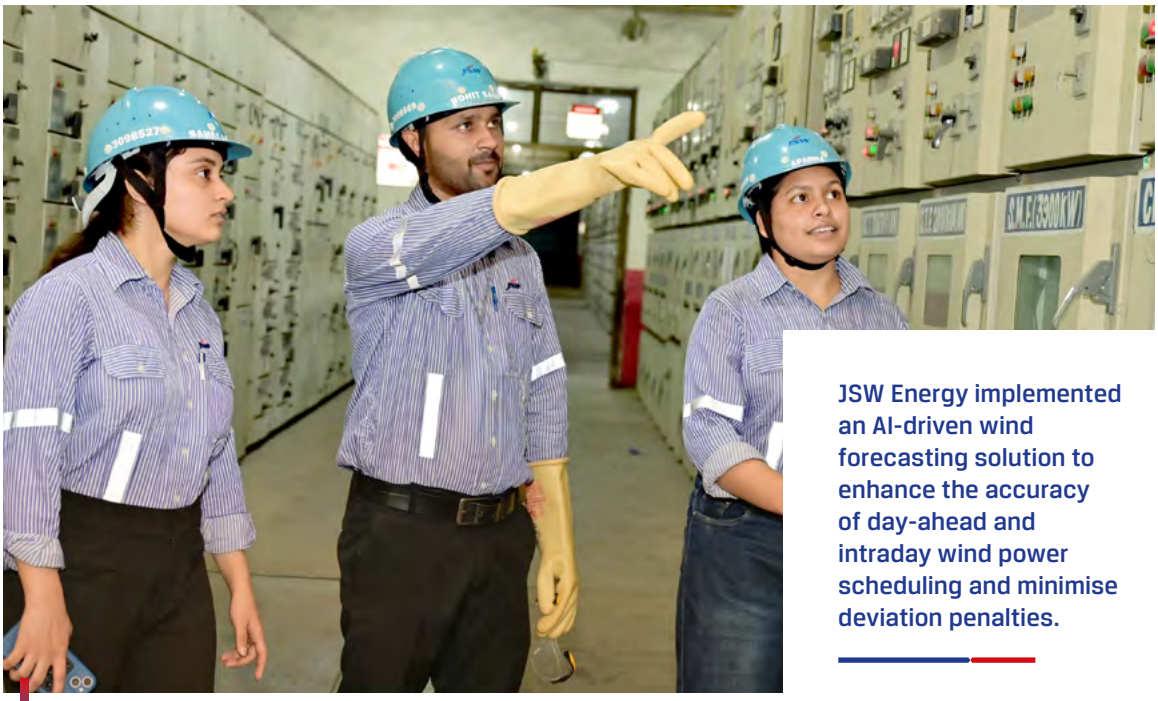
- Saving in energy consumption in pumps, compressors, CHP and AHP
- Conservative APC improvement of 0.09%, translating to operational cost efficiency
- Estimated payback period of 5.4 months, making this a high-ROI initiative
- Long-term cost avoidance through proactive maintenance and improved system reliability

6. Integrated Coal Value Stream Management System (ICMS)

Traditionally, coal procurement, inventory, and utilization were managed in silos, leading to inefficiencies, inconsistent reporting, and sub-optimal cost decisions. To address this challenge, the Integrated Coal Value Stream Management System (ICMS) was developed by integrating two powerful tools – Coal ViU (Value-in-Use) and Coal Inventory Management System.

Key functionalities

- Unified inventory visibility
- Demand forecasting and consumption planning
- Performance driven analytics
- Integrated vessel and rake tracking
- Best value coal and reconciliation
- Automation and integration



Ratnagiri Plant

JSW Energy implemented an AI-driven wind forecasting solution to enhance the accuracy of day-ahead and intraday wind power scheduling and minimise deviation penalties.

7. Computer Vision AI-based Surveillance System

The Company has taken a significant leap forward by deploying AI-based safety monitoring across its operations, covering 45 CCTV cameras and addressing 18 critical safety and compliance use cases.

This initiative reflects its commitment to leveraging cutting-edge technology for ensuring a safer, more accountable, and data-driven work environment. With the integration of AI-powered video analytics, it transitioned from manual oversight to proactive, automated safety management. The system continuously scans multiple camera feeds to identify safety violations, risky behaviour, and compliance deviations – all in real time.

Benefits of AI-Driven Safety Monitoring

- Real-time alerts and incidents are flagged instantly, allowing immediate response
- Data-backed decisions violation trends are visualised via dashboards for corrective actions
- 24/7 monitoring eliminates human fatigue and ensures consistent vigilance
- Behavioural Change teams become more safety-conscious with continuous visibility
- Vehicle analytics - historical footage tagged with AI events help in compliance reporting and root cause analysis

8. Forecasting and Scheduling: Renewable (Advanced Analytics)

JSW Energy implemented an AI-driven wind forecasting solution to enhance the accuracy of day-ahead and intraday wind power scheduling and minimise deviation penalties. Using turbine-level SCADA data integrated with third-party weather forecasts, machine learning models were developed to predict generation at 15-minute intervals (96 blocks/day), targeting accuracy, responsiveness and automation.

Measurable impact across forecasting

- Improved scheduling accuracy
- Reduction in deviation penalties
- Model adaptiveness via continuous retraining
- Operational burden by reducing manual effort
- Fleet-wide scalability

9. Wind turbine anomaly detection: Enhancing predictive maintenance through advanced analytics

The Company initiated a data-driven transformation in how gearbox health is monitored and managed. The Gearbox Anomaly Detection project introduces advanced analytics and machine learning to proactively identify potential issues before they escalate, reducing unplanned downtime and optimising asset performance.

Evolved gearbox monitoring

- Integrates business logic, statistical pattern recognition, and machine learning
- Considers a wider range of parameters beyond temperature
- Detects early-stage deviations using trends, rates of change, and multivariate patterns

Key features of intelligent gearbox monitoring

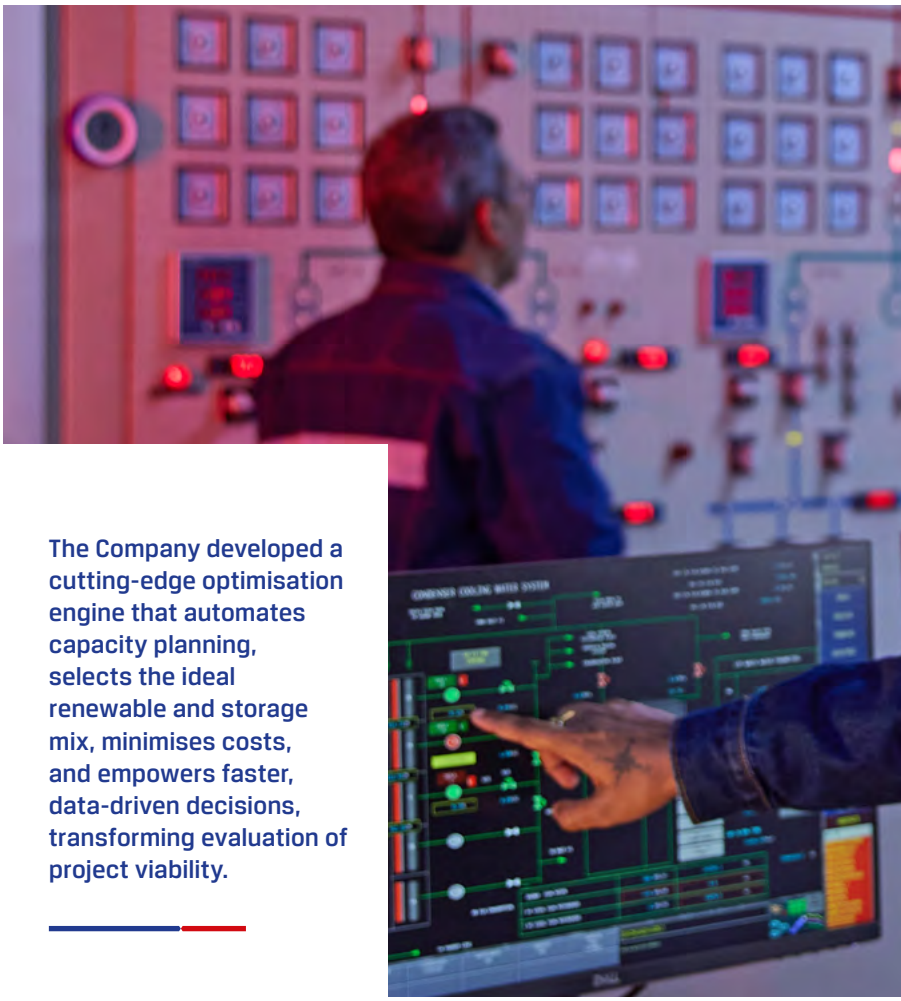
- Early detection
- Operational efficiency
- Improved uptime
- Scalability
- Data-driven decision-making

10. Green hydrogen optimisation model

Manual and spreadsheet-based models for Green Hydrogen projects limited the ability to determine optimal plant capacity and making financial viability assessments highly sensitive and unreliable. The Company developed a cutting-edge optimisation engine that automates capacity planning, selects the ideal renewable and storage mix, minimises costs, and empowers faster, data-driven decisions, transforming evaluation of project viability. The solution combines computational power with intuitive UI, enabling scalable, accurate, and automated decision support for complex Green Hydrogen projects.

Key outcomes of the solution:

- Delivered over 50% faster analysis
- improved IRR visibility
- automated risk insights
- Empowered confident, investment-grade decisions



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11. Firm and dispatchable renewable energy

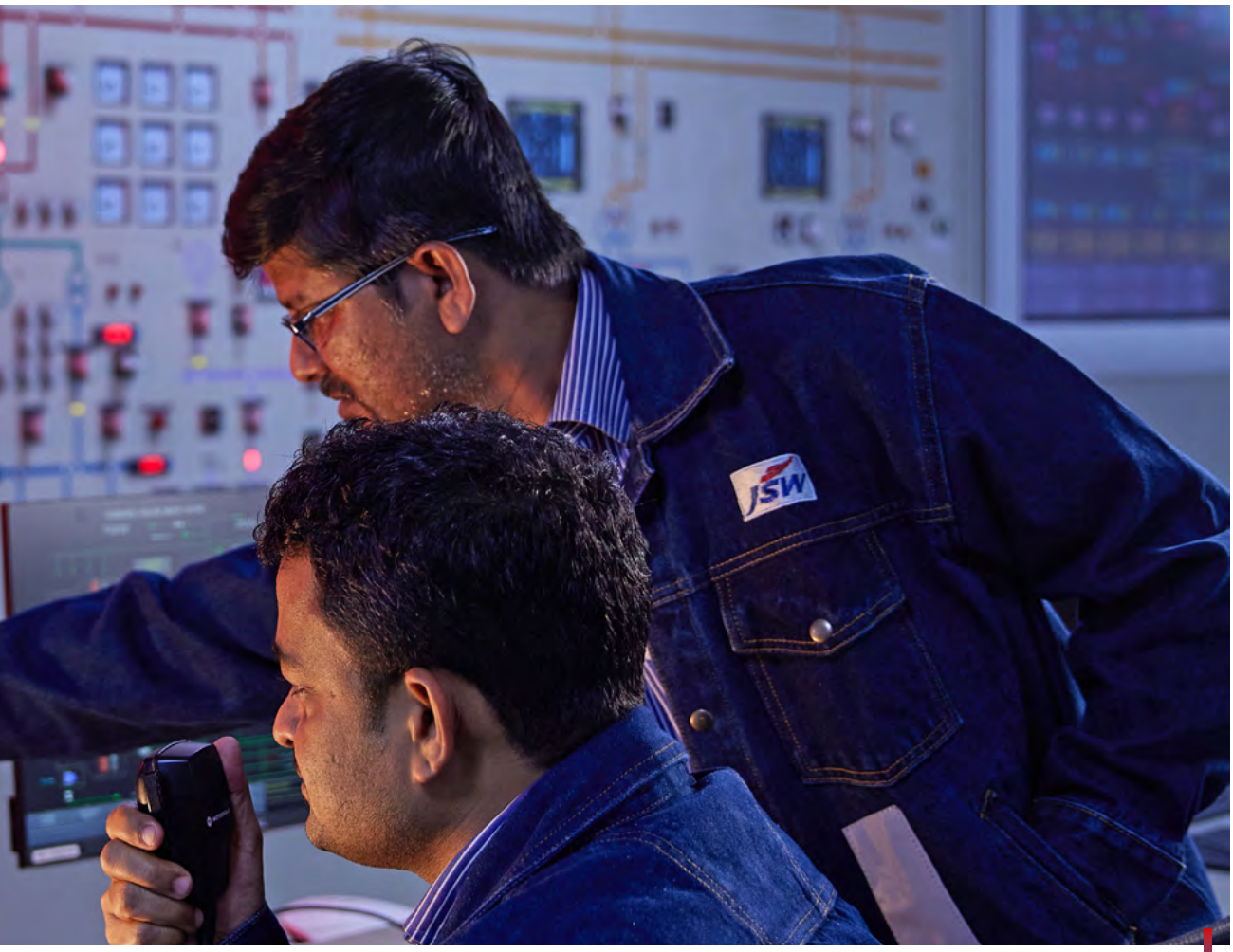
An advanced optimisation model combining MILP (Mixed Integer Linear Programming) and machine learning was developed to automate optimal sizing of solar, wind, and storage capacities, integrate wind variability, and deliver data-driven, faster, and more confident power cost decisions. Integrated with automated reporting tools, the solution delivered a scalable, intelligent, and digitally transformative optimisation platform.

Key outcomes of the model:

- Empowers faster, more accurate decisions
- Achieves potential 20% CAPEX savings
- Improves tariff competitiveness
- Reduces decision time by 30%
- Scientifically validated, data-driven optimisation

12. Inhouse innovation: Platform and Product

The Company is developing a world-class digital platform that delivers market-ready energy solutions, empowering industries to optimise performance, reduce costs, and accelerate



Vijayanagar Plant

innovation across the renewable energy, manufacturing, and storage sectors. The platform will be the key to unlocking transformative solutions and enhanced operational efficiencies for businesses.

Capabilities of the Platform

- **Operations & Monitoring:** Refers to continuous oversight and management of IT systems, applications, and infrastructure to ensure performance, availability and security.
- **IoT Integration:** A network of interconnected physical devices that collect and exchange data using embedded sensors, software and connectivity.
- **Digital Twin:** A virtual replica of a physical asset, system or process that uses real-time data to simulate, predict, and optimize performance.
- **Chatbot Interfaces:** A software application that uses natural language processing to simulate human conversation, often used for customer support or user interaction.
- **RPA (Robotic Process Automation):** Technology that uses software robots to automate repetitive, rule-based tasks typically performed by humans.
- **Computer Vision:** A field of AI that enables machines to interpret and make decisions based on visual data from the world, such as images and videos.
- **Data as a Service (DaaS):** A data management strategy that delivers data on demand over a network, enabling easier access, integration, and analysis.
- **ML Ops:** A set of practices for deploying, monitoring, and managing machine learning models in production environments efficiently and reliably.