

Smarter grids towards efficiency

How a pilot project is helping to reshape Delhi's power system – one smart meter at a time

In a bustling neighborhood in South Delhi, engineers from Panitek Power stood before a tangled web of wires and transformers. For decades, overloaded circuits and sudden outages had been part of daily life. But that was about to change.

With support from the UN Environment Programme (UNEP), the International Energy Agency (IEA), and the Italian Ministry of Environment and Energy Security, Panitek set out to do something bold: build a Digital Twin – a real-time, virtual replica of the electricity distribution grid – to identify hidden inefficiencies and help utilities fix them before they caused blackouts.

“Digital twin refers to a virtual replica of your physical grid,” explains Rajeev Bhatt, Senior Manager for Grid Digitalization at Panitek Power. “We mapped every consumer and transformer on a GIS platform so we can see loading patterns in real time and make smarter, faster decisions.”

What Panitek did

Panitek deployed India's first large-scale digital twin for electric distribution, focusing on four Delhi neighborhoods: Taimur Nagar, Tughlakabad, Vasant Kunj, and Shivalik.

Using a network of smart meters and sensors (called Power Quality meters), they monitored electricity flows, load imbalances, voltage drops, and stress points across the grid.

All this fed into a cloud-based platform, enabling real-time decision-making for the local utility.

The results? The utility started fixing problems before customers noticed them – a radical shift from reactive to proactive maintenance.



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Rajeev Bhatt
Senior Manager for Grid Digitalization
Panitek Power

3DEN Initiative

Panitek, India | 2025

Impact highlights

One of Delhi's major utility companies, BSES Rajdhani Power, moved from reactive repairs to proactive planning.

The project has helped reduce power cuts and improve power quality and measurement accuracy by 2%. This small change makes the grid work more efficiently and brings in an average of USD 3,600 in additional revenue per transformer each year.

"Because of this reliable power and improvement in the supply, the dependency on diesel (generators) has come down drastically," said Sugandhita Wadhera from BSES Rajdhani Power.



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Sugandhita Wadhera
Manager
BSES Rajdhani Power

2% accuracy
improvement
in measurement

Power cuts
reduction

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The bigger picture

Panitek's project is one of four pilot initiatives supported by the **Digital Demand-Driven Electricity Networks (3DEN) initiative** – helps countries harness the power of digital tools to make their energy systems more efficient, accessible, and clean.

Across four countries – India, Brazil, Morocco, and Colombia – Phase I of 3DEN has mobilized over USD 9.2 million, helped avoid over 5,166 tonnes of CO₂ emissions, and reached 340,000+ people.

"We're helping make advanced digital tools – the kind still emerging in markets like Denmark or Singapore – accessible and impactful in countries that need reliable, efficient energy most," said Aarth Saraph, UNEP Associate Programme Manager. "3DEN means reliable energy for more people, with fewer emissions."



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Aarth Saraph
Associate
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Manager
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