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India Smart Grid Forum



**DISTRIBUTION
UTILITY MEET
DUM 2023**

Session :GROWTH OF RE AND EV; AND THE PLAN FOR ENHANCING GRID FLEXIBILITY

Experience on BESS & Digital Tools for DER Management

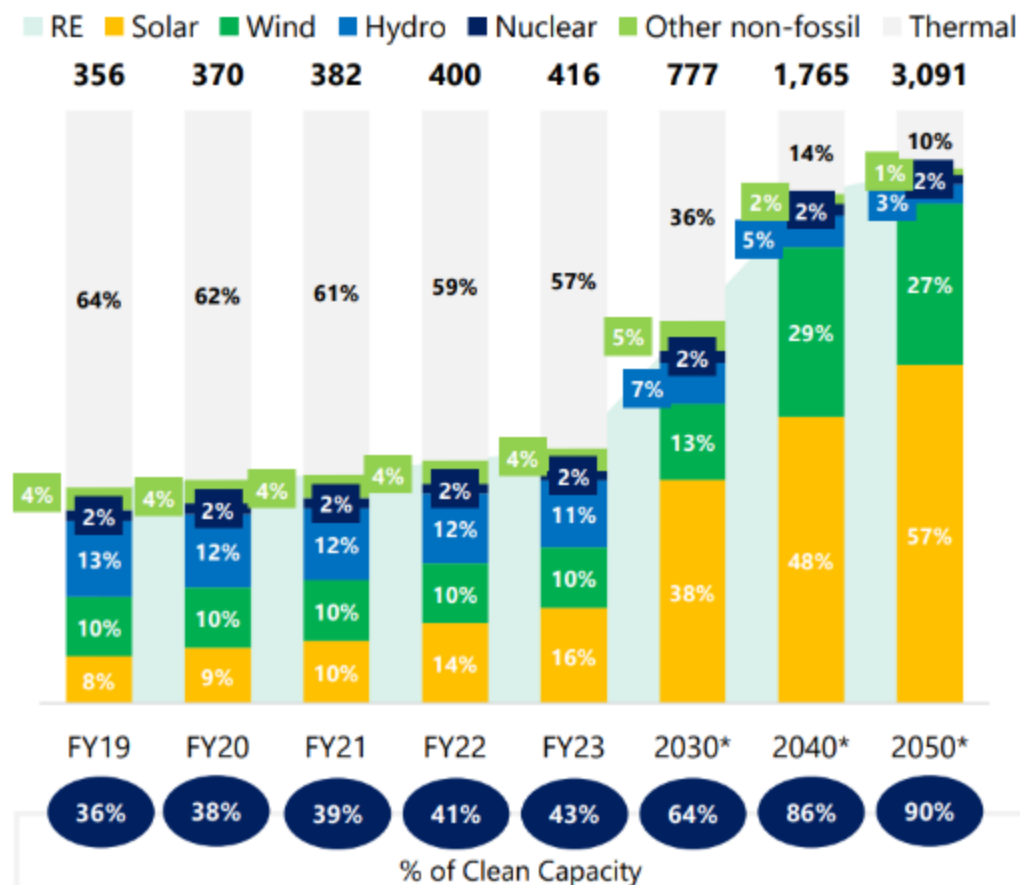
Presented By

**Dr. Nilesh Kane, Chief-Distribution & EV Charging
TATA Power**

Distribution Utility Meet | 02 - 03 November 2023 | www.dumindia.in



Installed capacity by source (GW)



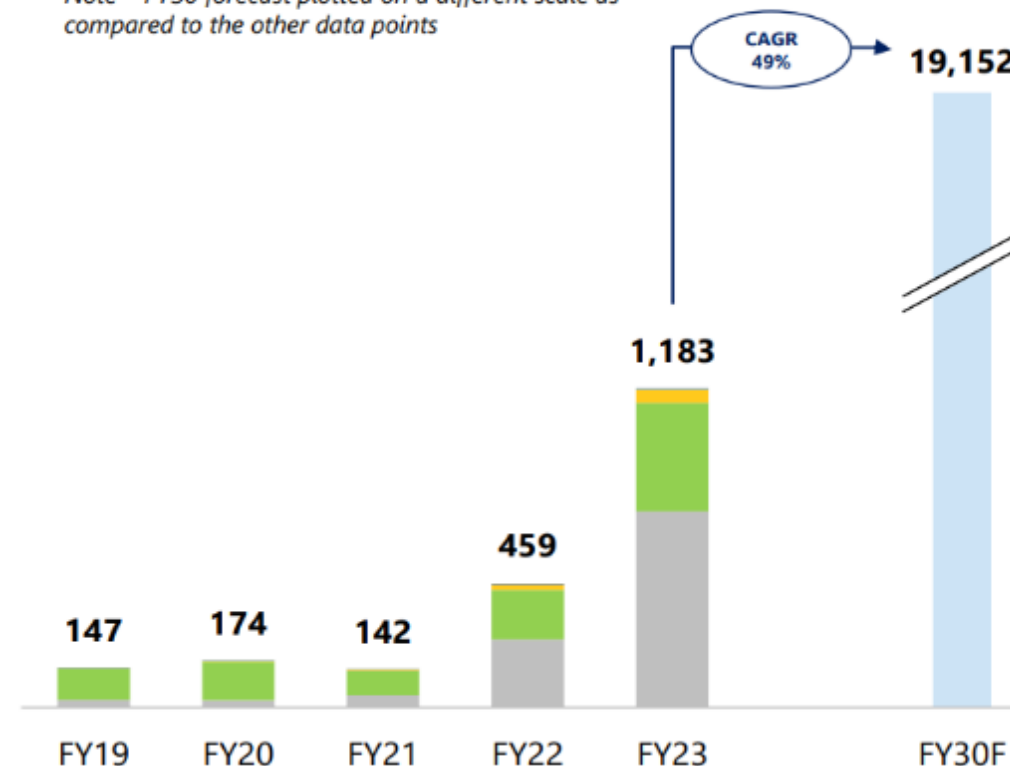
500GW clean energy by 2030(50% growth from 2023)

Source: Data for FY19-23 from CEA; 2030, 2040 & 2050 from Mckinsey, WRI etc;

EV sales in India ('000s)

■ 2W ■ 3W ■ 4W passenger ■ Bus ■ Others

Note – FY30 forecast plotted on a different scale as compared to the other data points

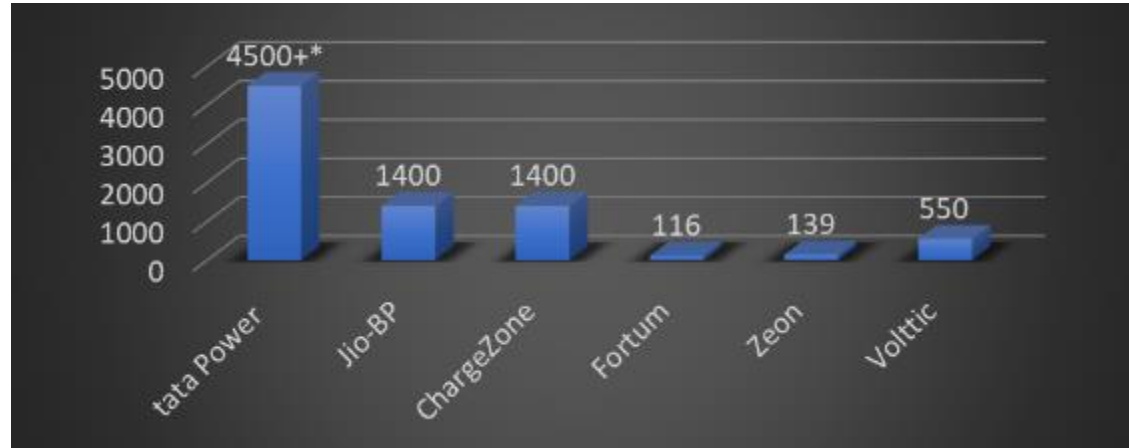


49% CAGR from FY23

Electricity demand may reach 69.6TWh by 2030

Source – Vahaan Dashboard,. FY30 Forecast from 'Accelerating Transport Electrification in India by 2030

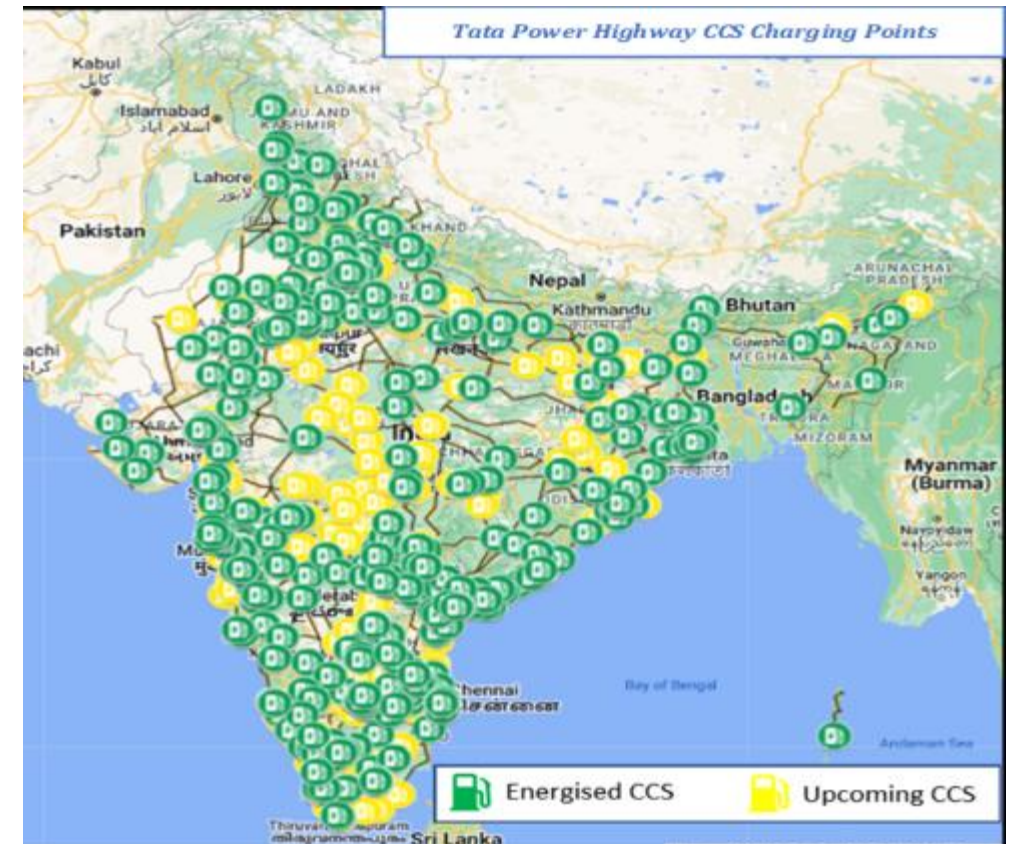
EV charger Projections



OEM wise Charge Points- Total 8105 Charge points

Challenge:

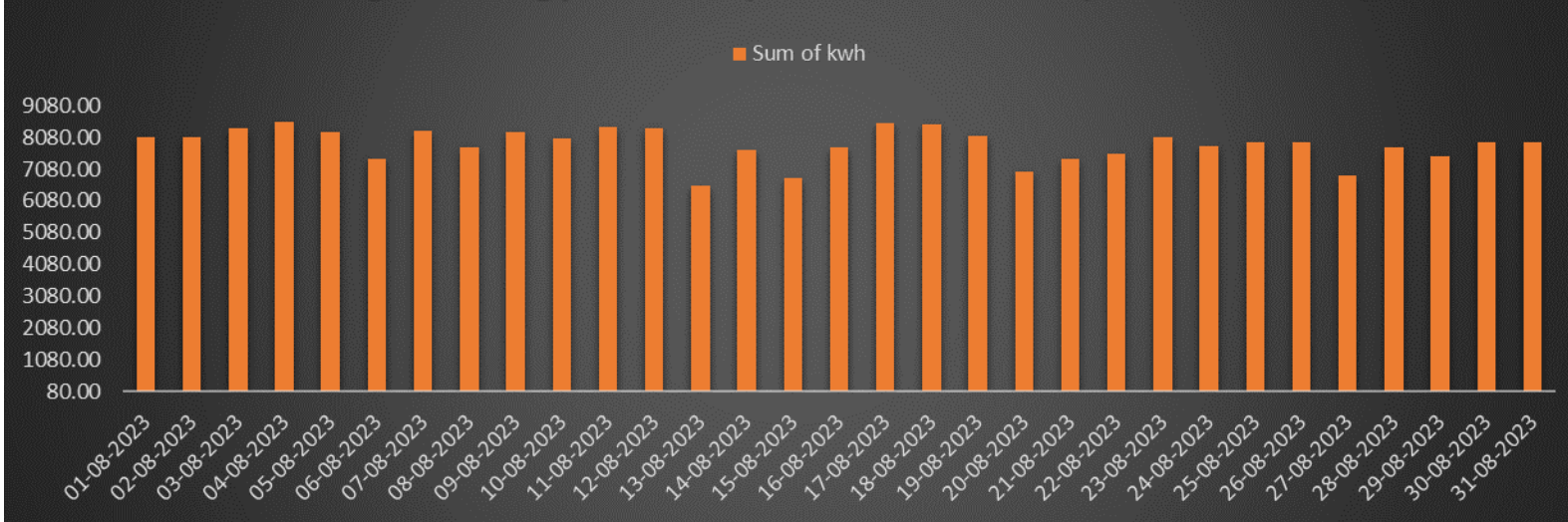
- Hi-way charger located on Hotels/ Dhaba which are predominantly fed by Rural Feeder resulting in Reliability issues
- Lack of Power infrastructure to enable charger Commissioning
- High Infrastructure cost to develop Electrical Network for the charger.
- Delay in Obtaining Power connection



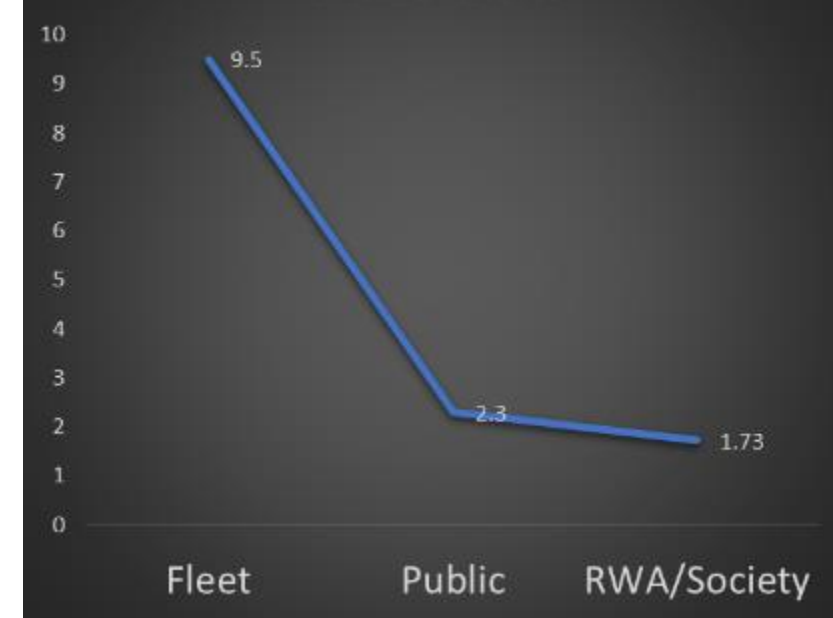
Hiway charger: 746 no's covering 189 National Hi-ways
Covering K2K and Golden Quadrilateral
Additional 353 under commissioning stage
85% coverage of K2K by TATA Power

EV charger Energy pattern analysis

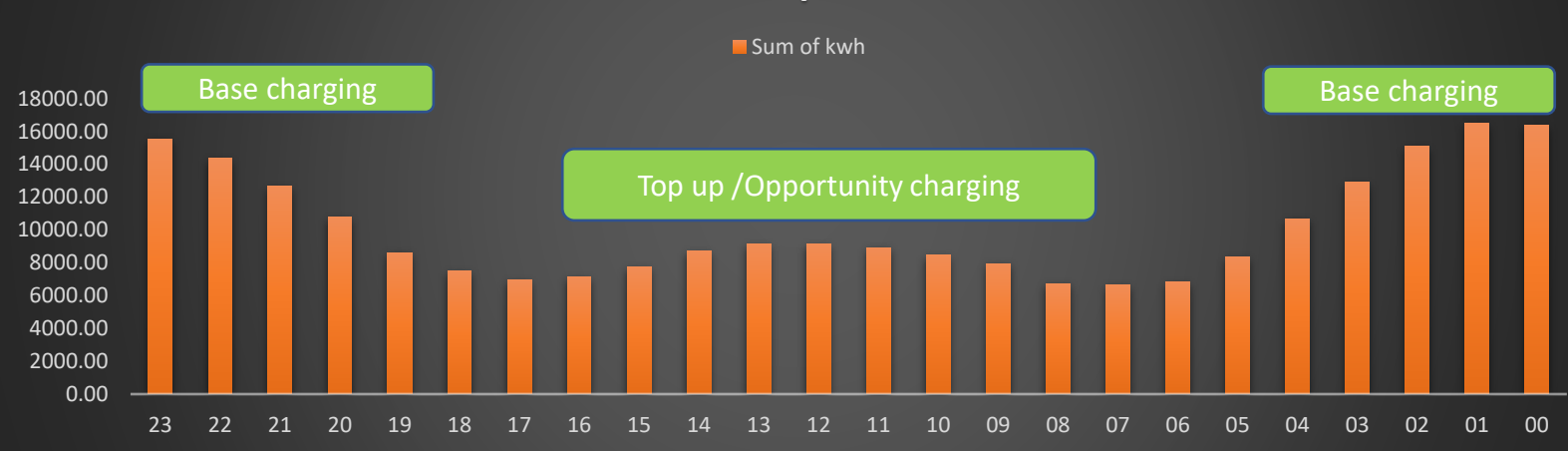
Charger Energy consumption in Mumbai(5.6MW Load)



Utilization %



Hour wise consumption for a month



Average Utilization- 2.1%

Tata Power BESS Experience



**10MW/10MWh BESS-
Grid connected Energy
Storage Applications**



**150KW/528KWh
Community Energy Storage**



**Pole mounted Battery energy
storage 10KW/20KWh**



Flow Batteries-40KWh



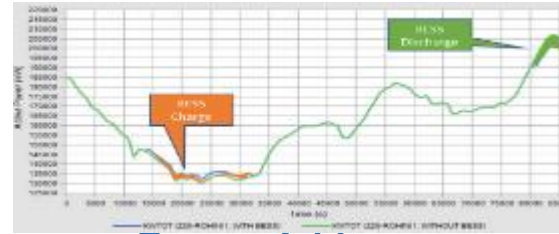
**Battery Swapping
stations-58.8Kwh**



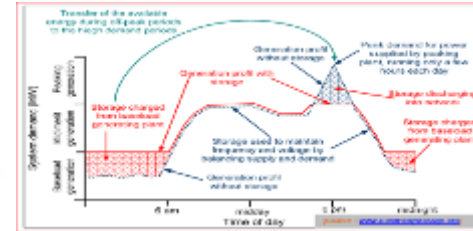
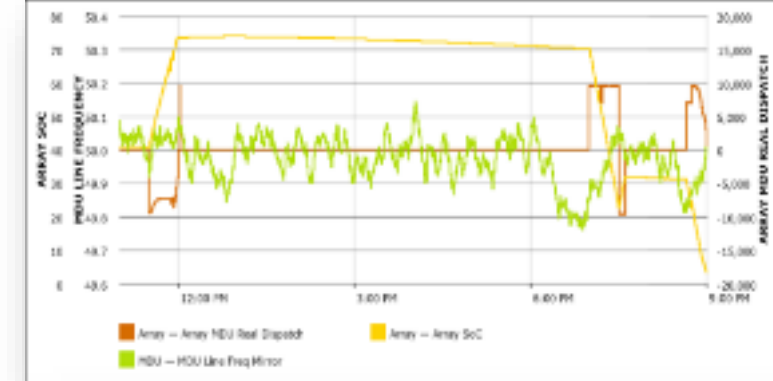
10MW/10MWh BESS- Grid connected Energy Storage Applications



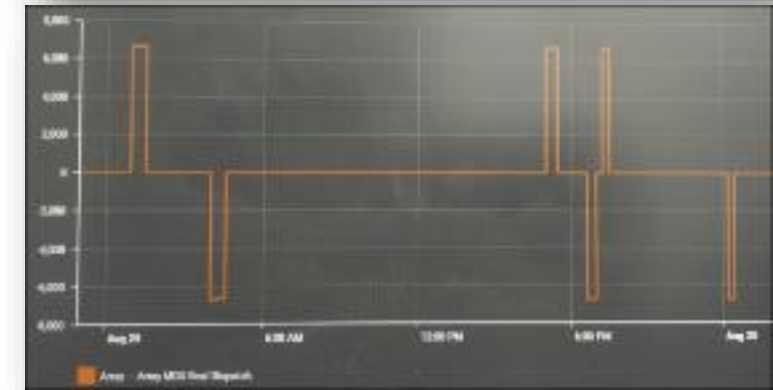
Capex
Deferral



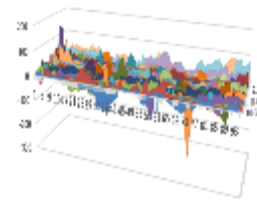
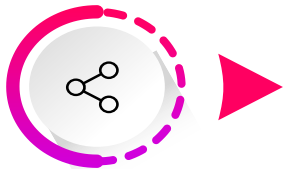
Energy Arbitrage



Peak Load Management



Black Start



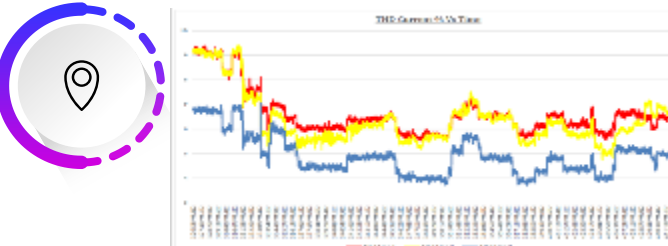
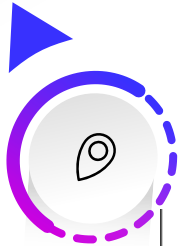
DSM



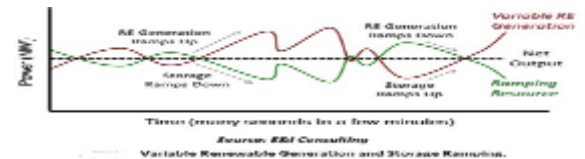
Frequency Regulation



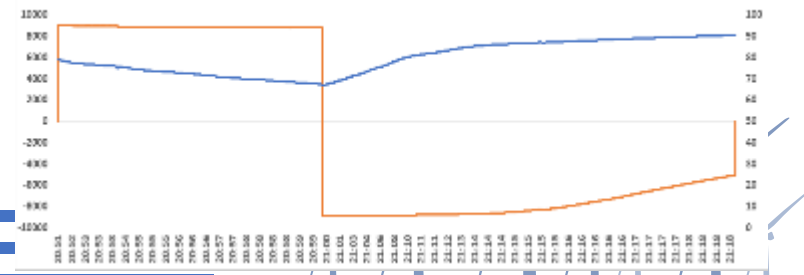
Renewable Integration



Power Quality/Reactive Power



Response of 10MW BESS during 5th April 20 Light out day



MYSINE- BTM & Roof Top applications



MYSINE - Premium



MYSINE – ECO

MYSINE		ECO	Premium	Mega
Inverter capacity	kW	3	3	10
DC kWp	kWp	3.24	4.32	10-15
Battery kWh	kWh	3	5	15-20
Price w/o tax	Rs lacs	2.71	5.03	wip
	Rs/Wp	83.64	116.44	

- Intelligent Algorithms inbuilt to Maximize the Energy optimization
- Store excess energy from Solar
- Support grid during Evening Peak for Revenue Maximisation



Behaviour Demand response –Auto grid

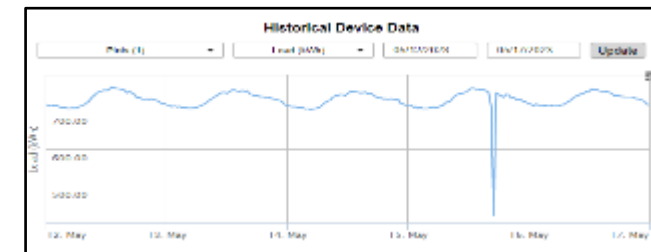


Details of completed DR Projects

Date	Time	Nos. of Consumer Participated	Total Curtailment (W.r.t. baseline consumption)	Total Incentive Amount
			(kW)	(Rs)
10-Mar-23	18:00-20:00	24,788	10012	₹ 61,022
13-Apr-23	18:00-20:00	18,285	13856	₹ 57,288
26-Apr-23	15:00-16:00	30,266	22667	₹ 60,342
15-May-23	15:00-17:00	23,579	10604	₹ 66,035
19-May-23	18:00-20:00	27,202	10544	₹ 49,089
23-May-23	18:00-20:00	27,438	9810	₹ 48,321
Total		1,51,558	77493	₹ 3,42,097



Melronia Hospitality

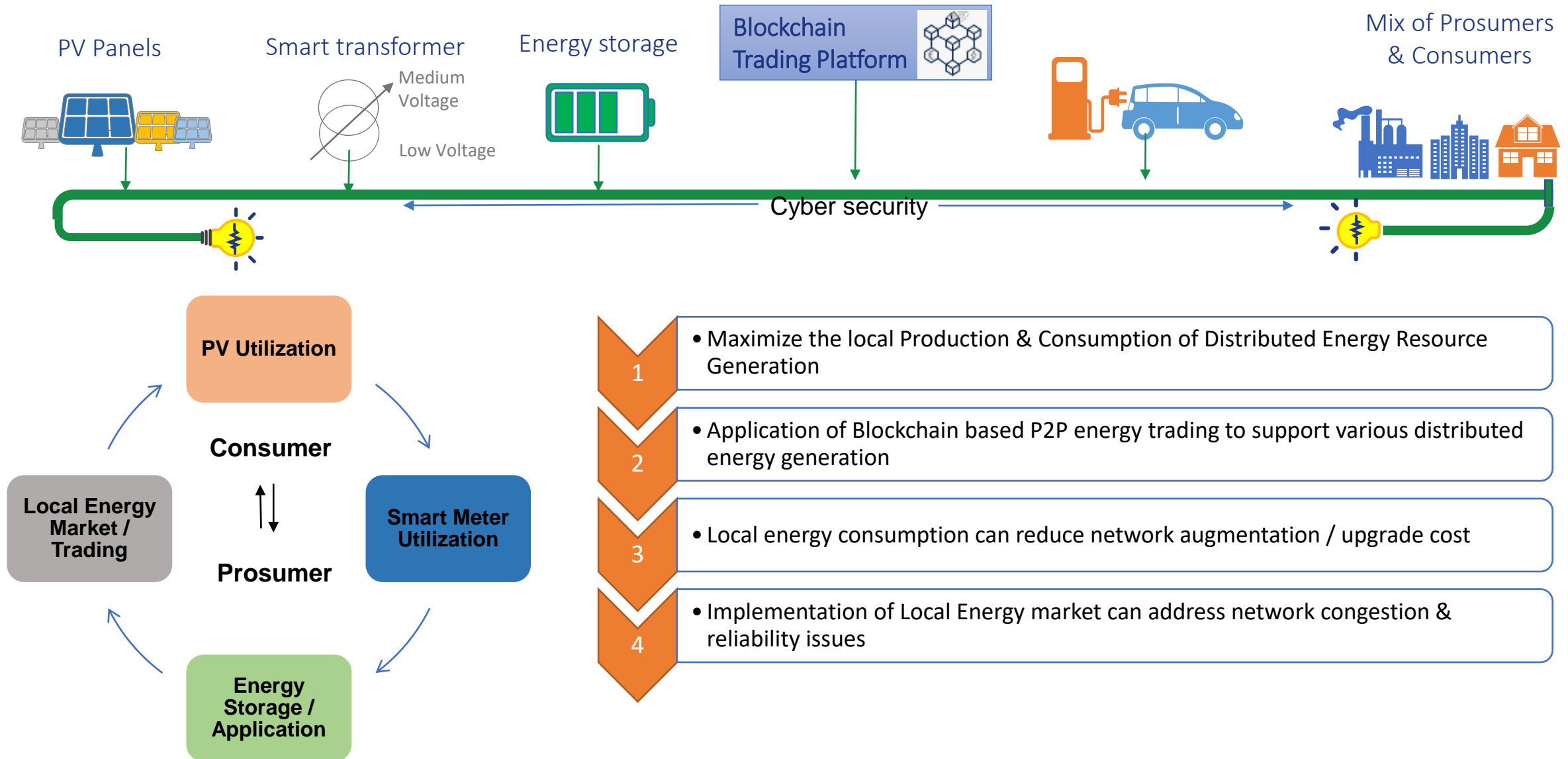


77MW load curtailed

Top contributor for DR program

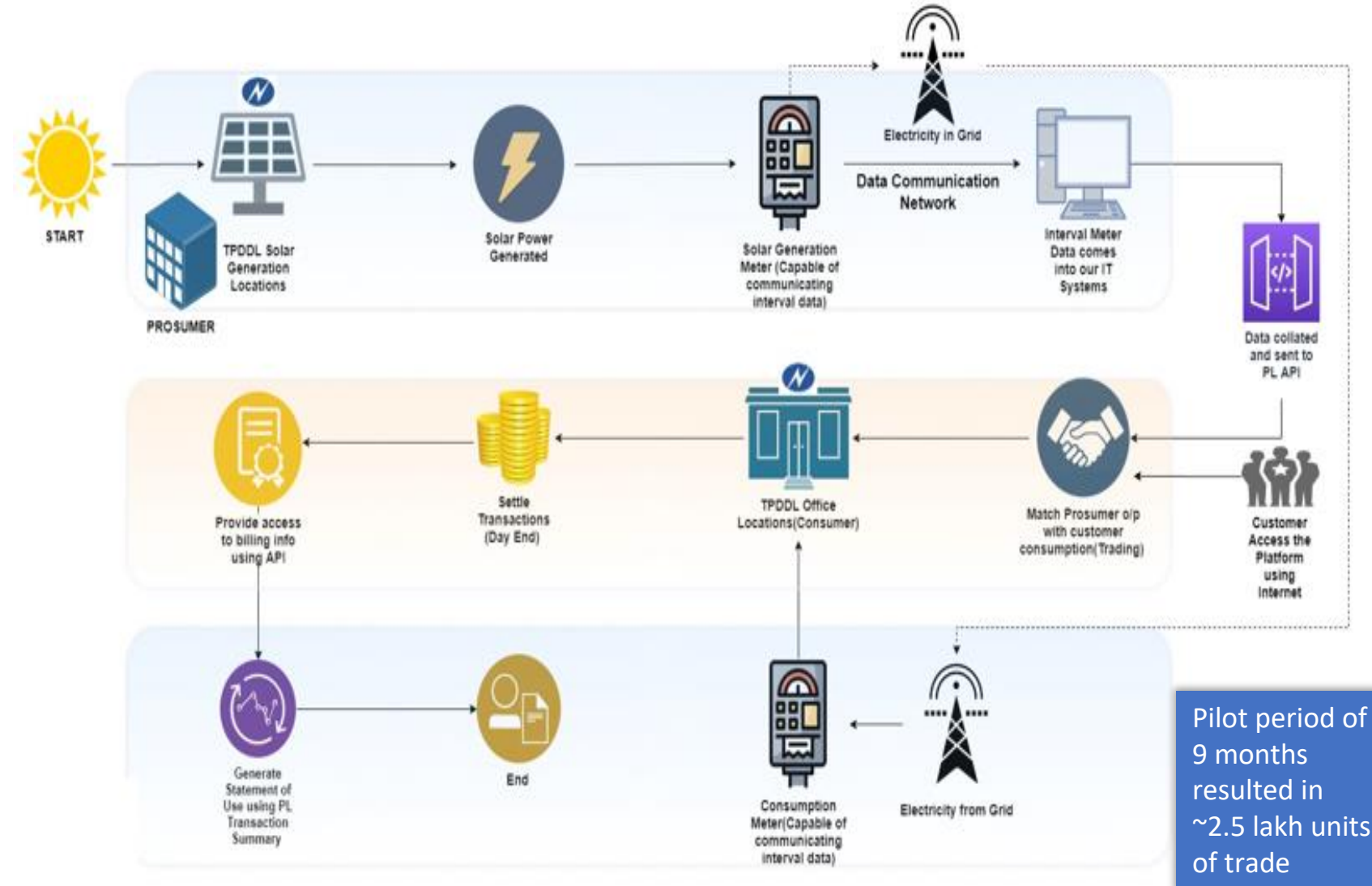


Peer to Peer Energy Trading via Blockchain



P2P Process Flow

P2P SOLAR ENERGY TRADING USING BLOCKCHAIN PILOT PROCESS FLOW



Potential Block Chain Application Areas

01

Optimizing Customer Energy Costs

Grid Settlements

02

03

Electric Vehicle Charging

Peer to Peer trading among prosumers, Distributed micro-grids

04

05

Real time power trading at the Energy Exchanges

Smart contracts for financial transactions

06

- EV projects to be considered under Ease of doing Business
- Single Window system for faster clearance of EV connection
- Conducive policy from Government to promote BESS and bringing Battery levelized cost between Rs. 5 to 6 per Kwh.
- Subsidies to consumer for promoting Behind the meter system
- Uniform Power Banking Policy across India for Open access consumers(MH,MP,GJ-Monthly; Rajasthan-Annual; UP-Quarterly)
- Approval of Peer-to-peer trading and advanced IoT technologies for DER management by Regulator.
- TOU tariff implementation by all regulator to shift the consumption towards Off Peak hours
- Fast Tracking the Transmission corridor for Green Power Project
- Finalisation of Settlement mechanism between consumer and Utility for DER support.

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THANK YOU

For discussions/suggestions/queries email: dum@indiasmartgrid.org

www.isuw.in

[Links/References \(If any\)](#)

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