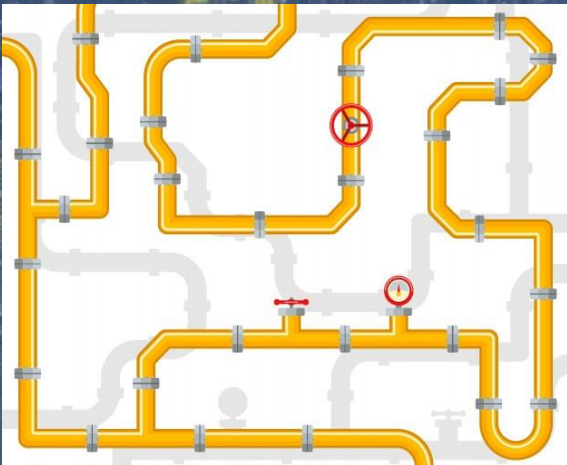


TATA COMMUNICATIONS



INTERNET OF THINGS SMART GAS METERING & DIGITALIZE MORE

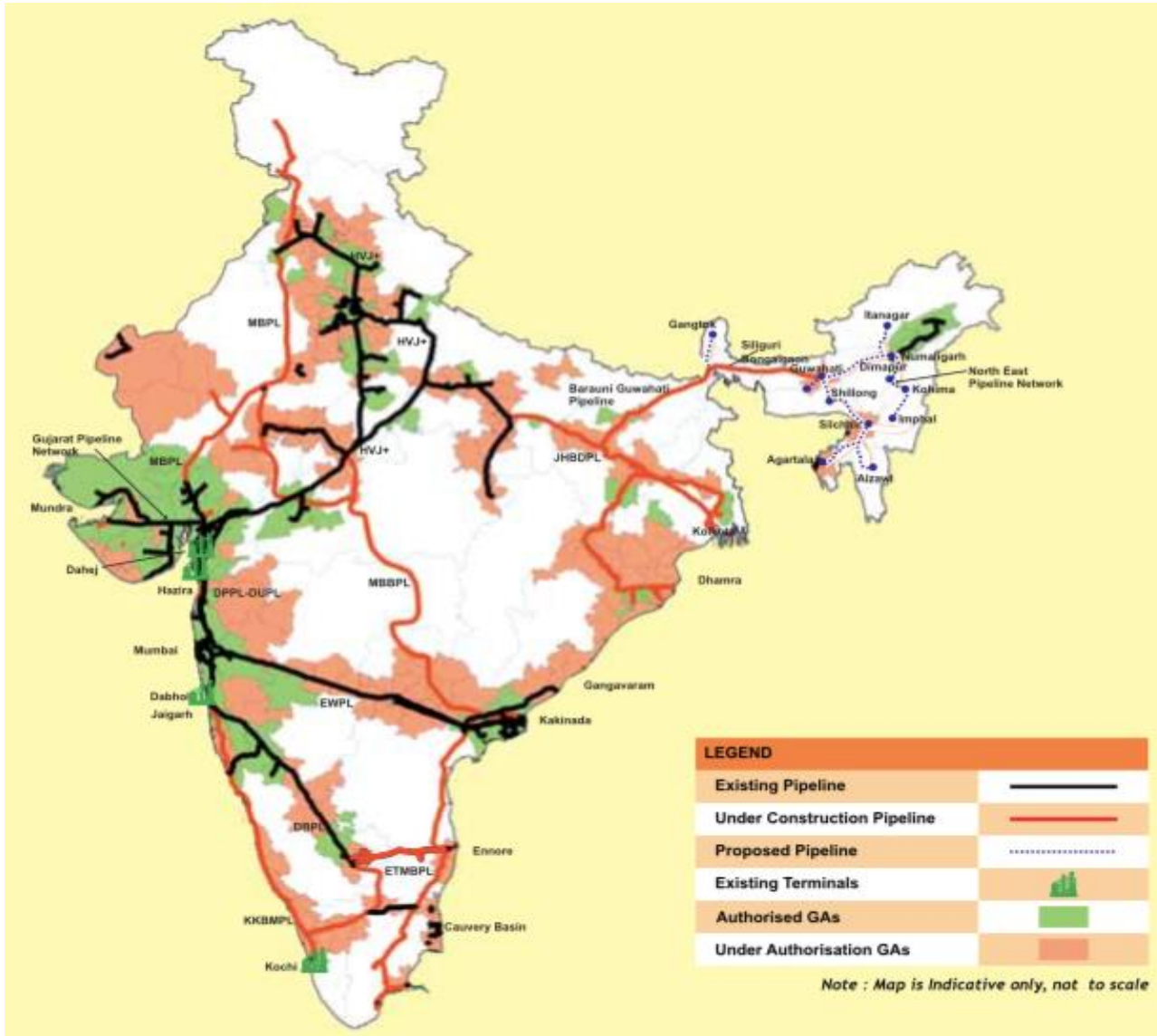


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March 5, 2020

CGD MARKET



Govt aims to expand CGD coverage to 50% of 640 districts to cover 50% population of the country.

237 GAs allocated after 10 round of bidding.

Targeted PNG Connections: 10 million by 2022 & 20 million by 2030.

Meters

- Installed base: ~ 5 mn
 - GGL + IGL + MGL (90%); Others 10%
 - 40-45%: Mechanical
 - 55-60%: AMR ready (Magnetic + Inductive)
- New Demand:
 - AMR Ready
 - Smart meter (Post Paid)
 - Smart Meter (Pre-Paid)

CGD ON EXPONENTIAL GROWTH PATH

Households PNG

PNG used for cooking, water heating, space heating, air conditioning, refrigeration and power generation. The concept of a single switch solution in the household sector is picking up momentum.

Commercial PNG

Hotels, Restaurants, Hospitals, Dairies, Bakeries, Cold Storages, Malls, Shopping Complexes, Shops, Educational institutes, Hostels etc. Major applications of PNG in this category are in kitchens, ovens, boilers, geysers, refrigerators etc. Some Complexes, offices, malls use PNG for power generation and Air Conditioning also.

GAIL's CGD entities are supplying PNG to over 8424 commercial units.

Industrial PNG

Industries require a continuous and reliable natural gas supply which can provide better efficiency and economy. A broad range of industries like Chemicals, Food Processing, Engineering Goods, Power Generation, Glass Industries etc. are using Industrial PNG.

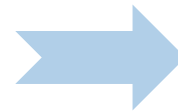
Gas is used by these industries for application like Heating - Boiler, Thermic Fluid Heater, Furnace; Cooling-Absorption Chiller; Power- Gas Engine and Gas Turbine; Process- for dryers, furnace, oven etc.

GAIL's CGD entities are supplying PNG to over 1860 industrial units across the country.

CHALLENGES OF RAPID GROWTH

2.7

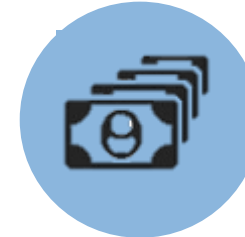
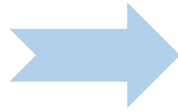
Times more readings required



Expanding field workforce requirement

64
lakh

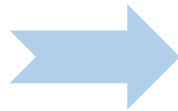
New customers to be billed



High cost of billing

5800

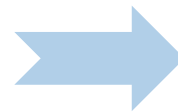
New connections to be added every day



Tracking transmission losses in the network



Dynamic Pricing



How to pass on benefits / charge Consumers

CHALLENGES WITH EXISTING SOLUTIONS



Door to Door Manual Reading Collection:

- Not scalable
- Huge manpower requirement
- Customer unavailability leading to multiple visits
- Invasion of privacy/security concern to resident / personnel
- Challenges in identifying the house and location of meter



Walk By/drive through:

- Only services basic automation.
- Poor frequency of data
- No temper alert / accident alert
- No value added solutions like proactive maintenance
- Human Intervention

Spot / Self Billing:

- Not scalable
- On mercy of consumer
- Irregular revenue forecast & payment collection
- No clue to CGD if tampering is done by the consumer

Only Smart Metering is the solution in long term to support the long term growth of CGD

CHALLENGES WITH EXISTING SMART METERING SOLUTIONS



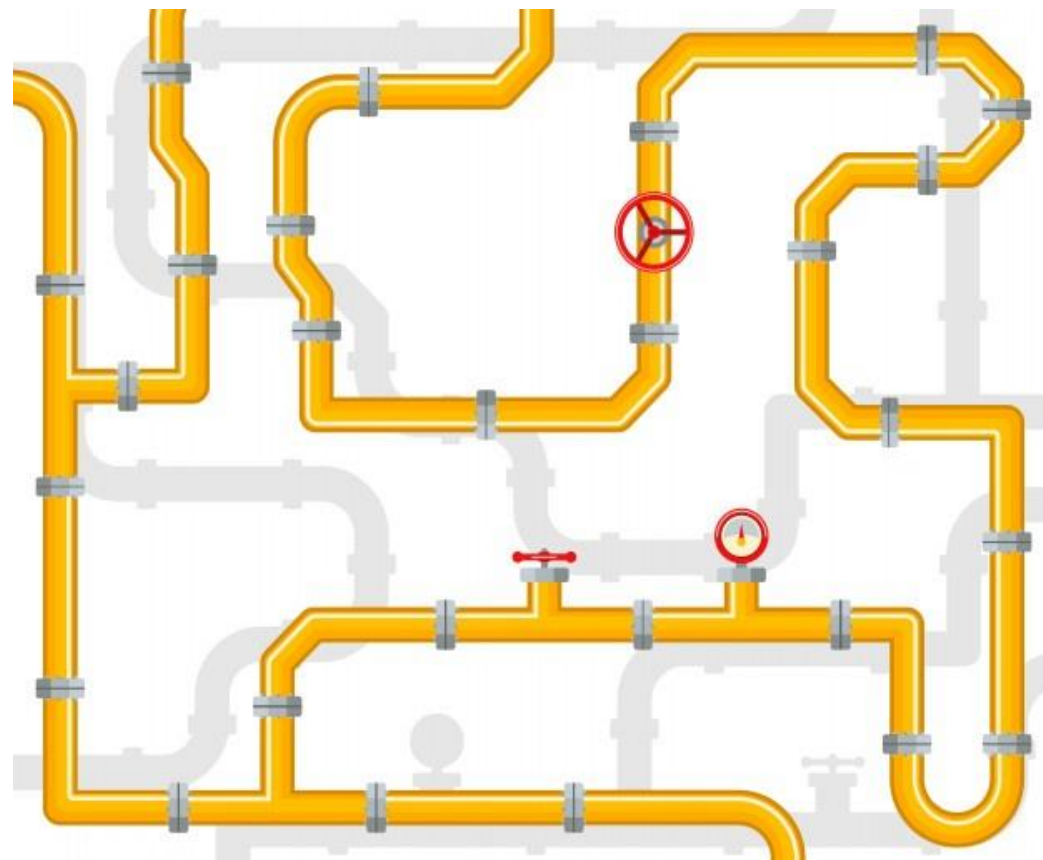
GSM/GPRS:

- Gas meters are non-powered while GSM based solutions drain power
- SIM Management challenges

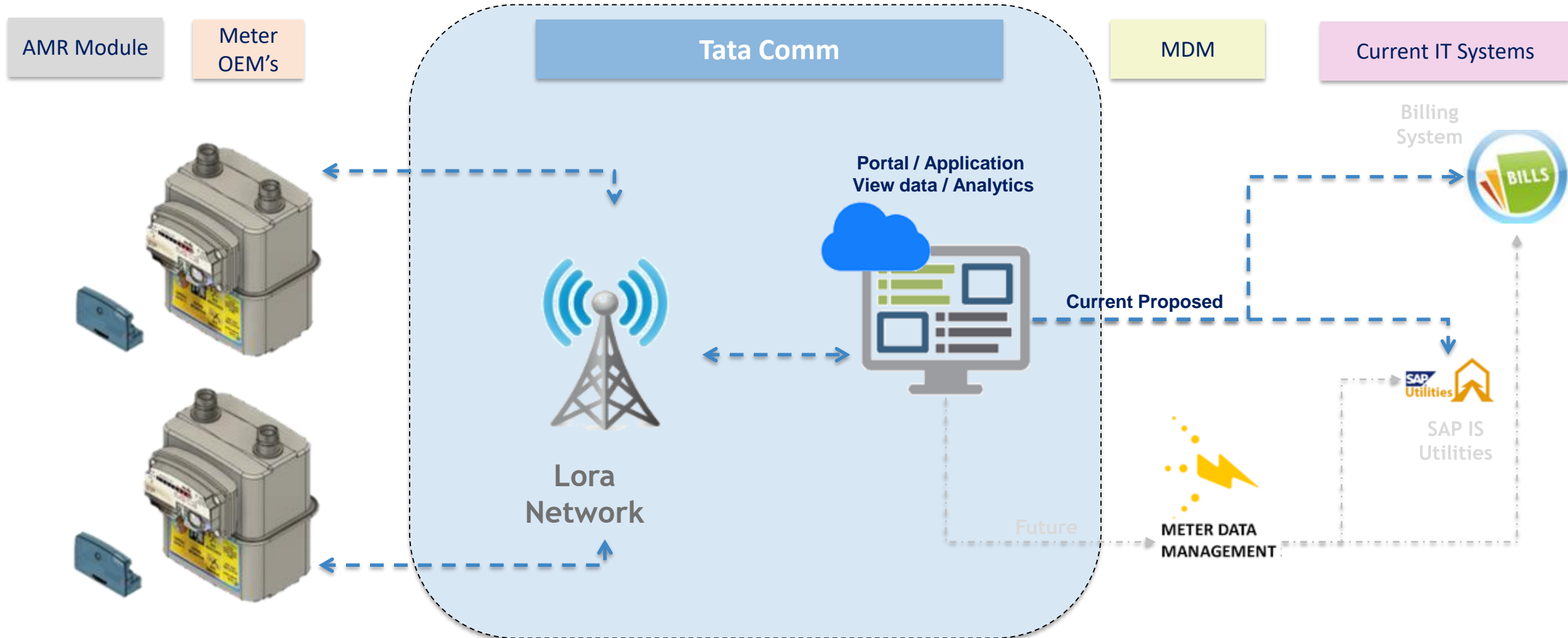


Zigbee/Proprietary RF:

- Maintenance of multiple small network environments
- Data concentrator unit requirements
- Cost of DCU, Electricity, real estate rentals
- Challenges in scale deployments



GAS AMR/AMI SOLUTION



BENEFITS OF TATA COMMUNICATIONS AMR SOLUTIONS

Rapid, scaled deployments across India using pan-India N/W

Insights through interactive dashboard

Low maintenance – smart unit battery lasts for years

Monitor tampering and theft through alerts

Avoid labour-intensive manual metering and inaccuracies

Reduce customer complaint calls

Reduce meter reading intrusion for Customer

Better reconciliation between distribution points/loss tracking

Promote energy conservation by providing consumption details to customers

End-to-end data security



Reduced Operational Costs & Increased Customer Satisfaction



PROJECT DEPLOYMENT

PRE-PAID SMART GAS METERING AT IGL
REWARI
MUZZAFFARNAGAR
KARNAL

Dashboard

REWARI



Alloted Meters
3884

[Click here to see details](#)



Meters Installed On Site
1196

[Click here to see details](#)



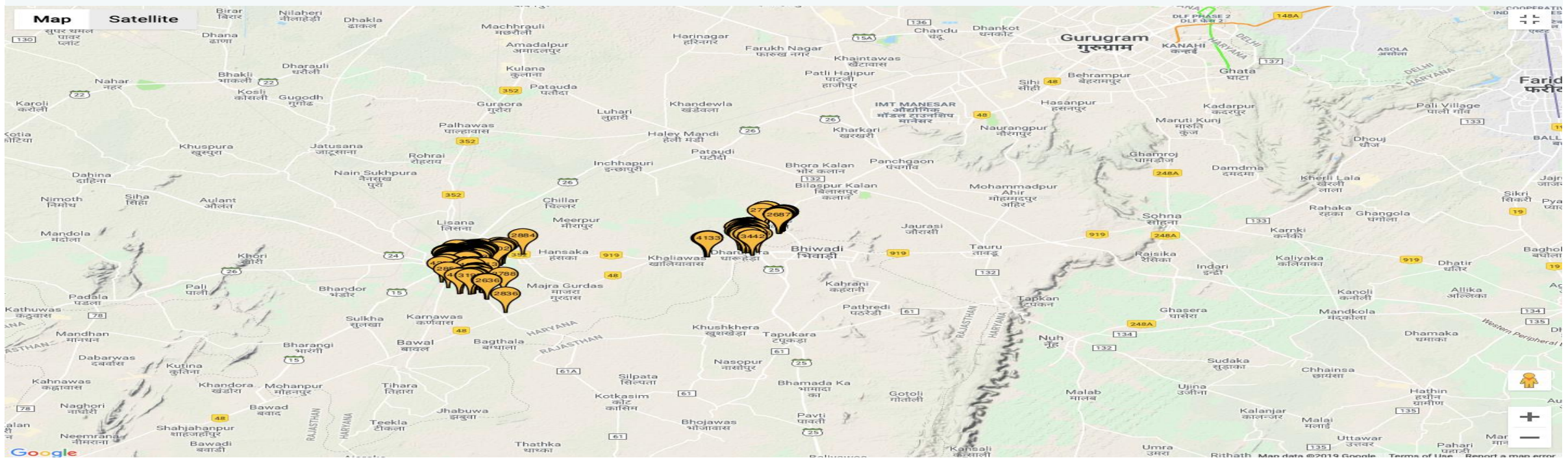
NG Meters
896

[Click here to see details](#)



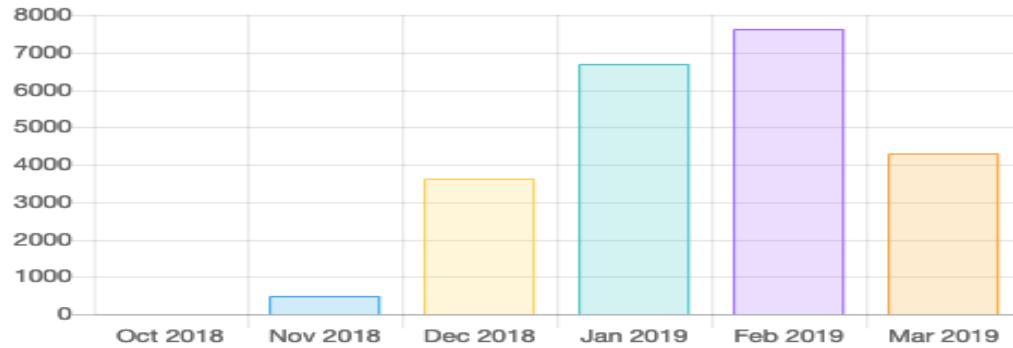
Pending Meters
2688

[Click here to see details](#)

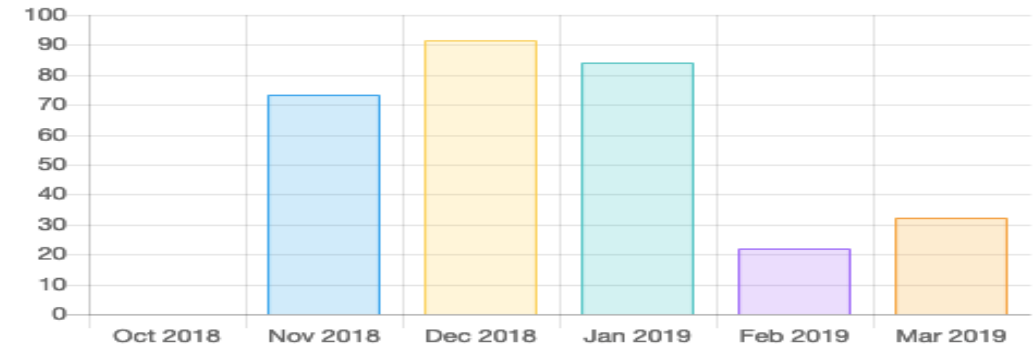


[View/Download the entire remission dashboard now](#)

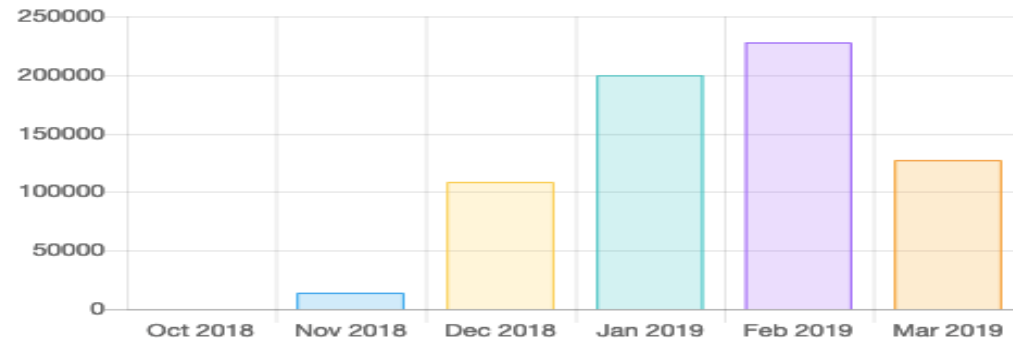
Last Six Month Total Consumption



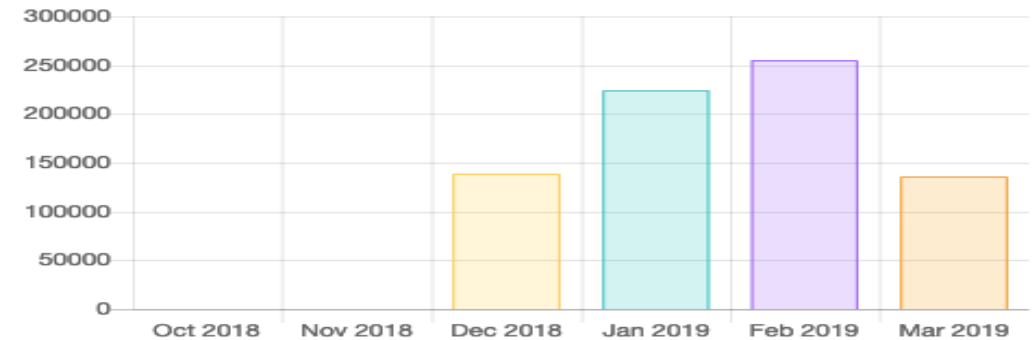
Average Monthly Consumption



Last Six Month Actual Billing Amount



Last Six Month Recharge Amount

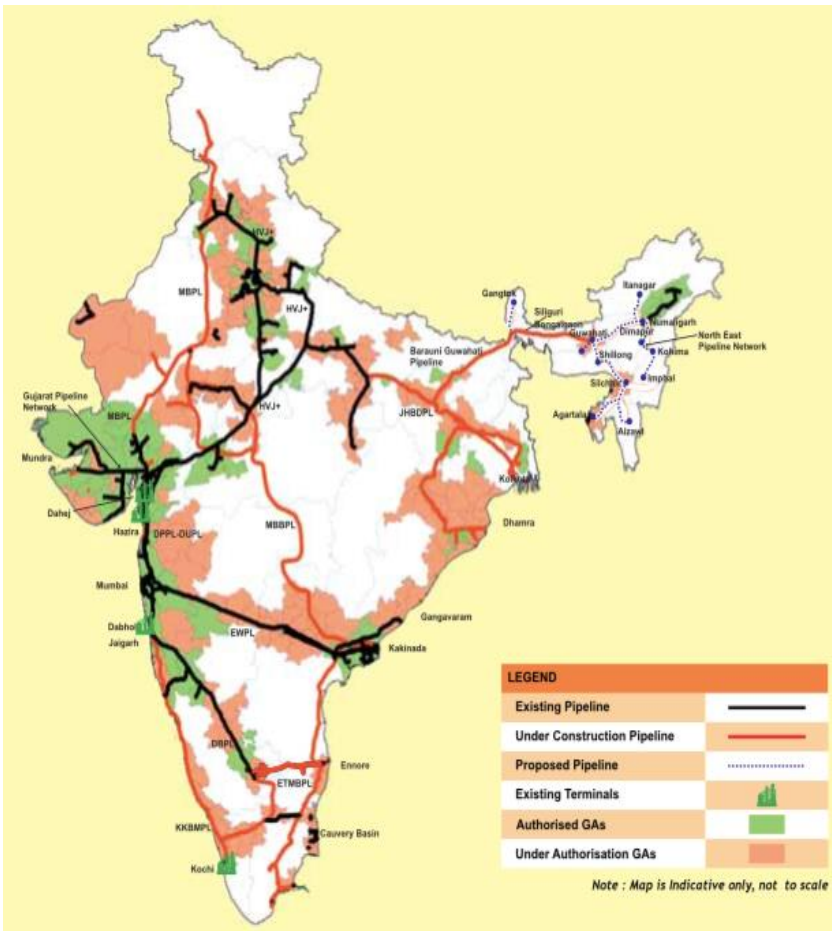


List of cities

- | | |
|--------------------------|---------------|
| 1 Mumbai | 20 Dehradun |
| 2 Bengaluru | 21 Jodhpur |
| NCR (New Delhi, Gurgaon, | |
| 3 Noida | 22 Kanpur |
| Faridabad, Ghaziabad) | 23 Amritsar |
| 4 Pune | 24 Ludhiana |
| 5 Bhubaneshwar | 25 Chandigarh |
| 6 Ahmedabad | 26 Kolkata |
| | Hubli - |
| 7 Bhopal | 27 Dharwad |
| 8 Indore | 28 Mysore |
| 9 Gwalior | 29 Vijayawada |
| 10 Aurangabad | 30 Hyderabad |
| | Vishakhapatna |
| 11 Nagpur | 31 m |
| 12 Solapur | 32 Chennai |
| 13 Nasik | 33 Coimbatore |
| 14 Surat | 34 Tiruppur |
| 15 Baroda | 35 Kochi |
| 16 Jaipur | 36 Thrissur |
| 17 Jamshedpur | 37 Calicut |
| 18 Lucknow | 38 Trivandrum |
| 19 Meerut | |

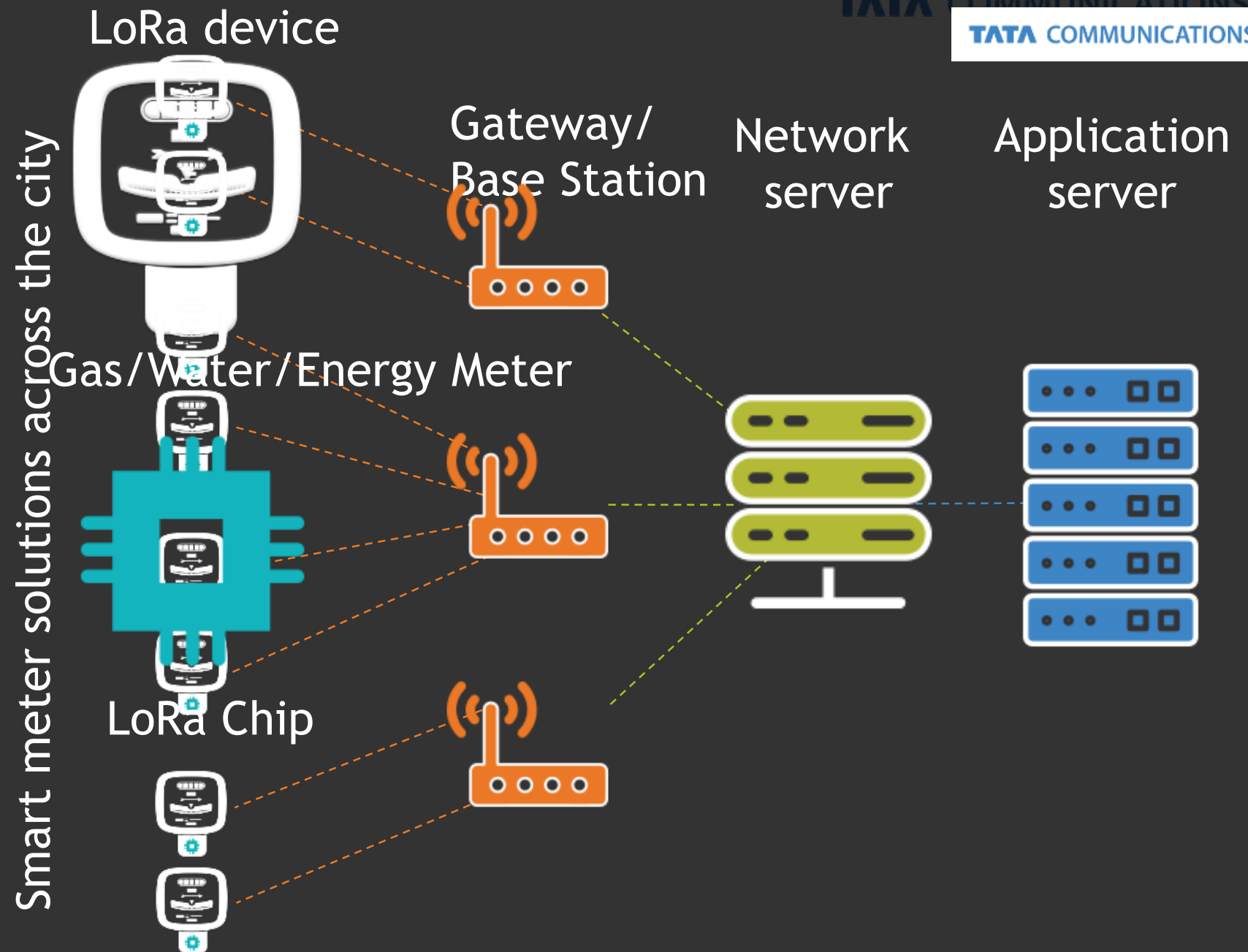


TCL LoRaWAN Map



Pipeline /CGD Map

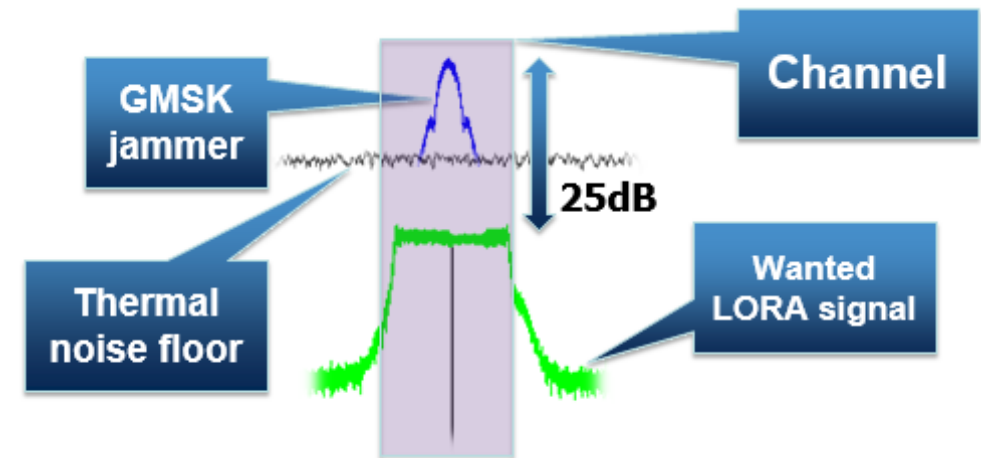
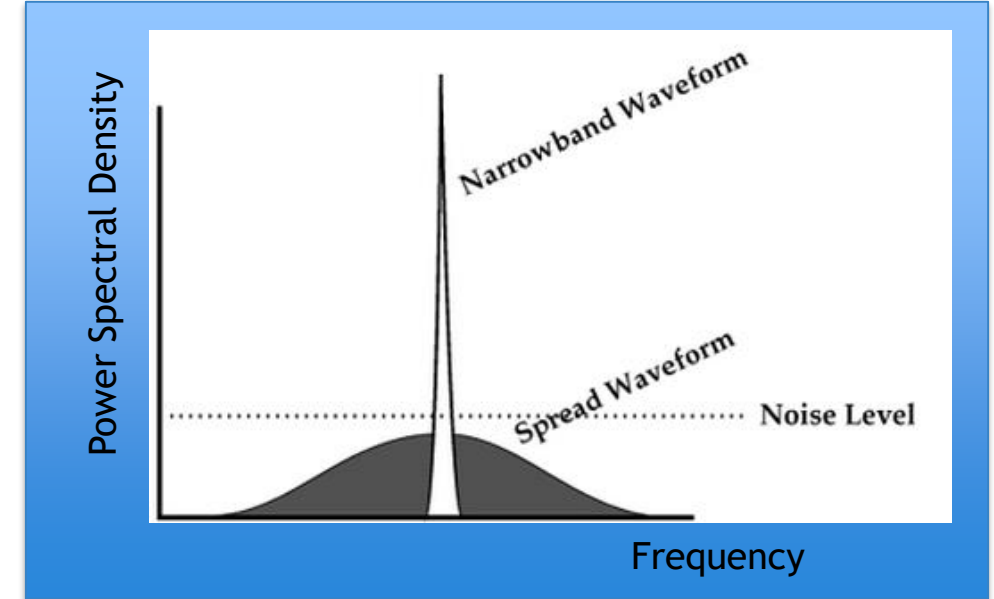
Smart Utilities Solution



LORAWAN FEATURES & KEY DIFFERENTIATOR

Class	Application
A “All”	Bi-directional communications whereby each end-device’s uplink transmission is followed by two short downlink receive windows. Downlink communications from the server at any other time will have to wait until the next scheduled uplink. Most energy efficient class.
B “Beacon”	Class B devices open extra receive windows at scheduled times. In order to keep synchronization and schedule receive windows, devices receive a time synchronized Beacon from the gateway (every 128s).
C “Continuous”	Class C nodes have nearly continuously open receive windows, only closed when transmitting

SF	SNR	Data rate	TOA for 10Bytes payload	Relative power consumption
SF12	-20 dB	293 bps	1480 ms	24,7
SF11	-17,5 dB	537 bps	740 ms	12,3
SF10	-15 dB	977 bps	370 ms	6,2
SF9	-12,5 dB	1758 bps	200 ms	3,3
SF8	-10 dB	3125 bps	100 ms	1,7
SF7	-7,5 dB	5469 bps	60 ms	1

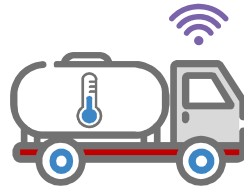


INDIA IOT SOLUTIONS

DIGITISE OPERATIONS AND ACCELERATE NEW REVENUE OPPORTUNITIES

Asset Tracking solution

Track asset location, monitor temperature and vibration anomalies remotely



Smart Lighting solution

Enable better management of energy by orchestrating street lights

Employee Health and Safety

Monitor employee and environment with a two way alert mechanism



Smart Button solution

Place the power of feedback at the customer's fingertips

Women's Safety solution

Call for help, even in areas that are not covered by GSM

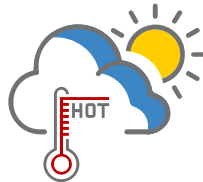


Automated Metering solution

Monitor customer usage through automated meter reading and data processing

Environment Monitoring

Sensors to monitor environmental parameters accurately



We are just getting started, soon one of our solutions will touch your lives

EMPLOYEE SAFETY WEARABLE

FLEXIBLE CONFIGURABLE SOLUTION ENABLING WELLNESS AND LOCATION BASED SERVICES FOR CUSTOMERS



WELLNESS FEATURES



Heart rate measurement



Body skin temperature



Fall and immobility



Elevation (Absolute, relative)

LOCATION FEATURES



Hazardous Area by proximity



Geofencing



Access Control



SOS Button

MANAGED SERVICES



Enterprise grade managed service - service delivery and assurance



Configurable Application

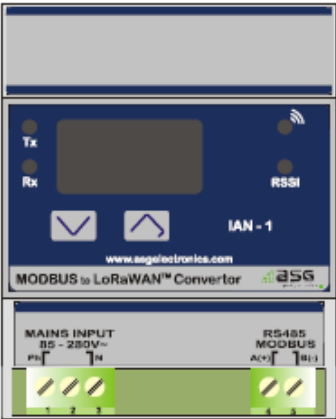


Analytics engine

Bedrock of Robust Network, Platform and Application

INDUSTRIAL IOT DEVICES

Energy Monitoring Interface Device



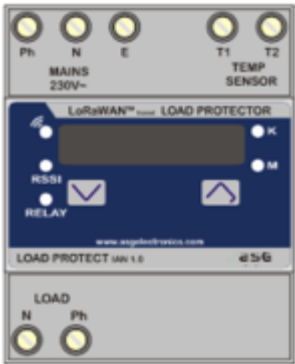
NONC



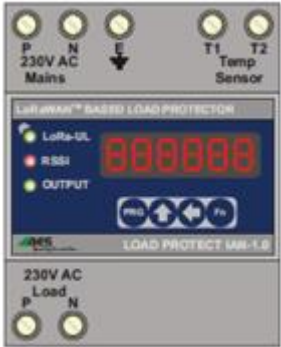
Temperature & Humidity Sensor



Load Protect



PROCESS METER
DI/DO/RELAY/UI



MODBUS TO LORAWAN
CONVERTER



ASSET TRACKING

The Challenge

- Higher turn around time for material shipments
- Lost assets - difficulties in locating
- Idle assets - reduced productivity
- Real Time tracking of asset movement
- Alerts for breaching geofence
- Pay per Use of Assets
- Asset Health Monitoring Challenges

Benefits

- Less time spent tracking assets
- Save money from inventory shrinkage when a lost asset must be replaced
- Optimum utilization of resources or asset
- Low maintenance costs thanks to LoRa sensors low power operation, ensuring batteries can last longer
- Employee safety
- Monitor Asset condition remotely

Solution

- GPS, Accelerometer, BLE, WiFi, AGPS, Temperature & Humidity
- Longer battery life
- Geo-fence & POI
- Facility to integrate analogue or digital sensors
- Asset Tracking history



(A)



(B)



(C)

A,B,C are LoRa based asset tracking devices

THANK YOU