EcoStruxure™
Innovation At Every Level

Tata Power makes digital self healing grid a reality with EcoStruxure™ Grid

For Tata Power, restoring service to 350,000 households within seconds was a bold idea.

Deploying the right digital grid technology was key to realizing their ambition. Schneider Electric brought their vision to life with EcoStruxure™ Grid, creating a self-healing grid that restores power in under 20 seconds.

#WhatsYourBoldIdea

schneider-electric.com/tata-power

Life Is On | Schneider Electric

EcoStruxure™
Innovation At Every Level

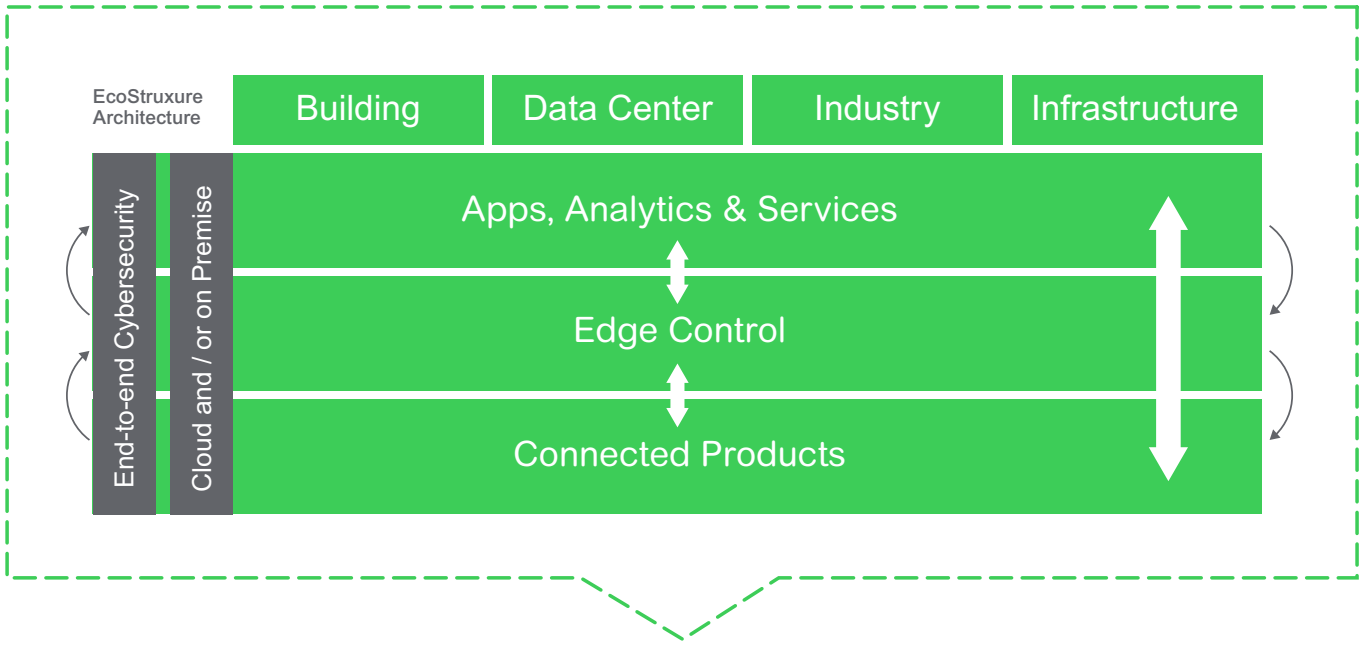
IoT-enabled solutions that drive operational and energy efficiency

EcoStruxure is Schneider Electric's open, interoperable, IoT-enabled system architecture and platform.

EcoStruxure delivers enhanced value around safety, reliability, efficiency, sustainability, and connectivity for our customers.

EcoStruxure leverages advancements in IoT, mobility, sensing, cloud, analytics, and cybersecurity to deliver Innovation at Every Level including Connected Products, Edge Control, and Apps, Analytics & Services. EcoStruxure has been deployed in 450,000+ installations, with the support of 9,000 system integrators, connecting over 1 billion devices.

One EcoStruxure architecture, serving 4 End Markets with 6 Domains of Expertise



EcoStruxure Building | **EcoStruxure Power** | **EcoStruxure IT** | **EcoStruxure Machine** | **EcoStruxure Plant** | **EcoStruxure Grid**

Connected Products

The Internet of Things starts with the best things. Our IoT-enabled best-in-class connected products include breakers, drives, UPSs, relays, sensors, and more. Devices with embedded intelligence drive better decision-making throughout operations.

Edge Control

Mission-critical scenarios can be unpredictable, so control of devices at the edge of the IoT network is a must. This essential capability provides real-time solutions that enable local control at the edge, protecting safety and uptime.

Apps, Analytics & Services

Interoperability is imperative to supporting the diverse hardware and systems in building, data center, industry, and grid environments. EcoStruxure enables a breadth of agnostic Applications, Analytics, & Services for seamless enterprise integration.

Importance of energy management

India-based Tata Power provides electricity to more than 350,000 households in the Mumbai area. The utility is committed to deliver more reliable power to their customers by means of systematic improvements to their network. Tata Power focused on energy management solutions as critical to the company's strategy to boost operational and business excellence. The demand-side and supply-side quality management solutions deployed led to both enhanced customer experience and improved profitability.

Challenges in delivering efficient power

Tata Power identified two major challenges in delivering reliable power:

1. Unknown theft areas (commercial losses) and improper quantification at point of occurrence: There is no real-time data and therefore less ability to avoid technical losses. Mumbai is a very distributed area and this makes it difficult to pinpoint losses.
2. Operational flexibility with a rigid and evolved grid: There is overutilization of the grid and increasing power demand with poor power demand planning.

Solution by Schneider Electric

Schneider Electric helped Tata Power change the topology of their electrical distribution network to make it more flexible allowing the utility to rapidly adapt and respond to emerging needs. The solution package deployed includes: EcoStruxure ADMS, smart digital substations, smart RMUs, smart packaged systems, and smart circuit breakers. Such a comprehensive approach has enabled improved operational efficiency and minimized losses with load balancing through feeder reconfiguration.

Goal

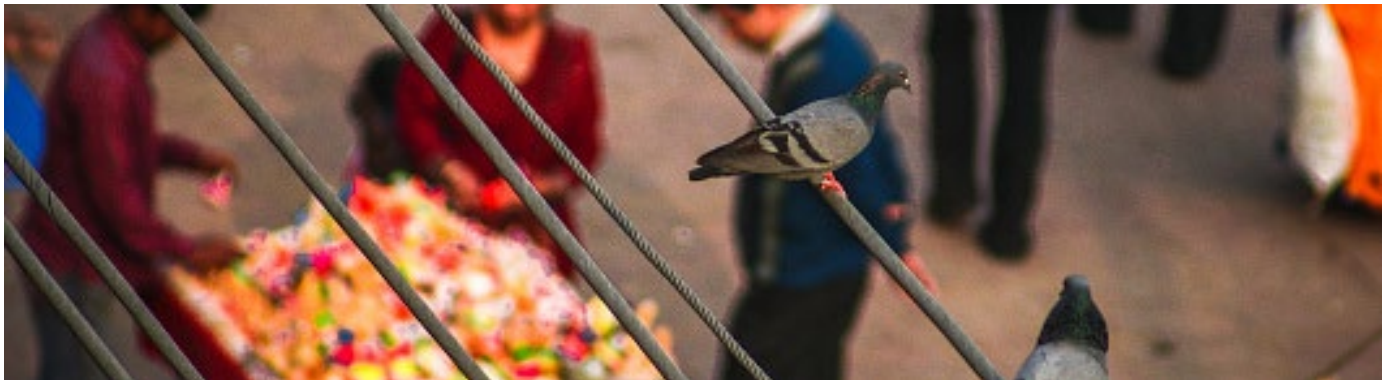
1. A good-quality, reliable power supply to Tata Power customers in Mumbai.
2. Develop a robust supply network that can support growth in the customer base, minimize revenue losses and dramatically reduce restoration times.

Solution

India's first self-healing distribution grid uses smart ring main units from Schneider Electric as a decentralized approach to handling power disruption.

Key Benefits

1. Rapid fault isolation and fast restoration of power supply in under one minute on average.
2. Reducing power restoration time from hours to under one minute, improving Standard Average Interruption Index & Frequency Index (SAIDI/FI), resulting in improved customer satisfaction and increased revenue recognition.
3. Automatic intervention minimizes errors or delays in restoration.
4. While the self-healing technology operates at a local level, it is easy to deploy in existing centralized systems by means of installing FRTU, motors, and auxiliary switches.



Schneider's self-healing grid

Tata Power partnered with Schneider Electric to deploy the innovative EcoStruxure architecture in their distribution network. The utility adopted a decentralized control approach to manage power outages with India's first self-healing grid, featuring smart RMUs.

The self-healing grid technology helps automate power restoration, reducing outage duration to a minimum. Unlike a conventional solution using a centralized control approach, the self-healing grid (SHG) is fully decentralized.

In the event of a power fault, substations communicate with each other to execute the best possible instruction for rapid fault isolation and restoration of power supply. The average restoration time with SHG is reduced to under one minute, while the conventional approach may take hours.

Top advantages of the self-healing solution

- Isolation and service restoration improved fault clearance
- Fully automated solution
- Cost effective as DMS SCADA is not required for remote control
- Reduction of SAIDI or Customer Minutes Lost
- Cable and transformer life extended thanks to the fault isolation process
- FPIs and voltage monitoring built-in
- Existing SCADA DMS system can be used to monitor the system
- Easy migration path from switch solution to self-healing solution
- Easy for implementation as a plug-and-play solution
- Easy to deploy with limited intrusion to existing primary substation automation
- Well-structured, prefabricated cables as part of SHG (no extra cables required between the RMUs and SHG system).

From bold idea to real advantage

The self-healing grid solution improves the reliability and efficiency of Tata Power's electric distribution network while decreasing the company's carbon footprint through reduced emissions.

Requiring no manual intervention, the SHG technology minimizes the number of errors and outage durations. Quick power restoration turnaround is key to essential services and critical buildings, such as hospitals, banks, or data centers, serving the community.

The solution has led to increased customer satisfaction and faster ROI with improved revenue realization thanks to a reduced ENS (Energy Not Supplied) value.

Schneider Electric helped resolve Tata Power's immediate network and deployment issues:

- Rapid fault isolation and quick restoration of power supply
- Reduction of average restoration time from hours to under one minute leading to improved SAIDI and increased revenue
- Minimized errors and outage duration thanks to an automated solution
- Easy adaptation of self-healing grid to the existing centralized solution
- Easy deployment thanks to a standard offer by means of plugging in FRTU, motors, and auxiliary switches.

A look ahead

Tata Power will further work with Schneider Electric as it expands and improves its distribution network. The scope for future cooperation includes innovative technology offering seamless integration, communication, and access to energy in an increasingly complex energy landscape.

"We've taken an innovative step in implementing a decentralized control approach to handle power interruption – a self-healing grid by Schneider Electric."

— Tata Power, India

A high-quality,

24/7

power supply to Tata Power customers in Mumbai.

Reduced average power restoration time from

Hours to < 20sec

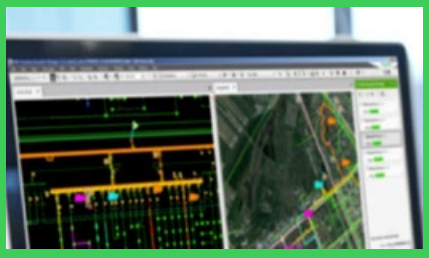
6%

growth in consumption

Learn More

Discover EcoStruxure™

Discover EcoStruxure™ for Utilities



Discover EcoStruxure™ Grid

Contact us to start your journey

See the Enel story

See the SA Power Networks story

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