Peer-to-Peer (P2P) Energy Trading Platform on Blockchain

Empowering People's Energy Choices: A Revolutionary Approach to Decentralized Green Energy

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RCO Context and Strategic Importance –

The Ministry of Power, Government of India, vide notification dated 20.10.2023, has notified distinct Renewable Consumption Obligation (RCO) categories for each State, namely:

- Hydro Power Obligation **(HPO)**
- Wind Power Obligation **(WPO)**
- Other Renewable Energy Obligation
- Distributed Renewable Energy (**DRE)** Obligation

Energy generated from renewable energy plants with installed capacity **below 10 MW** is eligible for compliance under the DRE category.

Rooftop solar installations, therefore, become critical for meeting DRE targets, particularly as:

- **DRE obligations do not have inter-category fungibility, unlike other RCO categories**
- **Non-achievement of DRE targets cannot be offset through surplus in other RCO segment.**

Peer-to-Peer (P2P) Energy Trading

What is P2P Energy Trading?

- Direct **buy–sell of surplus rooftop solar power** between Prosumers and Consumers
- Happens **within the same DISCOM network,** through a **digital trading platforms**
- Enabled Prosumers are able to **realise a higher value for surplus solar energy** compared to prevailing net-feed-in tariffs
- Consumers can **procure green power at tariffs lower than retail DISCOM tariffs**
- This **economic incentive structure** encourages wider adoption of rooftop solar

How it Works

- Prosumers sell surplus solar energy to consumers in their network
- Power flows through the **existing distribution grid**
- Platforms manages **price matching, contracts and settlements**
- **DISCOM remains grid operator** and charges network fees

Status in India

- **Regulated by State Electricity Regulatory Commissions (SERCs)**
- Guidelines / regulations issued in:
  - Uttar Pradesh in 2023
  - Delhi in 2024
  - Karnataka in 2024
  - Kerala in 2025
- Implemented through **pilot / sandbox projects**

Regulatory Position

- P2P is I**NTRA-DISCOM power trading**
- Platform is **not a licensed power trader**

Only India has P2P regulations and we are driving a silent revolution on P2P Trading of Green Energy which rest of the world will emulate!

Success in Uttar Pradesh (UP)

Key Achievements in UP

India's first UEI-based P2P pilot implemented with ISGF Team in MVVNL (Lucknow)
Live platform tested with real consumers and prosumers (since July 2025)
End-to-end digital P2P platform developed and deployed (Trading, Meter Data, Settlement, Billing Integration)

Integration with Utility's Systems

Integrated with MDMS of AMISPs (IntelliSmart & Genus); and UPPCL's RMS
Secure daily smart-meter data ingestion and monthly billing reconciliation
API and SFTP-based data exchange aligned with DISCOM-approved workflows

Regulatory and Grid Compliance

Fully aligned with UPERC P2P Guidelines
Designed with SLDC visibility, audit trails, and blockchain-based trust
Ensures transparent settlement with minimal DISCOM operational burden

Why UP Matters

First state to issue regulations and move from policy → pilot → statewide rollout
Establishes a replicable national reference model for P2P energy markets
Forms the foundation for inter-state P2P trading under UEI / IES

Interstate P2P Trading of Green Energy

What is this initiative?

- India's **first inter-state P2P green energy trading pilot under India Energy Stack (IES)**
- Led by **ISGF and FIDE** with **PowerXchange** as core technology partner
- Built on **Unified Energy Interface (UEI) Architecture** and **India Energy Stack (IES)** Vision

Core Concept

- Prosumers in one state **sell surplus green power to consumers in another state**
- Power flows through **existing DISCOM networks**
- Digital platforms enables **price matching, metering, and payment settlement**

Regulatory & Grid Alignment

- Implemented under **regulatory sandbox**
- Aligned with **state P2P and open-access frameworks**
- Network Fees and platform charges handled **transparently**

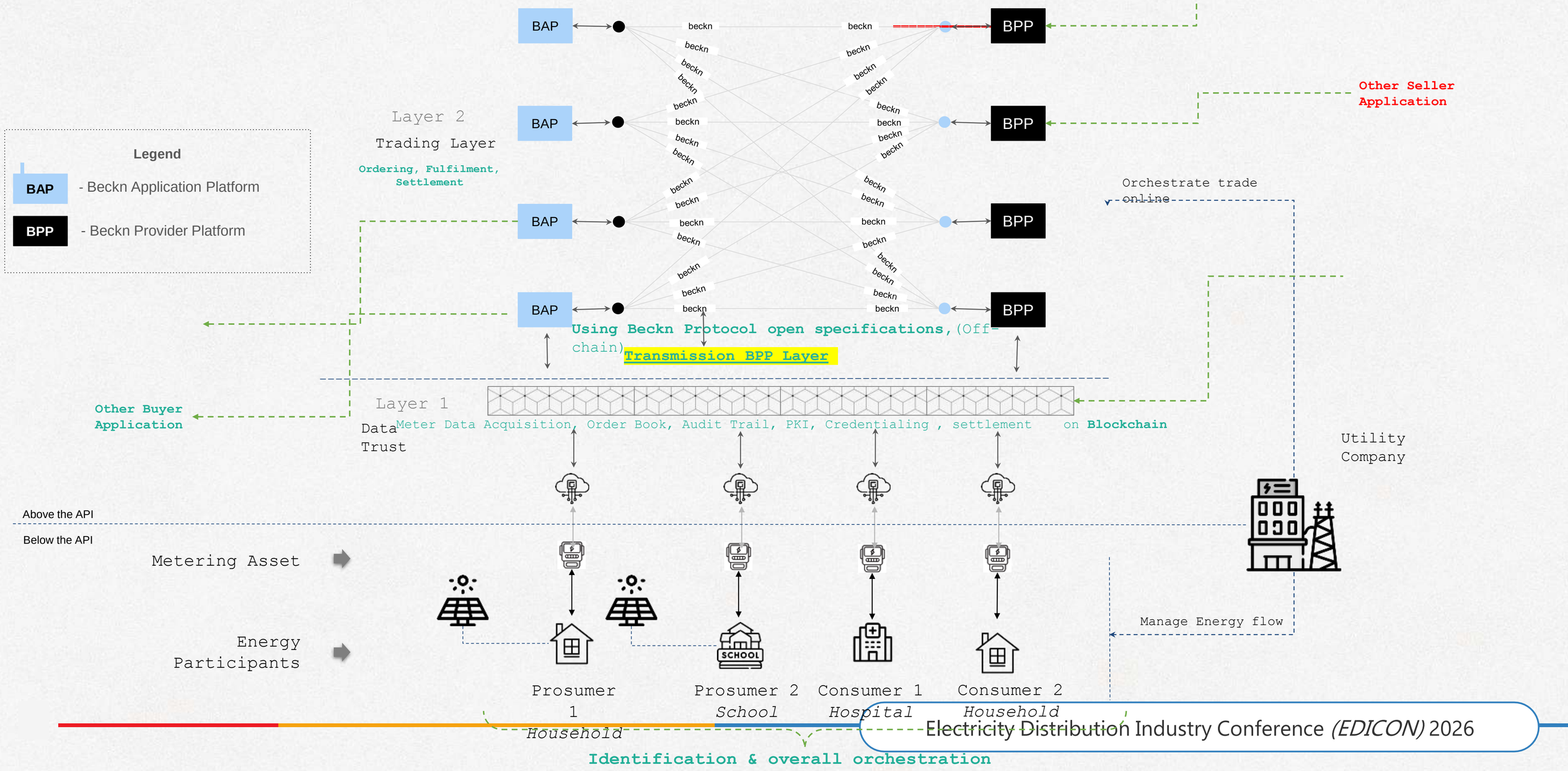
Why It Matters

- Proves **inter-state P2P is feasible** (technical + regulatory)
- Creates a **replicable national model** for digital energy markets

PowerXchange's Role

- End-to-end **Blockchain + Digital Platform**
- **DISCOM-integrated** settlement and billing

Interstate P2P Energy Trading Network Architecture



Policy & Regulatory Support for Scaling up P2P

Bottlenecks (Ground Reality)

•**Regulatory clarity gaps**:

Regulations exist, but **operational details on charges, settlement, and DISCOM role remain unclear**

Example: Delhi – guidelines notified, but clarity on platform service fees and billing flow yet to be issued

•**Digital and metering readiness**:

P2P depends on **smart meters and reliable meter data**, which is still limited in many states

Examples: Kerala and Karnataka – regulations in place, but smart meter rollout is yet to begin!

•**DISCOM concerns**:

Perceived risks around **revenue protection, cross-subsidy impact, and operational control**

Probable Solutions (Practical Way Forward)

•**Regulatory playbooks**:

Issue implementation clarifications (charges, settlement, roles) to move from *policy to execution; also clarity on regulatory control periods*

•**Smart meter–led rollout**:

Prioritize P2P in areas with **AMI/MDMS readiness** for accurate accounting and scalable settlement

•**DISCOM-centric P2P design**:

Ensure **DISCOM visibility, control, and revenue neutrality**, positioning P2P as an RCO-enabling tool

Key Message

☞ *P2P has not stalled due to lack of regulations, but due to readiness gaps*

With clear operational rules, smart meters, and DISCOM-aligned platforms, P2P can scale quickly

POWER CHANGE

THANK YOU

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