

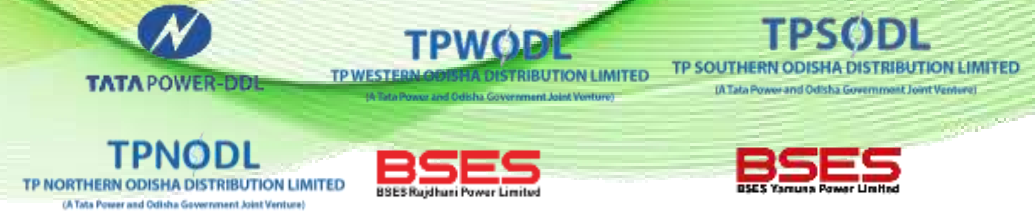
Organizing Partner



Host Utilities



Co-Host Utilities



**DISTRIBUTION  
UTILITY MEET  
DUM2022**

**SESSION – 7: NEW AND EMERGING TECHNOLOGIES FOR ELECTRIC UTILITIES**  
**18 NOVEMBER 2022 | 16:00 ~ 17:30 (IST)**

---

**Speaker: Mr. Sumit Gupta**  
**Organization: Assetplus Consulting Pvt Ltd**



## INTRODUCTION

---

- AT&C loss reduction is the biggest challenge before the distribution utilities in the Country
- Government of India has launched RDSS scheme to restructure DISCOM with adoption of smart meters
- We at Assetplus Consulting drive **REVENUE MAXIMIZATION AND LOSS REDUCTION** for DISCOM with adoption of AI/ML-based solutions to enable efficient operation and cash flow improvements for DISCOM

**#DUM2022**



## CONTEXT-POWERTHON

( joint initiative of MoP, DISCOM, REC and SINE IIT Mumbai)

Bayana Sub division in Bharatpur circle under JVVNL is a high loss areas around 36.78%.

Out of 48000 Urban& Rural mix customers , 8500 smart meters are placed for URBAN customers and rest are on digital

DISCOM, under POWERTHON, is driving an initiative to drive holistic solution to cater improving the Deviation of energy points , Meter Reading accuracy, billing efficiency and revenue recovery by adoption of AI/ML driven solution

# #DUM2022



Our interventions for AT&C are aimed at driving excellence **BEFORE the METER (Billing)** and **AFTER THE METER (Recovery)**

Deployment of SUSTAINABLE AI & ML driven platform for DISCOM Revenue Assurance & Revenue Protection:

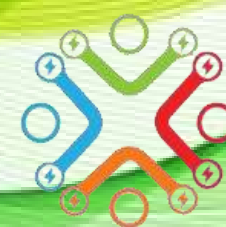
1. *Smart Meter Driven Network Loss Modelling Consumption & Event Data Analysis.*
2. *Non-Smart Meter Revenue Leakage prevention with meter reading Error & Inaccuracy.*
3. *Revenue Recovery Maximization & Cash flow Improvement.*



# BAYANA VIDEO

POWERTHON





assetplus Consulting  
an analytics organization  
www.assetplusconsulting.com

DASHBOARD

SMART METER DRIVEN NON  
TECHNICAL LOSS MODELLING

NON SMART METER READING  
ACCURACY FOR ENHANCED  
BILLING

REVENUE RECOVERY & CASH  
FLOW IMPROVEMENT



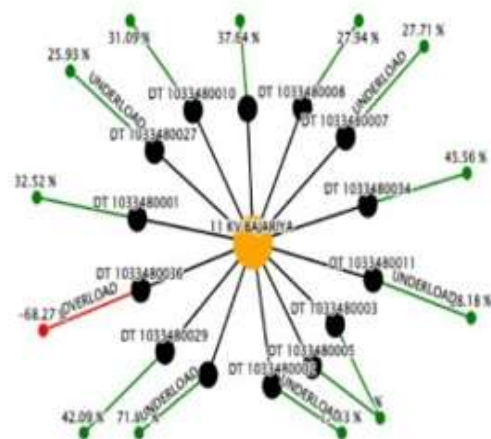
MINISTRY OF POWER

## AI &amp; ML DRIVEN PLATFORM FOR REVENUE ASSURANCE &amp; REVENUE PROTECTION

## AT&C LOSS REDUCTION SOLUTION FOR UTILITIES (AGGREGATED TECHNICAL & COMMERCIAL LOSS REDUCTION)

POWERTHON : BHARATPUR - BAYANA SUB DIVISION PILOT

### SMART METER DRIVEN NETWORK LOSS MODELLING CONSUMPTION & EVENT DATA ANALYSIS



### NON SMART METER REVENUE LEAKAGE PREVENTION WITH METER READING ERROR & INACCURACY



### REVENUE RECOVERY MAXIMIZATION & CASH FLOW IMPROVEMENT



Activate Windows  
Go to Settings to activate Windows





assetplus Consulting  
an analytics organization  
www.assetplusconsulting.com

# ADDRESSING URBAN CONSUMER WITH SMART METERS

AI & ML DRIVEN PLATFORM FOR REVENUE ASSURANCE & REVENUE PROTECTION

## AT&C LOSS REDUCTION SOLUTION FOR UTILITIES (AGGREGATED TECHNICAL & COMMERCIAL LOSS REDUCTION)

POWERTHON : BHARATPUR - BAYANA SUB DIVISION PILOT

DASHBOARD

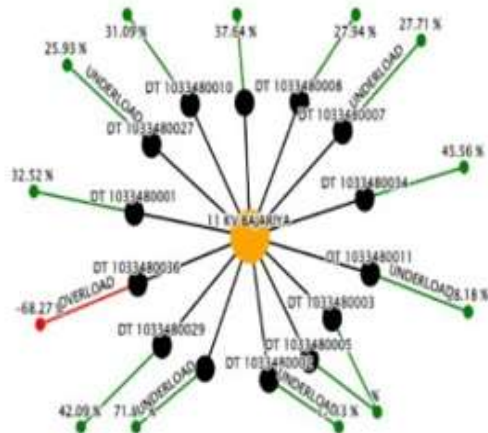
SMART METER DRIVEN NON  
TECHNICAL LOSS MODELLING

NON SMART METER READING  
ACCURACY FOR ENHANCED  
BILLING

REVENUE RECOVERY & CASH  
FLOW IMPROVEMENT



### SMART METER DRIVEN NETWORK LOSS MODELLING CONSUMPTION & EVENT DATA ANALYSIS



### NON SMART METER REVENUE LEAKAGE PREVENTION WITH METER READING ERROR & INACCURACY



### REVENUE RECOVERY MAXIMIZATION & CASH FLOW IMPROVEMENT



Activate Windows  
Go to Settings to activate Windows



# SMART METER DATA MODELLING

---

1. **LR<sup>+</sup> - Dynamic evaluation of ENERGY DEVIATION POINT ( Service parallel, bypass connection, customer indexing) Smart Meter Driven Network Loss Modelling on Consumption & Event Data for feeder , DT and consumers**

**Objective:-** Working on urban smart meter consumers AI-driven data analysis to get the below outcomes:-

- a) Network map with dynamic energy gap from Feeder DT to consumers
- b) Stress Network & Energy Loss on each DT to consumers.
- c) Service Parallel, bypass connection modeling using event analysis
- d) Consumer Behavior analysis by using consumption modelling.
- e) DT load Optimization

## #DUM2022

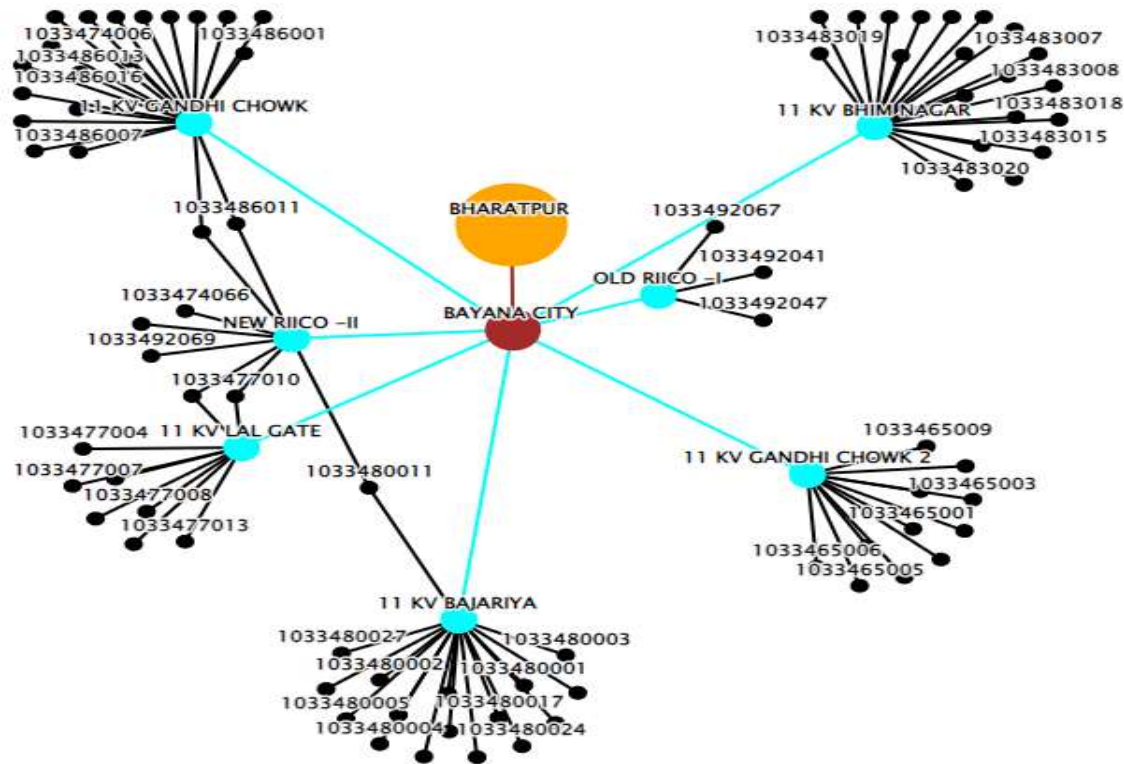




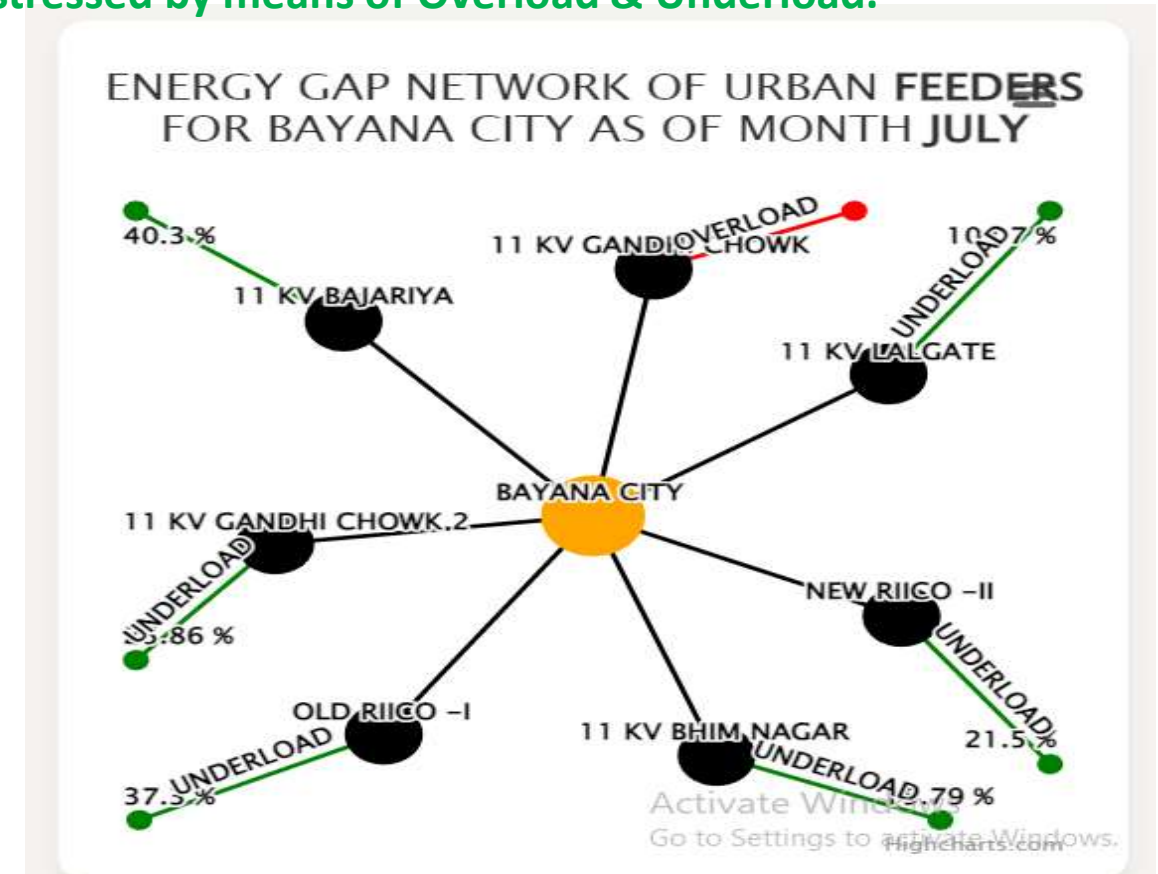


# DYNAMIC STRESS NETWORK EVALUATION

Below screenshot represents the Network map from Feeder to DT & intersects DTs for Bayana City Urban Area.



Dynamic Energy Gap – below screenshot represents dynamic energy gap% on feeder to its DT and which are the feeders in stressed by means of Overload & Underload.



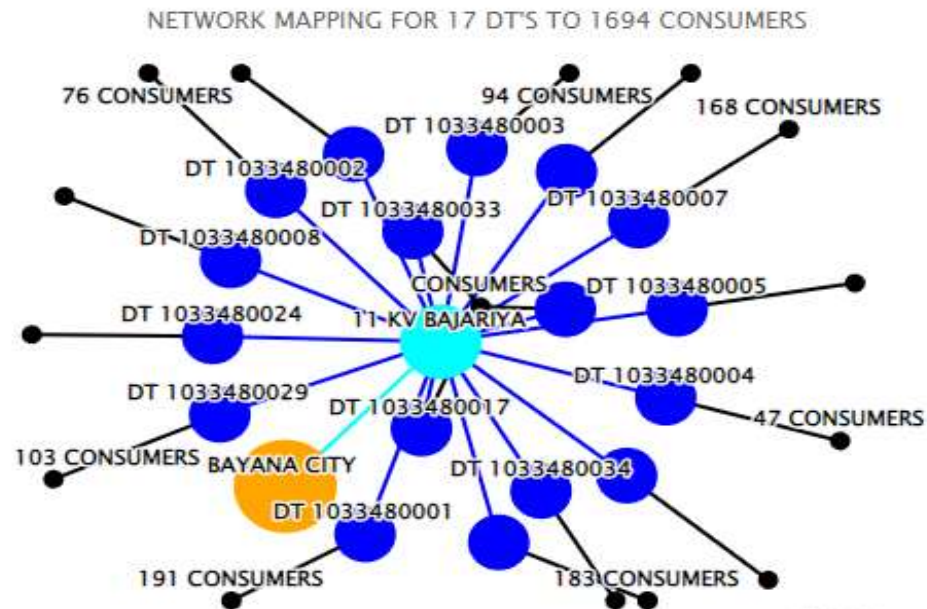




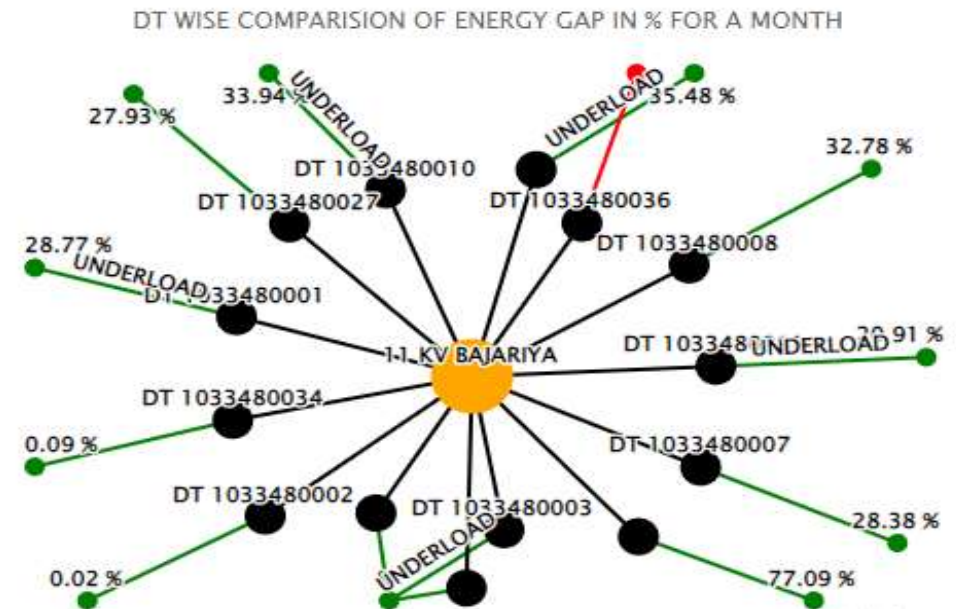
## STRESSED NETWORKED DTs

Dynamic Energy Gap – below screenshot represents number of consumers selected DT with dynamic energy gap% from DT to consumers and DTs which are in stressed by means of Overload & Underload.

DT TO CONSUMER NETWORK MAPPING FOR **BAJARIYA**  
FEEDER OF ALL CONSUMERS



ENERGY GAP NETWORK OF **ALL DTs** FOR **BAJARIYA**  
FEEDER IN **APRIL** MONTH

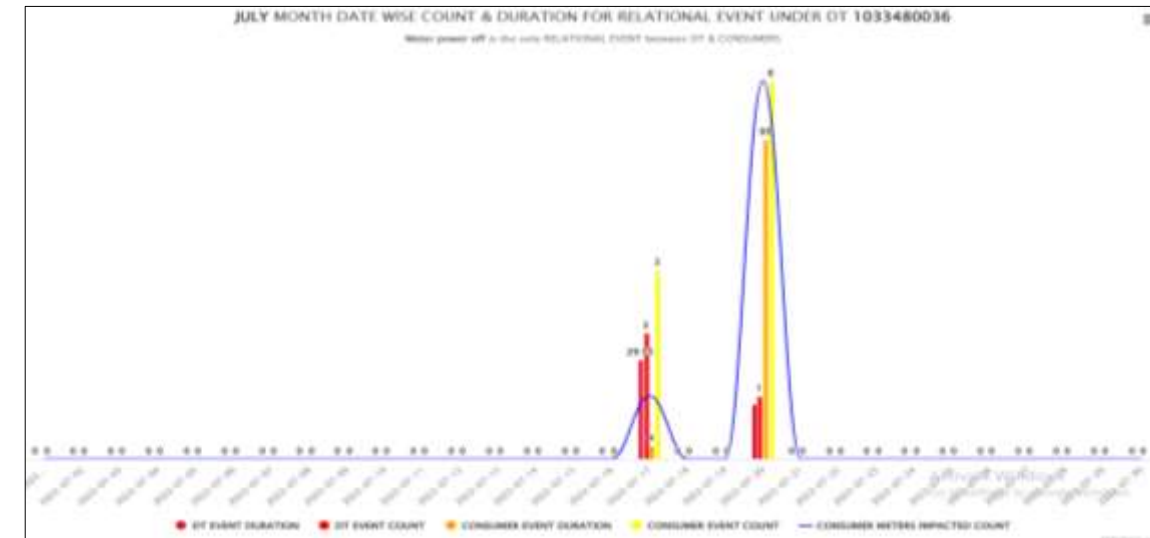
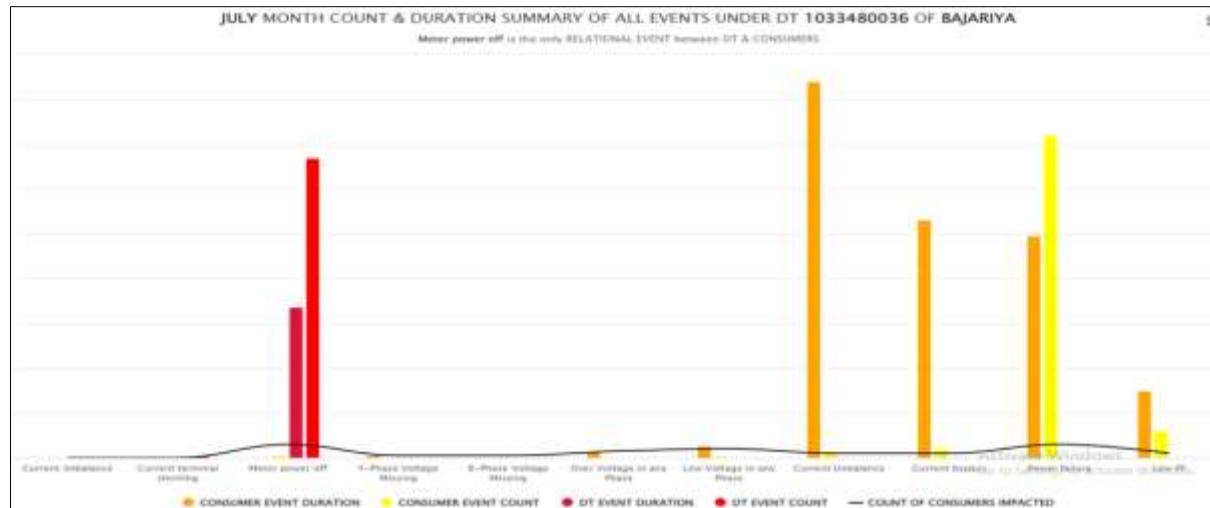


Activate Windows  
Go to Settings to activate Windows.





- Event Analysis Detailing of event Correlated behavior spread on the days & block level this also established the events are system induce or customer driven. Along with this consumption modelling helps in the identification of deviation points and form of service parallel and bypass connections.

SUSPECTED CATEGORY TABLE FOR TOTAL **6 CONSUMERS** OF **1033480036** DT

FEEDER	D.T	MONTH	CONSUMER_METER_NO.	CATEGORY	EVENT COUNT
11 KV BAJARIYA	1033480036	JULY	3286634	SUSPECTED DEGREE 2	2
11 KV BAJARIYA	1033480036	JULY	3286636	SUSPECTED DEGREE 1	4
11 KV BAJARIYA	1033480036	JULY	3286624	SUSPECTED DEGREE 1	3
11 KV BAJARIYA	1033480036	JULY	3287212	SUSPECTED DEGREE 1	5
11 KV BAJARIYA	1033480036	JULY	3795225	SUSPECTED DEGREE 1	2





assetplus Consulting  
an aspiro organization  
www.assetplusconsulting.com

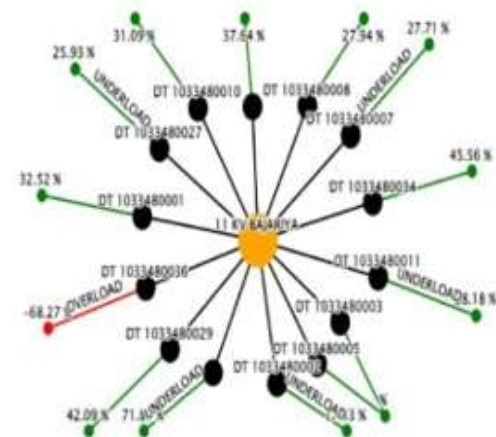
# ADDRESSING RURAL CONSUMER WITH NORMAL METERS

AI & ML DRIVEN PLATFORM FOR REVENUE ASSURANCE & REVENUE PROTECTION

## AT&C LOSS REDUCTION SOLUTION FOR UTILITIES (AGGREGATED TECHNICAL & COMMERCIAL LOSS REDUCTION)

POWERTHON : BHARATPUR - BAYANA SUB DIVISION PILOT

SMART METER DRIVEN  
NETWORK LOSS MODELLING CONSUMPTION  
& EVENT DATA ANALYSIS



NON SMART METER REVENUE LEAKAGE  
PREVENTION WITH METER READING  
ERROR & INACCURACY



REVENUE RECOVERY MAXIMIZATION  
&  
CASH FLOW IMPROVEMENT



Activate Windows  
Go to Settings to activate Windows

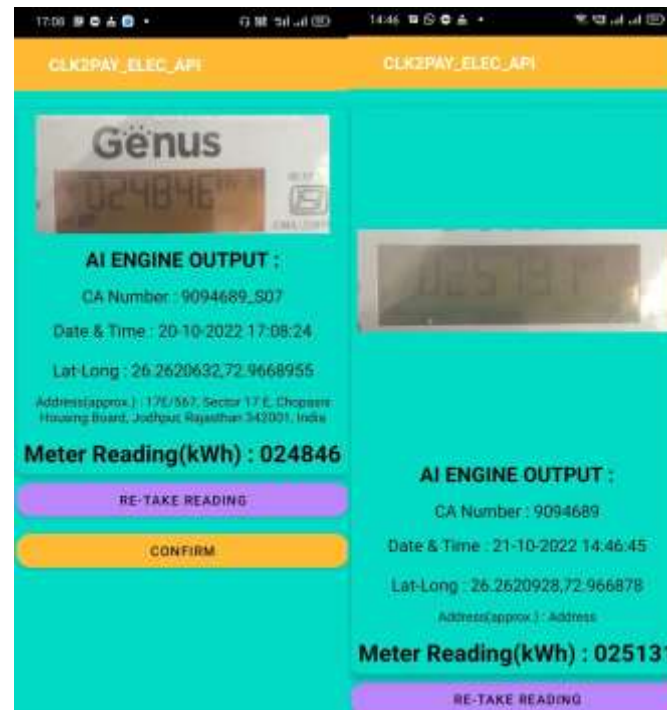




## NON SMART METER –Meter Reading Accuracies leading to higher billing

2. **Click to Pay app** - Non-Smart Meter Revenue Leakage prevention with Meter Reading Error & Inaccuracy

**Objective** - Work on non-smart Rural consumers i.e., digital meter, reducing error% in meter reading thus enhancing the billing propensity



**#DUM2022**







## REDUCTION IN AVERAGE BILLING



- Below screen represents all the Reading taken by the application with the details like Consumer Account No, Meter No, Area, Date & Time of read and Consumer Coordinates
- It also has the outcome with cases where the estimated readings are taken previously




GOVERNMENT OF INDIA  
MINISTRY OF POWER



आर ई सी  
REC  
असीमित ऊर्जा, अनन्त संभावनाएँ  
Endless energy. Infinite possibilities.

Artificial Intelligence enabled Meter  
Reading Automation



assetplus Consulting™  
an analytics organization

CSV

Excel

PDF








Show

10

▼

entries

Search:

S.No	Meter Reading DateTime	Site Location	CA Number	Image	Meter Number	Meter Reading	Image Path	Lat-Long
1	2022-11-05 17:28:08	Bayana Rural	210241003526		15959484	003306	https://clk2pay.com/images/210241003526_05-11-2022_1876.jpg	26.939004,77.2442871
2	2022-11-05 17:20:18	Bayana Rural	210241003473		3752272	001689	https://clk2pay.com/images/210241003473_05-11-2022_4326.jpg	26.939004,77.2442871
3	2022-11-05 17:19:03	Bayana Rural	210241003473		3752272	001689	https://clk2pay.com/images/210241003473_05-11-2022_5032.jpg	26.939004,77.2442871
4	2022-11-05 17:15:12	Bayana Rural	210241003423		10265826	000818	https://clk2pay.com/images/210241003423_05-11-2022_9499.jpg	
5	2022-11-05 15:54:38	Bayana Rural	210241003448		6218832	003243	https://clk2pay.com/images/210241003448_05-11-2022_7640.jpg	26.9497876,77.2396172
6	2022-11-05 15:28:28	Bayana Rural	210241003415		6258636	0002088	https://clk2pay.com/images/210241003415_05-11-2022_8300.jpg	26.9347794,77.2503742
	2022-11-04	Bavana					https://clk2nav.com/images/210241041990_04-	

Activate Windows  
Go to Settings to activate Windows.





assetplus Consulting  
an aspiro organization  
www.assetplusconsulting.com

# ADDRESSING URBAN & RURAL CONSUMER FOR RECOVERY

AI & ML DRIVEN PLATFORM FOR REVENUE ASSURANCE & REVENUE PROTECTION

## AT&C LOSS REDUCTION SOLUTION FOR UTILITIES (AGGREGATED TECHNICAL & COMMERCIAL LOSS REDUCTION)

POWERTHON : BHARATPUR - BAYANA SUB DIVISION PILOT

DASHBOARD

SMART METER DRIVEN NON  
TECHNICAL LOSS MODELLING

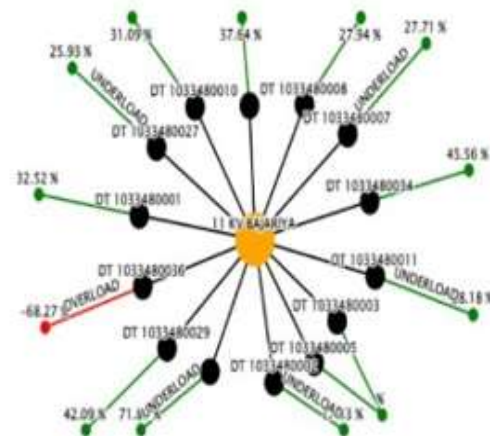
NON SMART METER READING  
ACCURACY FOR ENHANCED  
BILLING

REVENUE RECOVERY & CASH  
FLOW IMPROVEMENT



MINISTRY OF POWER

### SMART METER DRIVEN NETWORK LOSS MODELLING CONSUMPTION & EVENT DATA ANALYSIS



### NON SMART METER REVENUE LEAKAGE PREVENTION WITH METER READING ERROR & INACCURACY



### REVENUE RECOVERY MAXIMIZATION & CASH FLOW IMPROVEMENT



Activate Windows  
Go to Settings to activate Windows



**Revenue <sup>+</sup>** - Revenue Predictions with Recovery Maximization & Cash flow Improvement

**Objective:** - To work on Urban & Rural consumers AI driven data analysis for Revenue Maximization & Cash flow management to get below outcomes: -

- Bucket & slab wise payment modeling dashboard
- Customer predictions (count of consumer & Amount)
- Customer behavior on event & season
- Customer payment mode prediction
- Campaign for shifting the consumer buckets/improving cash flow
- Actual measurements & benefits against the prediction

**#DUM2022**

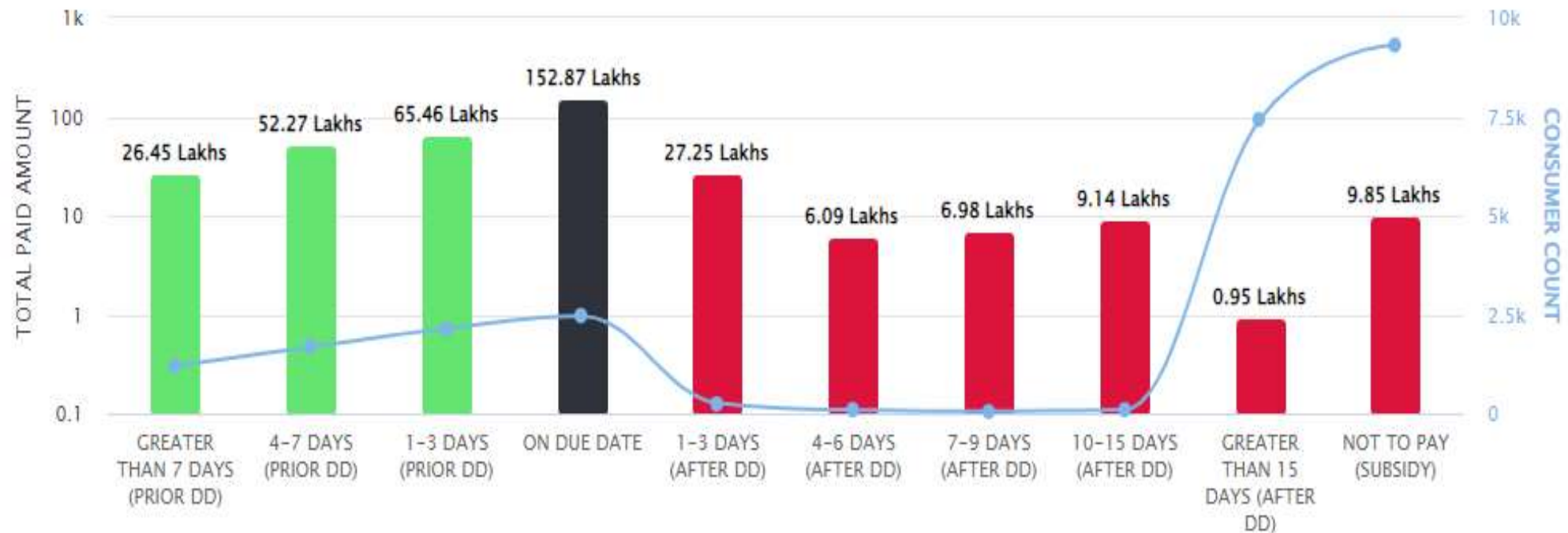




# ACTUAL RECOVERY WITHOUT AI/Intervention

## TOTAL PAID AMOUNT VS CUSTOMER COUNT AT BAYANA SUB-DIVISION, UNDER BHARATPUR

TOTAL PAID AMOUNT 357.31 IN LAKHS AND CUSTOMER COUNT 24735 FOR FEEDER ALL, OF MONTH MAY, FOR ACCOUNT CLASS ALL, OF YEAR 2022



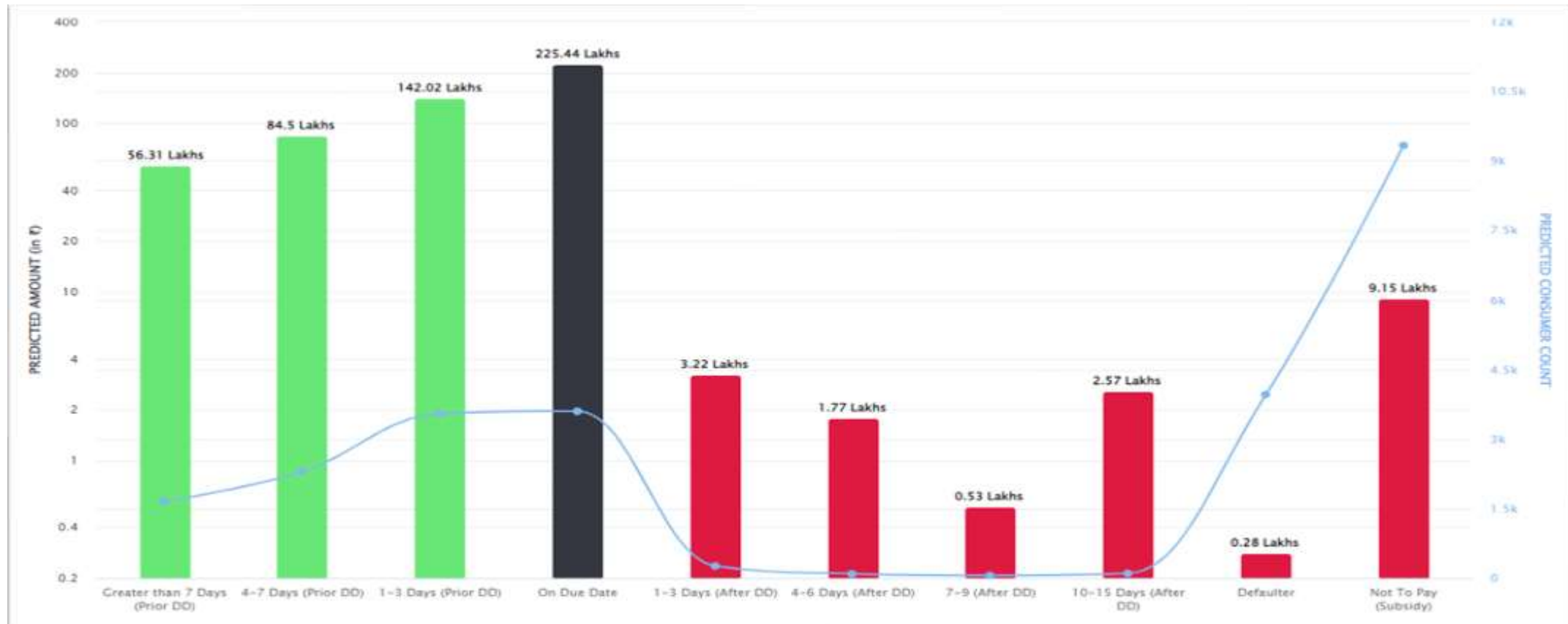
# #DUM2022







**Payment Prediction-** Prediction of the payment amount could be recovered for the consumers before due date to improve the cash flow management & timely recovery for the selected month





## KEY TAKEAWAYS/ RECOMMENDATIONS

---

- By having AI/ML solutions utility Bayana sub-division is likely to have benefits in terms of INR **168.17 Lakhs** per month on Revenue Recovery
- **Revenue Recovery by Cash flow Management system** - Prediction done by Revenue Plus model for July-22 month showcase the increasing of recovery amount in prior Due Date buckets in “Green Zone” which is **538.27 Lakhs** whereas the actual amount recovered prior to the due date is **372.17 Lakhs**

**#DUM2022**



## KEY TAKEAWAYS/ RECOMMENDATIONS

---

- **Revenue Realization by Network loss Modelling** – Event data is mapped & analyzed at DT to Consumer Level
- Three DTs are taken for the consideration.
- When Power Failure event occurred at this DT and to its downstream consumers for a certain duration by the system failure, If that supply can be provided to the consumers for the same duration Discom will be able to generate revenue of around Rs. **2.07 Lakhs** at one DT which can be extended for all urban feeders and its DTs

**#DUM2022**





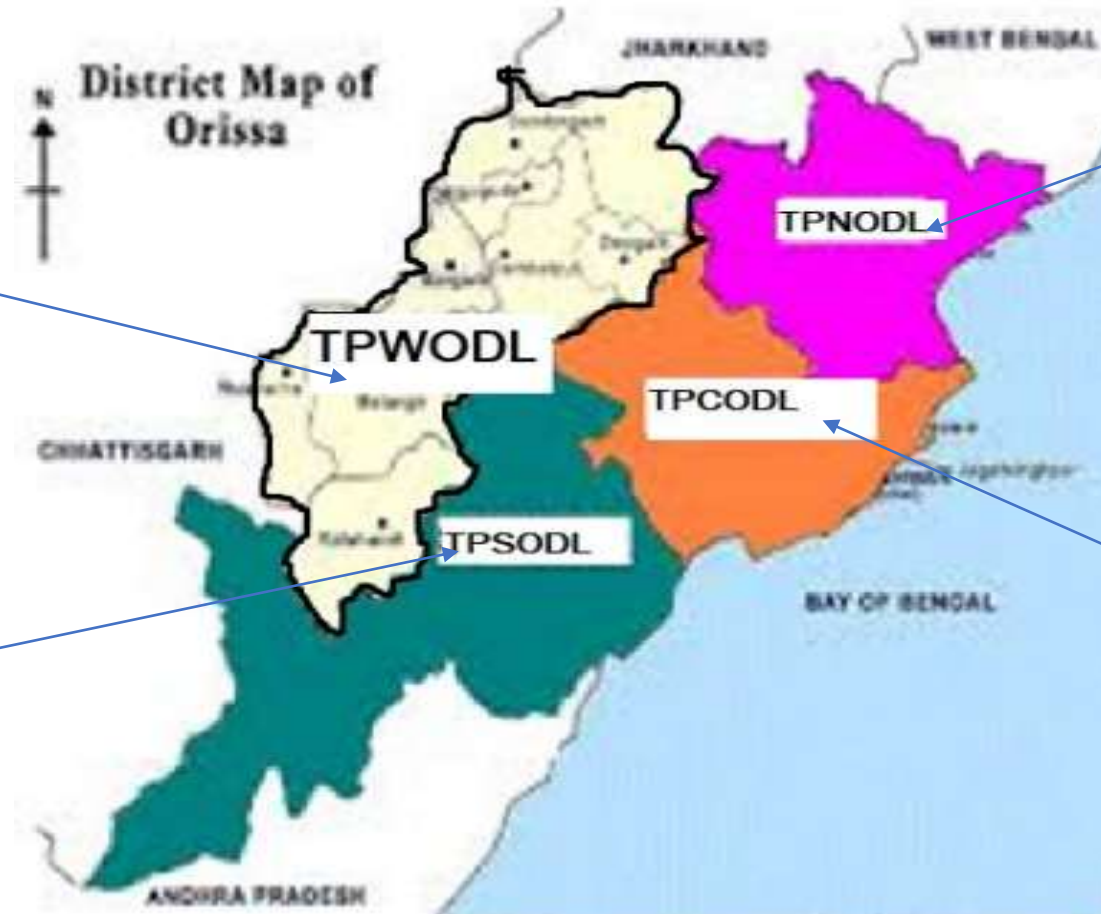
# Giving back to State :Odisha DISCOMs

## TPWODL

Consumer Base 23.96 Lakhs  
 AT&C loss 47.52 %  
 Billing Efficiency-65.22%  
 Collection Efficiency – 80.47%  
 Target Smart Meter –70K

## TPSODL

Consumer Base 24 Lakhs  
 AT&C loss 31.54 %  
 Billing Efficiency-78.82%  
 Collection Efficiency – 86.66%  
 Target Smart Meter –80K



## TPNODL

Consumer Base 19.54 Lakhs  
 AT&C loss 35.89 %  
 Billing Efficiency-74.60%  
 Collection Efficiency – 86.56%  
 Target Smart Meter –80K

## TPCODL

Consumer Base 27.5 Lakhs  
 AT&C loss 35.55 %  
 Billing Efficiency-72.34%  
 Collection Efficiency – 89.10%  
 Target Smart Meter –255K







## GIVING BACK TO STATE : Potential in Odisha

---

### **Revenue Realization –**

- Mitigate Gap in LT collection
- Reduce Substantial number of non-paying consumers
- Enhancement in bill collection as consumers are normally not in a habit of making payments at the counter
- Improve digital collection awareness for rural consumers

### **Energy Audit -**

- Division and Sub-Division wise Energy Audit

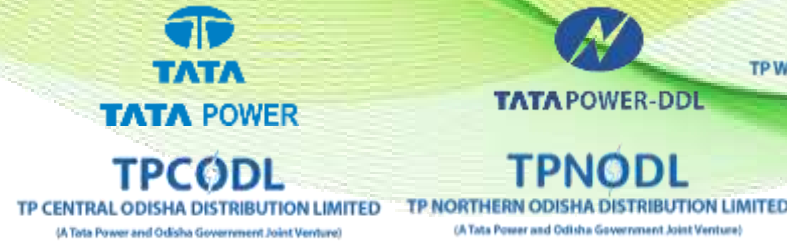
**#DUM2022**



Organizing Partner



Host Utilities



Co-Host Utilities



# DISTRIBUTION UTILITY MEET DUM2022

## THANK YOU

Organizer

