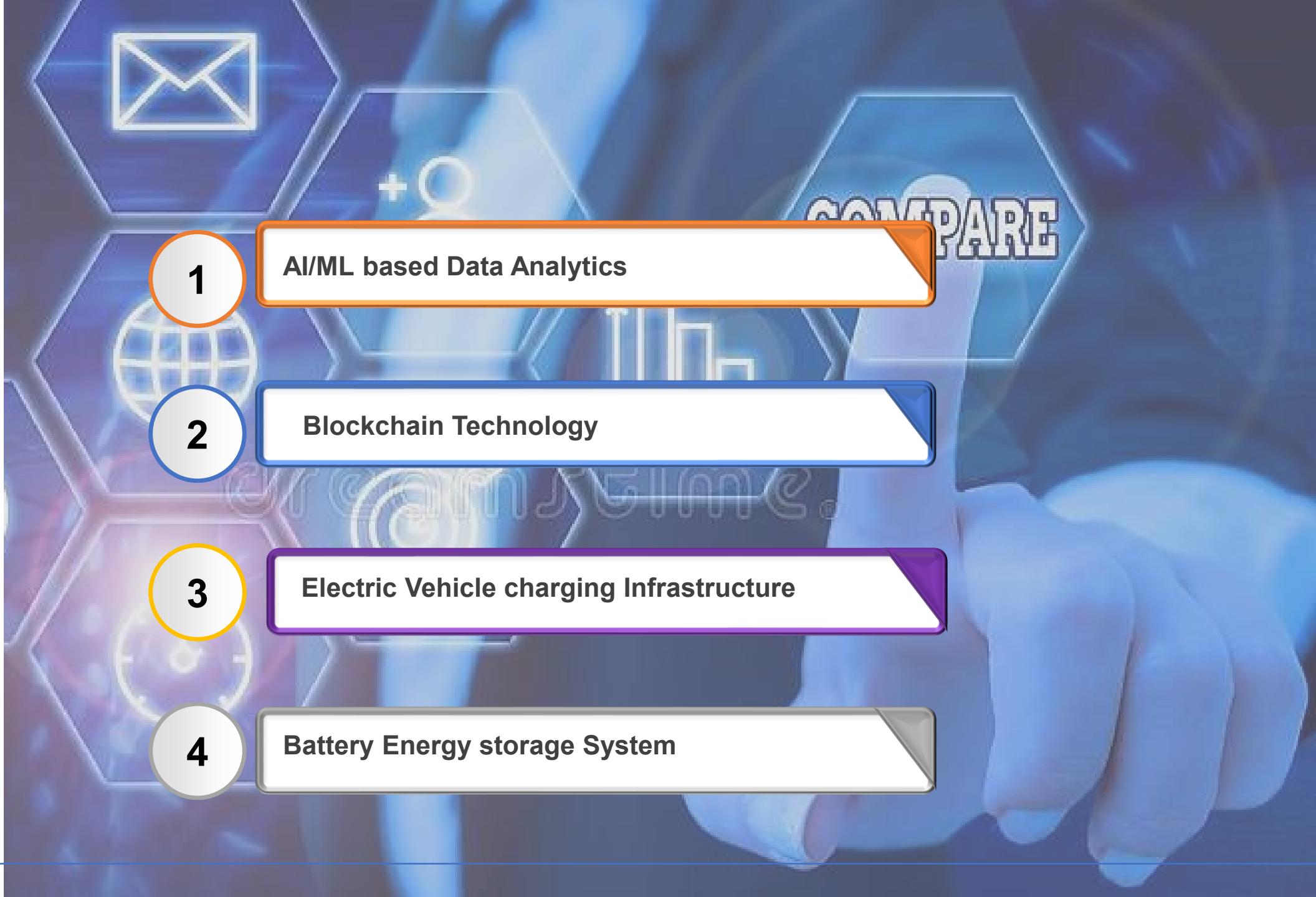




DISTRIBUTION UTILITY MEET

New and emerging technologies for electric utilities
-Nilesh Kane

Content



1

AI/ML based Data Analytics

2

Blockchain Technology

3

Electric Vehicle charging Infrastructure

4

Battery Energy storage System

AI/ML Based Data Analytics





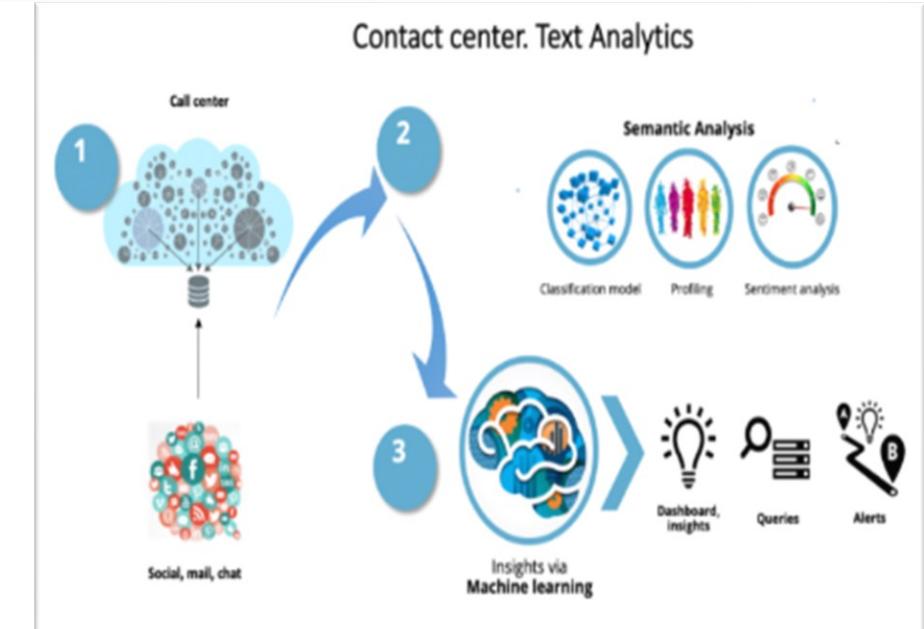
Sentiment analysis based on Customer feedback



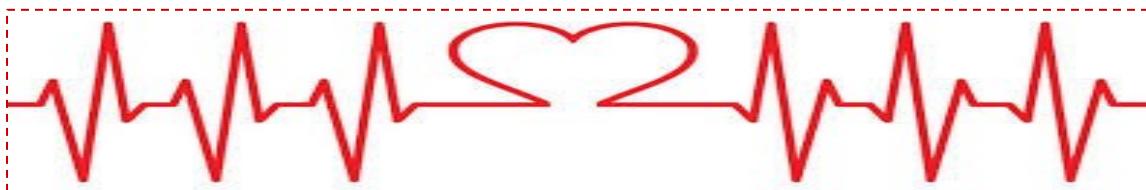
Post Transactional Feedback



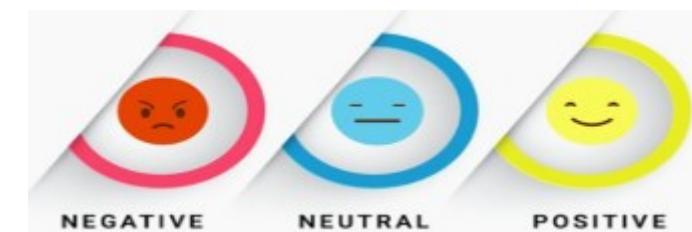
VOC,, Social Media comments
including WhatsApp Chats



Calls received at the Call Centre



Healthiness Indicator





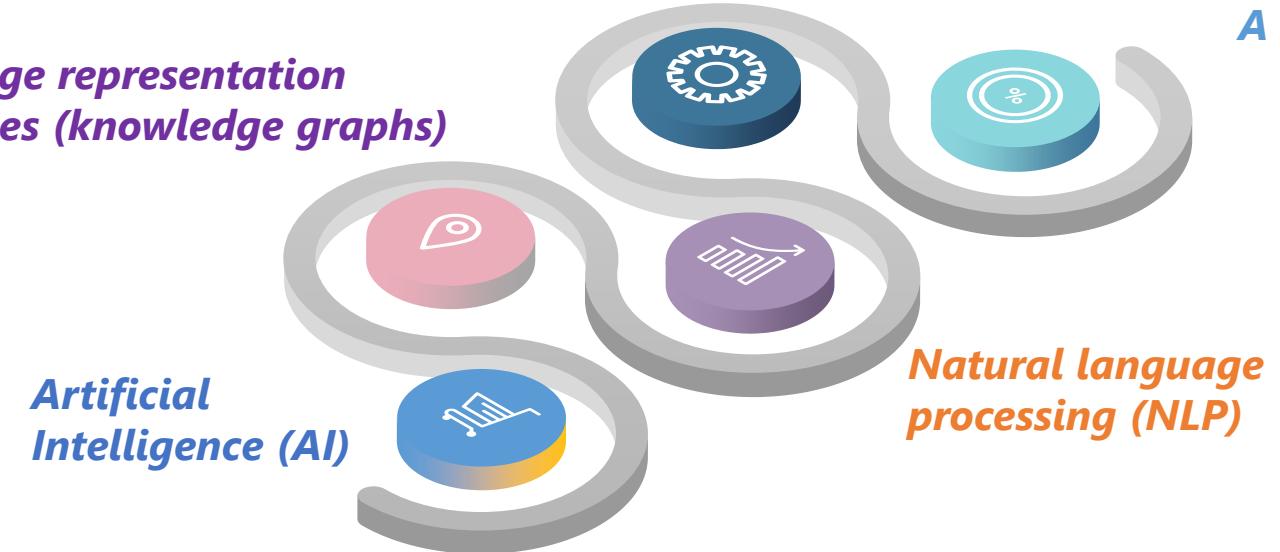
Approach

1st Power Utility In India

- **E-mail Response Management System(ERMS) of Mumbai Distribution** already enhanced through AI-ML NLP having customer sentiment value captured – Positive, Negative & Neutral.
- **Dashboard developed** for Customer feedback received through PTF on various customer touchpoints.

Study of Customer Sentiment using:

Machine Learning (ML)



A single dashboard for Customer Sentiment





Sentiment analytics Dashboard

SENTIMENTAL ANALYSIS

Customer Relationship Center Analytics

May 1, 2022 - May 31, 2022 Date Wise ↑

Dashboard

- Home
- Summary
- CRC
- Call Center
- E-Care
- Digital
- Word Cloud
- Verbatim

PTF Score: 4.61

Visited for same issue: Once (83%) / Multiple (17%)

Addressed concerns: Yes (95%) / No (5%)

Query resolved: Yes (94%) / No (6%)

Responses: 1493

PTF %: 92

Promoters: 1386

NPS: 87.68

Staff Attitude: Very Good (Green), Good (Yellow), Average (Orange), Bad (Red), Very Bad (Dark Red)

Quality of Interaction: Very Good (Green), Good (Yellow), Average (Orange), Bad (Red), Very Bad (Dark Red)

Were you informed of the alternate digital channels to register your concerns?

Response	Count
Yes With Detail	298
No	132
Yes	882

SENTIMENTAL ANALYSIS

Customer Relation Center

Call Center

E-Care

Digital

Dashboard

May 1, 2022 - May 31, 2022

Home

Summary

CRC

Call Center

E-Care

Digital

Word Cloud

Verbatim

Process: Name Change
Source: Goregaon (W)
CRC
Good
POSITIVE
Action Point:

ID: 5006680092

Process: General Query
Source: Technical Contact Center
Good work
POSITIVE
Action Point:

ID: 5006649515

Process: General Query
Source: Mobile App
All good
POSITIVE
Action Point:

ID: 5006703662

Process: General Query
Source: WhatsApp
Excellent service
POSITIVE
Action Point:

ID: 5006661391

Action Point:

ID: 5006645133

Action Point:

ID: 5006688717

Action Point:

ID: 5006657781

Action Point:

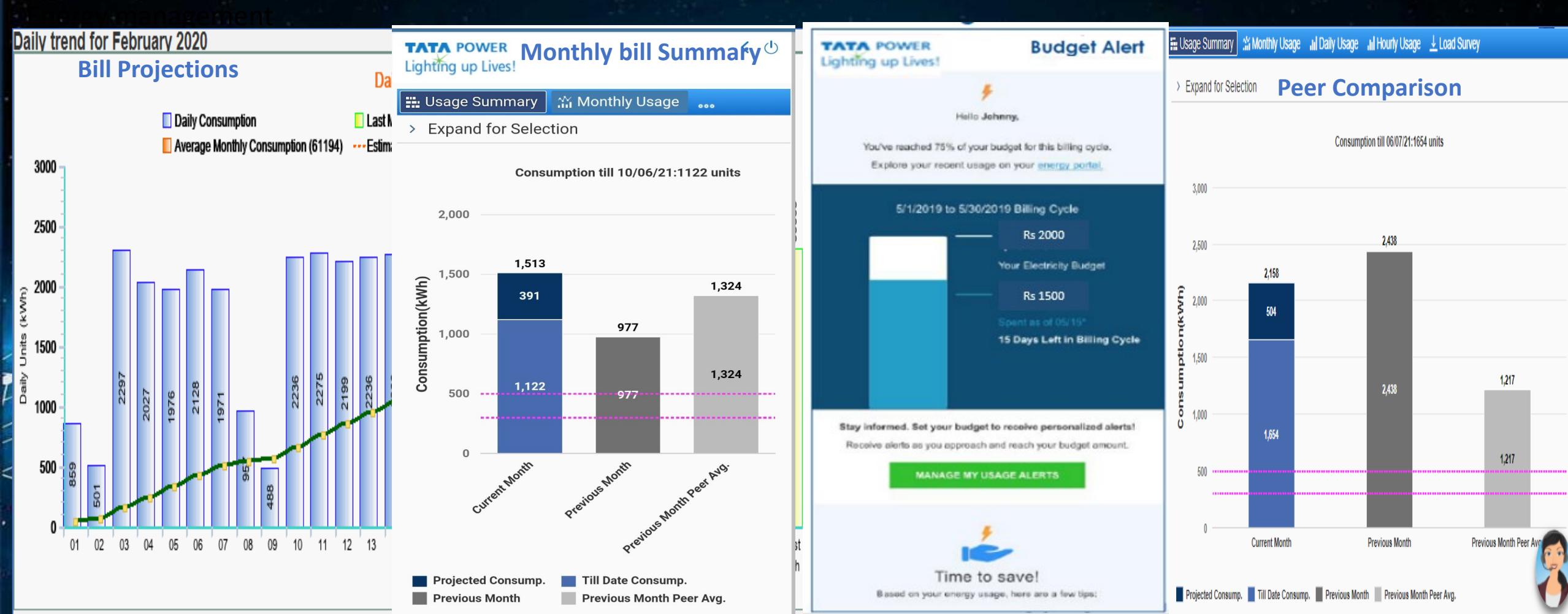
ID: 5006726380

Action Point:

ID: 5006645133

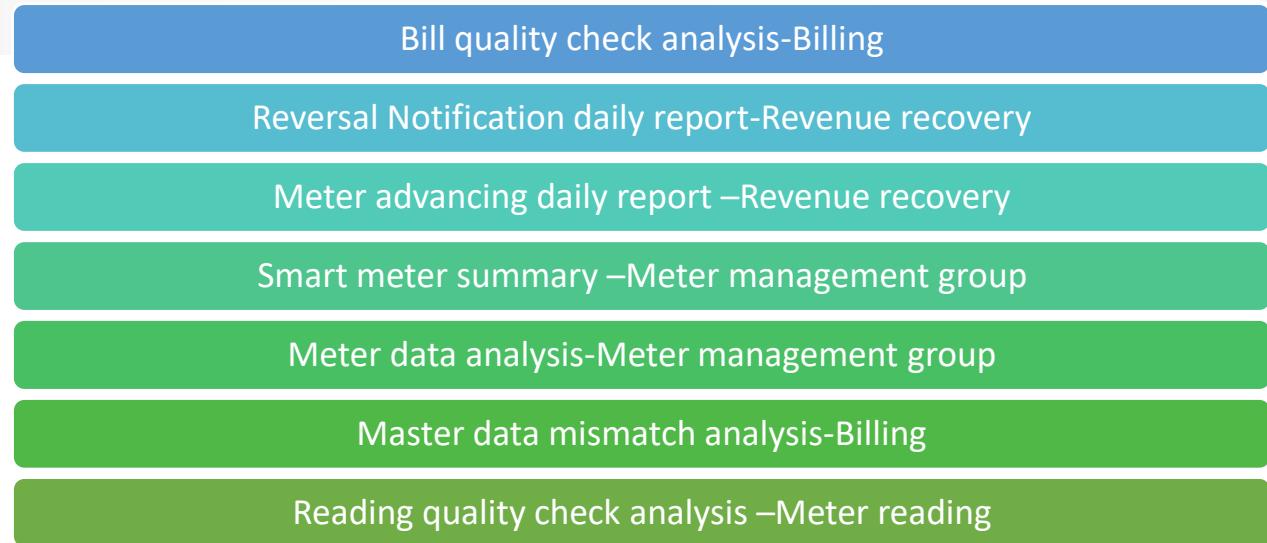
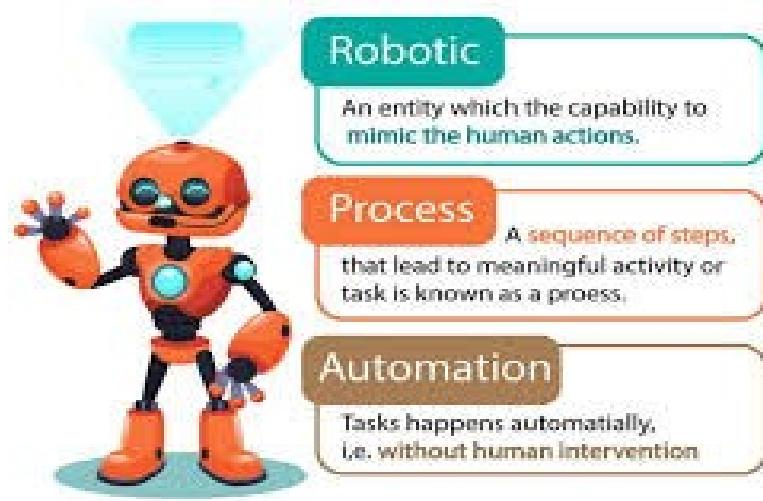
Smart meter Data Analytics

Personalized services on data analytics and AI/ML logic for Energy management & electricity bills optimization.....

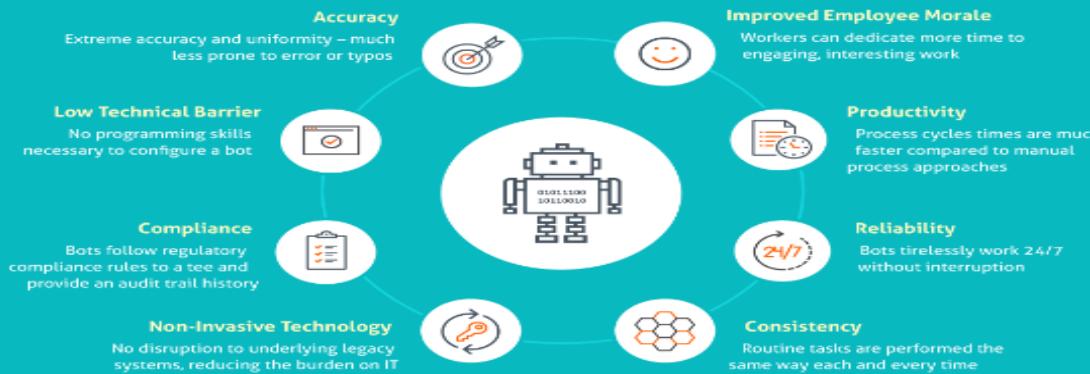




Deployment of Robotic Process Automation

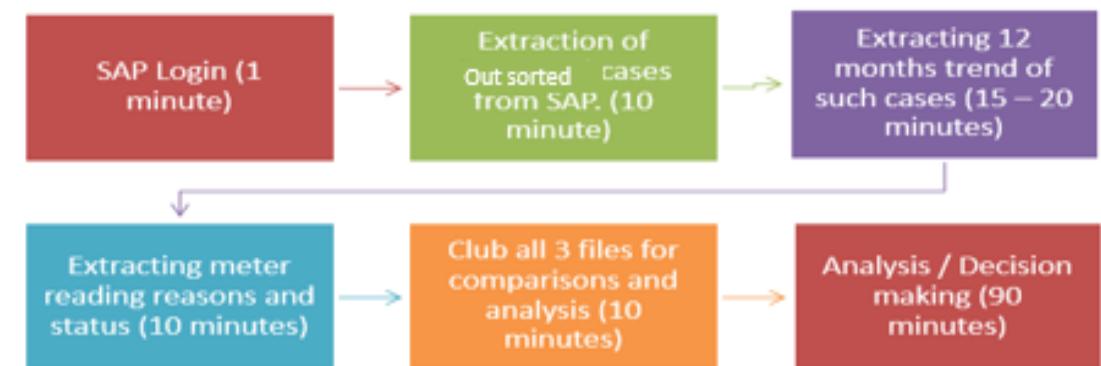


Benefits of **Robotic Process Automation**



BQC analysis time

Before RPA- 2.5 Hrs ; After RPA – 4-5 mins





Use cases of Drone in Electrical Distribution



01

GIS Survey

- ✓ 200 Sq KM Drone Fly to Capture Orthoimage.
- ✓ 11 number of 11 kV & 1 number of 33 kV feeder survey.
- ✓ 198 DT are captured .
- ✓ 10325 consumers has been mapped under this survey.

02

Suspicious site marking & Power Theft Detection

- ✓ 33 Sq. Km site survey completed 8 no's of theft detected

03

Ease of O & M activities for large Geographical area

- ✓ 22 Km Line & 350 no's of 33Kv poles inspected for identify anomalies in network, tree trimming requirement & encroachment identification.
- ✓ Thermal mapping of PSS equipment.

04

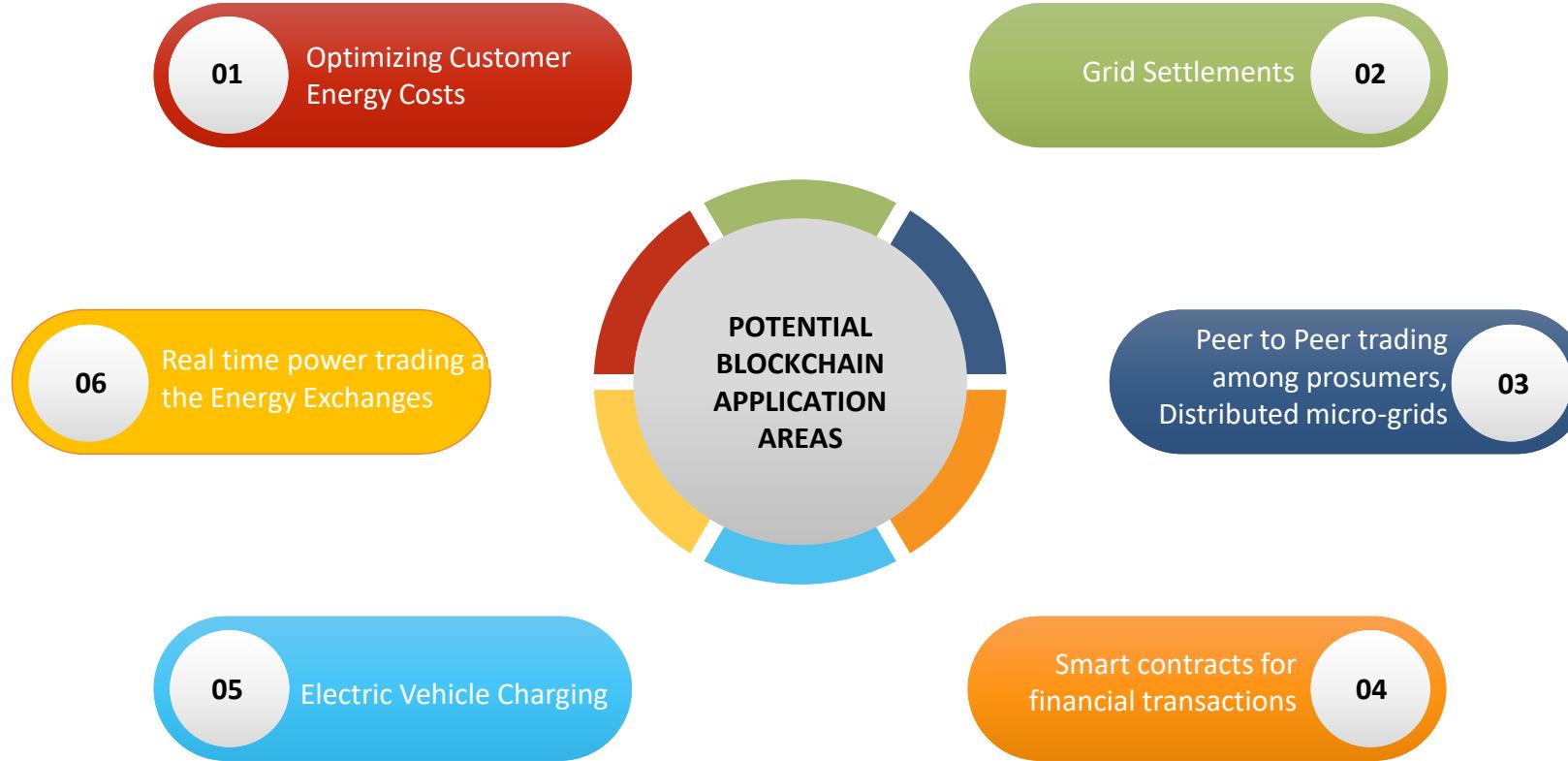
Remote meter reading for rural area and LI

- ✓ 20 Nos of BLE Meter reading for LI consumers / unreachable meter.
- ✓ 100% successful meter reading.

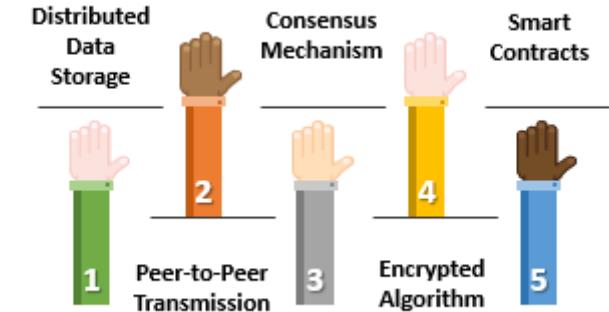
Blockchain Technology



Blockchain Applications for Power Utility



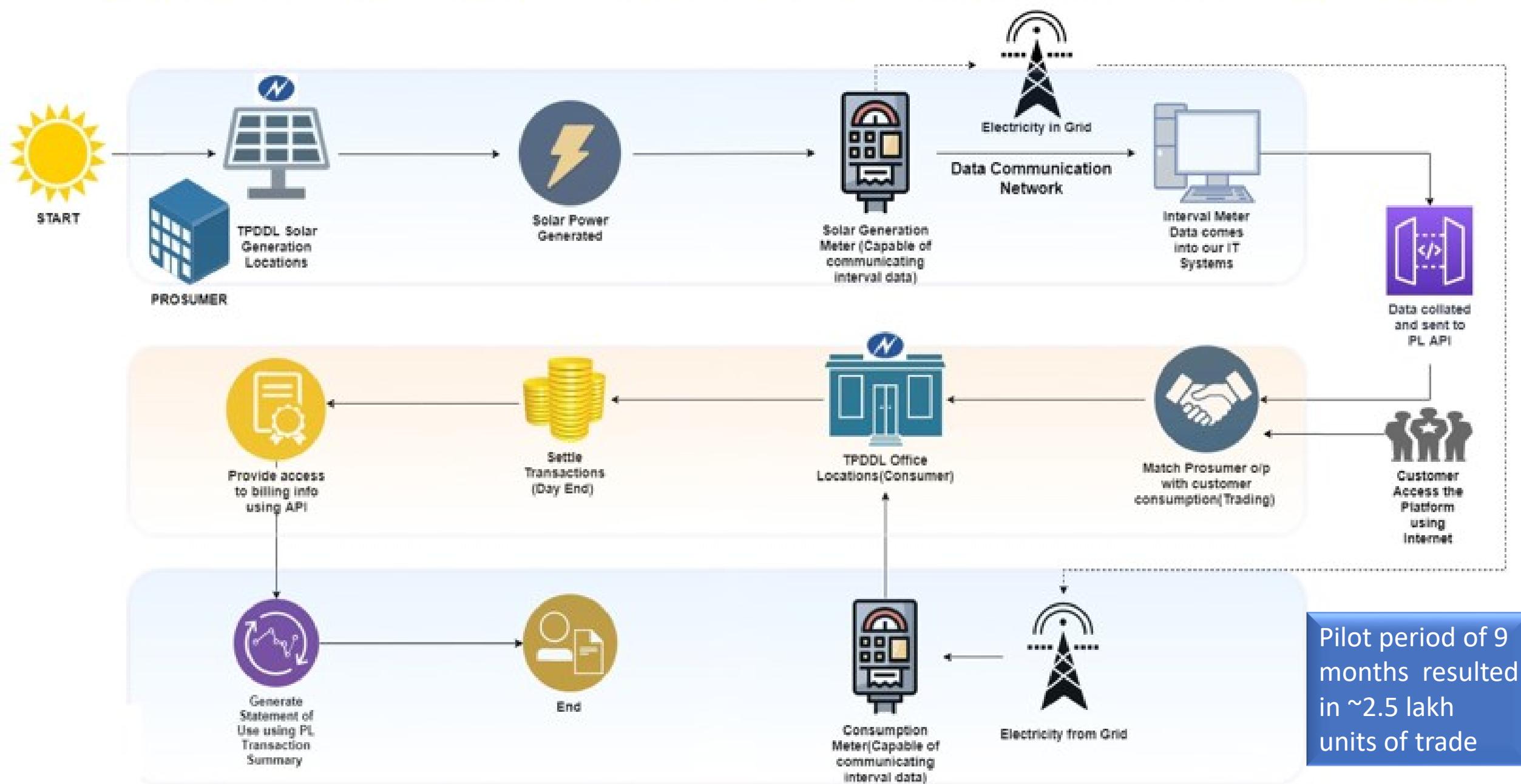
Blockchain consists of:



**Leverage
Blockchain
Technology for
Tata Power**

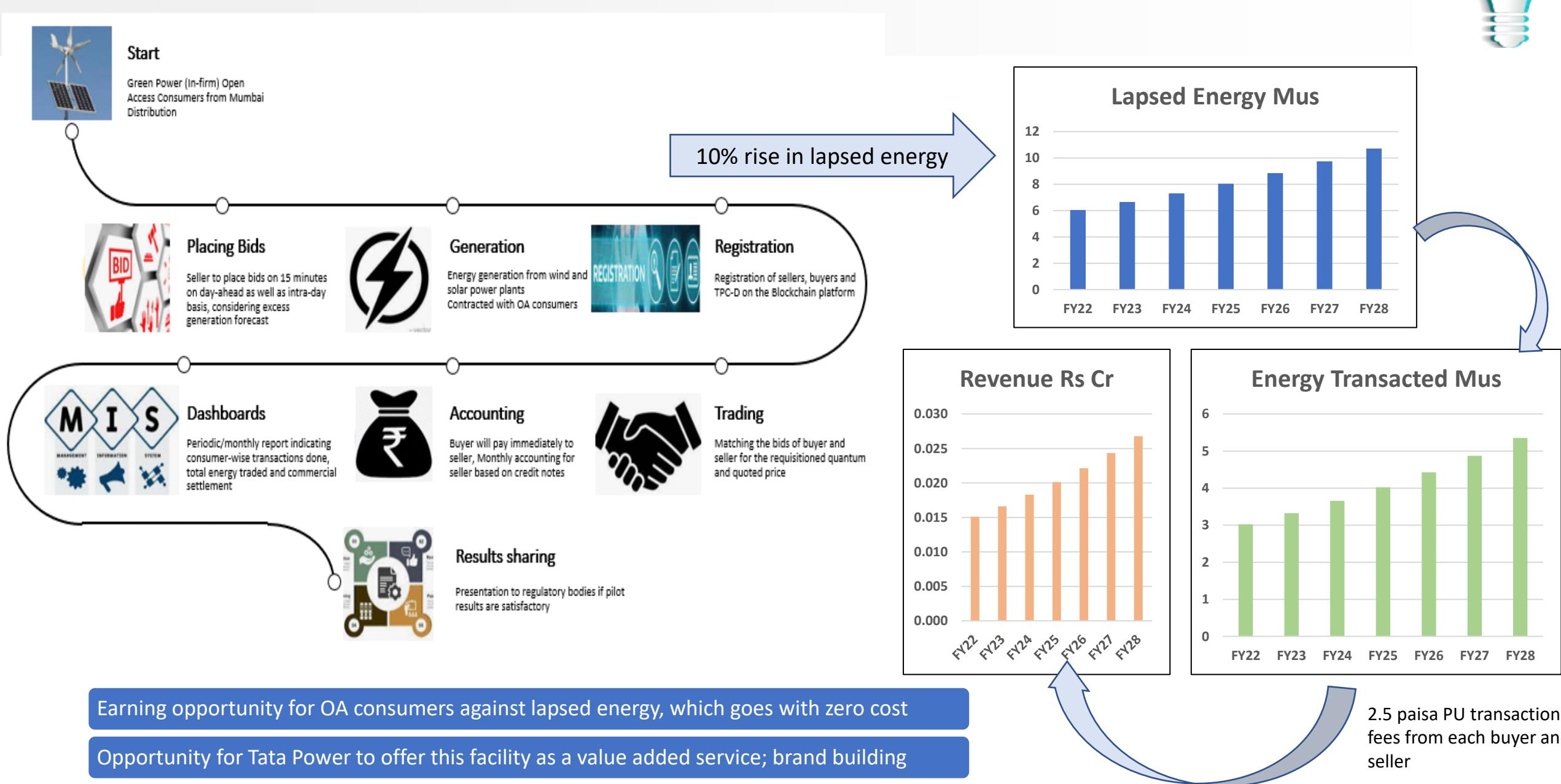
- To create new, disruptive & scalable business models
- Significantly improve efficiency of existing business processes/ operations to create value for stakeholders (Customers, Discoms, etc..)

P2P SOLAR ENERGY TRADING USING BLOCKCHAIN PILOT PROCESS FLOW



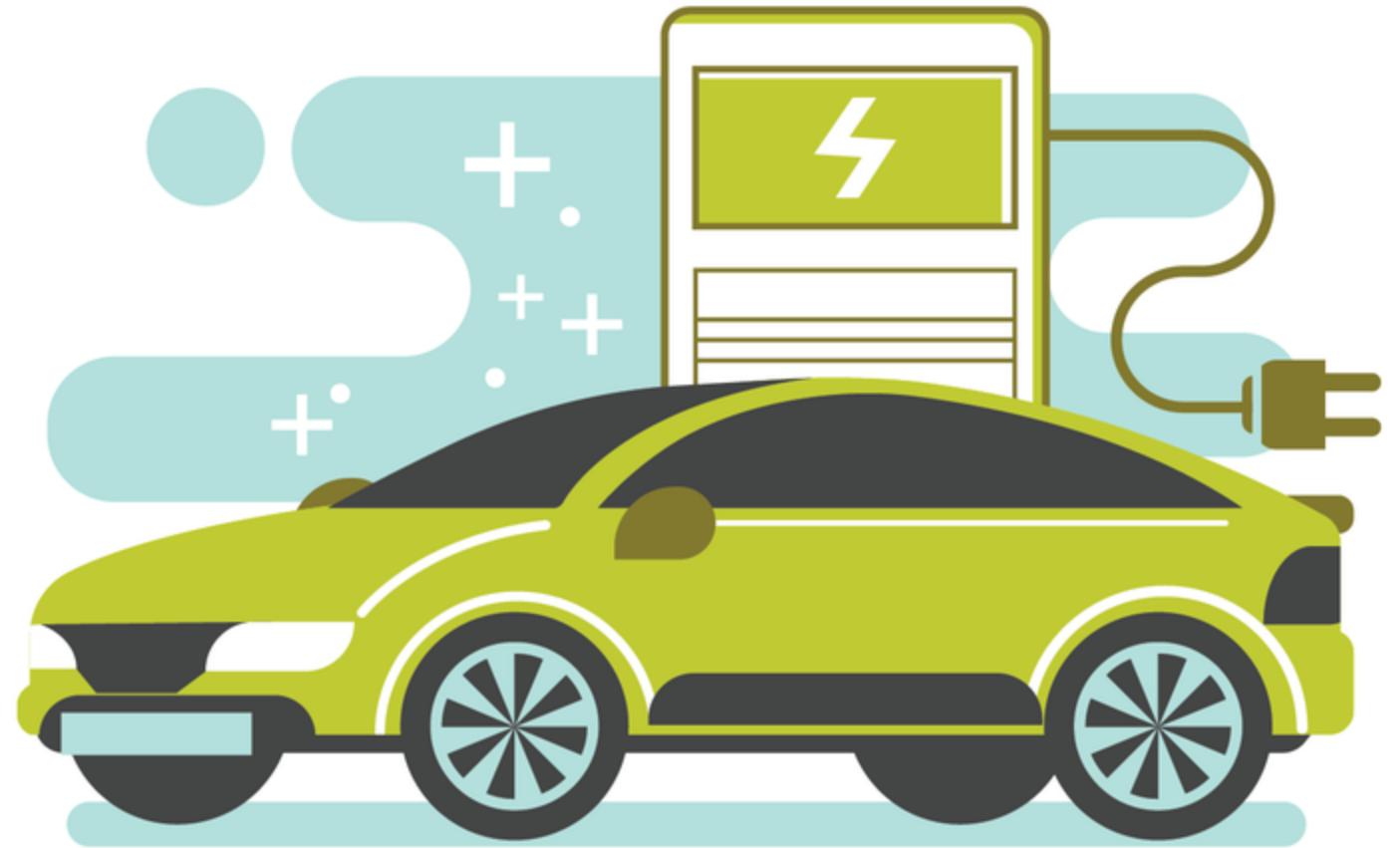


Solution - Energy trading for Mumbai Infirm OA Consumers

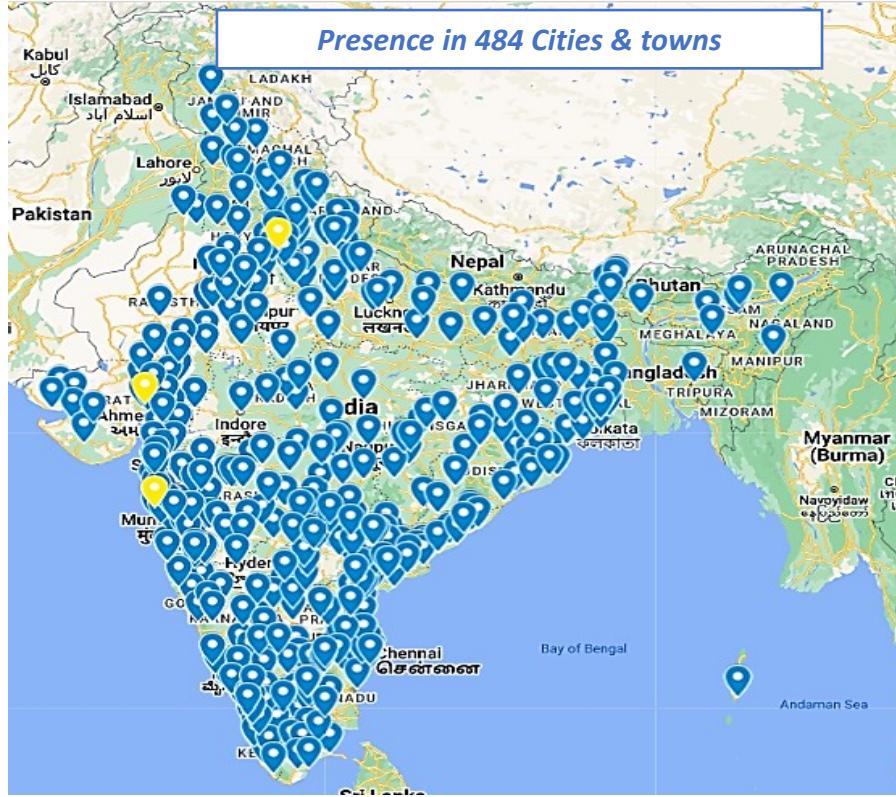


TATA POWER
EZ CHARGE

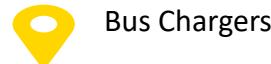
Future is Here



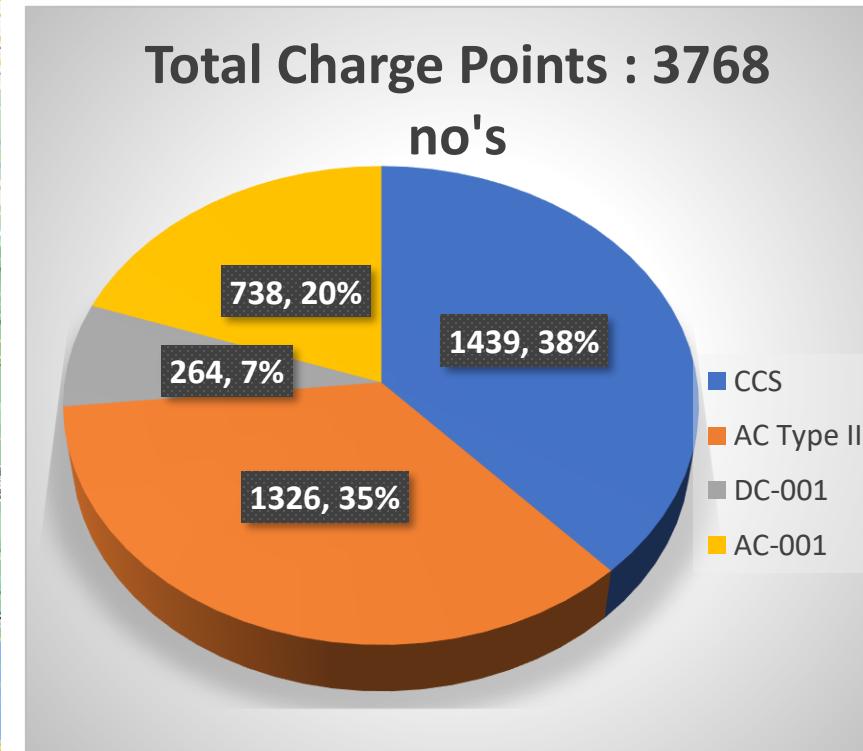
EV charger Footprint across India



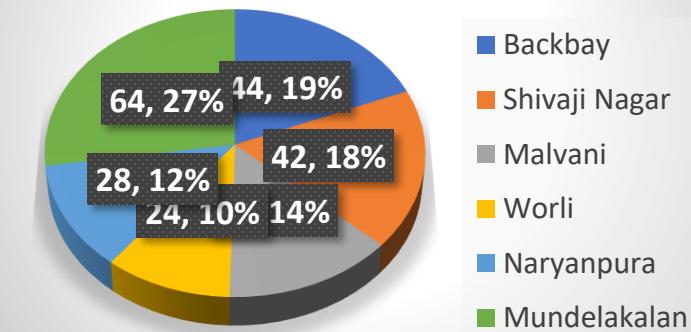
E4W Chargers



Bus Chargers



EV bus depot Charge points-234 no's



- ✓ 876 fast chargers installed in Highway covering 225 highways.
- ✓ 1000 charger installed across Residential societies.

- ✓ Tata Power is market leader with 75% market share in EV infra-Development with an aim of reaching 10000+ charge points by 2025.
- ✓ Currently India has 1 charger for 135 Electric vehicles compared to 6 EVs in China. Tata Power aspire to achieve this benchmark and have 1 charger every 100 kms in Highways.

Public Charger Installations



India Post GPO, Kolkata



Taj Jodhpur



Sangam Hotel, Karad



Taj President, Mumbai

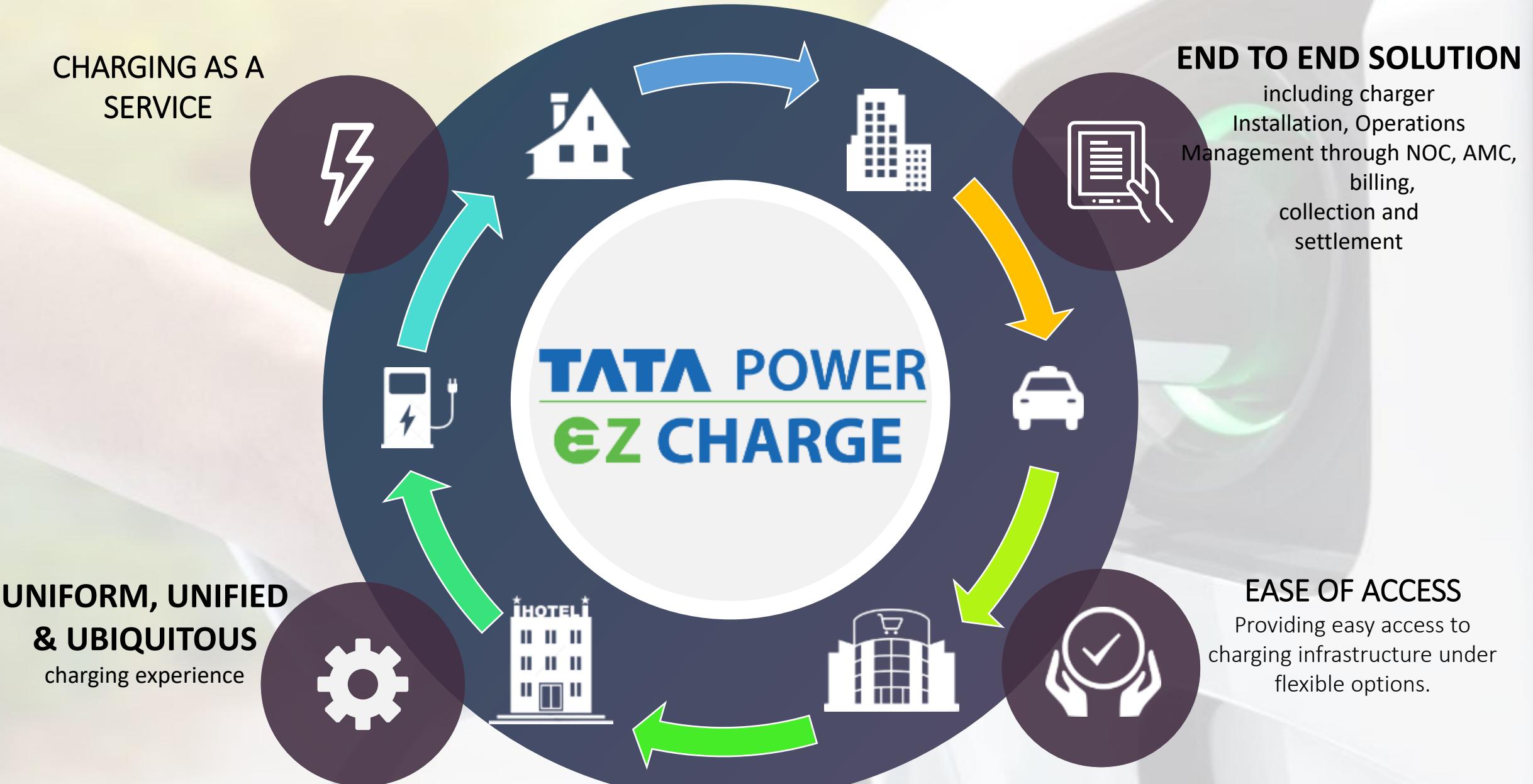


India Expo-mart Gate 12, Noida



India Expo-mart Gate 1, Noida

Tata Power EV Charging Network



Network Operations Center



Key Features :

- *Real time monitoring of Pan-India network for charger availability – state-wise, category (Public/Captive/Home), status-wise (Available/Inactive/Faulted)*
- *Alarms & alerts for charger faults/stuck sessions*
- *Remote operations – charger hard reset, stuck sessions clearing*
- *Server health monitoring*
- *Integrated with Call Center for online complaint addressal*

India's First of its kind Operation Centre for Real time Management of EV Chargers

Tata Power EV Charging Software Platform.

TATA POWER



RFID Management



User Management



Charger Management



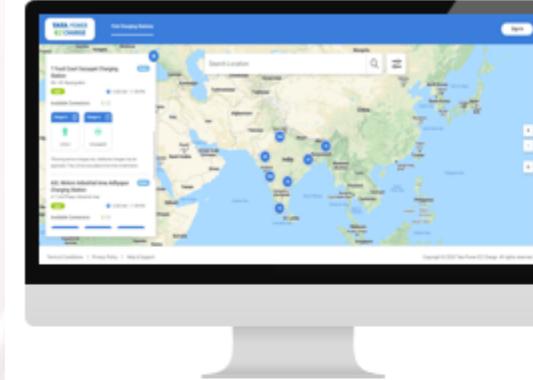
Pricing Management



Wallet Management



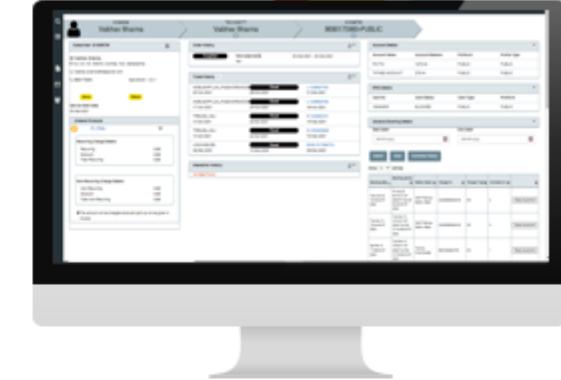
Partner Management



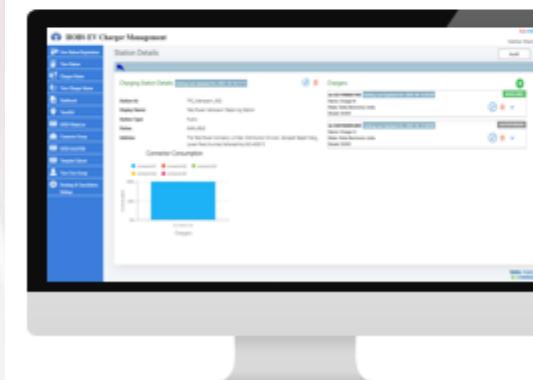
Selfcare Portal (B2C)



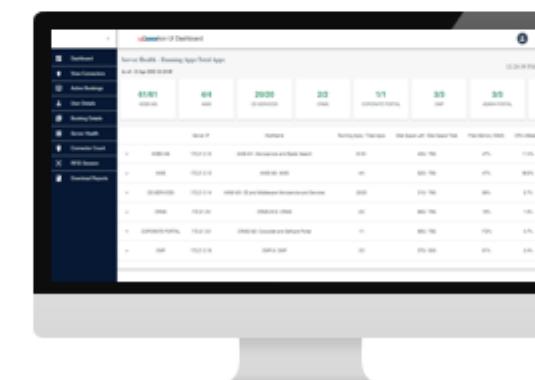
Corporate Admin Portal (B2C)



CRM Portal (Customer Care)*



HOBS Portals Charger Admin Portal



Operations UI Portals*



CDM Portal (Charger Comm.)*²⁰



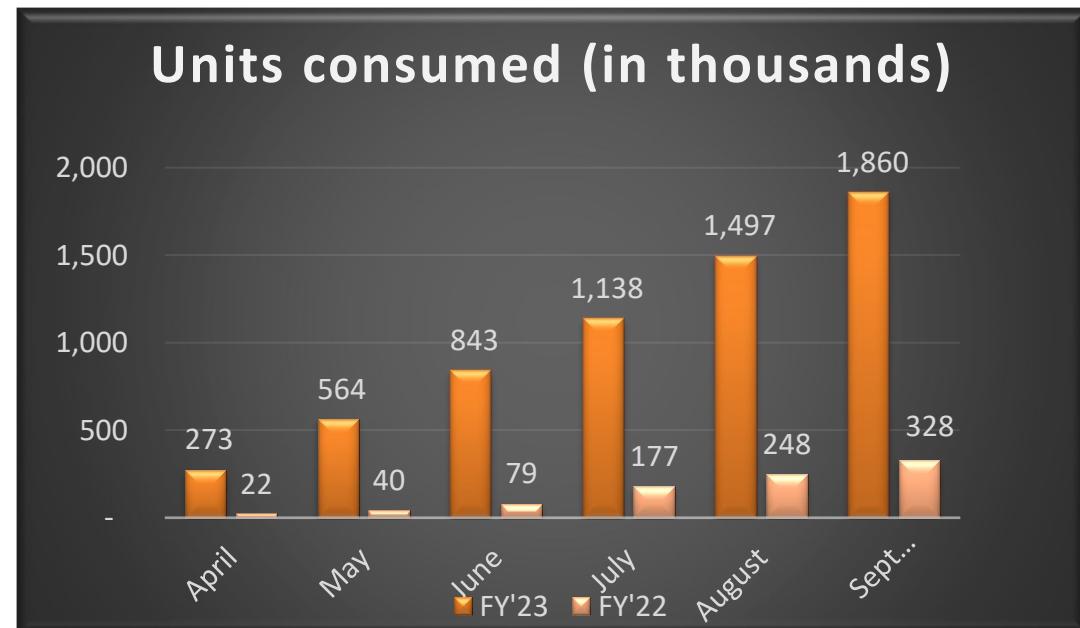
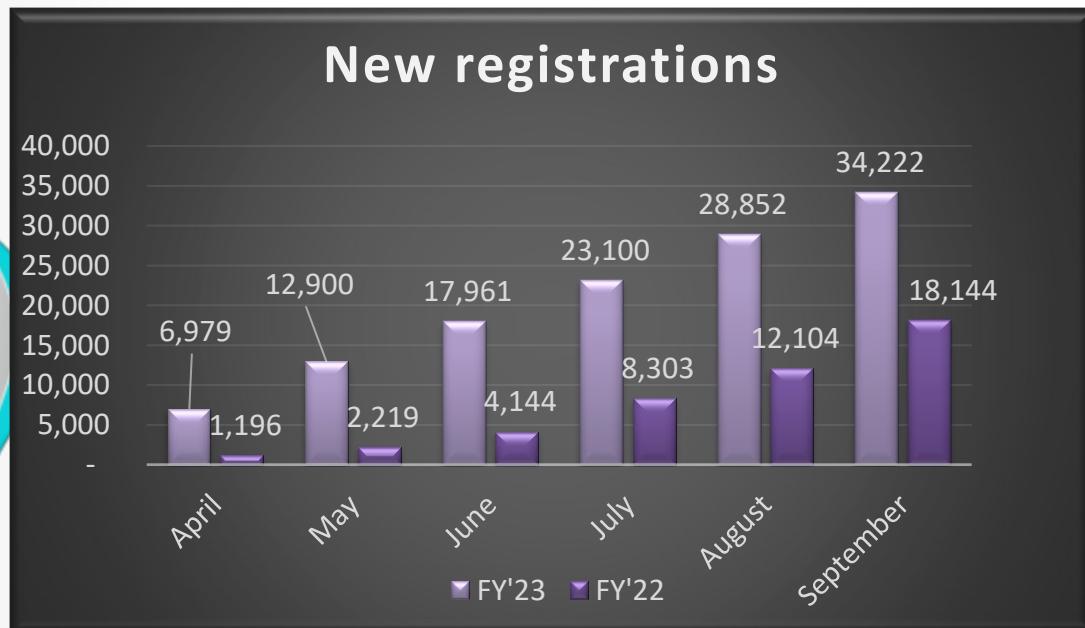
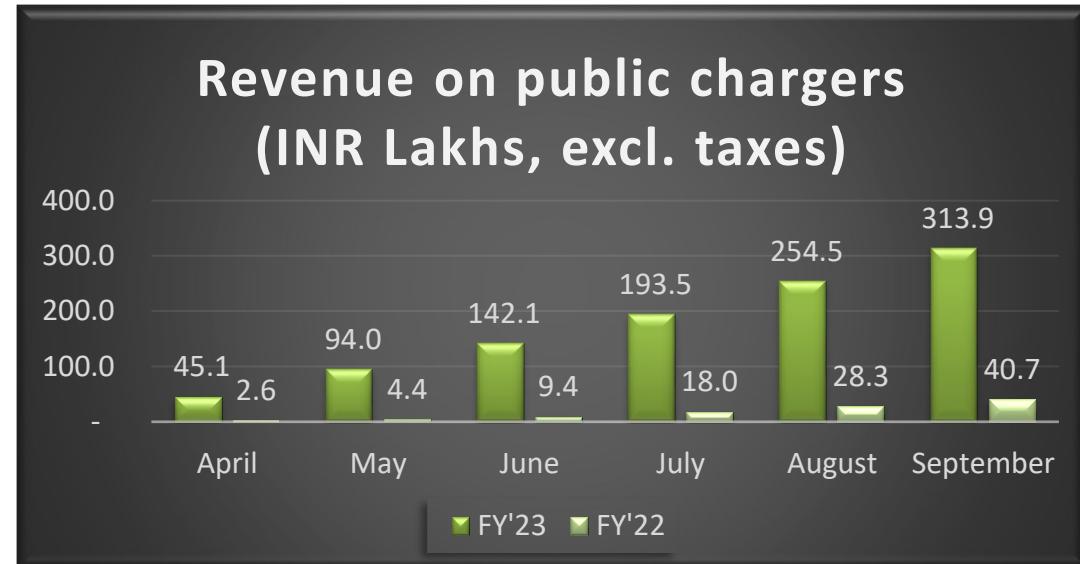
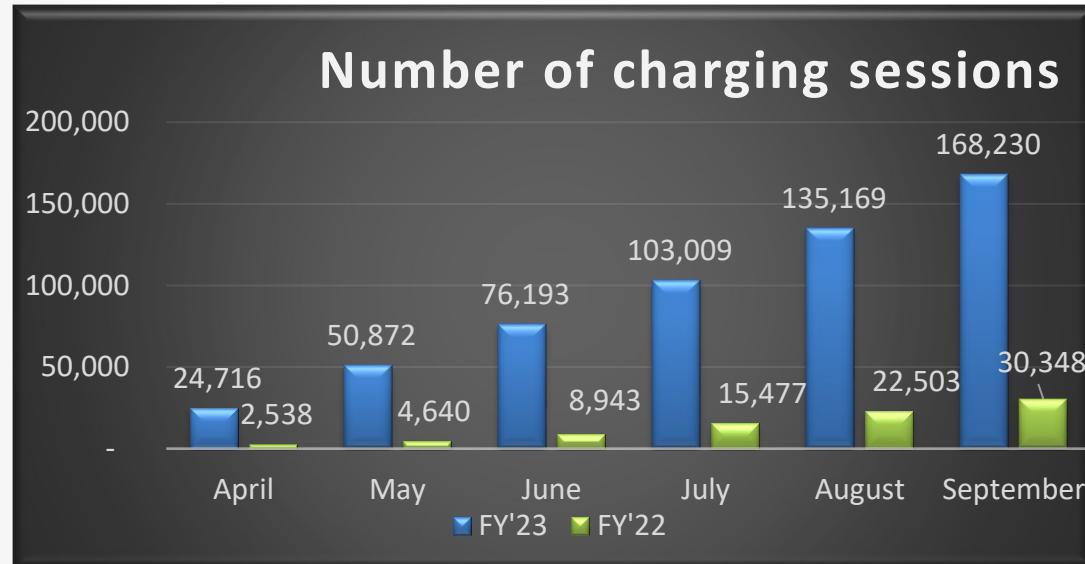
Tata Power EZ Charge App

Key Features

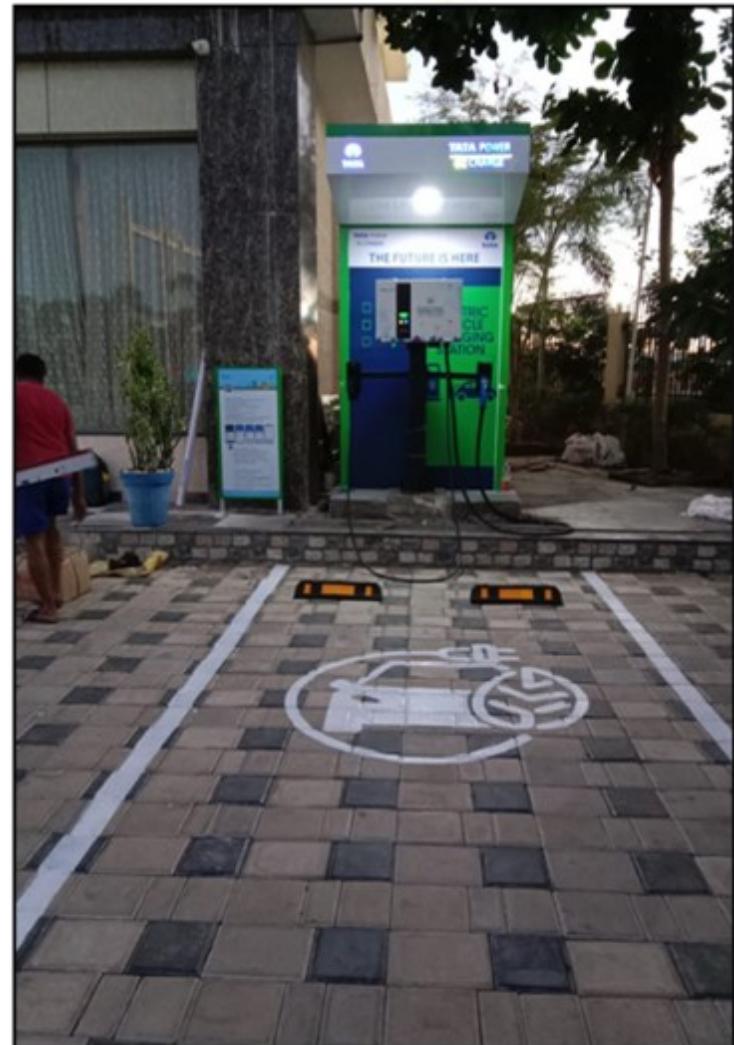
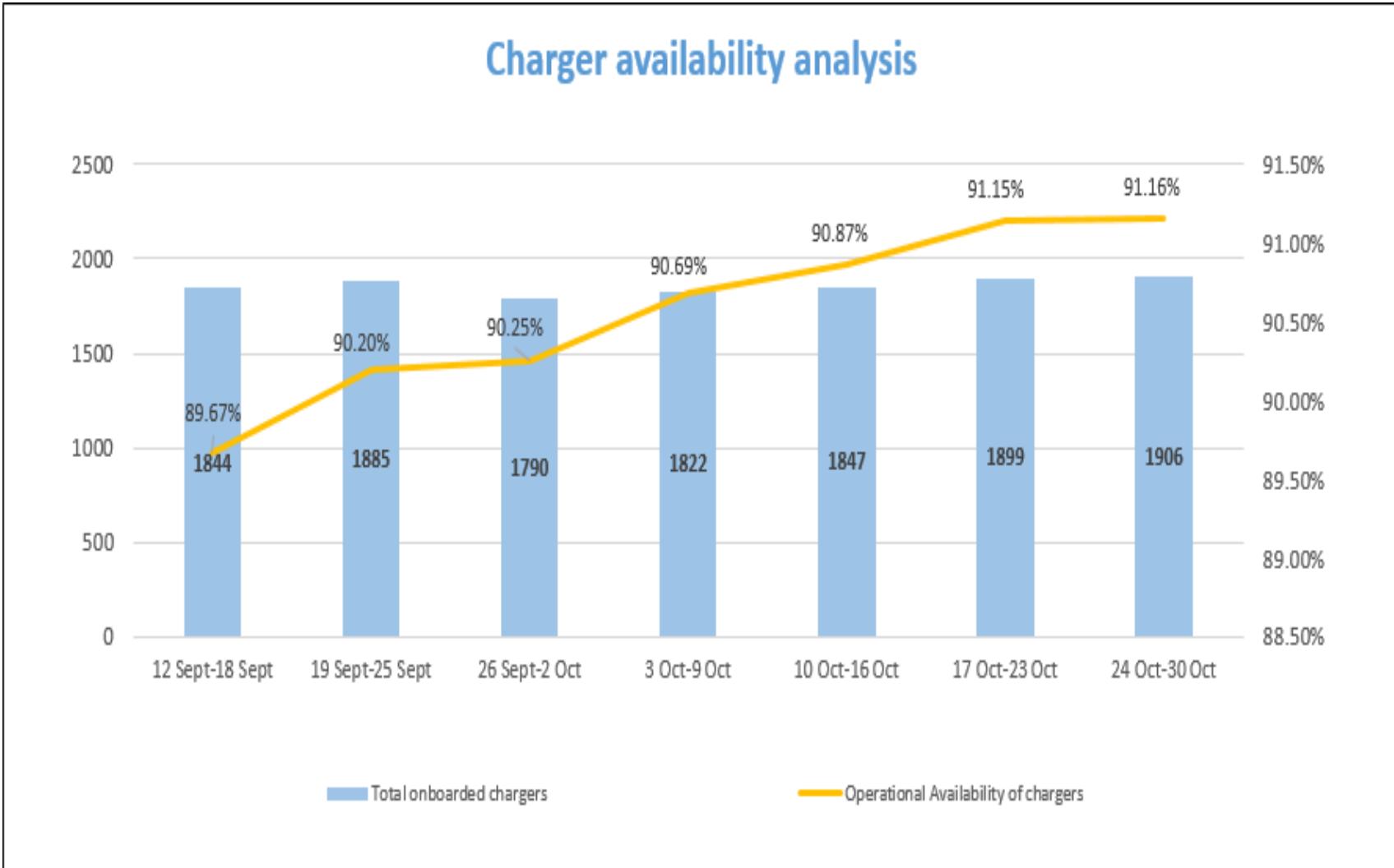
- ✓ Locate chargers (Map & List view)
- ✓ RFID card-based charging
- ✓ Real time charger status & availability
- ✓ Advance Booking & Cancellation
- ✓ Corporate & Fleet profiles
- ✓ Home Profile
- ✓ User Analytics
- ✓ Station analytics
- ✓ Charging History
- ✓ Multiple Payment Gateways/Wallets
- ✓ Payment Account History
- ✓ Refunds for booking Cancellation
- ✓ Scheduling- Home Profile
- ✓ API for sharing charging station data with Auto-OEMs
- ✓ Notifications



EV Charging Platform Statistics & Trends (Cumulative YoY comparison)



EV Charging Platform Statistics & Trends

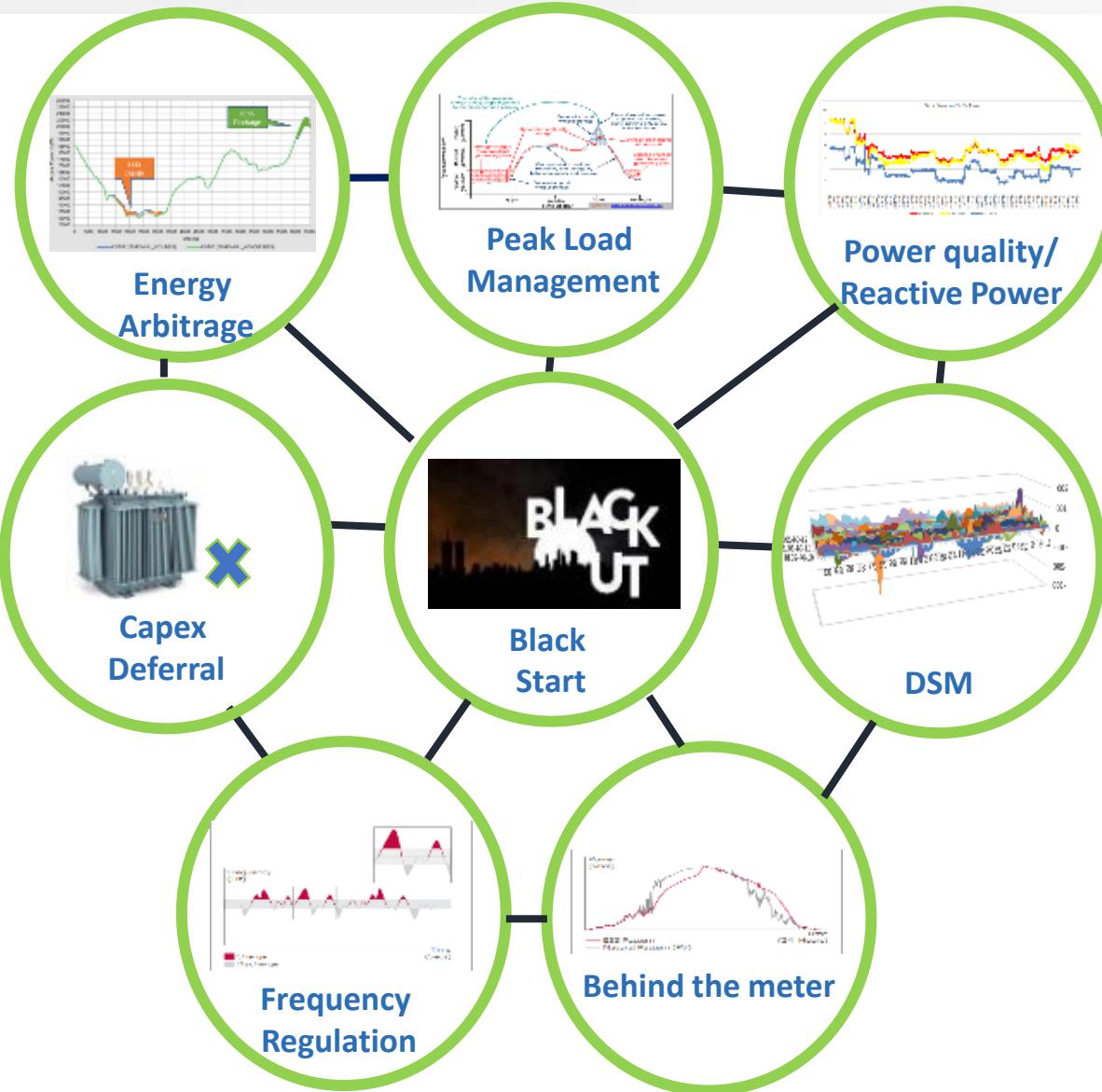


Battery energy storage System



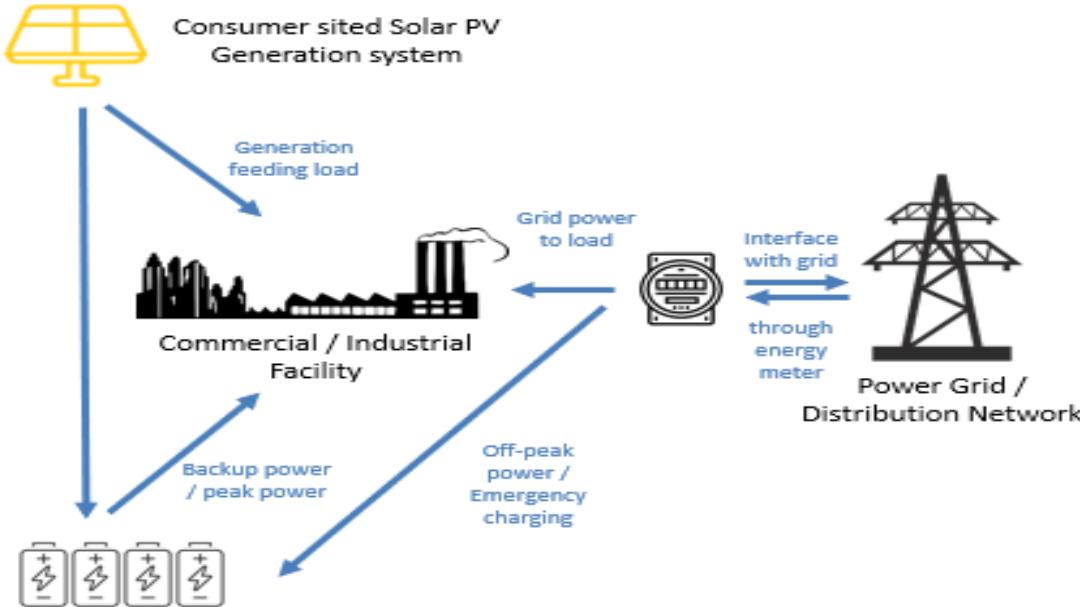


Battery Energy Storage Applications





Behind the Meter -BESS



Value for Consumer

Reduction in Demand Charges, Peer to Peer Energy trading

Possible incentives for participation in Demand Response program

Arbitrage against Time of Day tariff and reduction in surcharge

Enhanced reliability and eliminating use of costly diesel generator

Value for Utility

Reduction in Peak Power requirement

Deferring / avoiding costlier PPA and capex for upgradation of infra

Integrated solution offering for C&I customer leading to retention

Scale-up by offering solutions to C&I consumers in other states

BTM Driving factors:



Green Power



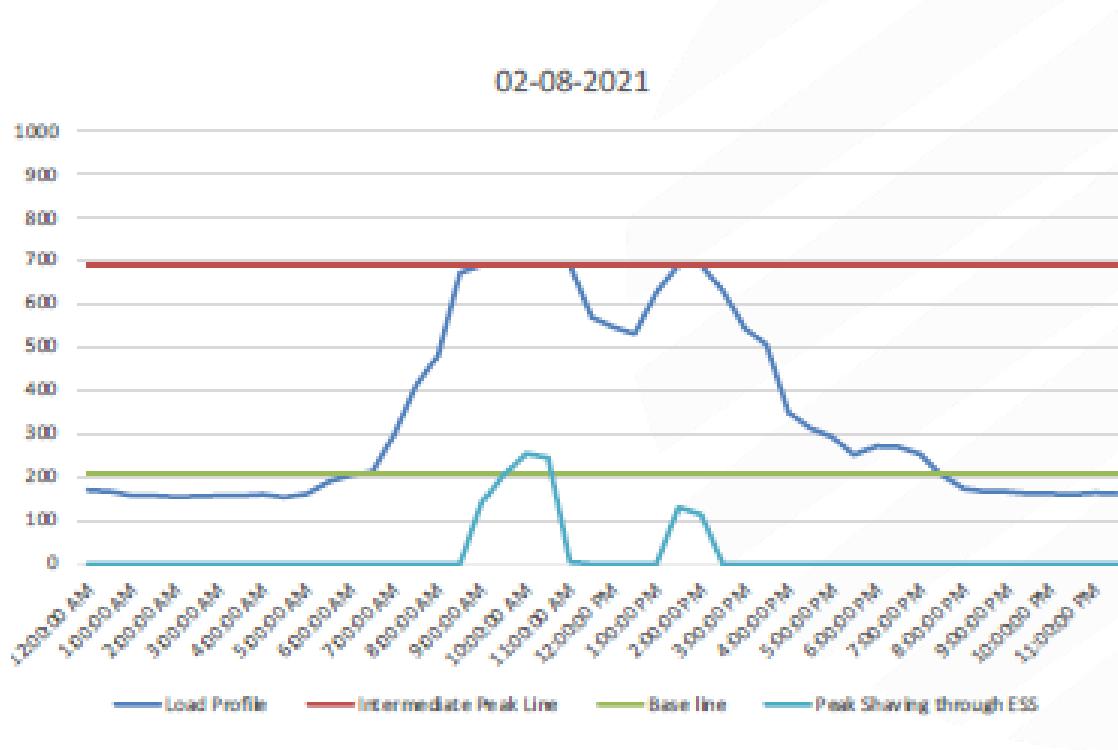
Reliability



Economics



BTM BESS- Energy arbitrage



Central Railway-Parel workshop

- ✓ By optimal sizing with combination of renewables and storage the payback period is between 4 to 6 years.
- ✓ India has BTM potential of approx. 1000 MW.

Slot	Demand Drop(KW)	Consumption(kWh)	TOD Rate benefit per day
08:30 to 9:00	100	50	37.5
09:00 to 09:30	200	100	125
09:30 to 10:00	250	125	156.25
10:00 to 10:30	225	112.5	140.625
10:30 to 11:00	150	75	93.75
13:00 to 13:30	125	62.5	46.875
13:30 to 14:00	110	55	41.25
Total savings Per day			641.25

BTM Applicability :

States with
Low Reliability

Time of Day tariff-
Benefit Maharashtra:
1.75 rs per unit
Benefit in UP- 1.5 rs
per unit

Usage of more DG.



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Thank You!

Website: www.tatapower.com

1. Market share to be added.



Benefits to all stakeholders



Benefits to Discoms

- ✓ Reduction in distribution losses
- ✓ Defer investment on system upgrade
- ✓ New revenue streams for the utility:
 - Wheeling charges
 - Billing and transaction fees
- ✓ Additional RE generation to meet RPO obligations
- ✓ Balancing local generation and demand within the community
- ✓ Voltage & capacity constraint management

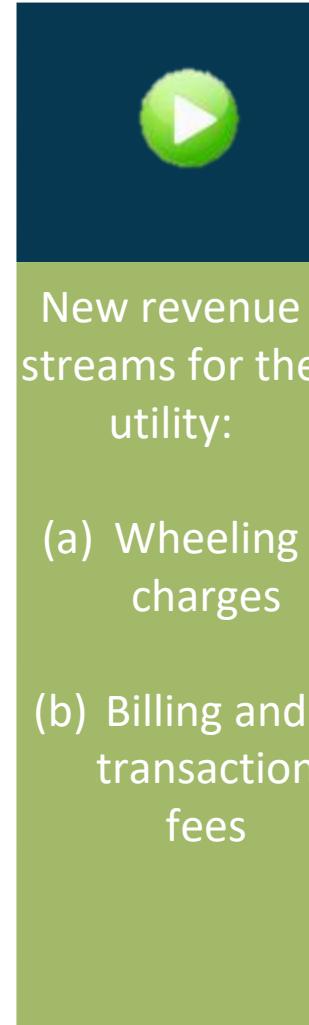
Benefits to Discoms



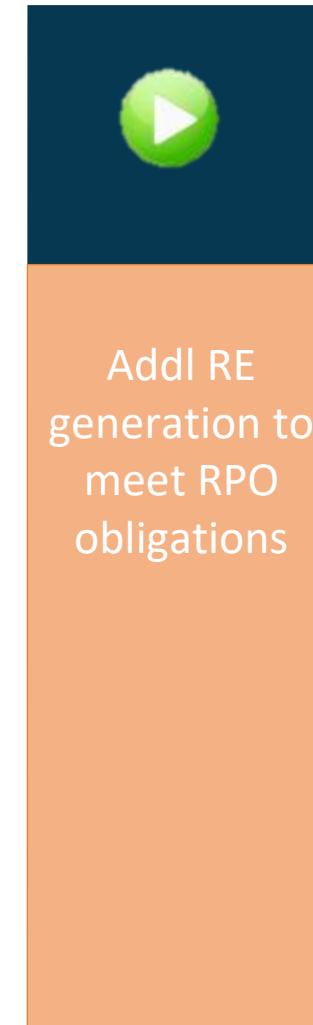
Reduction in distribution losses



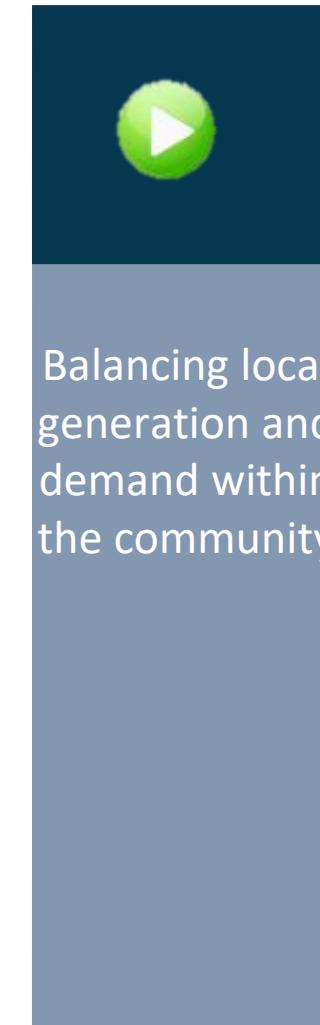
Defer investment on system upgrade



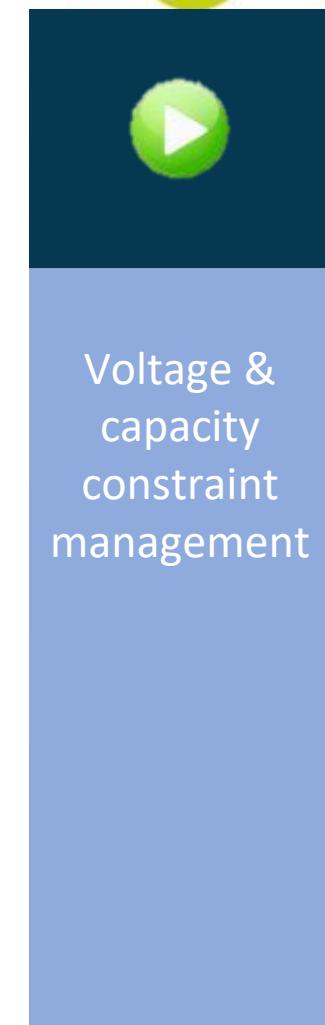
- New revenue streams for the utility:
- (a) Wheeling charges
 - (b) Billing and transaction fees



Addl RE generation to meet RPO obligations



Balancing local generation and demand within the community



Voltage & capacity constraint management