



Presented by
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Emerging Digital Technologies for Utilities

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SETTING THE CONTEXT – THE UTILITY SECTOR'S DIGITAL TRANSFORMATION

GLOBAL & INDIAN PERSPECTIVE:

- Global: Utilities adopt digital solutions for efficiency, decarbonization, and grid resilience.
- India: Smart grids, AI-driven analytics, and blockchain-based energy trading drive modernization and sustainability.

WHY NOW?

- Rising Energy Demand: Growing consumption requires smarter, more efficient grids.
- Renewable Energy Integration: Need for seamless solar and wind energy management.
- Regulatory Push: Government policies favoring smart grids and decentralization.
- Tech Advancements: AI, IoT, and blockchain enable real-time, data-driven decisions.
- Consumer Expectations: Demand for transparency, efficiency, and lower costs.

KEY QUESTION:

Can AI, Blockchain & Metaverse help utilities transition to a sustainable, efficient future?



SPEAKER: AI, ML, Blockchain, and Metaverse tech for Utilities



Founder & CEO,
PowerXchange



Mentor, COE Blockchain,
STPI



Founder & CEO, Teledgers

DHARMVEER SINGH

Founder & CEO, PowerXchange

I am the founder of PowerXchange, a pioneering blockchain-based peer-to-peer (P2P) energy trading platform revolutionizing India's renewable energy sector. A former NIT Rourkela student, he made the bold decision to drop out and pursue a career in emerging technologies, accumulating over a decade of experience in IT and blockchain services.

I played a pivotal role in leading India's largest blockchain implementation in the telecom sector before channeling his expertise into transforming the energy industry. Under his leadership, PowerXchange is driving decentralization, transparency, and efficiency in the utility sector, enabling prosumers to take control of their energy resources. Currently i am the mentor of blockchain centre of excellence, STPI.

We are a bootstrapped organization and generated lifetime revenue 8M + USD revenue in last 5 years.

At **PowerXchange**, we're driving the shift to decentralized energy systems that empower individuals and communities to control their energy resources, creating a cleaner, more efficient future.

By promoting local energy generation and smarter decision-making, we help people, businesses, and communities reduce carbon footprints, lower costs, and engage in energy decisions. Through these efforts, we're transforming the energy landscape and building a more connected, sustainable society.

Decentralized Energy System

Empower individuals to generate and trade energy locally, reducing dependence on centralized grids.

RTS adoption

P2P energy increases rate of rooftop solar adoption.

Renewable Integration

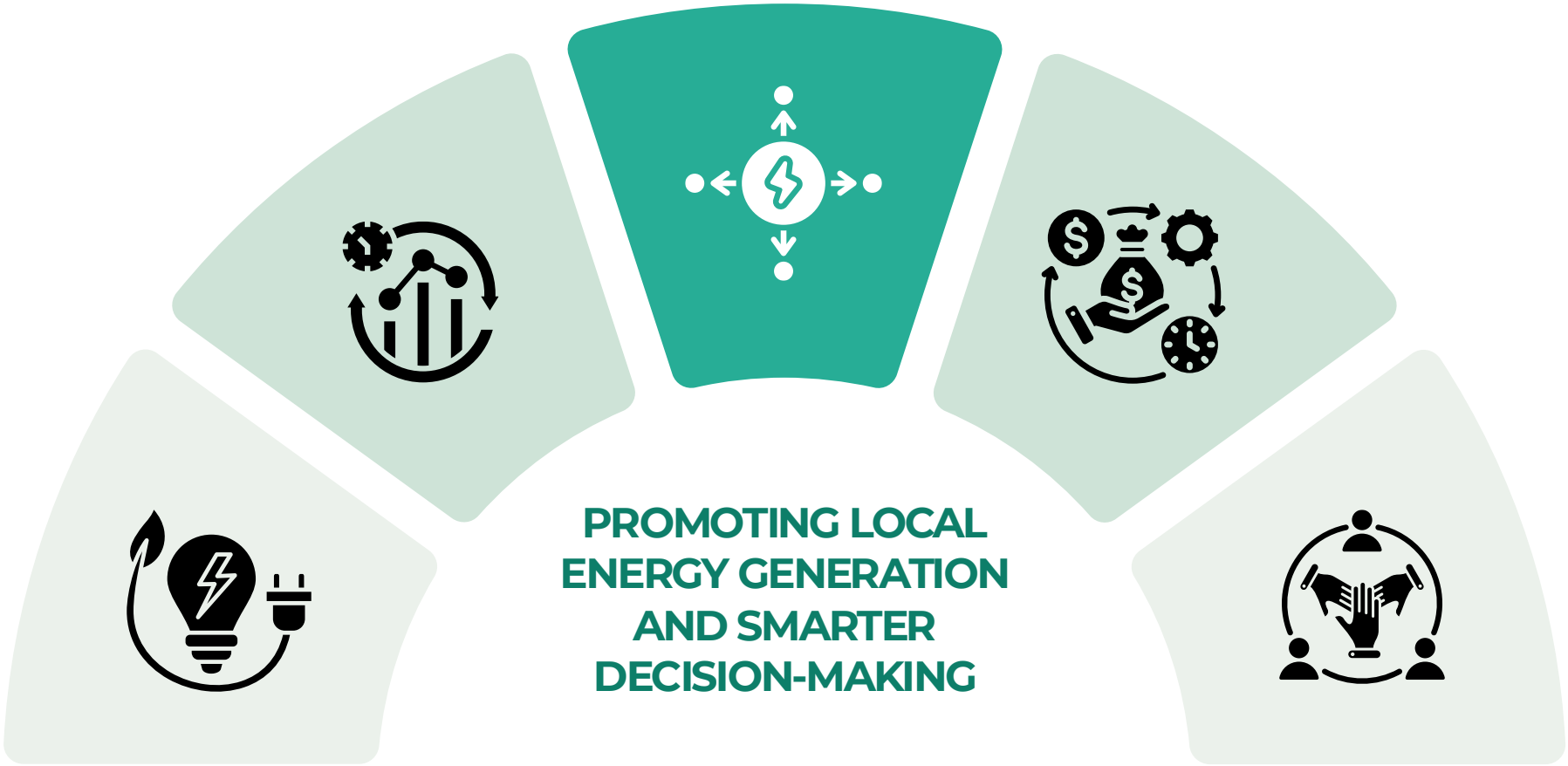
Support the adoption of solar sources to enhance sustainability and efficiency

Cost Efficiency

Help communities lower energy costs through localized generation and optimized energy usage.

Grid stability

P2P energy trading enables the grid stability.





AI & ML INTELLIGENT DECISION MAKING FOR UTILITIES

Applications:

1. AI-Driven Forecasting

Demand-supply prediction for power grids.

2. Predictive Maintenance –

AI-driven Solar Health Dashboard for proactive issue resolution.

3. Autonomous Grid Operations

AI models for real-time power flow adjustments.

4. Load Balancing

Smart meters and IoT-enabled AI analytics.

Impact:

✓ 10-15%
**improvement in
grid efficiency**

✓ 30% reduction in
**downtime due to
predictive analytics**



BLOCKCHAIN - ENABLING DECENTRALIZED ENERGY ECOSYSTEM.

1

P2P ENERGY TRADING

2

CARBON CREDIT MANAGEMENT

3

**ASSET MANAGEMENT
AND ASSET TRACKING**

4

**EV CHARGING AND
SMART MOBILITY**

5

**DISASTER RECOVERY AND
ENERGY RESILIENCE**

6

**POWER PURCHASE AGREEMENT
AUTOMATION**



METaverse & ROBOTICS

THE FUTURE OF UTILITY WORKFORCE TRAINING

Digital Twins for Power Grids

Real-time virtual simulation of power networks.

Metaverse-based Training Centers

Grid engineers trained in a VR environment.

AI-Powered Grid Management Bots

Automated monitoring & anomaly detection.

Example: KEPCO Research Institute in Korea using AI + VR for grid operations.



KEY BARRIERS & CHALLENGES

01

Regulatory Uncertainty

No policies for blockchain and AI adoption for Utilities.

02

Legacy Infrastructure

Existing grids not AI/blockchain-ready.

03

Data Privacy & Cybersecurity Risks

Need data privacy and cybersecurity guidelines specific to utilities.

04

Consumer Adoption

Lack of awareness about decentralize and AI technologies.



Solution: Public-Private Partnerships (PPP) and innovation sandbox for Utilities required at regulatory end or utilities end for tech adoption & innovation testing.



FUTURE OF SMART UTILITIES 2030 & BEYOND



01

AI-Driven Self-Healing Grids

Predict & fix faults autonomously

02

Decentralized Energy Marketplaces

Households, businesses trading energy freely

03

100% Digital Utility Operations

Blockchain securing all grid transactions

**India's Opportunity:
\$50B+ investment in
smart grids by 2030.**



OUR VISION & ACTION PLANS



Building India's first AI agent enabled blockchain dedicated for energy sector who have the capability of self healing as per use cases. We called Power-X Network. It's a open source.



Partnering with utilities and organizations for innovative uses cases testing and POC which can contribute cost saving or revenue generation for Utilities.



Developed the AI and blockchain based applications which will be integrated with utilities infrastructure for Smart grid operations.

SUGGESTED CALL TO ACTION

- Govt & Regulators: Frame blockchain and AI adoption policies for Utilities.
- Utilities: Invest in AI, ML, and smart contract-based automation to reduce the operational cost and boost revenue.
- Startups & Corporates: Collaborate for a decentralized, intelligent smart grid future to enable the smooth integration and decentralization.



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A

Questions & Answers

"The future of energy is decentralized, digital, and intelligent.
Let's build it together!"

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THANK YOU



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Get in
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