Peer to Peer Trading using Blockchain

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HoD – Power System Control & Battery Energy Storage System

Tata Power Delhi Distribution Limited

About Tata Power - DDL

"To be the most trusted and admired provider of reliable, competitive power and services, and be the company of choice for all stakeholders"

License Area: North and North West Delhi (510 sq. km)

Government of National Capital Territory of Delhi

TATA POWER

51:49 Joint Venture
of The Tata Power Company Limited
(Tata Power)
and
Government of Delhi
Formed on 1st July 2002
in

- **TATA Power-DDL is an *ISO 9001, ISO-14001, ISO-22301,ISO-45001, ISO 31001, ISO-27001, SA-8000 and ISO-50001* certified organization.**

P2P – Opportunities & Solution

- Local Consumption of energy among peers
- Peak Shaving
- Network Congestion Management
- Demand Side Management
- RPO Obligation
- Lower CAPEX for DISCOM on Distribution Line upgrade

Role of Blockchain in P2P

- Settlement of transactions b/w distribution utilities, prosumers & consumers
- Reduction of transaction cost settlement
- Safe, Reliable & transparent
- Immutable Record
- Option to consumer to select mix b/w conventional & non-conventional sources

P2P Trading Options

Fixed Price Trading

- Ensures P2P trading at a fixed price
- Guarantees each user certainty over the price they will receive for their energy traded through P2P

Dynamic Price Trading

- Prosumers and Consumers trading with each other & setting their own prices
- Cleared price will be the highest price being offered by the buyer & the lowest price being offered by the seller

Dynamic Price with Preferential Trading

- Prosumer will be given a choice to identify its preferred consumer
- Offers percentage of its excess energy at a specific price

Possible Business Model

PPO b/w Prosumer & Consumer

- DISCOM to be notified by Prosumer
- Wheeling ,cross-subsidy & associated charges to be paid by consumer
- Billing to be settled through blockchain

PPO b/w Prosumer & DISCOM

- Mid Term/Long Term Tie-up with inter-state & intra-state prosumers
- Blockchain to be used for settlement of Energy transaction

Energy-as-a-Service (EaaS)

- Annual Subscription plan for Rooftop energy to Prosumer
- Prosumer & Consumer to pay per kwh transaction cost for trading on Power Ledger Platform

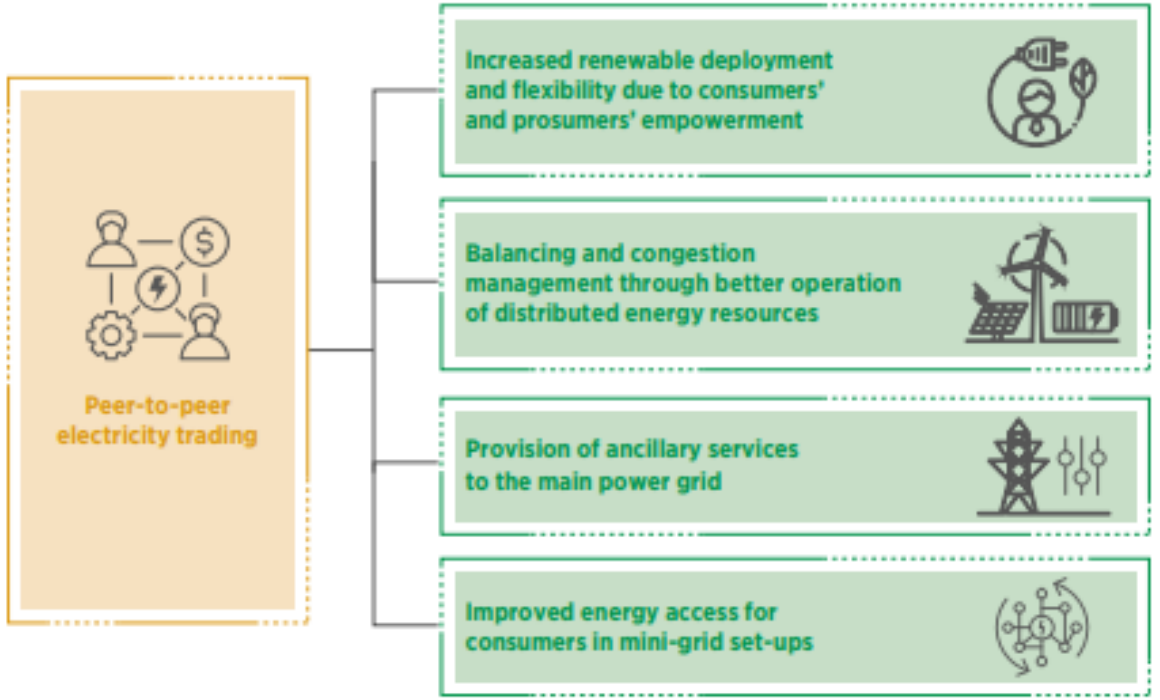
Benefits to Stakeholders

Prosumer/ Producer:
Additional Revenue stream
Incentive to increase RTPV installation

Consumer:
Lower costs
Promotion of Renewable Energy
Participation in Demand Response Measures

Trader/ Aggregator:
Fees for hosting the platform

DISCOM:
Demand Side Management and offsetting RPO obligations;
Fees for usage of electricity network.



Case Study – Use of Blockchain for P2P Trading

- Joint Collaboration b/w Tata Power – DDL, Power Ledger & ISGF
- 65 Prosumers & 75 consumers have participated on Fixed Price Trading Model
- Following units have been settled virtually through Blockchain:

Month	Energy Purchased from Grid		Energy Purchased -P2P		Energy Sold -P2P		Energy Sold to Grid	
	kWh	₹	kWh	₹	kWh	₹	kWh	₹
Feb'21	42,885	2,98,806	20,846	1,50,147	20,846	1,50,147	2,685	15,576
Ma'21	48086	3,40,345	28,327	2,05,060	28,327	2,05,060	9,170	53,185
Apr'21	65,636	4,58,667	32,665	2,34,985	32,665	2,34,985	7,731	44,841
May'21	77,112	5,39,043	28,834	2,14,565	28,834	2,14,565	5,572	32,313
Jun'21	1,09,322	7,60,172	30,213	2,27,323	30,213	2,27,323	1,095	6,349
Jul'21	1,20,520	8,50,000	24,689	1,85,100	24,689	1,85,100	604	3,500
Aug'21	93,495	6,59,574	17,768	1,33,305	17,768	1,33,305	745	4,323
Sep'21	1,21,666	8,67,681	19,424	1,45,885	19,424	1,45,885	1,254	7,274
Oct'21	77,500	5,47,117	27,806	2,07,077	27,806	2,07,077	5,218	30,259
Total	**7,56,222**	**53,21,405**	**2,30,572**	**17,03,447**	**2,30,572**	**17,03,447**	**34,074**	**1,97,620**

Recommendations

- Tech Neutrality in Blockchain application among State Regulators
- Framing of Blockchain rules at National level
- Active Support for Blockchain Adoption and Deployment

Thank You

For discussions/suggestions/queries email: nishant.singh2@tatapower-ddl.com