GOVERNMENT OF INDIA
MINISTRY OF POWER

सत्यमेव जयते

आरईसी REC
असीमित ऊर्जा, अनन्त संभावनाएं
Endless energy. Infinite possibilities.

Digitizing DISCOMs through Smart Meters

Power Sector Reforms

14th September 2023

Smart Metering initiative under RDSS

- Total outlay of INR 3.04 Lakh Crs. and categorized into 2 parts:
  - PART A: Metering & Distribution Infrastructure works
  - PART B: Training & Capacity Building & other enabling activities

Smart metering works:

- Provision for an outlay of INR 1.5 Lakh Crs with an estimated GBS of INR 23,300 Crs
- Implementation model – DBFOOT with complete responsibility of development and O&M on Implementing agency (AMISP)
- Funding pattern –15%/ 22.5% (limited to INR 900/ INR 1,350) of cost per meter
- Incentive for early completion (before Dec-23) – 7.5%/ 11.25% (limited to INR 450/ INR 675) of cost per meter

Improve quality, reliability & affordability of power supply

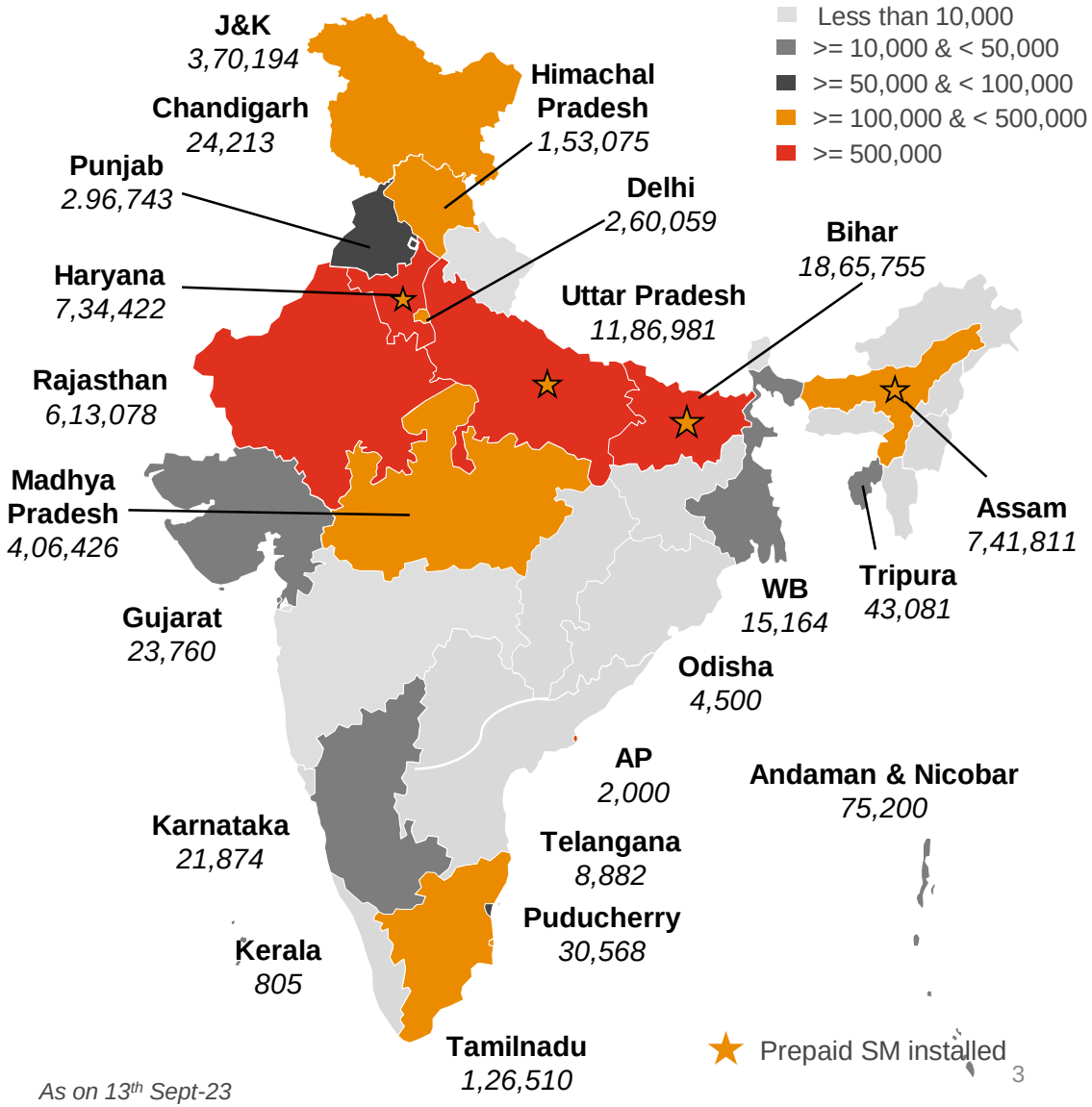
Reduce AT&C loss to 12-15% by FY-25

Reduce ACS-ARR Gap to zero by FY-25

Current status of smart metering

Smart Metering and AMI

- Govt. of India plans for replacement of all 25 Cr meters to smart prepaid meters
- Market still evolving - **~71 Lakh smart meters** installed across Bihar, Uttar Pradesh, Haryana, Delhi, Rajasthan, Assam etc.
- Implementation mostly on postpaid
- Around **23 Lakh** smart meters in **prepaid mode** in Bihar, Uttar Pradesh, Assam and Haryana
- Large-scale prepaid rollout only in Bihar (~80%)



As on 13th Sept-23

Consumer perception & Experience with Smart Meters

Positive	Negative
✓ **Improved Awareness and Understanding of their consumption, thus informed decision making of power consumption** ✓ **Positive Environmental Awareness, thus energy saving** ✓ **Increased Control**: Smart meters empower consumers with real-time data about their energy usage. ✓ **Potential for Cost Savings** ✓ **Increased Billing Accuracy thus** perception of fairness and trust in billing processes. ✓ **Convenience** of remote reading and automated billing reducing billing errors	**Initial Hiccups** during the transition to smart meters, such as initial arrears, technical glitches, or difficulties accessing usage data temporarily affecting perception negatively. **Communication Matters** - Effective communication can lead to more positive perceptions, while poor communication can breed skepticism. **Individual Experiences** related to adaptability to Smart Meter era and associated consumer behavioral change, based on the earlier billing/payment practices, can lead to resistance at consumer end.

Clear communication and proactive engagement with consumers are key to fostering positive perceptions and acceptance of smart meters in utility services.

Data Privacy Concerns and Resolution

Concern	Resolution
✓ **Unauthorized Access to Data** energy usage data, potentially leading to privacy breaches.	✓ Implement strong security measures such as **encryption, access controls, and regular security audits** to protect data from unauthorized access. ✓ Utility companies should also **educate consumers about data security measures** and best practices.
✓ Consumers are concerned about how their usage **data will be used, shared, or sold to third parties**.	✓ Utility companies should have t**ransparent data privacy policies** that clearly state how data will be used and shared. ✓ Consumers should be given the **option to opt in or opt out of data sharing** with third parties for marketing purposes.
✓ Consumers worry about vulnerabilities in smart meters and their potential exploitation.	✓ Regularly **update and patch smart meter firmware to address security vulnerabilities.**
✓ Consumers may want assurance that their data is being handled securely.	✓ Consider allowing independ**ent third-party audits of data handling practices** to build trust and transparency.

DOMESTIC VALUE ADDITION IN PROCUREMENT & SUPPLY CHAIN

% Composition of Smart Meter Components based on its Origin

S#	Component of Smart meter	Share of total sale Value	1- Phase		3-Phase	
			Indian Component	Imported Component	Indian Component	Imported Components
1	Controllers, ICs & other electronic components	12-13%	2.3%	10%	2.1%	11.00%
2	Lithium ion Battery	~2%		2%		1.80%
3	PCB	3.50%		3.50%		3.50%
4	LCD	~2.00%		2.00%		1.70%
5	Latching Relay	14%		14%		14.00%
6	Communication Chipset	~10.00%		10.00%		9.50%
7	Polycarbonate/Equivalent Granules	~10.00%	4.40%	4.80%	5.00%	5.40%
9	Metal	~5.00%	4.00%		6.00%	
10	Misc. (CT, Wiring, Packing etc.)	~3	3.00%		2.00%	
11	Design & Labour	~40%	40%		38.00%	
	Total		**53.70%**	**46.30%**	**53.10%**	**46.90%**

Average Indian Content

Single phase smart meters ~ 54%

Three phase smart meters ~ 53%.

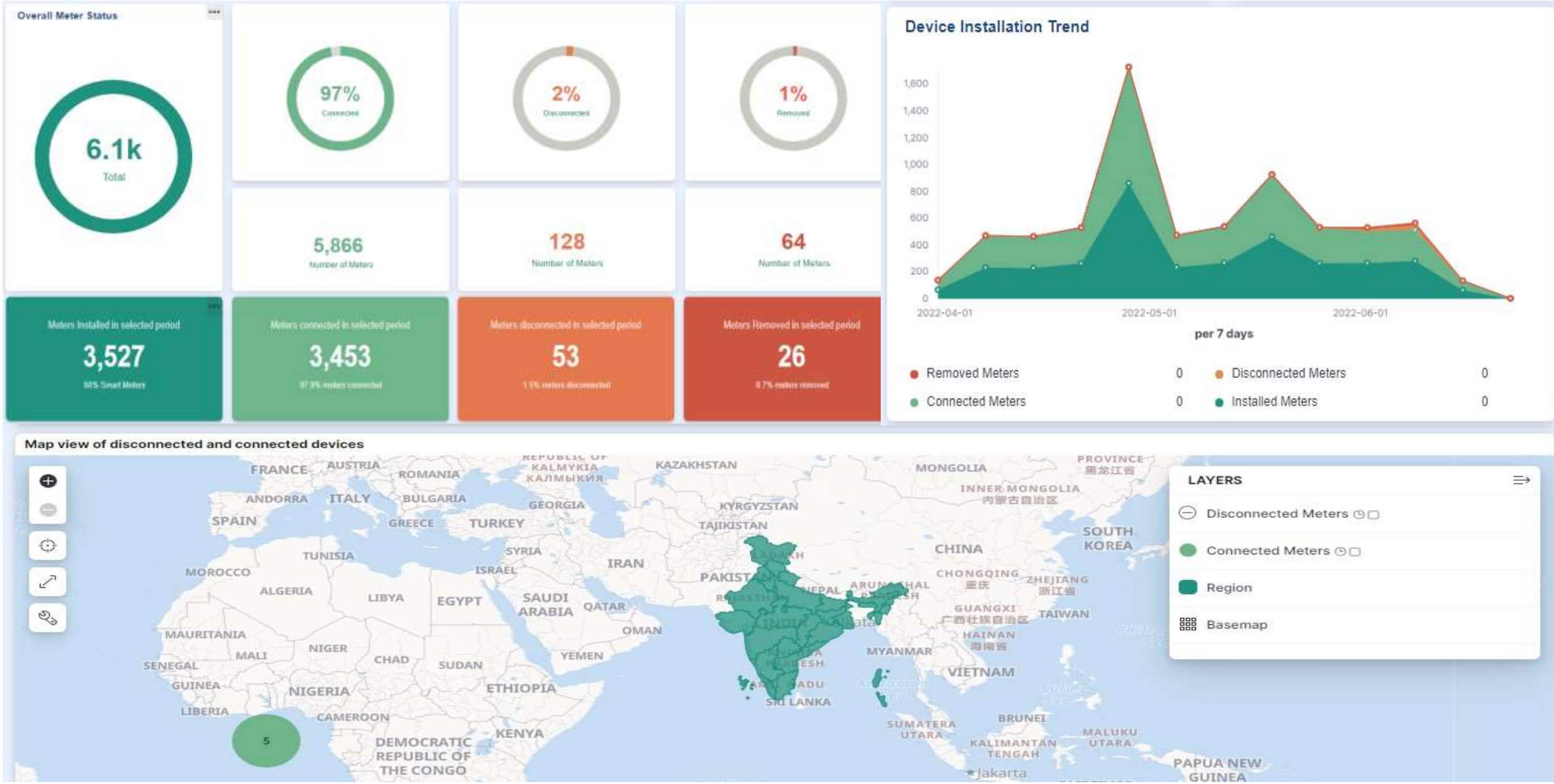
- As per the amendment issued by MoP dated 3rd July'2023 against Order no. A-1/2021-FSC-Part(5), Public procurement of **Energy meters including Smart meters with MLC of atleast 50%** will be given purchase preference under Make in India.

Digitization through Smart Metering Data

1. **Remote Monitoring and Control:** Smart meters enable DISCOMs to remotely connect and disconnect, detect outages, tampering, or abnormal usage patterns in real-time and allows for faster response times, reducing downtime and improving service reliability.
2. **Data Analytics through MDMS:**
    - **Demand Response Optimization:** By analyzing consumption data in real-time, utilities can identify opportunities to reduce peak demand.
    - **Data Validation and Cleansing:** MDMS analytics validate the incoming data from smart meters to ensure accuracy and completeness.
    - **Load Curve Analysis:** It helps understand peak demand periods and load profiles. This information can be used for demand response programs and load forecasting.
    - **Outage Detection and Restoration:** Utilities can use this information to quickly identify the location of outages and prioritize restoration efforts
    - **Anomaly Detection:** Advanced analytics can identify anomalies in energy consumption patterns, such as unusual spikes or drops in usage. These anomalies may indicate equipment malfunction, tampering, or theft
    - **Grid Optimization:** DISCOMs can identify areas with high losses, voltage issues, or equipment failures more quickly. They can also plan infrastructure upgrades based on actual demand data.
3. **Energy Accounting:** Faster, easier and accurate Energy Accounting through Smart Meter Data.
4. **NFMS** : National level monitoring of feeder's peak, outage, health and running status on real time.

Installation Summary Dashboard

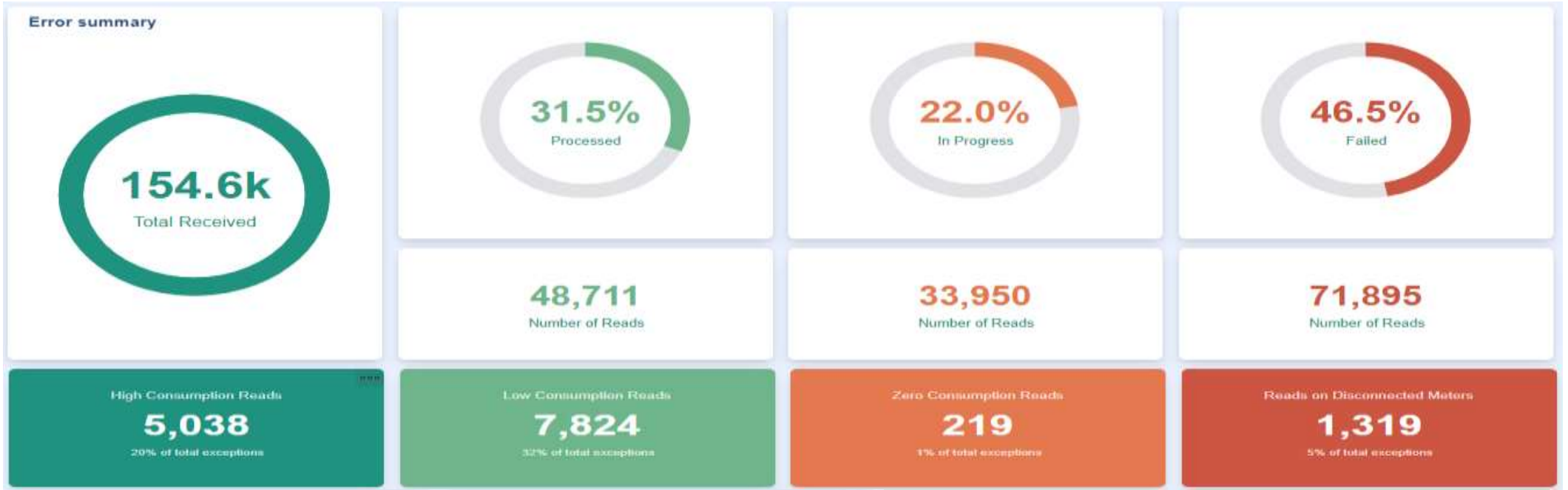
Back

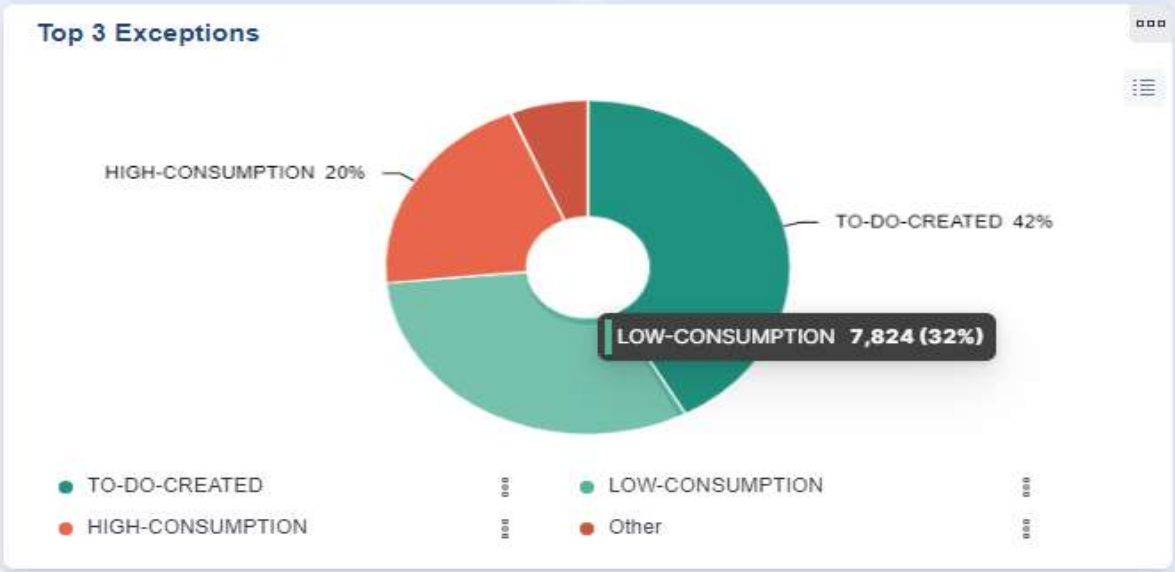


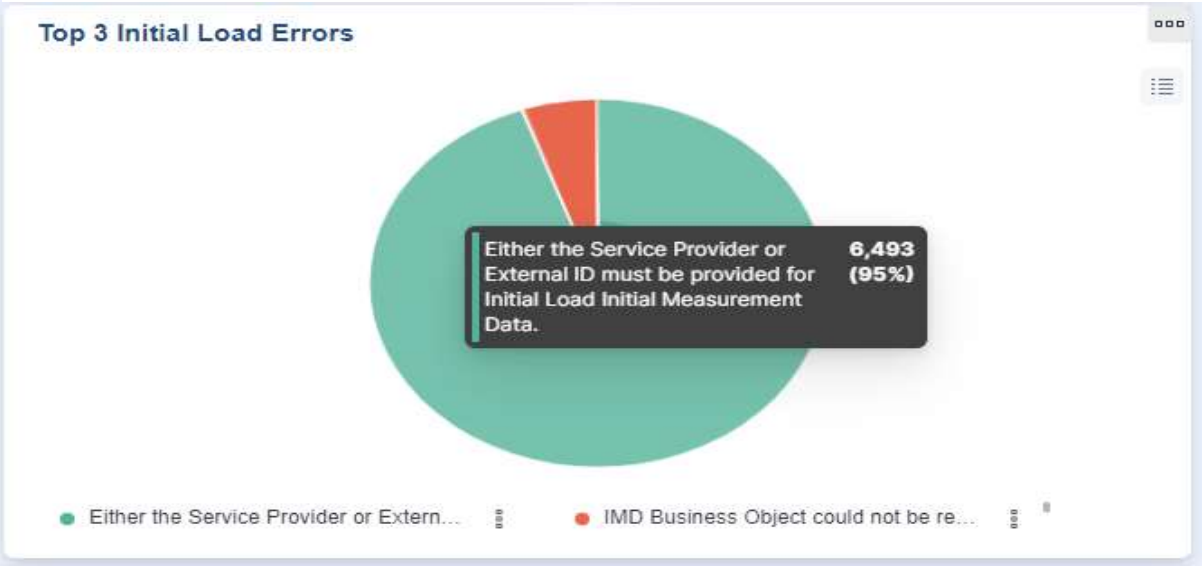
Credits: Abgyon Impressa dashboard

Read Error Summary Dashboard

Back



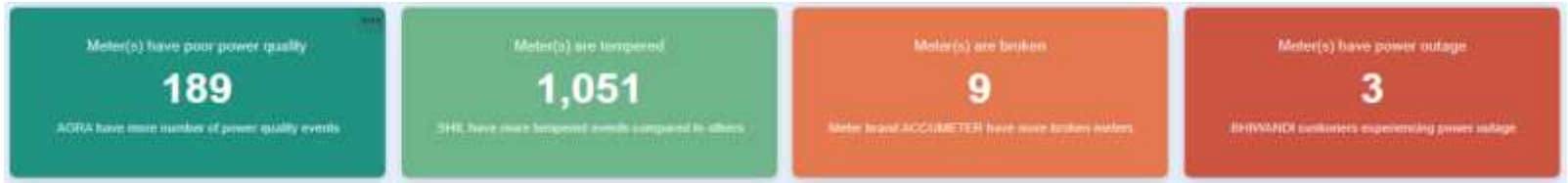


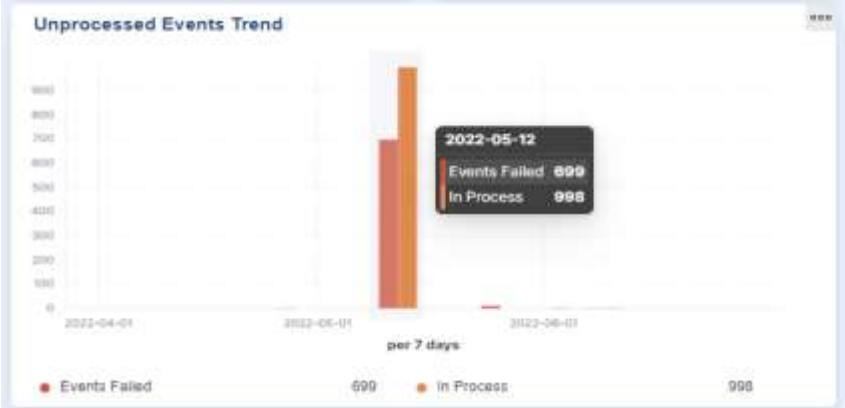


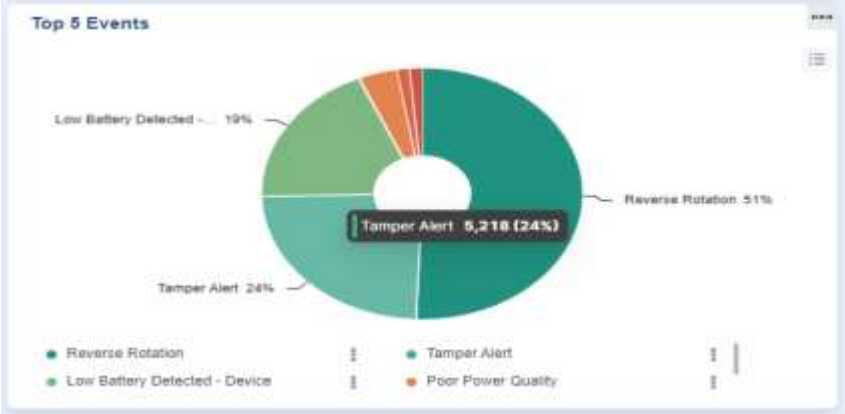
Credits: Abgyon Impressa dashboard

Device Events Dashboard

Back





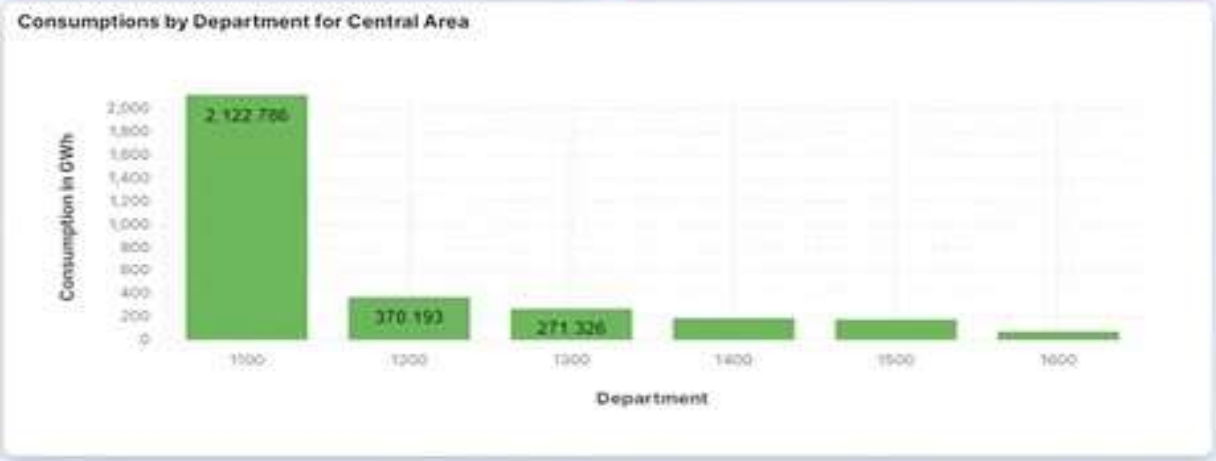


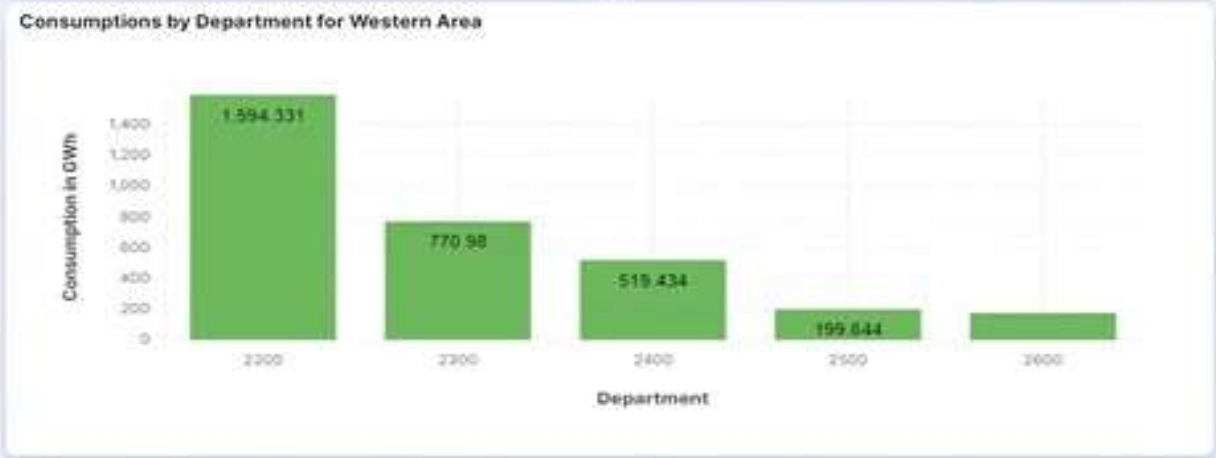
Credits: Abgyon Impressa dashboard

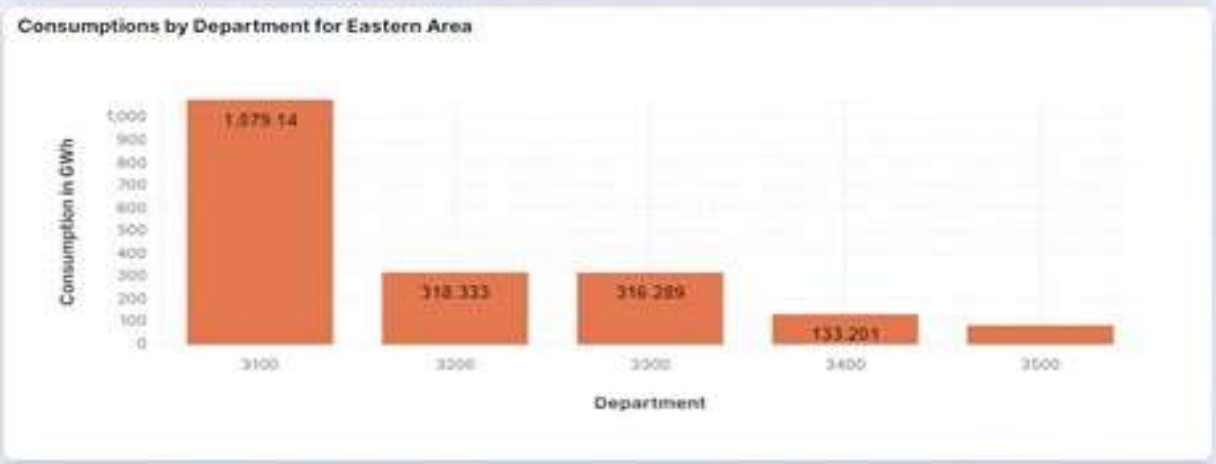
Consumption

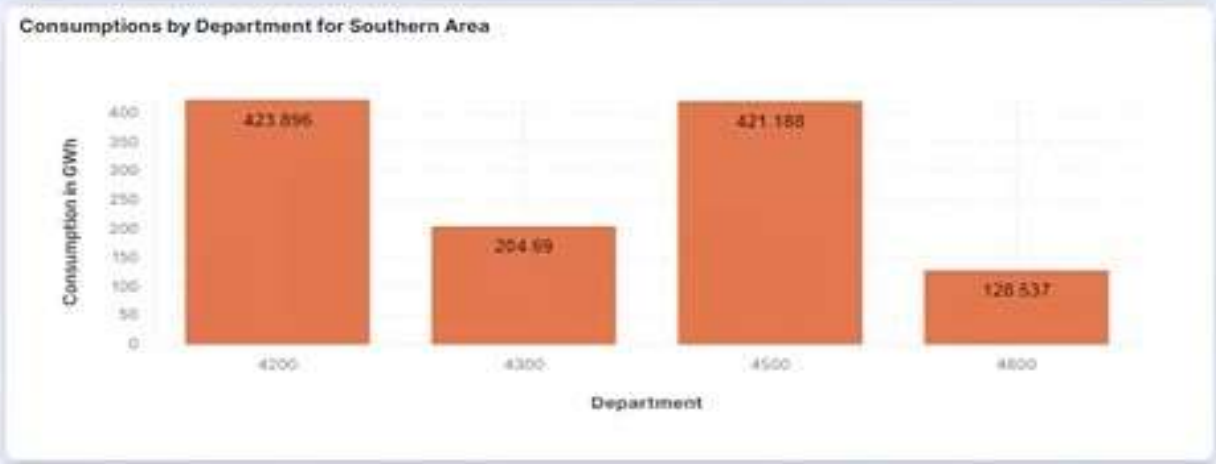
Back

Central Area	Western Area	Eastern Area	Southern Area
Total Consumption: **3,010 GWh**	Total Consumption: **3,085 GWh**	Total Consumption: **1,813 GWh**	Total Consumption: **1,117 GWh**
(Average Consumption: 26.905 kWh)	(Average consumption per meter: 26.526 kWh)	(Average consumption per meter: 27.878 kWh)	(Average consumption per meter: 21.792 kWh)





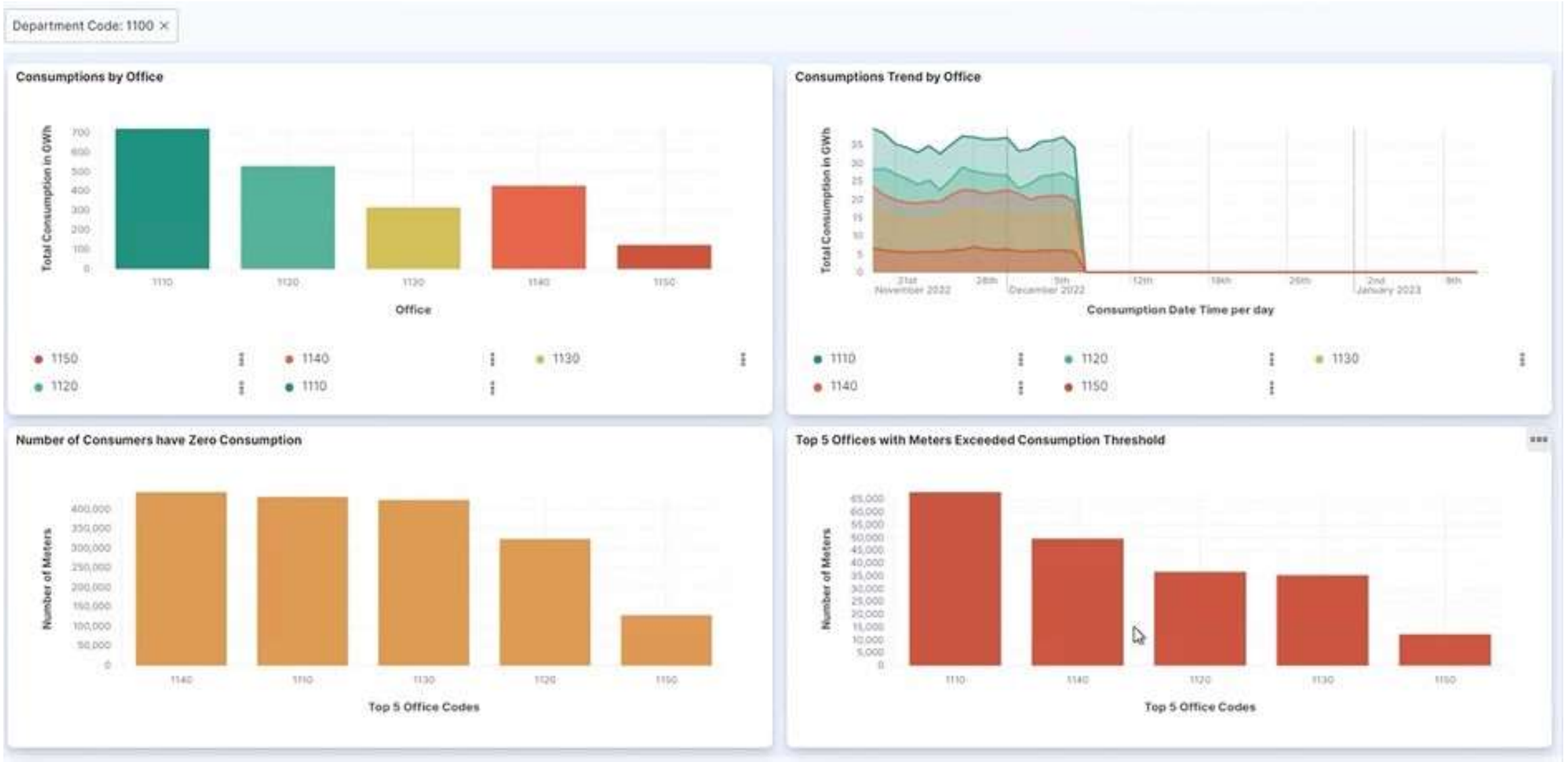




Credits: Abgyon Impressa dashboard

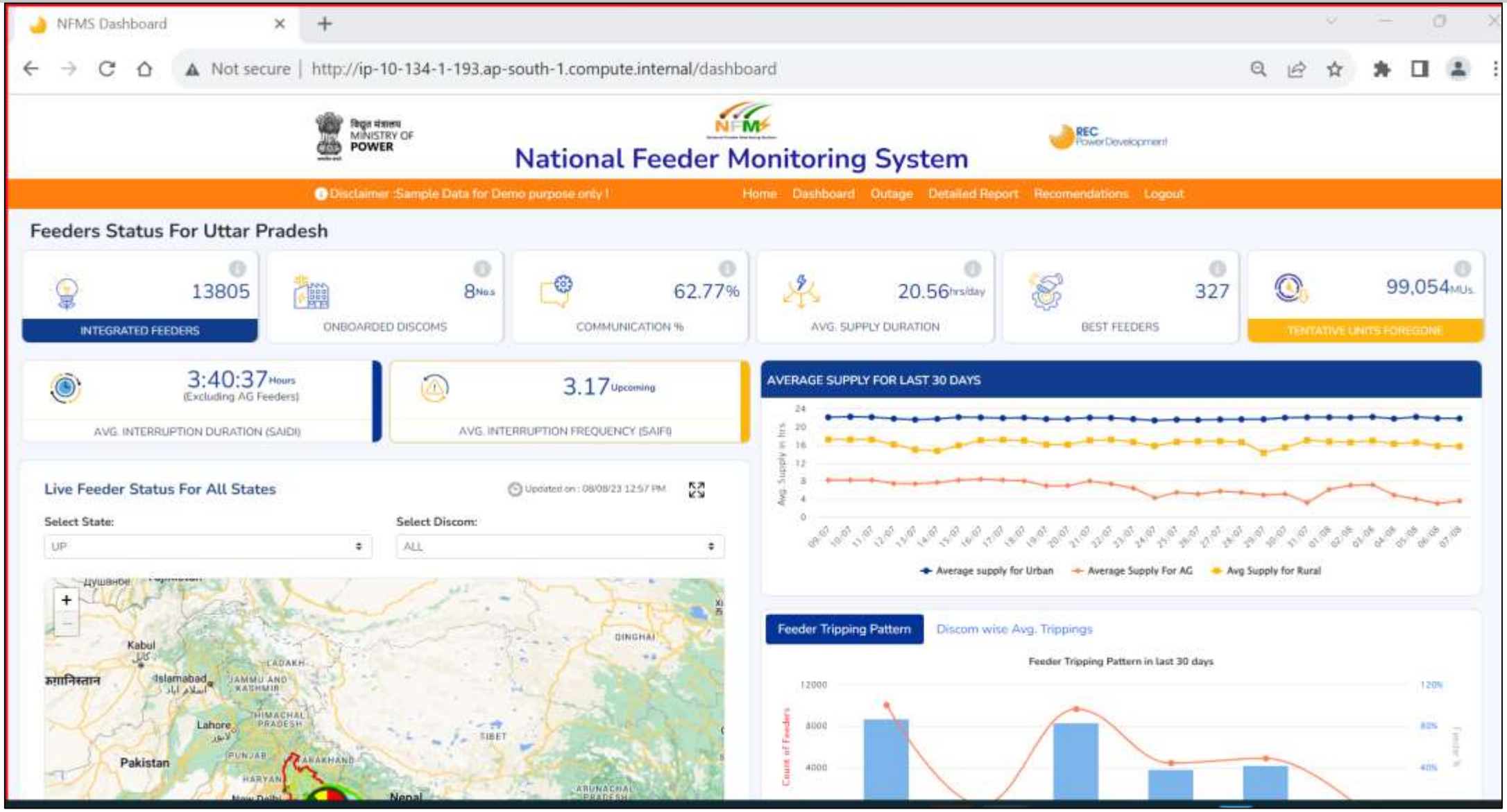
Consumption

Back

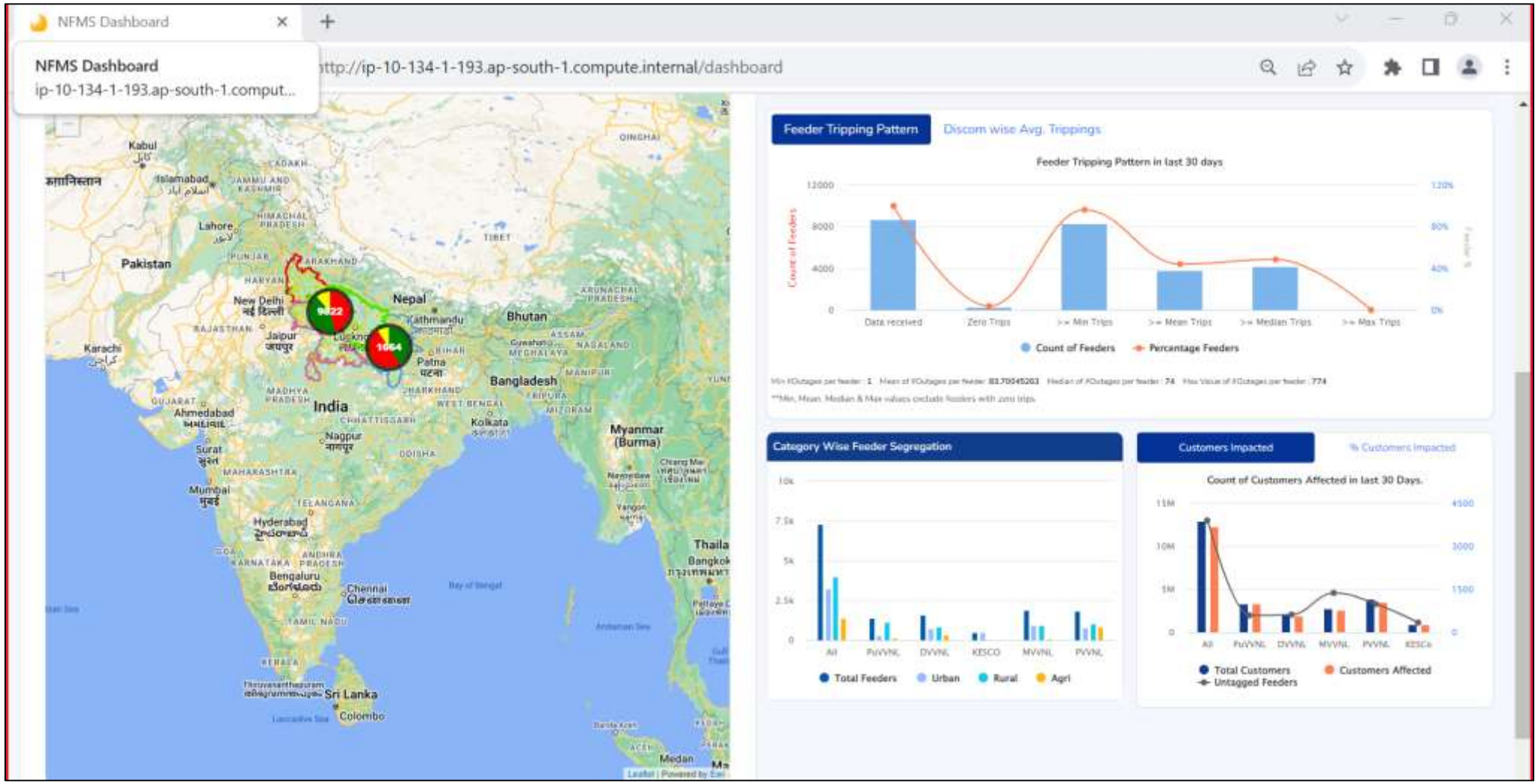


Credits: Abgyon Impressa dashboard

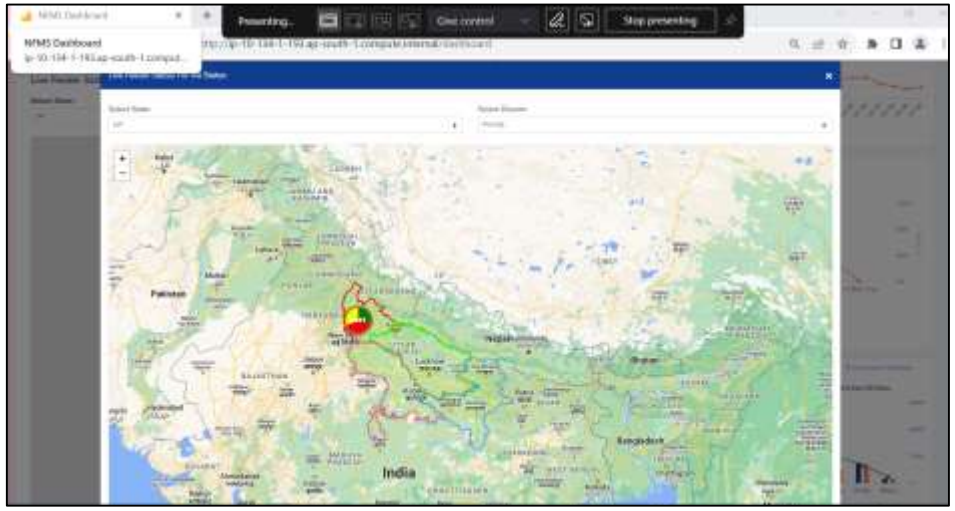
Glimpses of the NFMS Portal - Main Dashboard

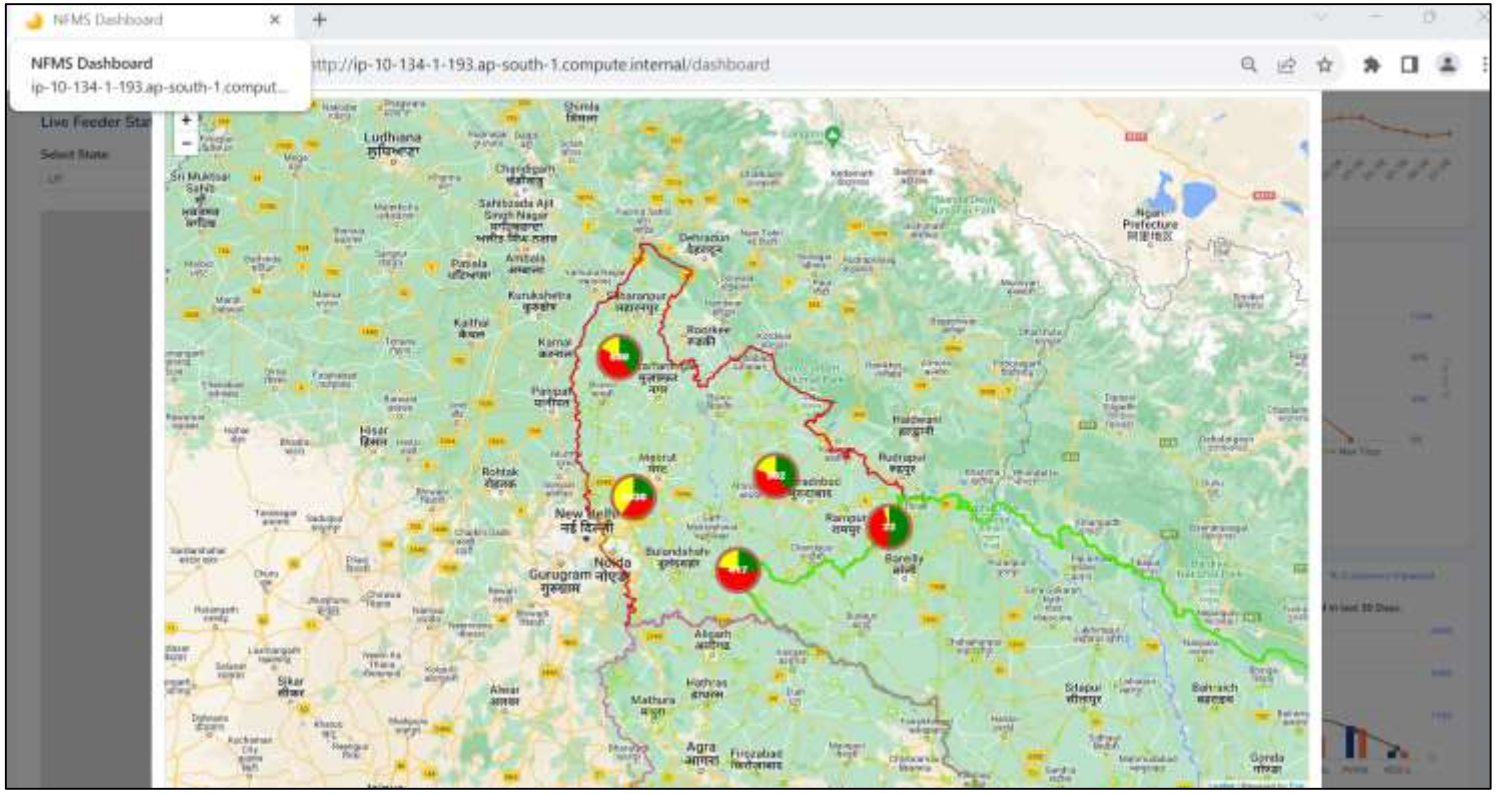


Glimpses of the NFMS Portal - Main Dashboard

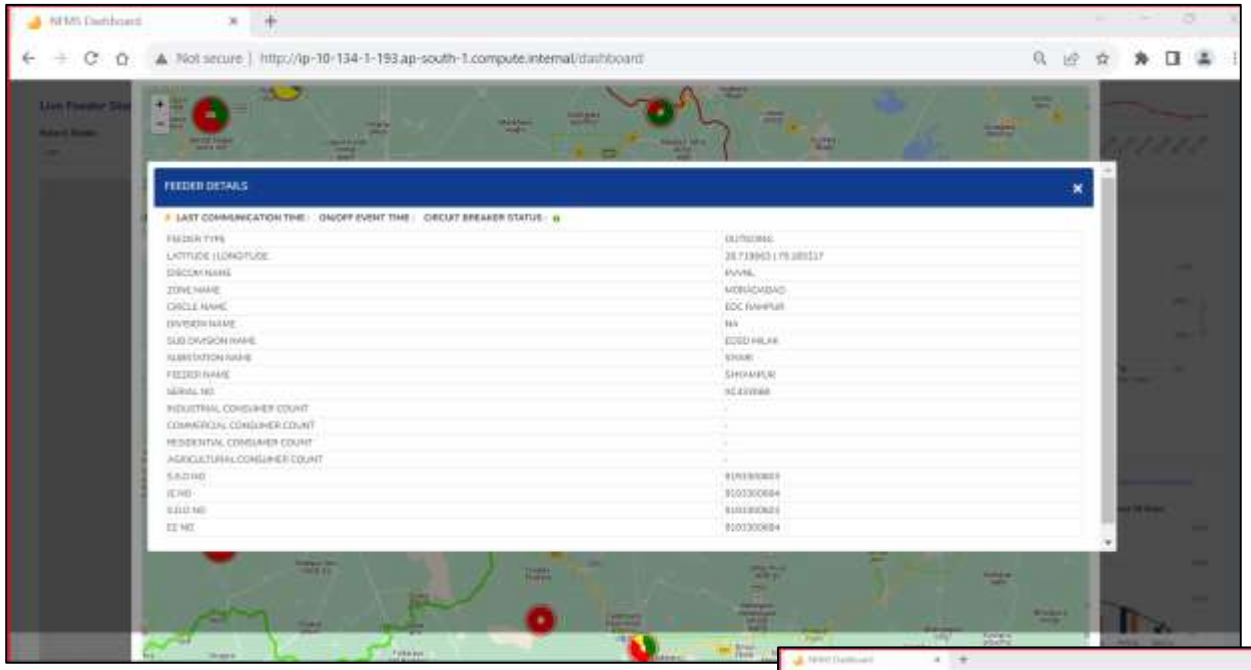


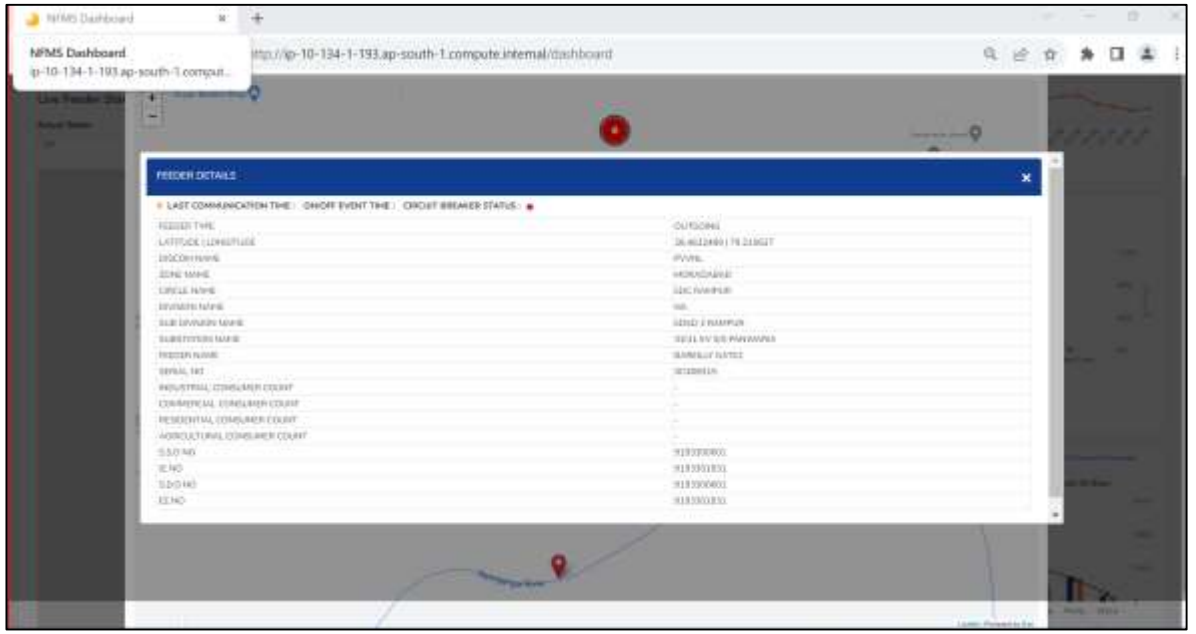
Glimpses of the Portal - Extension of Map & Feeder Details

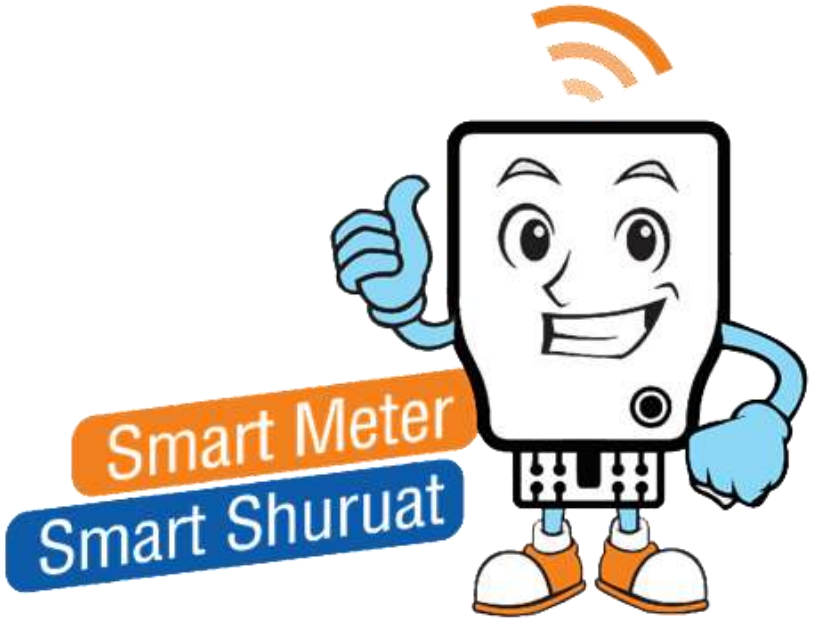


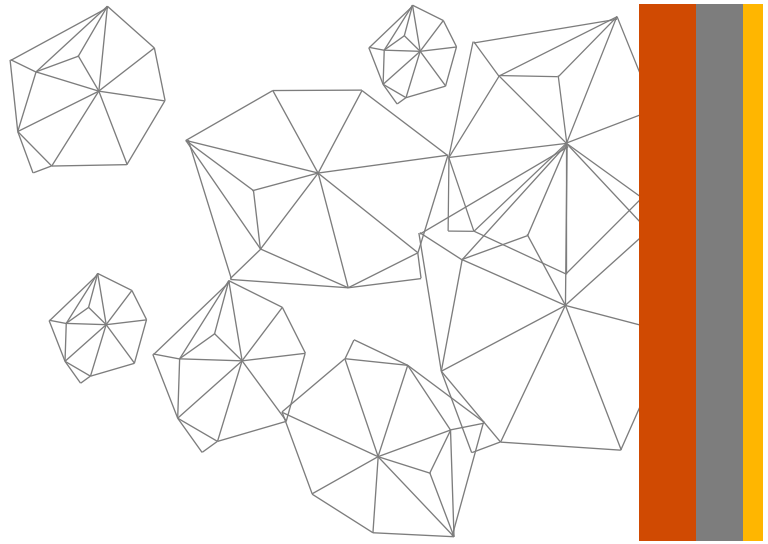


Glimpses of the NFMS Portal - Power On, Power Off & Non- communicating Details









Thank You