

SESSION-4: BLOCKCHAIN, METAVERSE FOR UTILITIES

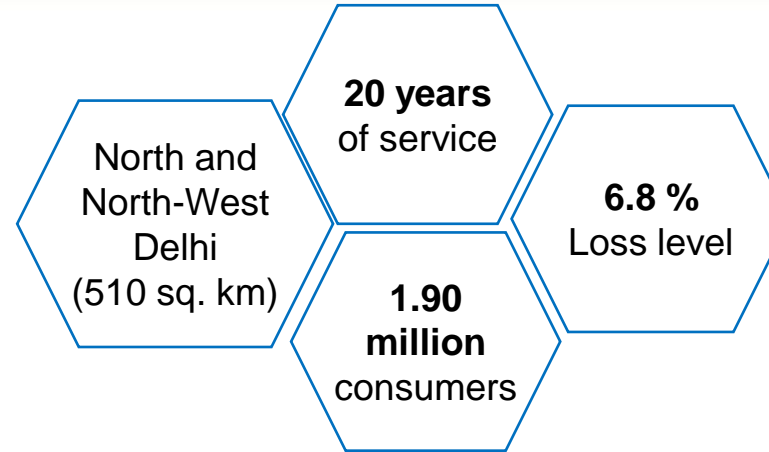
Speaker : *Sombuddha Hazra Chaudhury*

ABOUT TATA POWER DELHI DISTRIBUTION LIMITED

28 Feb – 04 March 2023 | New Delhi



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



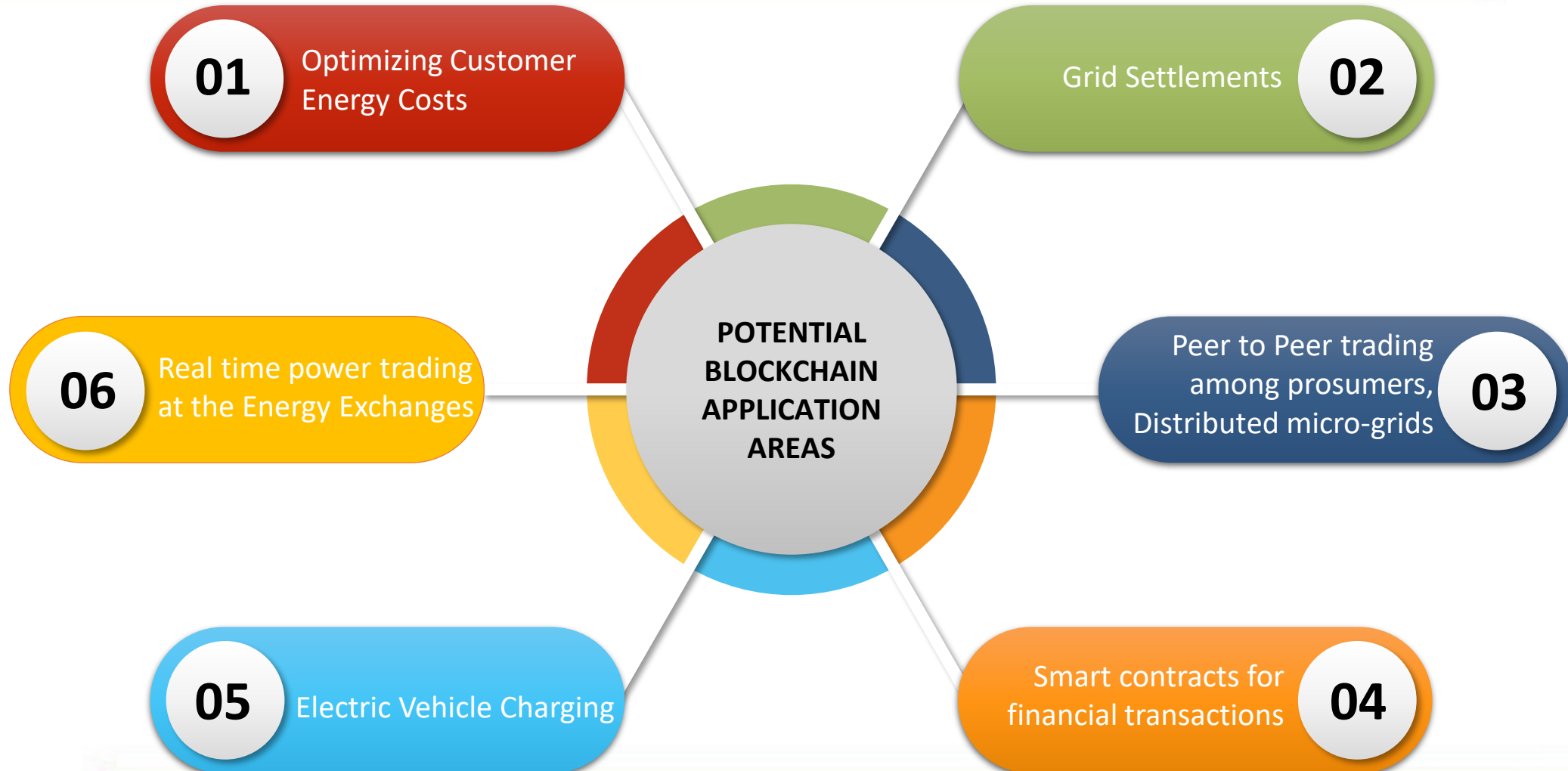
TATA Power-DDL's innovative & earnest efforts has reformed the Delhi Electricity service

- Reducing losses from **53.1%** in 2002 to **6.8%** in 2022.
- Deployment of world class technologies



TATA Power-DDL is an ISO 9001(QMS), 14001(EMS), 18001(OHSAS), 27001(ISMS), 8000(SA) and 50001 (EnMS) certified organization.

Potential Application Areas



BLOCKCHAIN PILOT PROJECT PEER TO PEER ENERGY TRADING-DELHI

TPDDL-ISGF-Power Ledger

Objectives

- ❖ Pilot is conducted by Tata Power - DDL in collaboration with ISGF and Power Ledger
- ❖ Test the technical viability and value proposition of P2P energy trading
- ❖ Develop business model for Blockchain enabled Peer to Peer (P2P) energy trading in Delhi

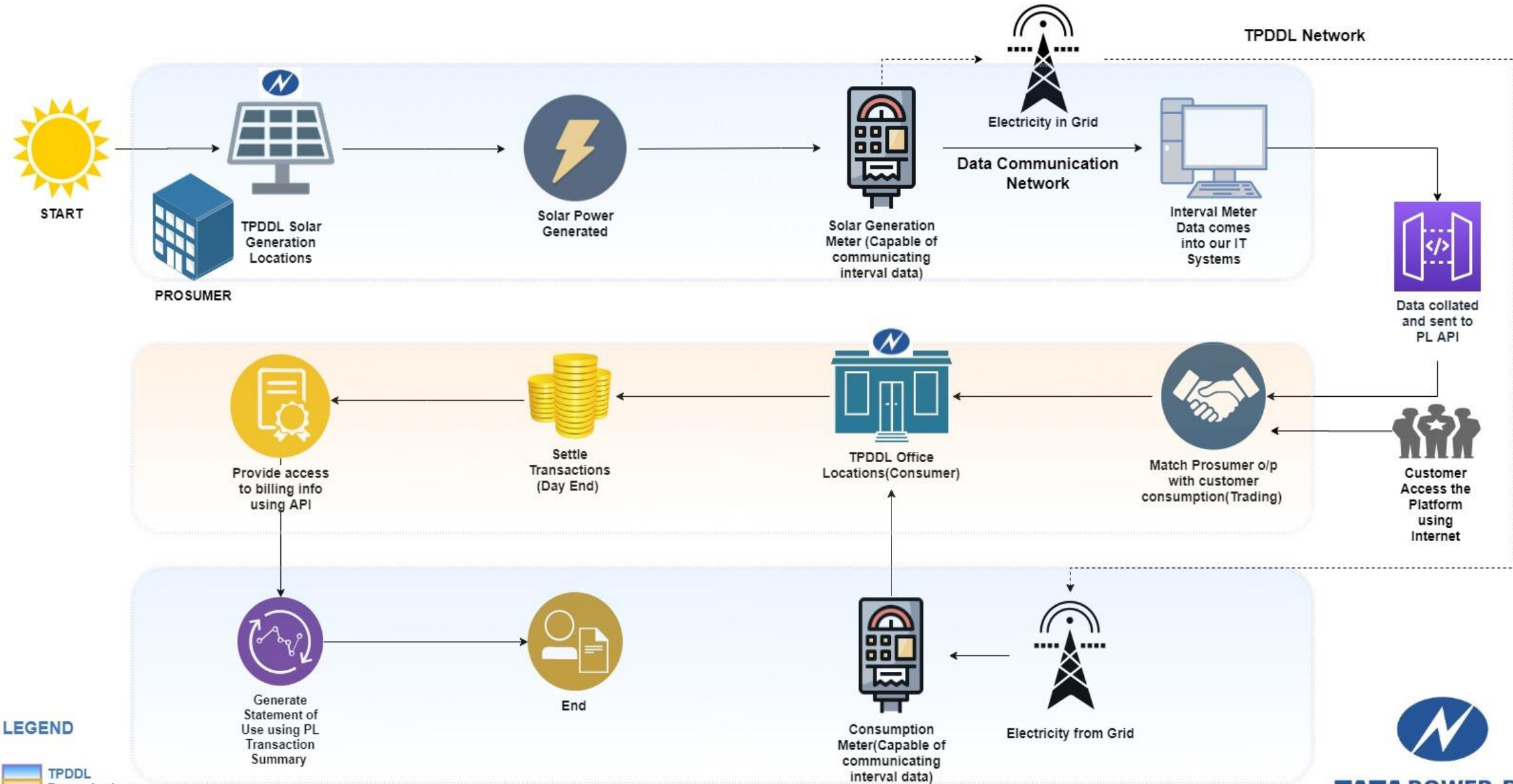
Pilot Architecture

- ❖ Tata Power-DDL's Grid Stations with Solar PVs and some real customers (In TPDDL N/w) to be prosumers; Other Grid stations/ Office Buildings along with real customers will be consumers
- ❖ Simulated trading to mirror the scenarios of real trading regimes

Unique aspects in Pilot

- ❖ Involvement of a rooftop provider who will subscribe to data feed
- ❖ Opportunity to add other elements pertaining to DERMs such as Storage, V2G and Demand Response

P2P SOLAR ENERGY TRADING USING BLOCKCHAIN PILOT PROCESS FLOW

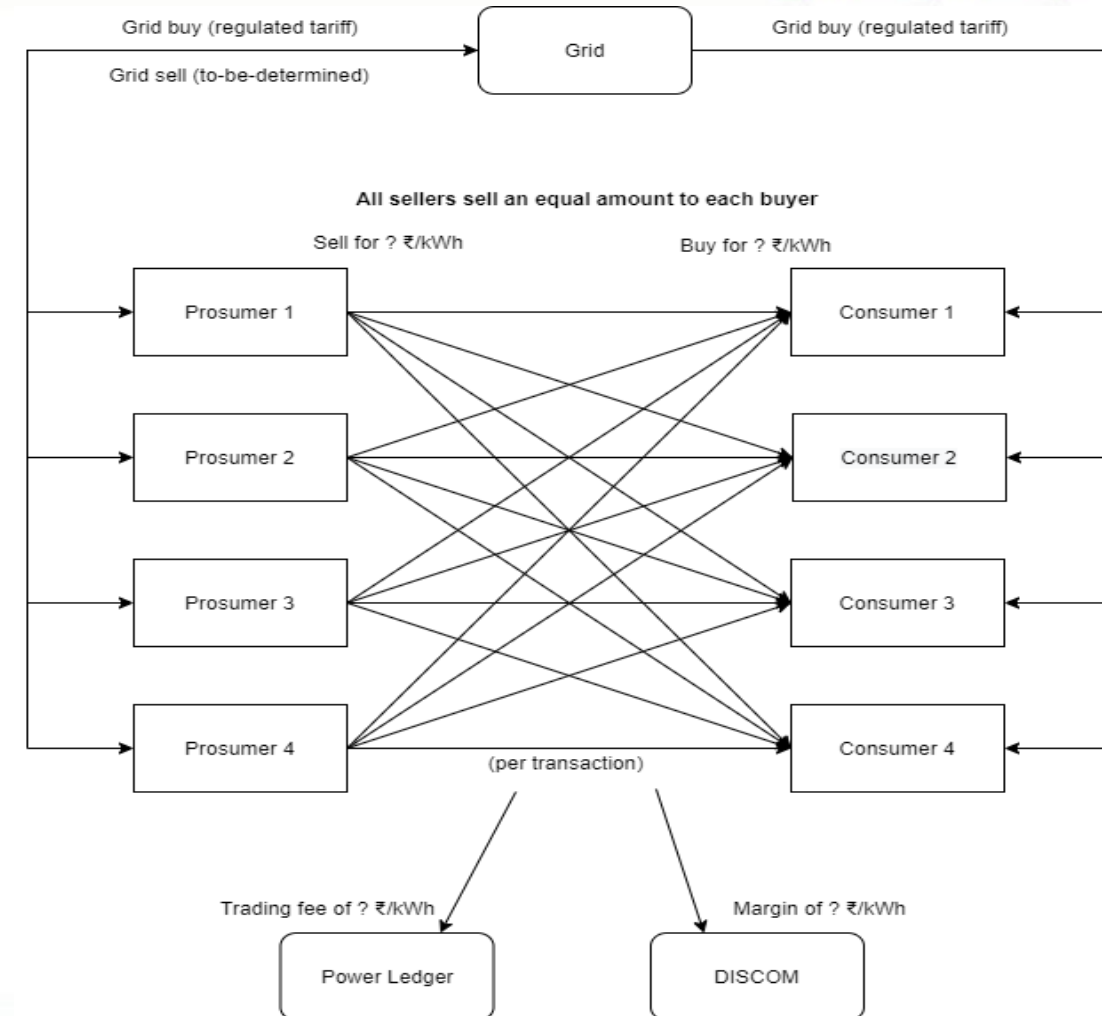


❖ There are 3 main trading models that are utilised:

- 1) Fixed Price Model
- 2) Dynamic Price
- 3) Dynamic Price with Preferential Trading

Fixed Price Model

- ❖ P2P trading at a fixed price: This guarantees each user certainty over the price they will receive for their energy and that they will receive energy from P2P when it is available
- ❖ If no energy is available P2P then the consumer's usage will be satisfied by the DISCOM
- ❖ Similarly, if no buyer is available for the P2P then it will be sold back to the DISCOM
- ❖ Price of ₹7.5 was taken as clearing price



Customer Details

TYPE	PROSUMERS	CONSUMERS	Total
TPDDL	14	41	55
Real	41	21	62
TOTAL	55	62	117
117 Participants are Trading			

TARIFF	BUY RATE (Rs/kWh)	SELL RATE (Rs/kWh)
Domestic	6.5	5.8
Non-domestic	8.5	5.8
Industrial	7.75	5.8
P2P	7.5	7.5

TYPE	PROSUMERS	CONSUMERS
Industrial	14	20
Non Domestic	2	12
Domestic	39	29
EV - 1		

Pilot period resulted in ~2.5 lakh units of trade

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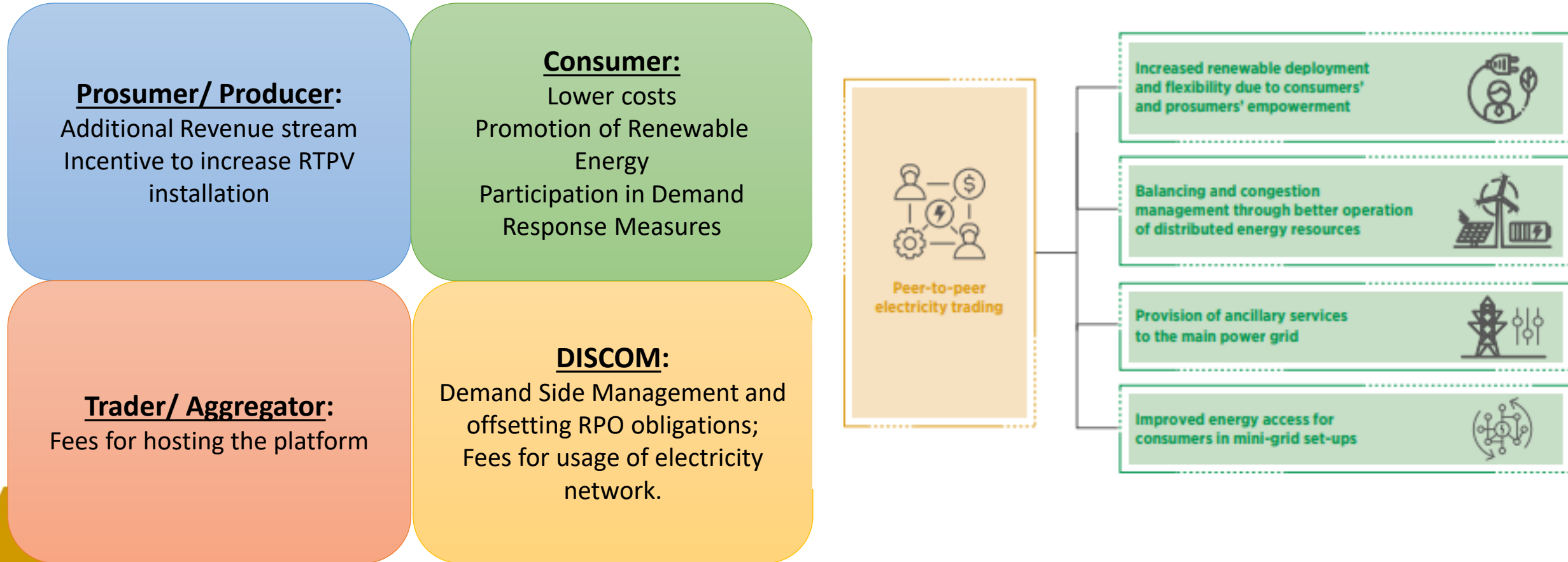
Month	Energy Purchased from Grid		Energy Purchased -P2P		Energy Sold -P2P		Energy Sold to Grid	
	kWh	₹	kWh	₹	kWh	₹	kWh	₹
Feb	42,885	2,98,806	20,846	1,50,147	20,846	1,50,147	2,685	15,576
Mar	48,086	3,40,345	28,327	2,05,060	28,327	2,05,060	9,170	53,185
April	65,636	4,58,667	32,665	2,34,985	32,665	2,34,985	7,731	44,841
May	77,112	5,39,043	28,834	2,14,565	28,834	2,14,565	5,572	32,313
June	1,09,322	7,60,172	30,213	2,27,323	30,213	2,27,323	1,095	6,349
July	1,20,520	8,50,000	24,689	1,85,100	24,689	1,85,100	604	3,500
August	93,495	6,59,574	17,768	1,33,305	17,768	1,33,305	745	4,323
September	1,21,666	8,67,681	19,424	1,45,885	19,424	1,45,885	1,254	7,274
October	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

Customer Behaviour

ROLE OF BLOCKCHAIN

- Customers require a simple and easy to understand platform, with very less technical data
- Customers seek very less interaction with the platform i.e. they don't want to login and change prices frequently, they prefer a fixed price on which automatic trade happens
- Early settlement is preferred
- Customers want to know if any additional taxes/surcharges or hidden cost on transactions will be there

Benefits

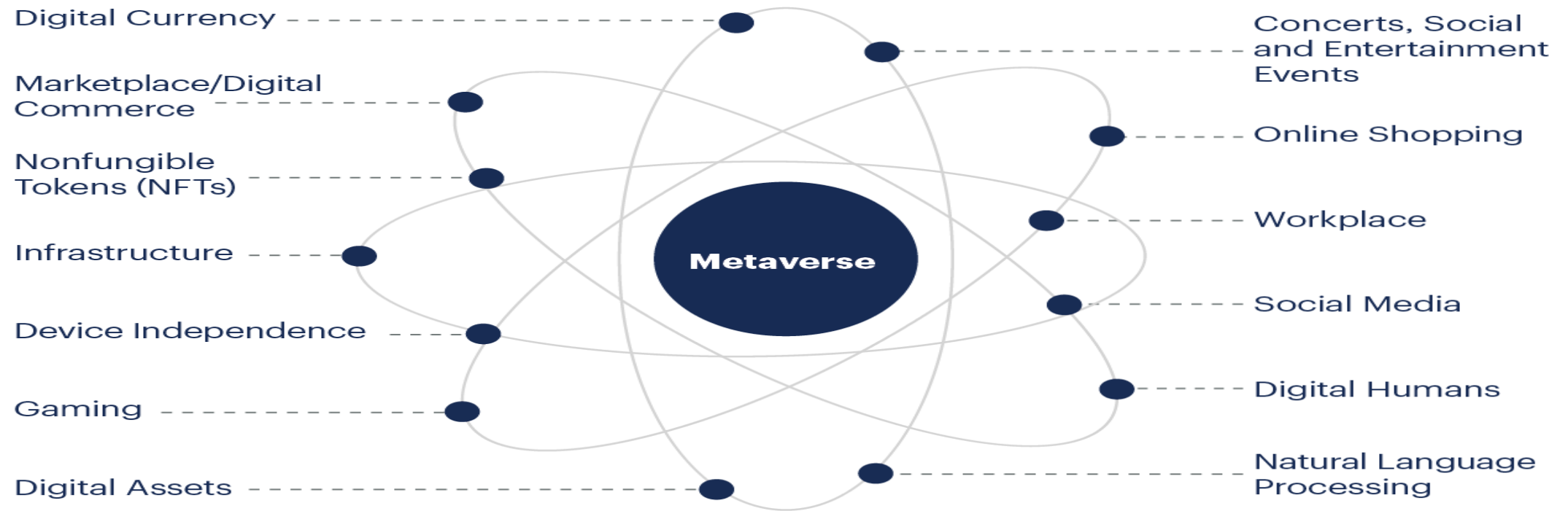


Metaverse is trending



Immersive, Participative, Customized, Insightful

Elements of a Metaverse



gartner.com

Source: Gartner
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Gartner®



Approach to Metaverse Implementation

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Technology

- Literature Surveys / Certifications
- Understanding the concepts with technology partners
- Discussion with Practitioners

Common Use Cases

- Virtual Tour of Real estates
- Virtual Meeting Spaces
- Gaming
- Decors , furniture within home spaces
- Tanishq wedding collection titled 'Romance of Polki' in the 3D display zones on the metaverse.
- Buried Network/Equipment visibility in real world
- Training & Simulations

Enablers

- AR, VR, MR, XR
- Devices
- Apps
- Blockchain, Cryptocurrencies, etc
- Digital Twins
- Decentraland, etc

Possible Use Cases: Consumerverse

ORGANIZER

ISGF

India Smart Grid Forum
Energy Saving Products



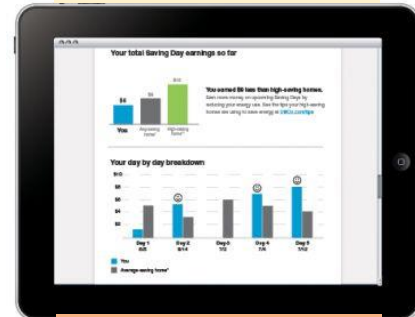
DSM



Service Tracking



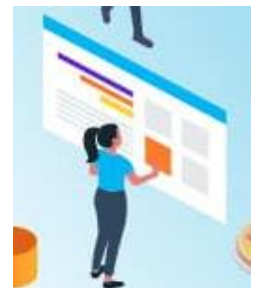
Home Automation Choices



Demand Response



Energy Portfolio



Build your own Service

Issues

Non engaging product

Captive consumer

Transaction based approach

Limited self service

Limited customization

Scattered offerings



Virtual Contact Centre



Customized Info & Self Service

Digital Tx

Data sufficiency ,
democratization &
observability

B2C & B2B offerings
consolidation

AI driven insights &
decisions

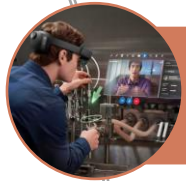
Blockchain, AR, XR

OCR, Load
disaggregation, etc

Operational Efficiency Use Cases



Network information on AR



Remote Support & Surveillance



Safety Trainings



Technology Tours

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[India Smart Utility Week \(ISUW\)](https://www.linkedin.com/company/india-smart-utility-week/)

Key Take aways

- P2P on blockchain is a win win proposition for all parties. Needs to be institutionalized.
- Metaverse is what you think it is.
- Business Relevant Use cases are key to a successful Metaverse Project.
- Technology is not a hurdle, imagination is.
- Power Utility has a lot of potential in leveraging the Blockchain, Web 3.0, Metaverse ecosystem.

Thank You