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# India SMART UTILITY Week 2025

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## JOINT INDONESIA-INDIA SMART ENERGY WORKSHOP

Smart Grids, Renewable Energy, Electric Mobility, and Smart City Solutions

*Presented By*

*Mr. Subhadip Raychaudhuri, Additional General Manager, Tata Power-DDL*



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# Performance in past 20 years



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





























































































































































Parameter	Unit	July 2002	March 2024
<b><u>OPERATIONAL PERFORMANCE</u></b>			
AT&C Losses	%	53.1	5.92
System Reliability – ASAI -Availability Index	%	70	99.9
Transformer Failure Rate	%	11	0.68
Peak Load served	MW	930	2481 (as on 18 June 2024)
Length of Network	Ckt. km	6750	14250
Street Light Functionality	%	40	99.6
Smart Meters Installed	Lakh	0	4.99
<b><u>CONSUMER RELATED PERFORMANCE</u></b>			
New Connection Energisation Time	Days	51.8	3
Meter Replacement Time	Days	25	3
Mean Time to Repair Faults	Hours	11	0.67
Consumer Satisfaction Index	%	-	97.8

## TATA POWER-DDL IS CERTIFIED WITH

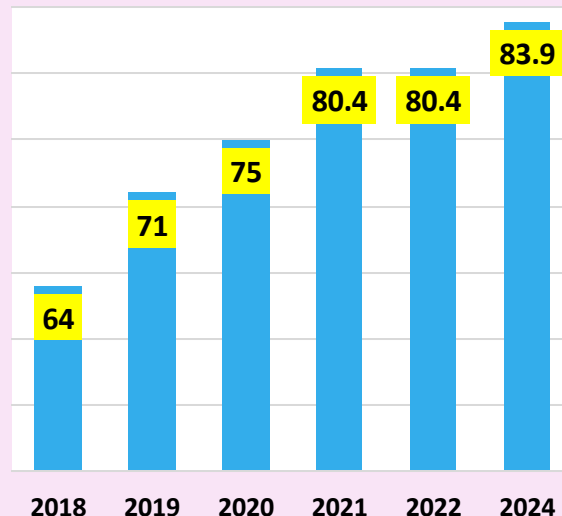
ISO 9001:2015	ISO 14001:2015	OHSAS 18001:2015	ISO 27001:2005	SA 8000 : 2008	EMS 50001:2018
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# Smart Grid Index 2024 (by Singapore Power)

Benchmarks a total of 92 utilities across 36 countries / markets

Utilities	Country/Market	Score %	Best Practices
Enedis	FRA	98.2	      
TaiPower	TWN	96.4	      
UKPN	GBR	96.4	      
CitiPower & Powercor	AUS	94.6	      
DEWA	ARE	94.6	      
State Grid Shanghai	CHN	94.6	      
ConEd	USA	92.9	      
SP Energy Networks	GBR	92.9	      
State Grid Beijing	CHN	92.9	      
WPD	GBR	92.9	      
Guangzhou Power	CHN	91.1	      
Shenzhen Power	CHN	91.1	      
ENWL	GBR	89.3	      
Northern Powergrid	GBR	89.3	      
SDGE	USA	89.3	      
TEPCO	JPN	89.3	      
ComEd	USA	87.5	      
SSEN	GBR	87.5	      
Stedin	NLD	87.5	      
Duke Energy	USA	85.7	      
FPL	USA	85.7	      
SCE	USA	85.7	      
BGE	USA	83.9	      
CLP	HKG	83.9	      
Chubu	JPN	83.9	      
e-distribuzione	ITA	83.9	      
i-DE	ESP	83.9	      
Jemena	AUS	83.9	      
LADWP	USA	83.9	      
PG&E	USA	83.9	      
PEPCO	USA	83.9	      
Tata power-DDL	IND	83.9	      
United Energy	AUS	83.9	      

Tata Power-DDL- Smart Grid Index Score trend (↑)



- Best Practice in 'Monitoring & Control' in 2018 rating
- Best Practices in 4 areas in 2024 - Monitoring & Control, Green Energy, Security, and Customer Empowerment & Satisfaction



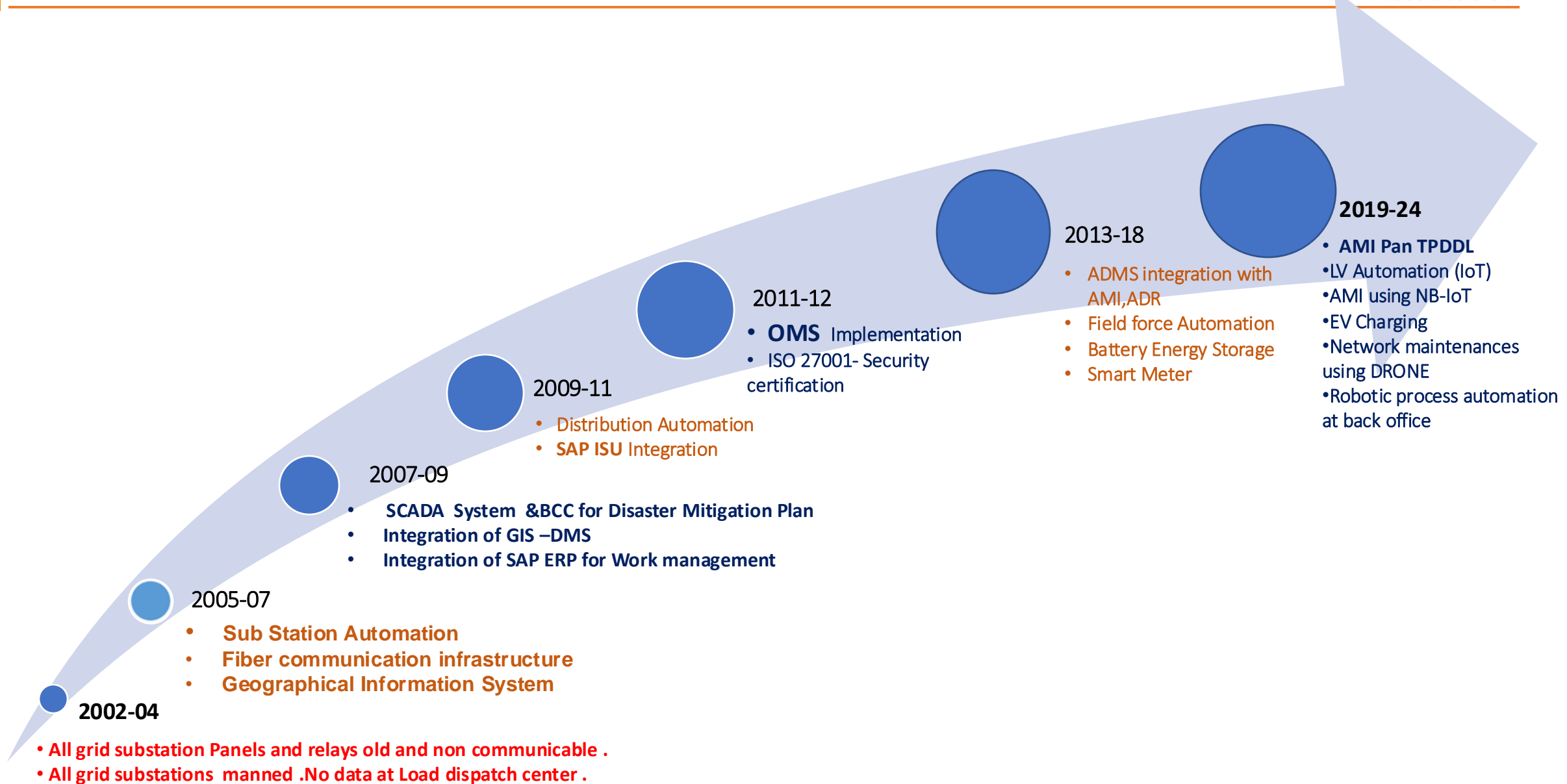


# The Technology Journey so far ...



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**Vision** → Empower a billion lives through **Sustainable**, **Affordable** and **Innovative** energy solutions.

## Current Portfolio Capacity ~ 14.3 GW

### Thermal & Hydro

**9032.5 MW**  
Thermal\*  
(Installed capacity)

**880 MW**  
Hydro  
(Installed capacity)

**443 MW**  
Waste Heat / BFG  
(Installed capacity)

### T&D

**4194 ckt km**  
Transmission  
(Line length)

**12.9 million**  
Distribution  
(No. of customers)

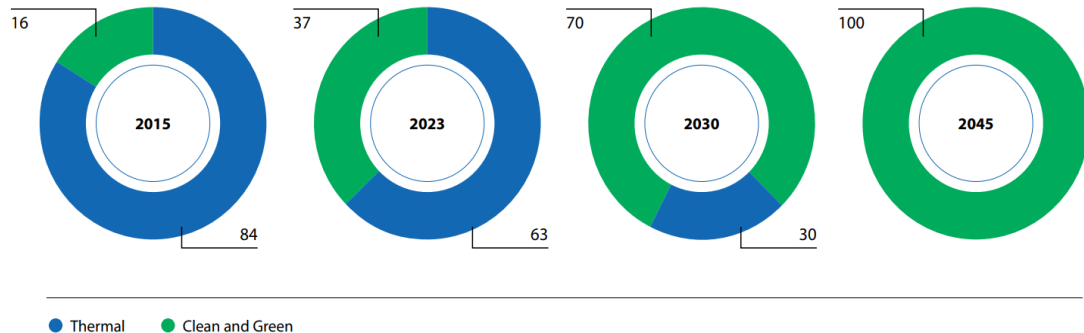
### Renewables

**932 MW**  
Wind  
(Installed capacity)

**3136 MW**  
Solar  
(Installed capacity)

**1,314 MW**  
Solar & Hybrid  
(Capacity under construction)

### Evolving Generation Mix (%)



### EV Charging

Over 3700+ points in  
350+ cities



### Rooftop Solar

1650+ MW, 275+ districts



### Solar Pumps

60,000+ pumps



### Microgrids

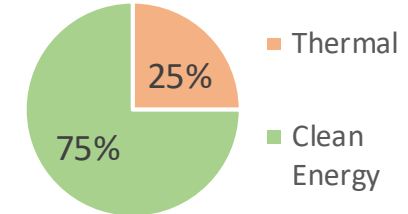
194+ Microgrids



### Home Automation

40000+ units sold

## Future Targets



**30 GW**  
Capacity  
in 2027



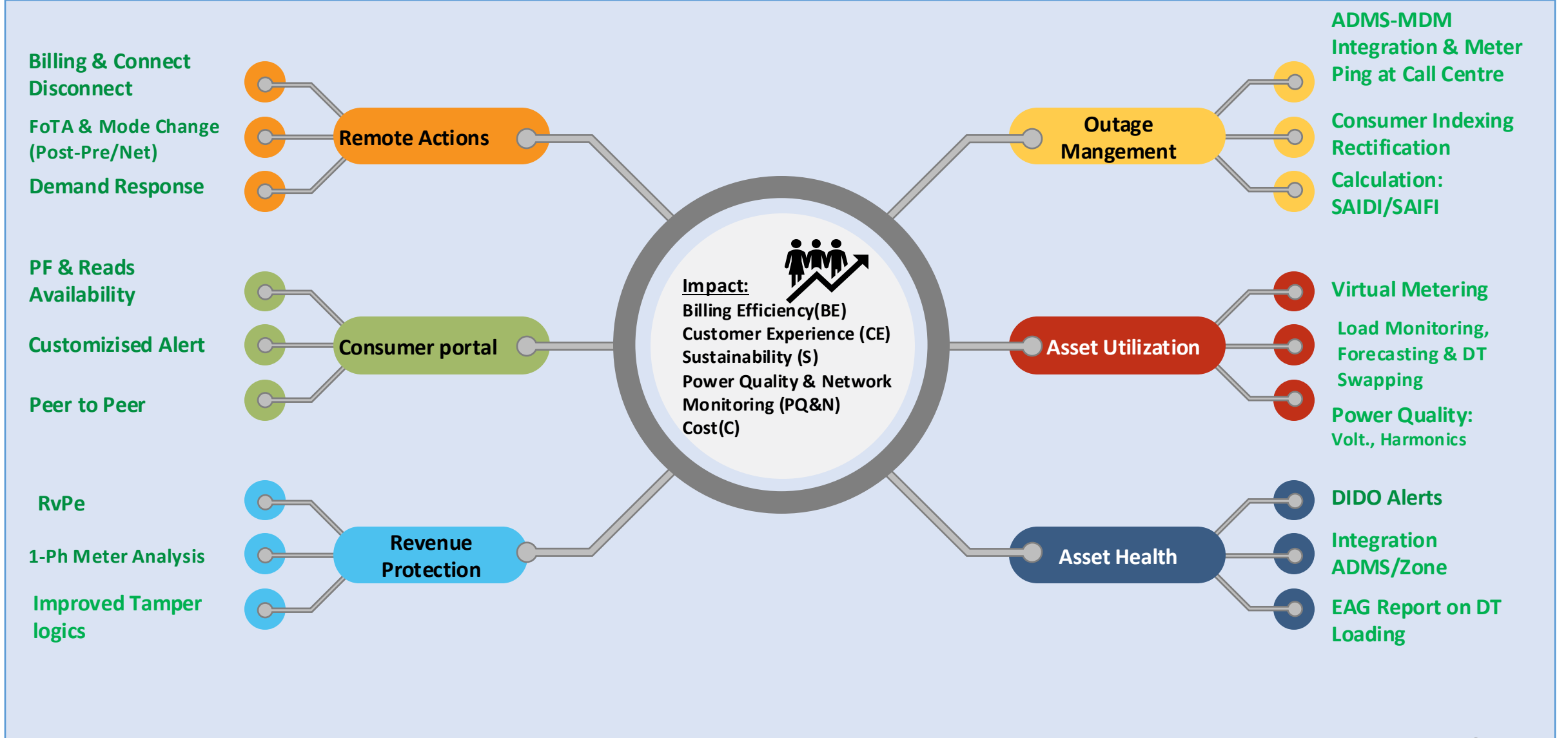
**Water**  
Neutral  
by 2030



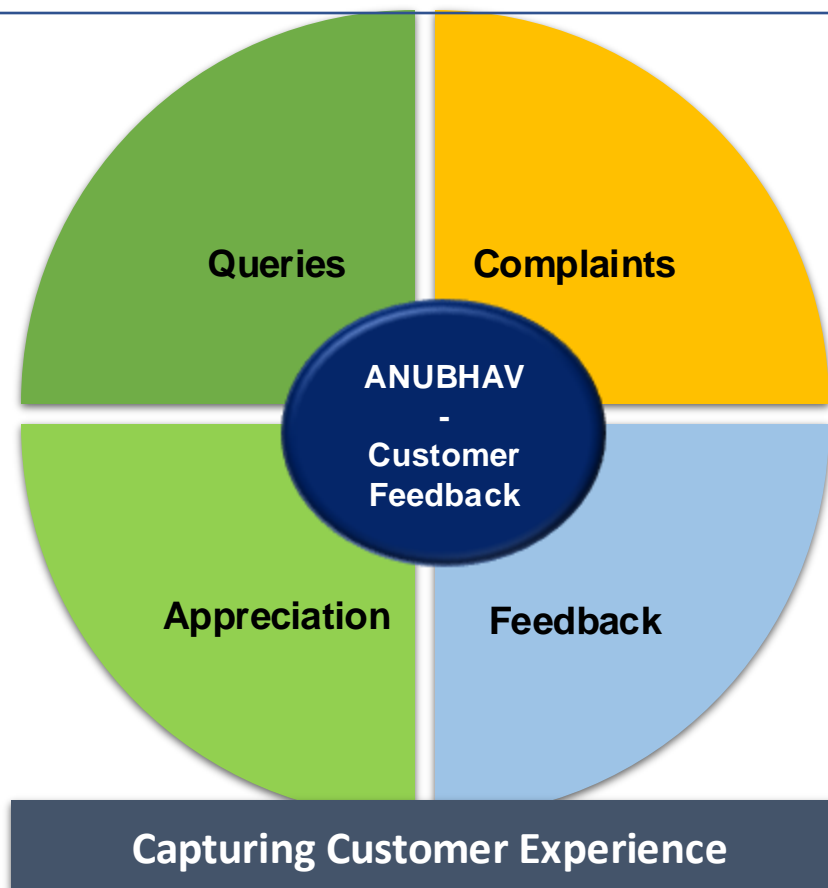
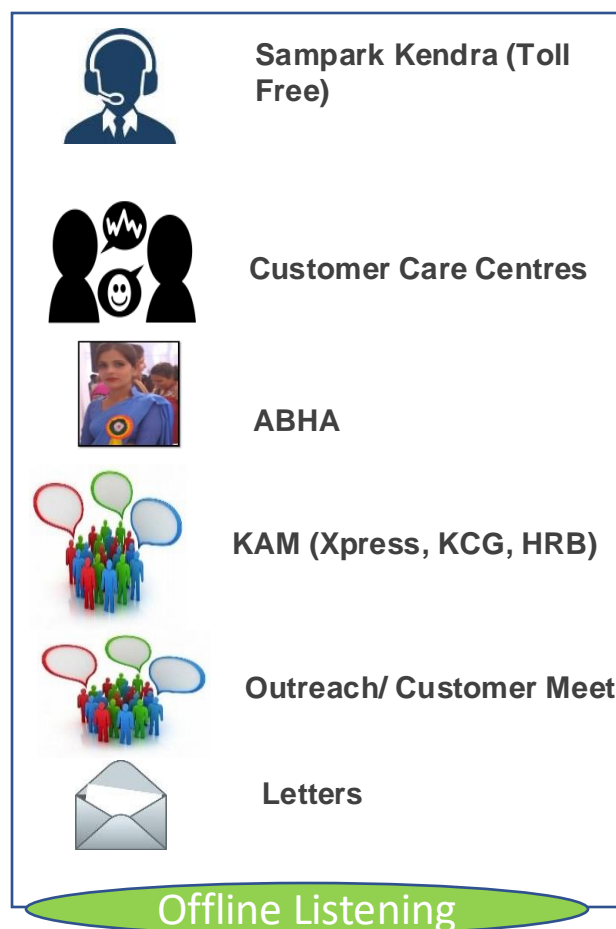
**Zero**  
Waste to  
Landfill  
by 2030

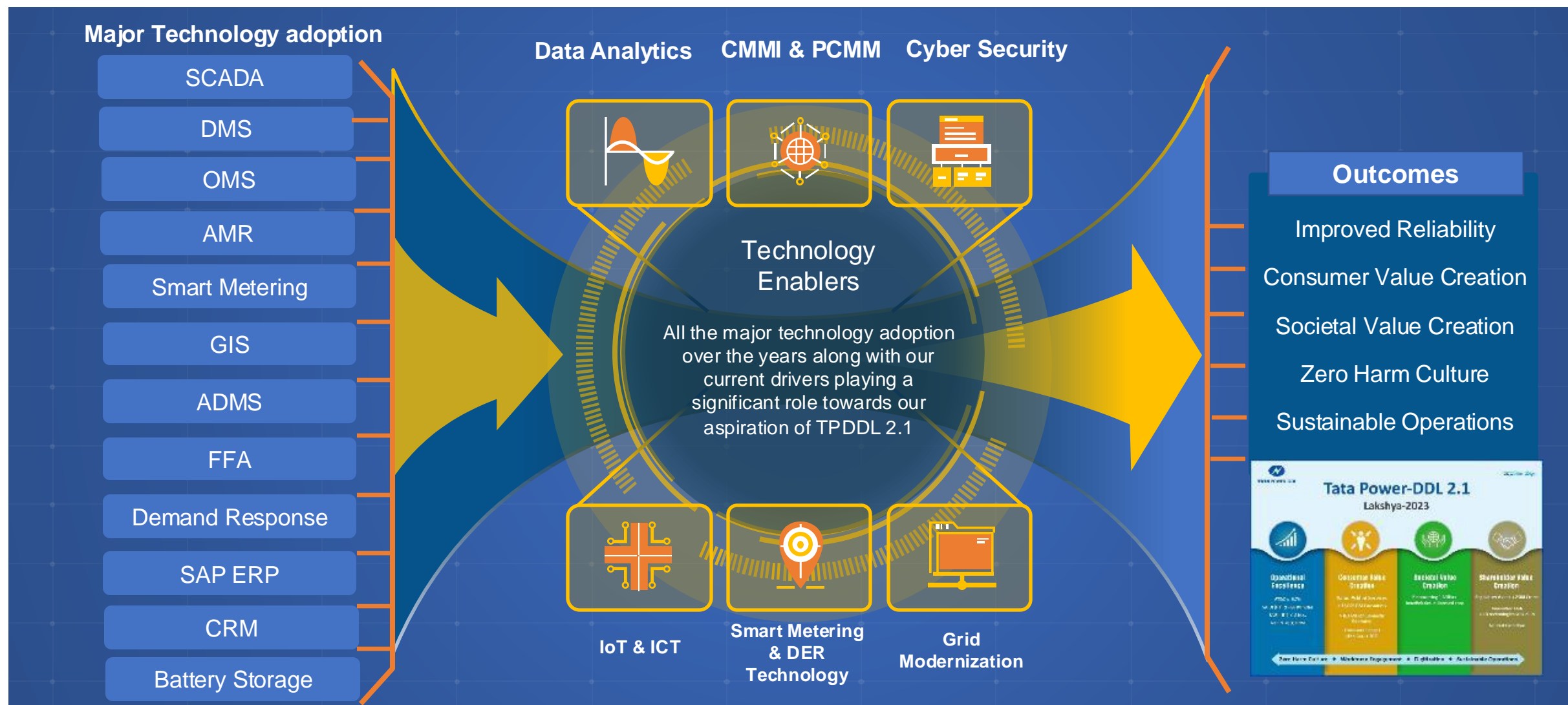


**Carbon Net Zero**  
by 2045



# Customer Listening & Learning – Customer Portals

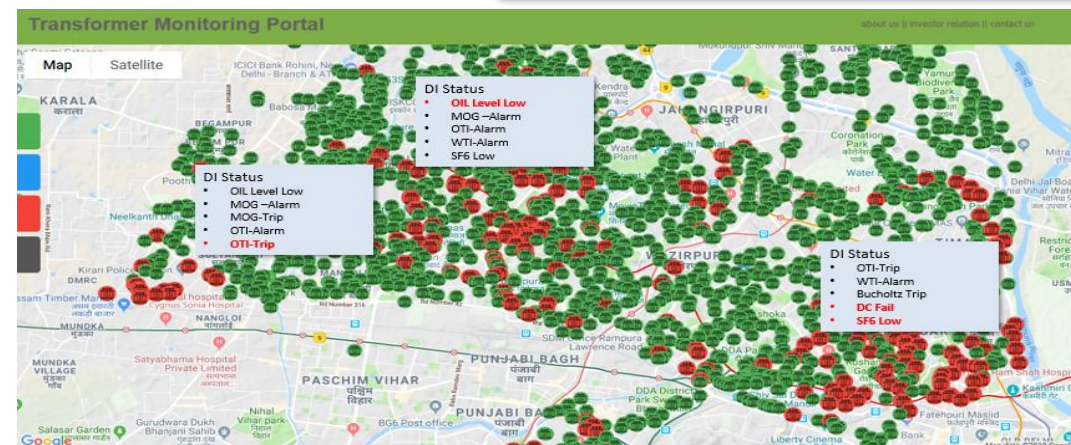
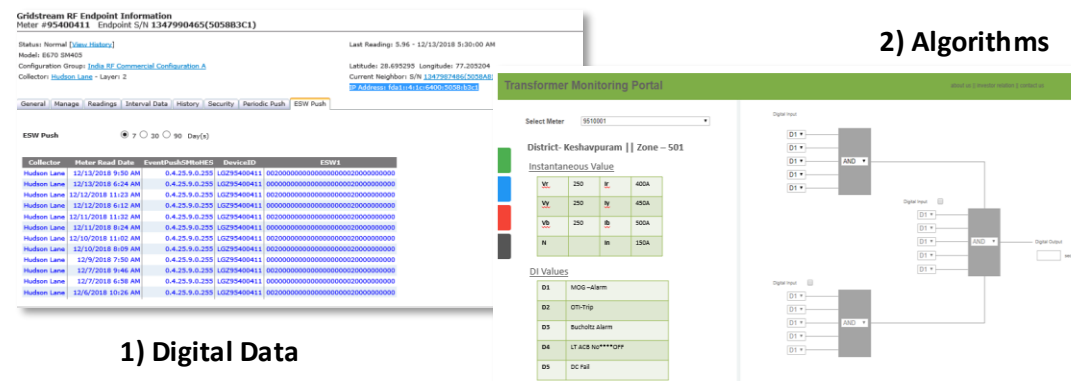






## Application

### At the Backend Servers (Network Operation Center)



### 3) Runtime visual representation to the (24X7) Network Operation Team

# Automation at TPDDL Contact Centre



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**Inbound Calls**  
– IVRS (handling 65% of total calls)



**Social Media**  
-Integrated with Omni channel



**WhatsApp Service**  
-Integrated with bot (handling 26% of total chats)



**Outbound Calls**  
-Predictive Dialer



**Emails**  
- Email Bot (46% use cases covered)



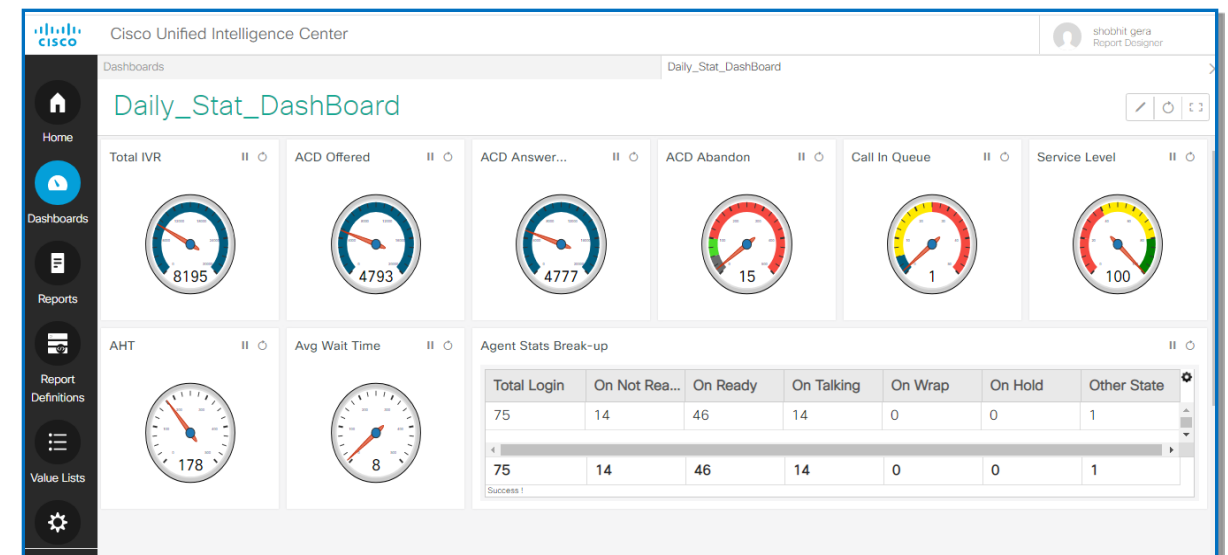
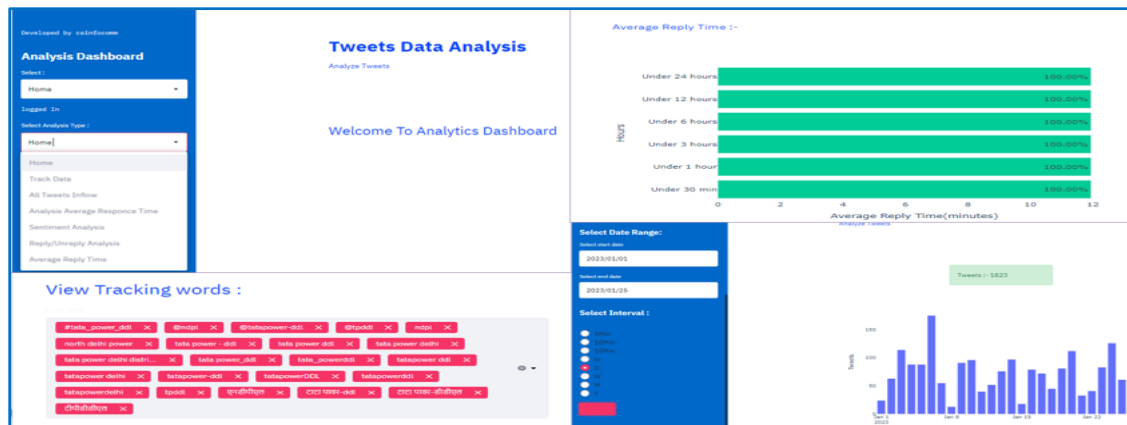
**Missed Call Service (96196 19124)**  
-For Power Supply related complaints



**Chat**  
- Chatbot (handling 95% queries)

Contact Centre Live Monitoring Dashboard

Social Media Real Time Dashboard Monitoring



# Key Themes and Focus Area



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**MR HAPPY CUSTOMER**







# We Serve

2000+ Users

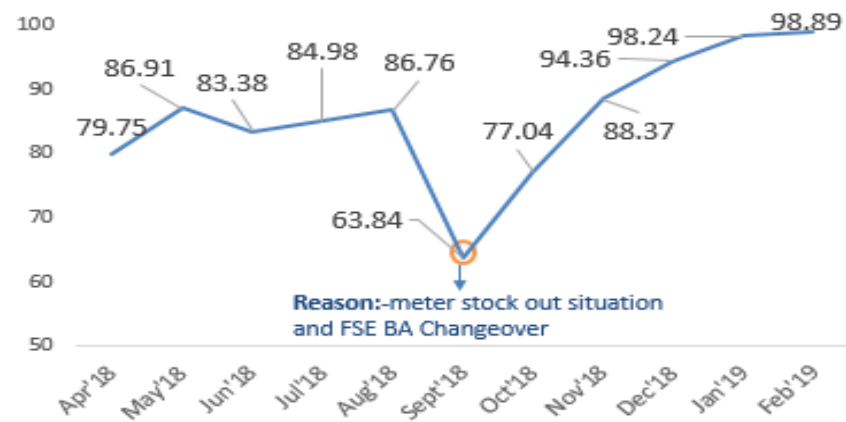
24x7 Customer  
Services

2.1 Million Customers

Financial Saving ~ **0.25 Cr.**

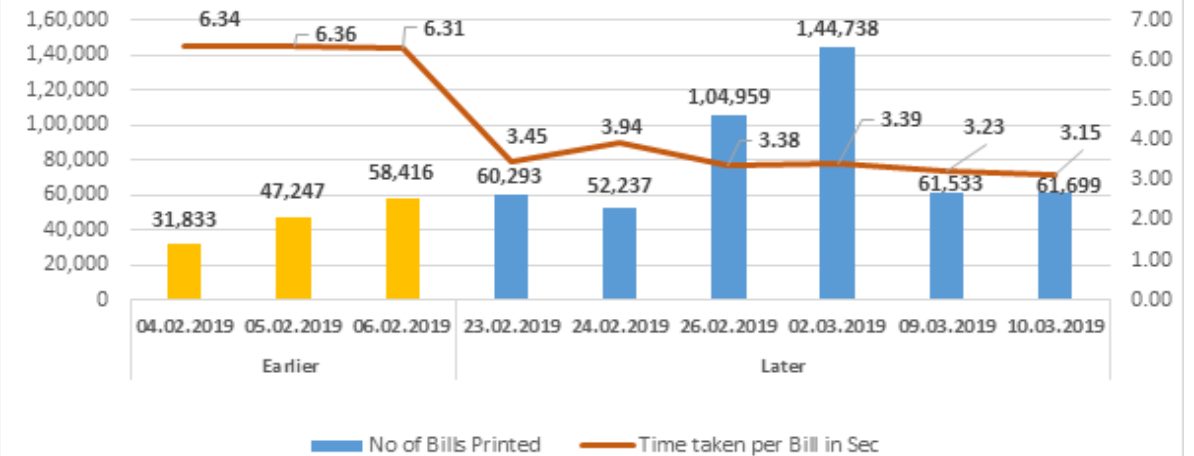
## Overall New Connection PA Compliance

PA improved from 63% (Sept 18) to 98.24% (Jan 19)



Overall New Connection PA Compliance~98%

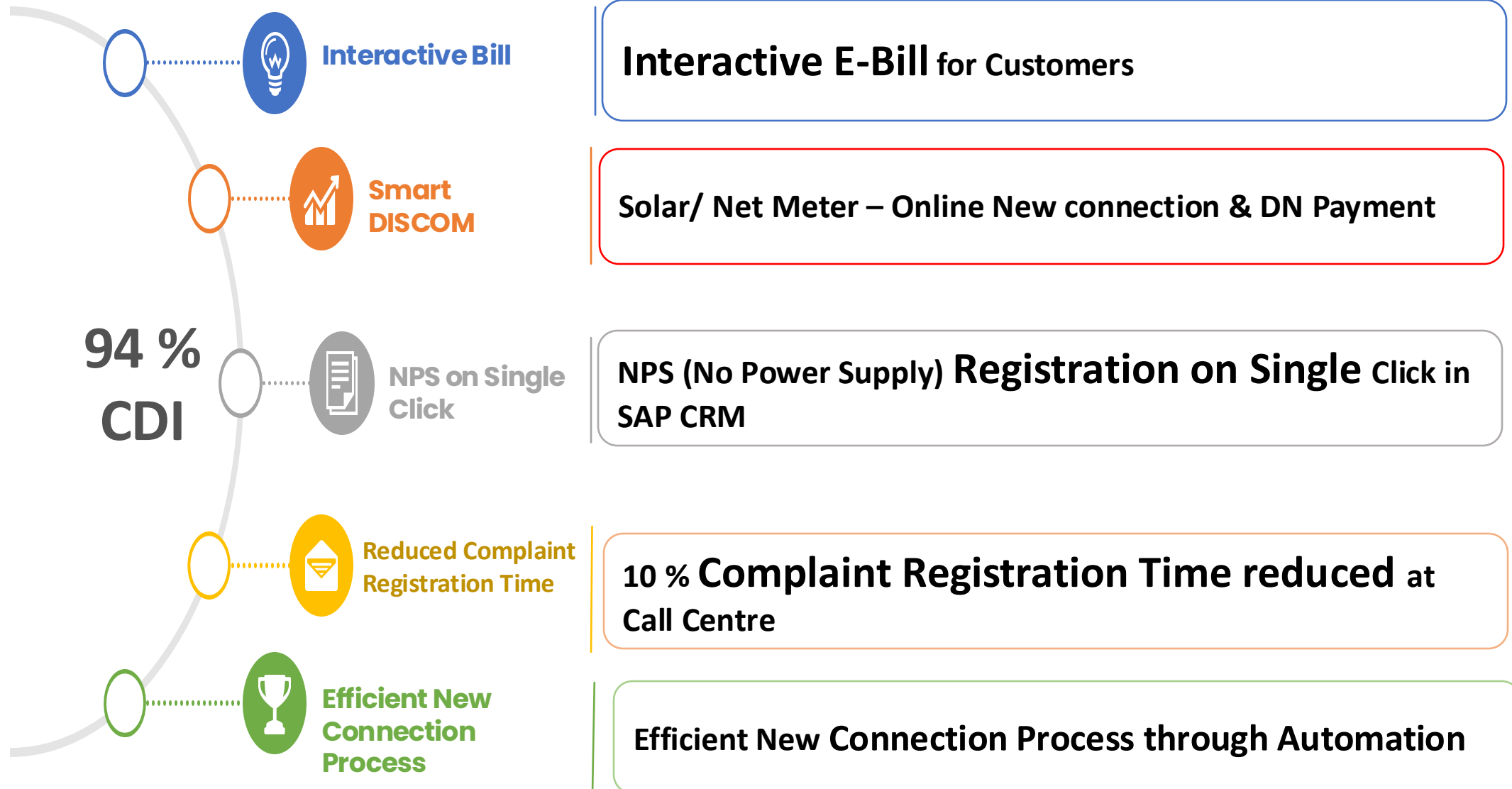
## Bill Printing Time Calculation



## System Performance Improvement in Billing Activity

SAP License Saving~ **40**



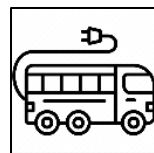
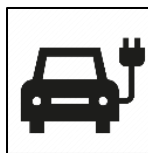
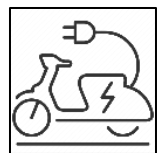


# Push towards Electric Mobility



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FY20

0.9%

22%

0.1%

1.5%

FY21

1%

16%

0.2%

14%

FY22

1.7%

41%

0.6%

19%

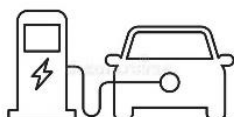
Growth of EV in past 3 years



Segment	Sub segment	EV Penetration %	
		2025	2030
2W	Scooters	15 - 25%	50 - 70%
	- B2B	40 - 60%	60 - 80%
	- B2C	13 - 18%	40 - 60%
	Motorcycles	1 - 2%	10 - 20%
	<b>Overall</b>	<b>7 - 10%</b>	<b>25 - 35%</b>
3W	<b>Overall</b>	<b>35 - 45%</b>	<b>65 - 75%</b>
4W - PV	Personal	1-3%	10-15%
	Commercial	5-10%	20-30%
Buses	STUs	15%-25%	25%-40%

Projected growth in FY25 and FY30

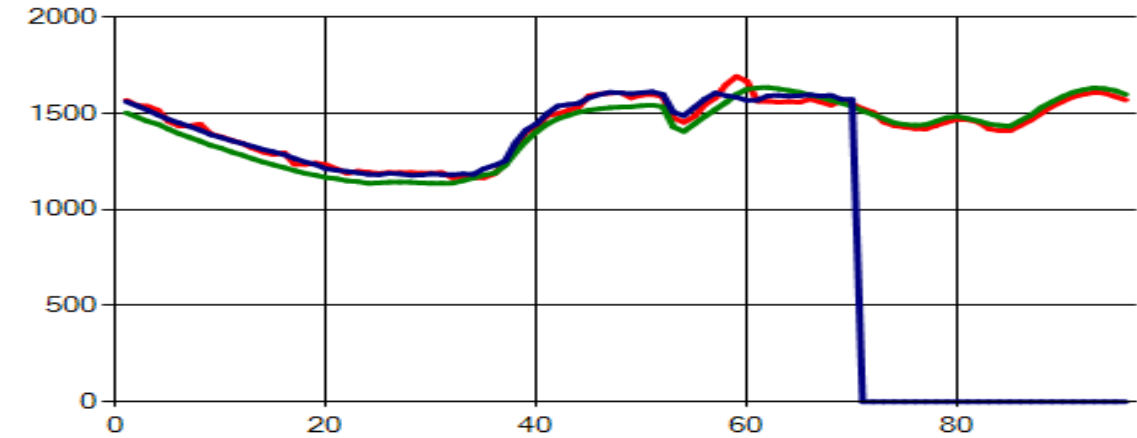
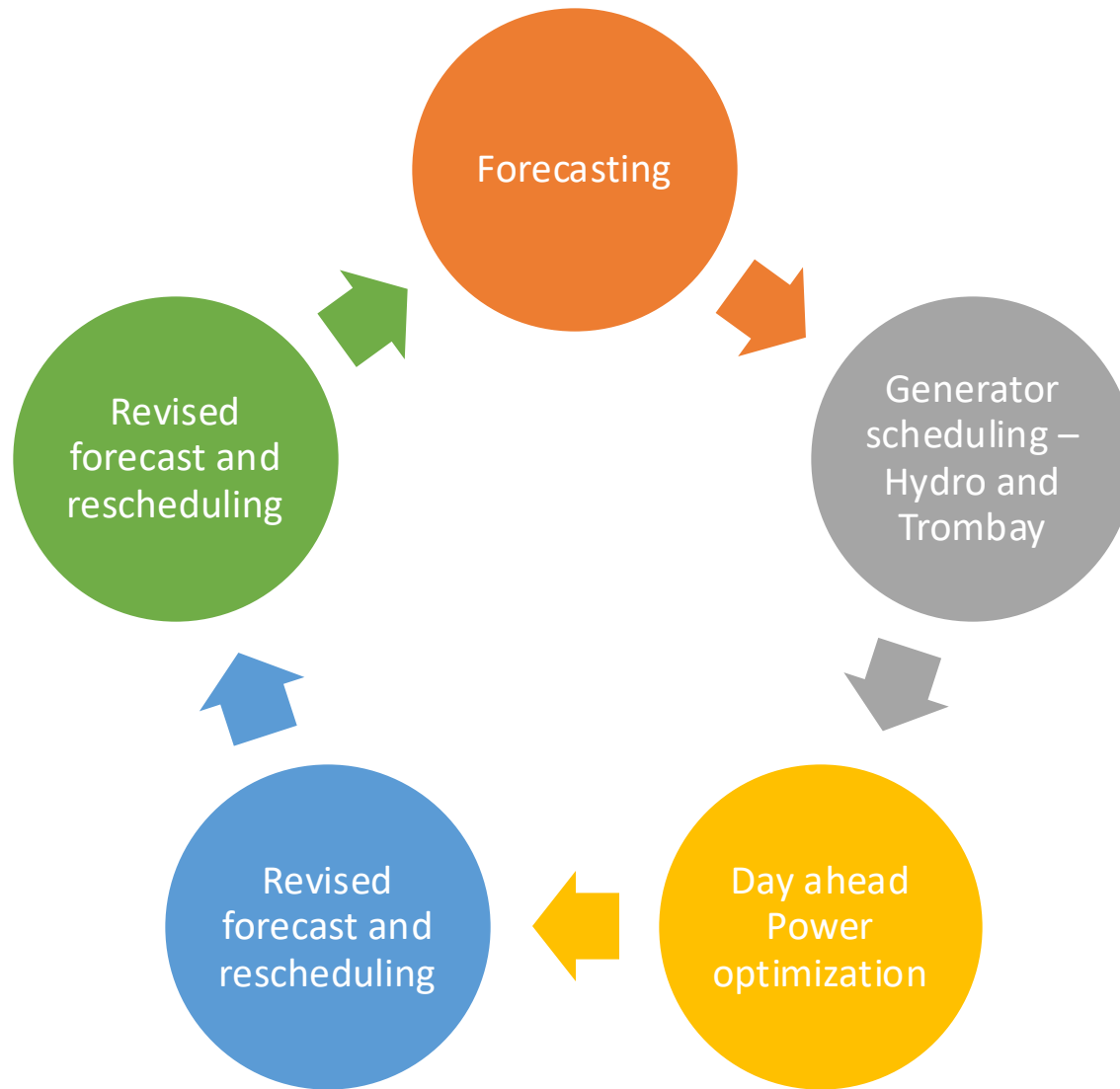
2030  
Target



30% penetration of Electric Vehicles in transportation network

Schemes to promote EV  
adoption in India



- ❖ Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) – I & II
- ❖ PLI Scheme for Advanced Chemistry Cell Battery
- ❖ National Electric Mobility Mission Plan
- ❖ National Mission on Transformative Mobility and Battery Storage
- ❖ State level EV policies





SLDC Drawl Schedule  
Forecasting Data  
Unrestricted Demand

Net DSM : -257656.70  
Total ADSM : -5907.66

Dash-board

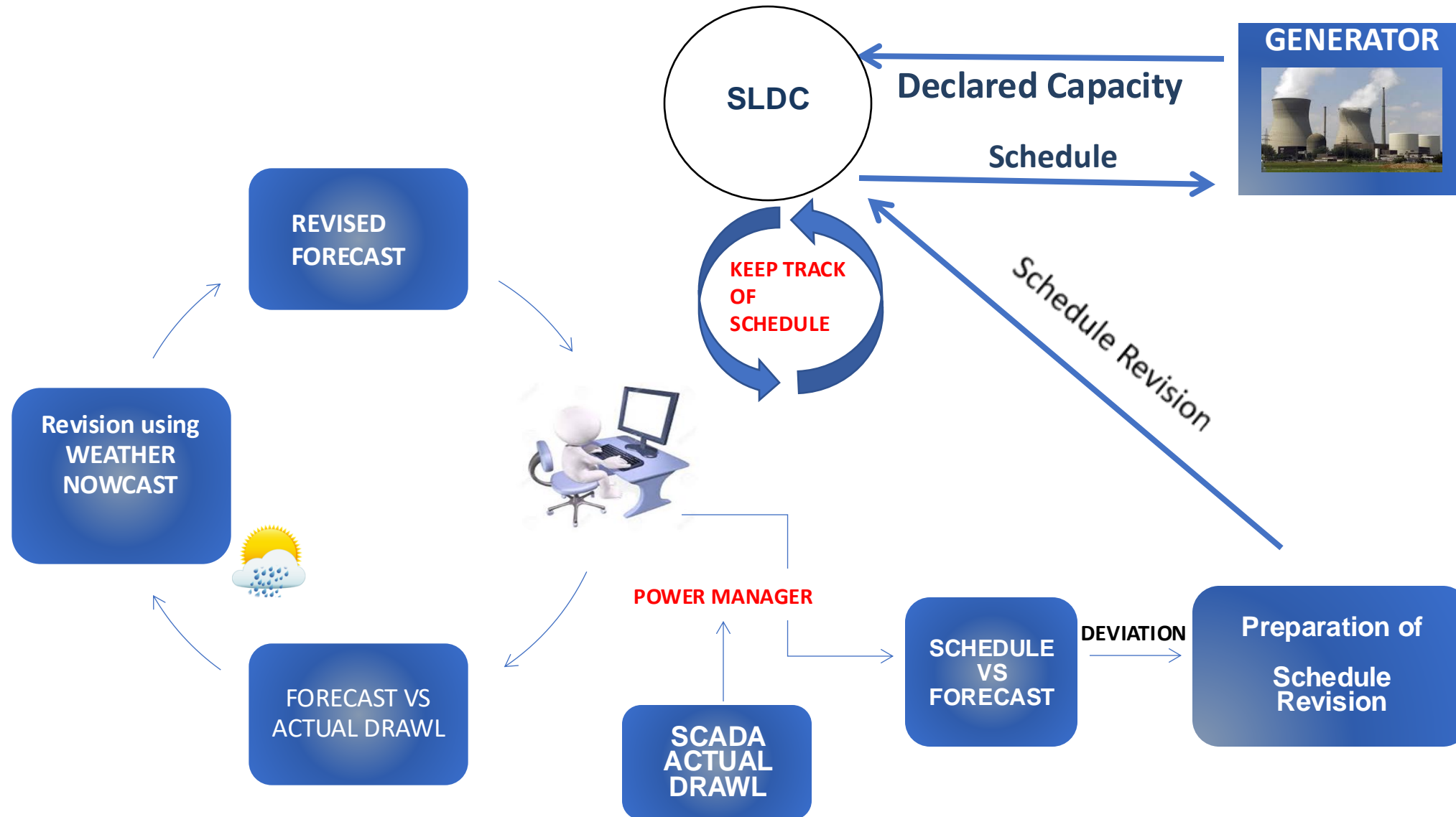
DSM Rate for to Update DSM Rat

Last Data saved at : 05-Aug-2019 05:25:31 PM

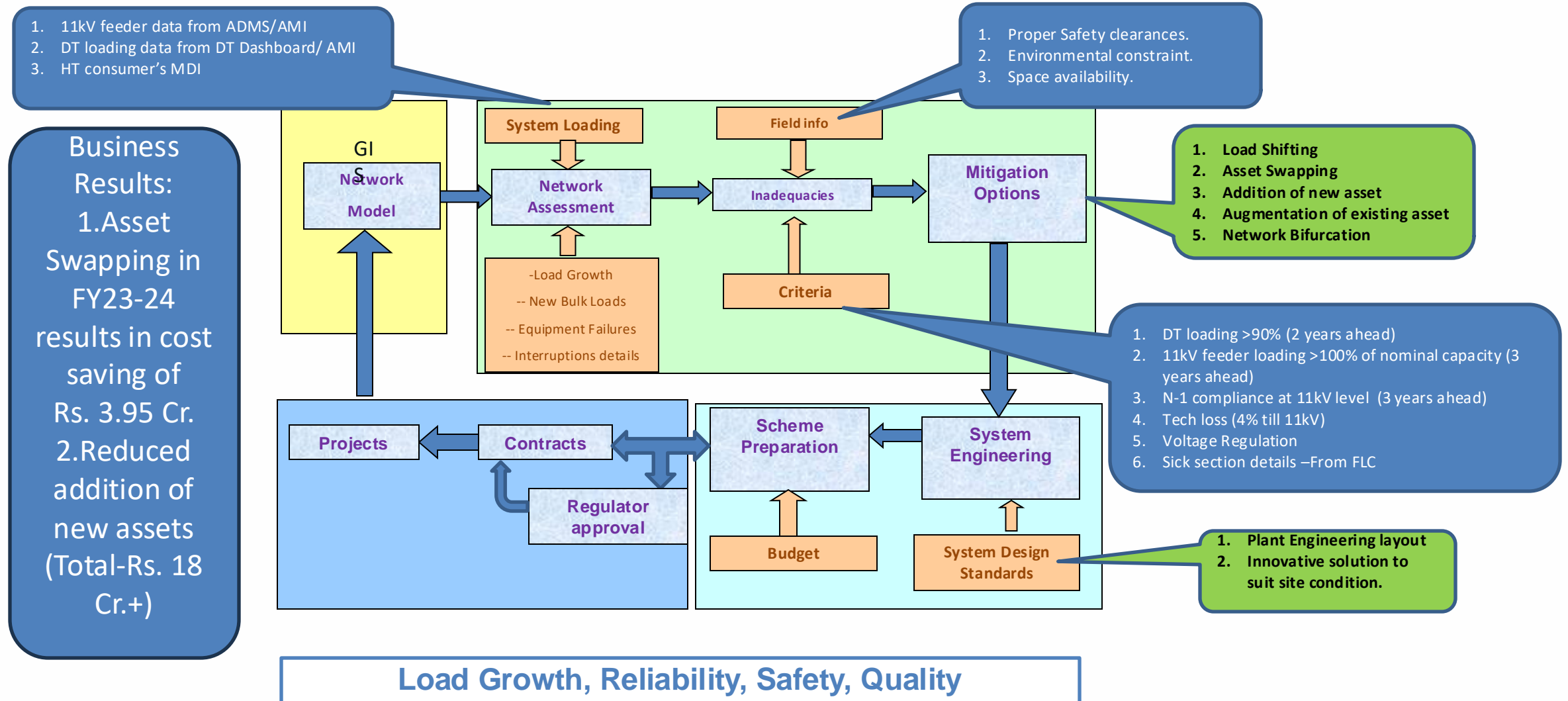
SLDC Latest Revision is 61 at 05-Aug-2019 04:24:17 AM

Scada Actual D

Slots	SLDC Drawl Schedule	Forecast	Actual Drawl	Freq/DSM Rate	Correcter	LS	Unrestricted Demand	Predicted OD/UD	Actual OD/UD	Forcast Error	DSM	ADSM
00:00-00:15	-	1504	1560.89	50.02/216	0.97	0	1561.86	-1504	-1561.86	57.86	-843404.4	-813488.4
00:15-00:30	-	1482	1538.96	50.03/144	1.82	0	1540.78	-1482	-1540.78	58.78	-554680.8	-534736.8
00:30-00:45	-	1460	1517.09	50.08/0	1.22	0	1518.31	-1460	-1518.31	58.31	0	0
00:45-01:00	-	1445	1491.37	50.05/0	1.57	0	1492.94	-1445	-1492.94	47.94	0	0
01:00-01:15	-	1419	1468.23	50.06/0	1.86	0	1470.09	-1419	-1470.09	51.09	0	0
01:15-01:30	-	1396	1449.88	50.03/144	1.53	0	1451.41	-1396	-1451.41	55.41	-522507.6	-502563.6
01:30-01:45	-	1376	1432.12	50.02/216	1.47	0	1433.59	-1376	-1433.59	57.59	-774138.6	-744222.6
01:45-02:00	-	1357	1412.34	50.02/216	1.73	0	1414.07	-1357	-1414.07	57.07	-763597.8	-733681.8
02:00-02:15	-	1335	1389.56	50.02/216	1.24	0	1390.80	-1335	-1390.80	55.80	-751032	-721116



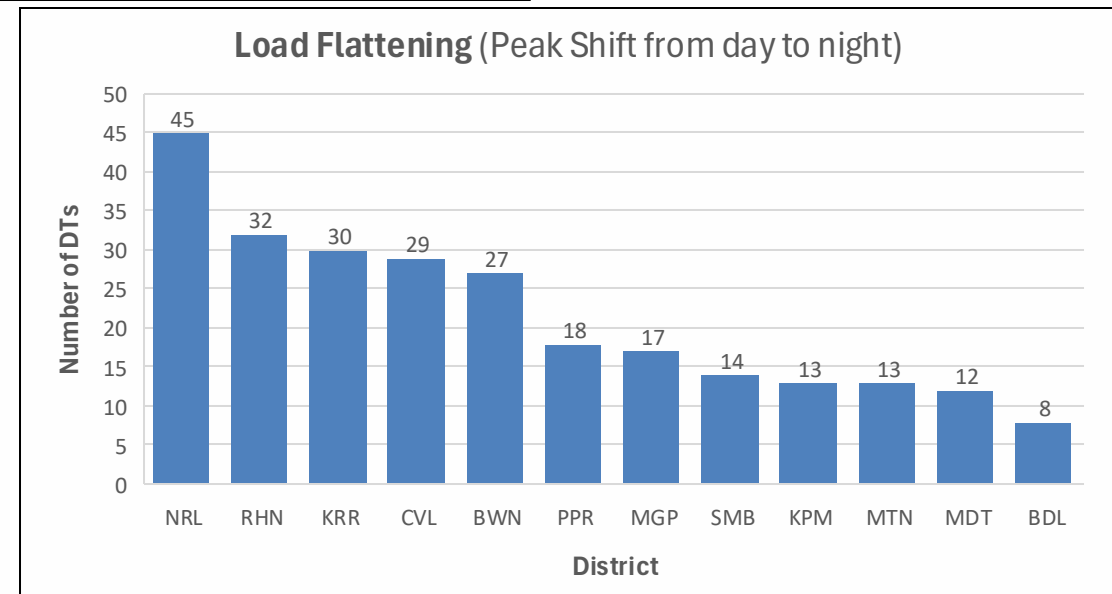
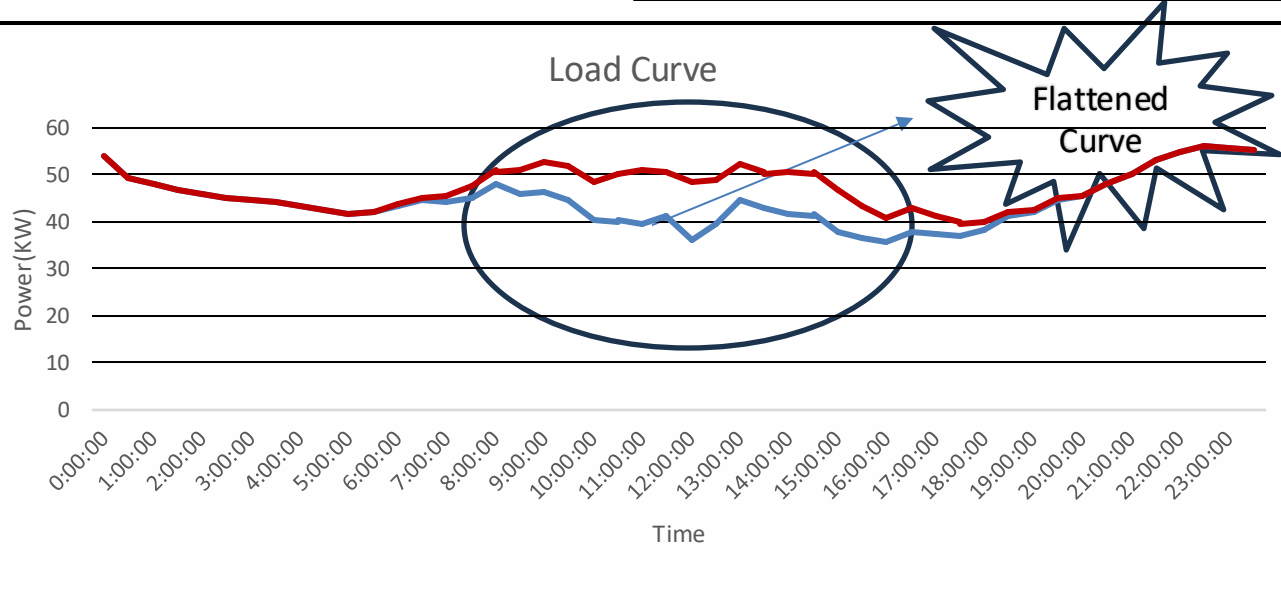
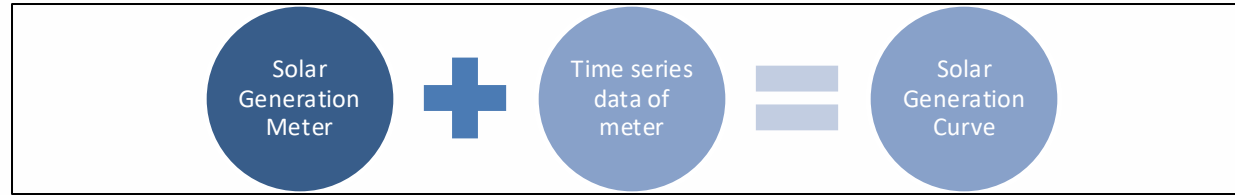




## DER Dashboard

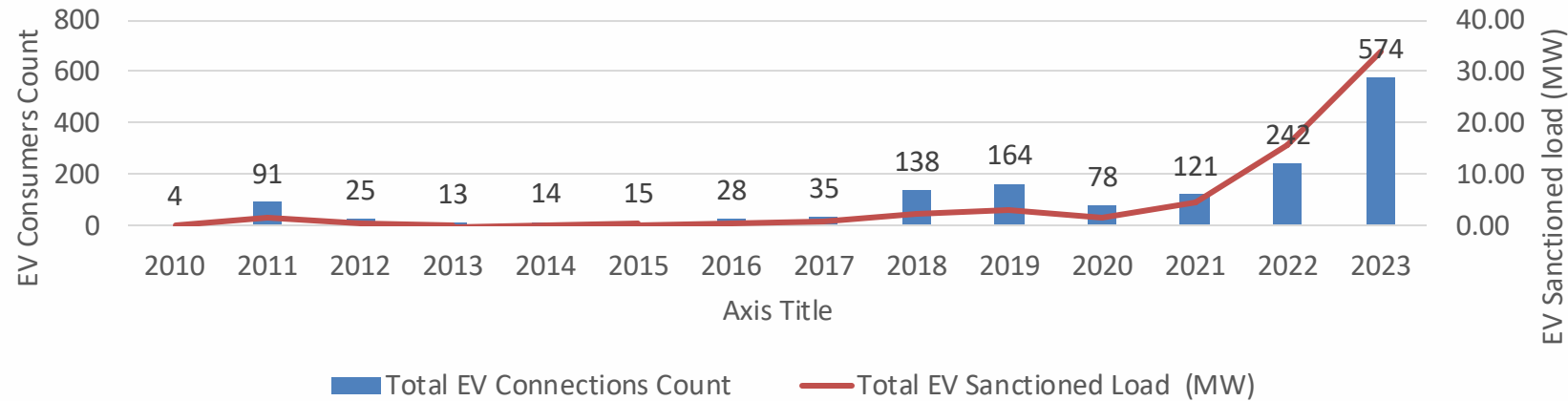
### Huge inflow of Solar connections: Change in Planning Philosophy

- Dashboard is required to have PV generation curve i.e. Summation of smart solar generation meter data with time stamping with respect to DT.
- Graph of solar generation with respect to DT loading and cumulative graph with updated DT loading for 30 min slot.
- Solar generation against DT (KVA) and 11 kV feeder(A) slot wise for 30 mins slot.



# EV Stations – Study in load profiling

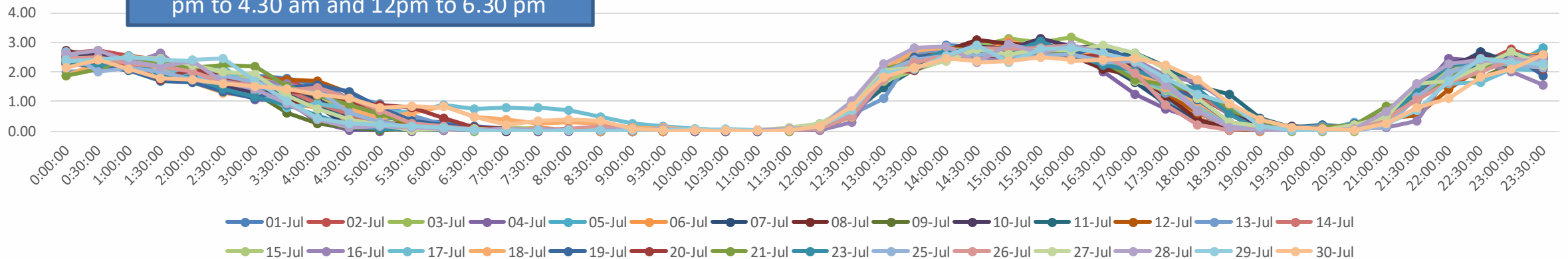
Year-wise EV Connections Trend



- Total EV connections = 1952 nos. (till Aug'24)
- Total sanctioned load = 76.43MW (till Aug'24)
- 8 nos. connections released for Delhi Transport (47.85MW).
- 1 no. connection released for DMRC (2.5MW)

Majorly same load run during from 9.30 pm to 4.30 am and 12pm to 6.30 pm

EV Station Loading Curve



# Revolutionize Business Visibility



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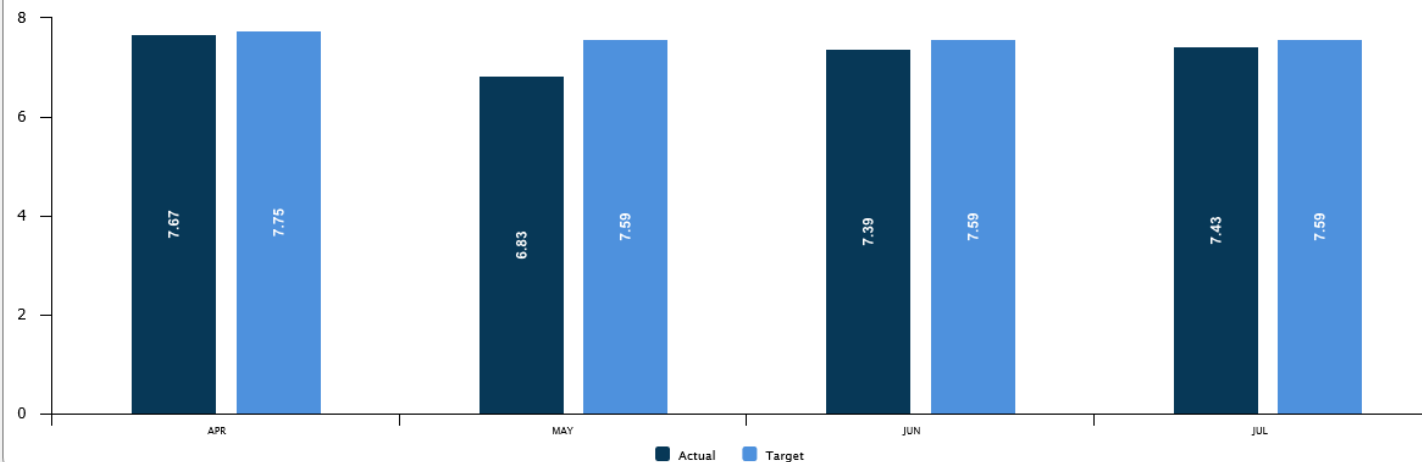
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## AT&C Loss

with you Non-Stop

2019-20 2018-19 2017-18 2016-17 2015-16

Actual Vs Target (%) For 2019-20



Compliance wrt Target (%) For APR 2019-20



Compliance wrt LFY (%) For APR 2019-20



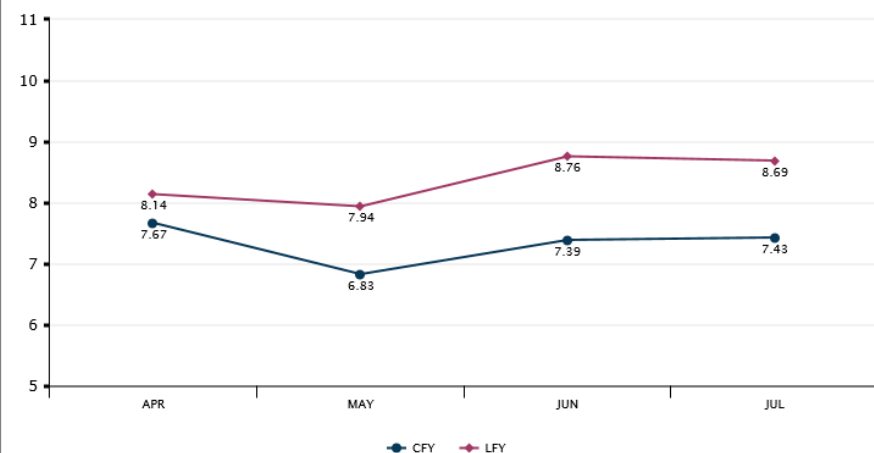
Billing Efficiency (%) For APR 2019-20

92.18

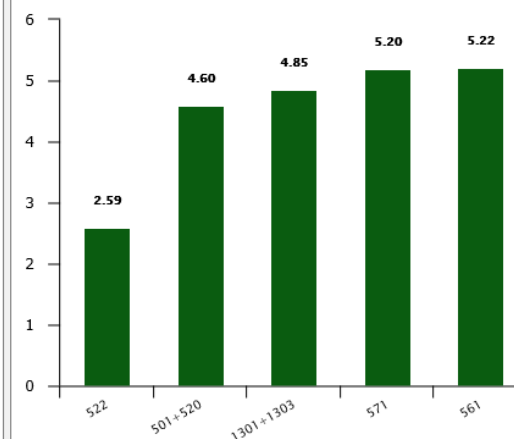
Collection Efficiency (%) For APR 2019-20

100.17

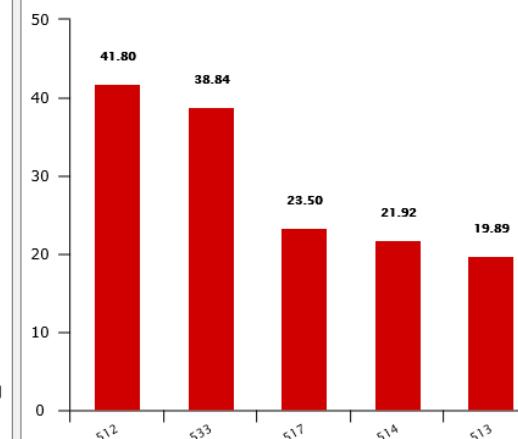
CFY Vs LFY (%) For 2019-20



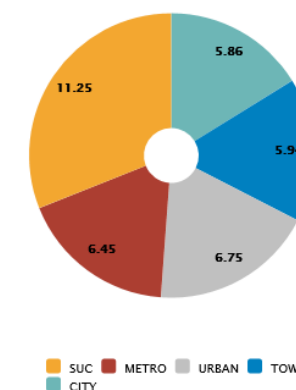
Top Five BUs/Zones For APR 2019-20



Bottom Five BUs/Zones For APR 2019-20



Circle Wise Detail (%) For APR 2019-20





# Key takeaways



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**Big Data Based advanced analytics** implementation  
Performance Assurance  
automation

**Integrated Security Solution** for Grids  
and Critical Locations  
**Industrial Air Conditioners** at Grids  
Communication Optical Fiber (OFC)

**KPI Dashboard** Revamp

Daily Solar Generation Dashboard

Consumption Behaviour Analysis  
Model

**SMRD App &  
Portal – AJMER**

**iNMS & SIEM**

**Block Replication** in Storage  
**Lync Conferencing** with  
external network

**Mobile Applications**

Streetlight, No Current Call, KYC,  
FSE, ...

**Backbone Services  
Provisioning** in IP/MPLS  
Com

Replacement of Toad by  
SQL Developer Client

**Reactive Power Manager**

Application

AMRDA : New Logic Development

ISO 27001:2013 Transfer cum Recertification  
Audit  
Implementation of **ICS Firewall** at Battery  
Energy Storage System (RG-24)  
Cyber Security Awareness Game

## Solutions for Smart Metering

- Smart Meter Data Management Solution
- Pre-Pay solution
- Customer App - TPDDL Connect

Optimization of New Connection process  
**Execution Quality Index**

## **New Development Technologies –**

- Angular APK for web view
- Speech to Text (Google API)
- QR Code creation and E-Signature
- Image Writing
- Full view calendar

**Journey never ends...**

Spare Parts Management System for Grid  
Bank Guarantee Management  
**Online Delivery Challan** generation  
Auto Posting of Virtual Stock by Finance  
Revamp of online approval forms of Contracts

Employee Portals i.e. **Employee Connect, Achievers Portal..**

Automation of **BEMI**  
**Safety Performance index**  
Kwik Book

## Host Utilities



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# THANK YOU

For discussions/suggestions/queries email: [isuw@isuw.in](mailto:isuw@isuw.in)

[www.isuw.in](http://www.isuw.in)

Links/References (If any)