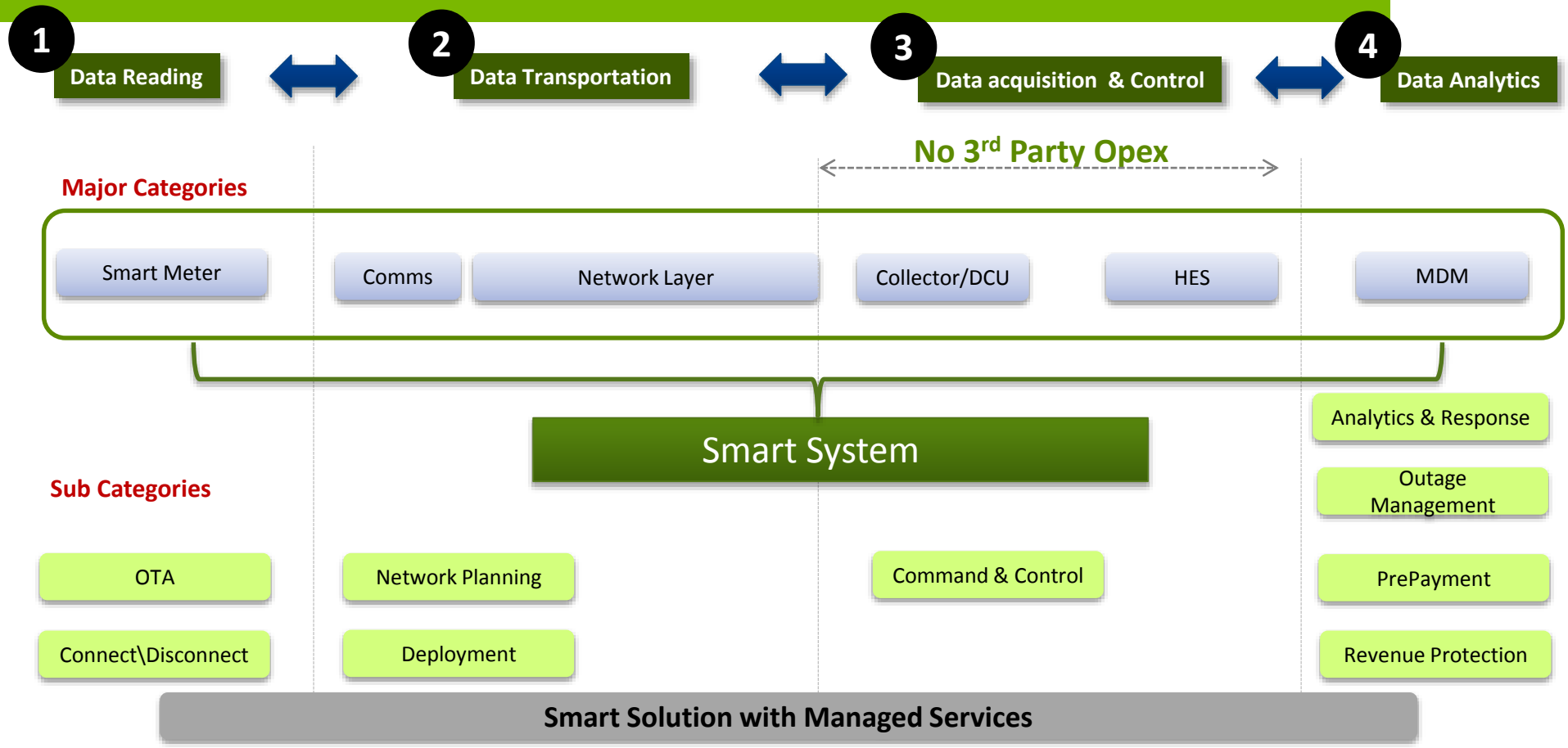
Smart Metering by Landis + Gyr

Key Components of Smart System



Smart Meter and its Real Time Smartness

Energy & Demand

- Registers for Energy & Demand: kWh, kVAh, kvarh (lag & lead), MD kW, MD kVA
- TOU Registers (8 rates, 10 time zones): kWh, kVAh, MD kW, MD kVA
- Last 12 billing storage
  Billing data Push to HES on every billing/reset

Interval & Daily Load Profile

- Daily Survey data push at midnight to HES for daily consumption monitoring
- Load Survey – 15, 30 or 60 Minutes IP.
  Load survey data push to HES as per defined frequency of Push
- Minimum of 35 days load survey data storage & 60 days daily survey data storage in meter

Accessibility

- Remote Programming/ Configuration change (OTA)
- Real time Remote Firmware upgrades with provision of future activation (OTA)
- Category-C DLMS compliance as per IS15959
- Tampers, Events & Outage Logs & Alerts to HES

Consumer Applications

- Remote Connect/Disconnect via command from HES
- Automatic Disconnect in case of Over load/Over current (with logic for reconnection cycle)
- ARM button for reconnection in field
- Events for connect/ disconnect, relay malfunction & communication card removal
- Relay disconnect in case of Front Cover Open

Smart features

Traditional features

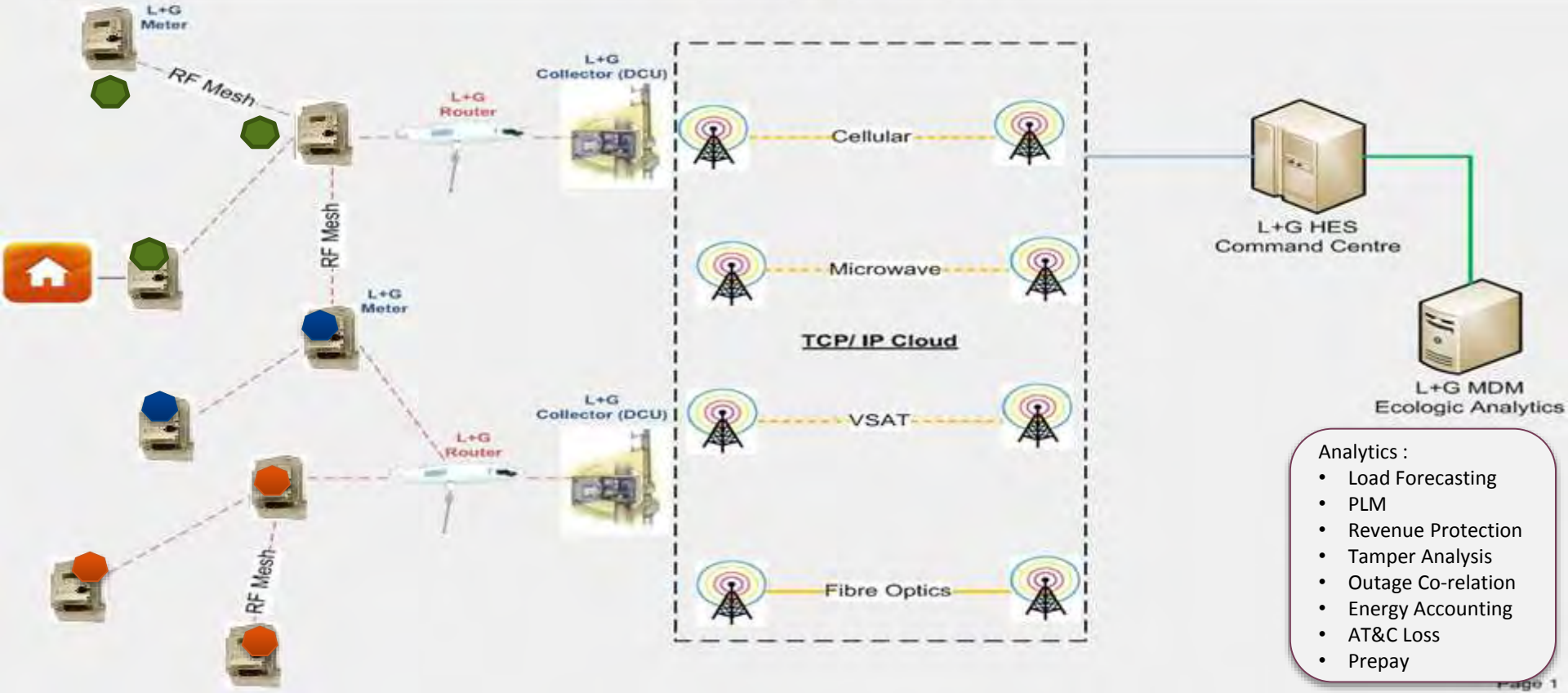
How Smart RF mesh canopy works?

Landis+Gyr

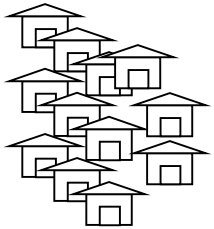
Smart Meters

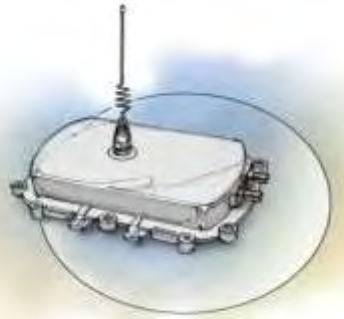
Smart Network

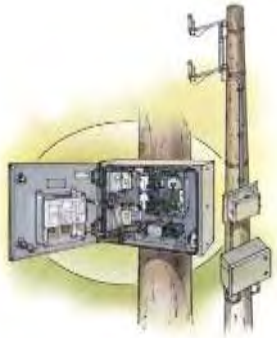
Smart Backend Servers



Smart RF Mesh Canopy Highway



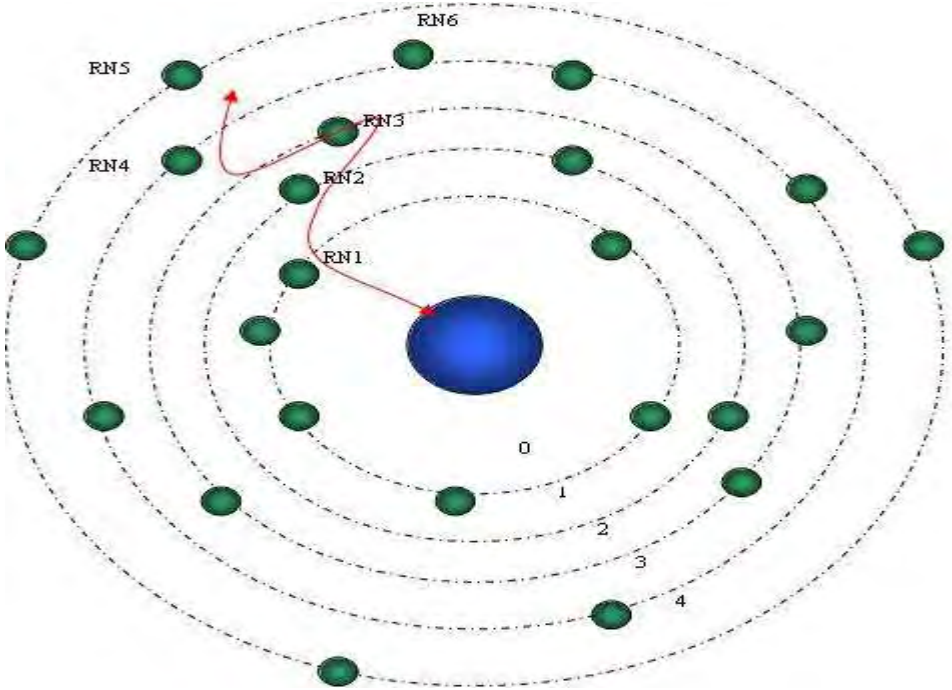




Data Flow →

Meters → **Router** → **Collector :2000 Endpoints@40%**

Self Registration = Scalable Deployment

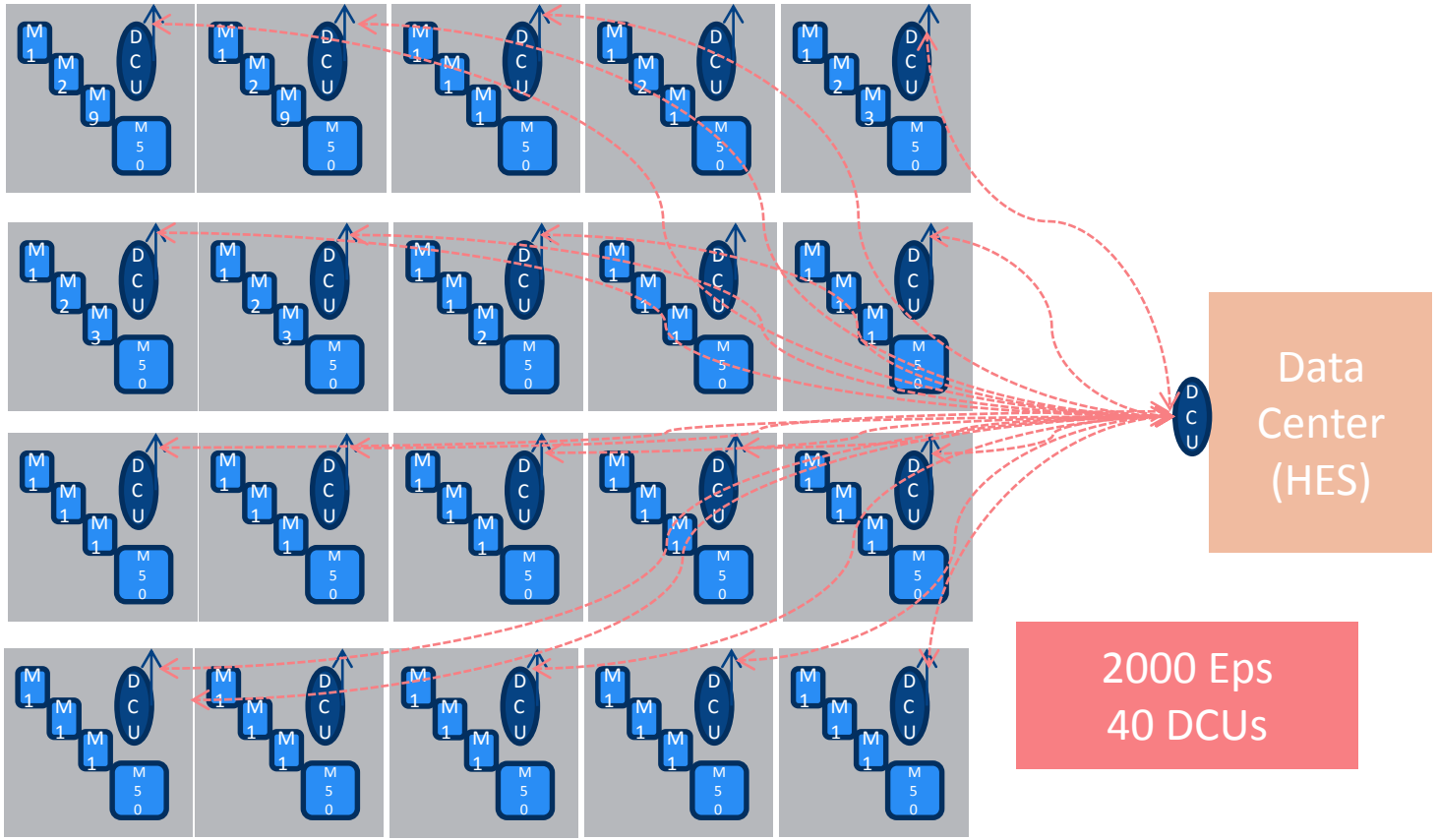


No special tools or process required during meter deployments

Meters send registration packet upon energization

Command Center authorizes meter to join network.

Challenges : DCU with 50 endpoints in Mass Roll Out



- DCU Capacity : 50 Eps
- Meter PAN is fixed with DCU
- Every DCU need : 1 SIM card for Backhaul connectivity, Opex cost to third party GPRS and field activity
- For 2000 Meters : 40 DCUs needed
- There is no mesh connectivity between DCUs
- Self healing is up to meter level only
- It is point to points connectivity with group of 50 meters with high opex

Gridstream® RF Data - Pushed, Not Polled

- Meter/Modules manufactured with utility default configuration
- Configuration defines reads/events pushed to HES

Data Type	Example	Timing
Billing (snap read) (Billing Profile)	Cumulative Energy , MD, TOD Energy & MD	Randomized push as per billing cycle
Load Profile Intervals	Different interval channels	Configurable (Ex : 15 minutes, 4 Hours, 24 Hours)
Command Confirmations Control & Other Commands	Demand Reset, Connect/Disconnect, Ping On Demand Read & Write	Immediate. Performance consistency based on the network and other customer schedules)
Alarms	Configurable (Sag/Swell, Outage/Restoration)(O/L, Magnet , C Open, Relay malfunction)	Immediate. Performance consistency based on the network and other customer schedules)

TPDDL AMI Project (1st ever commercial AMI project in India)

TPDDL wanted to perform Demand Response on its Key Consumer Group i.e. HT meters are 11kV

Profile of Consumers:

- 250 no's high end consumers
- Sanctioned Load of 300KW and above (70% revenue)
- 250 sq kms of clusters, spread across 900sq kms

Targets of Tata Power:

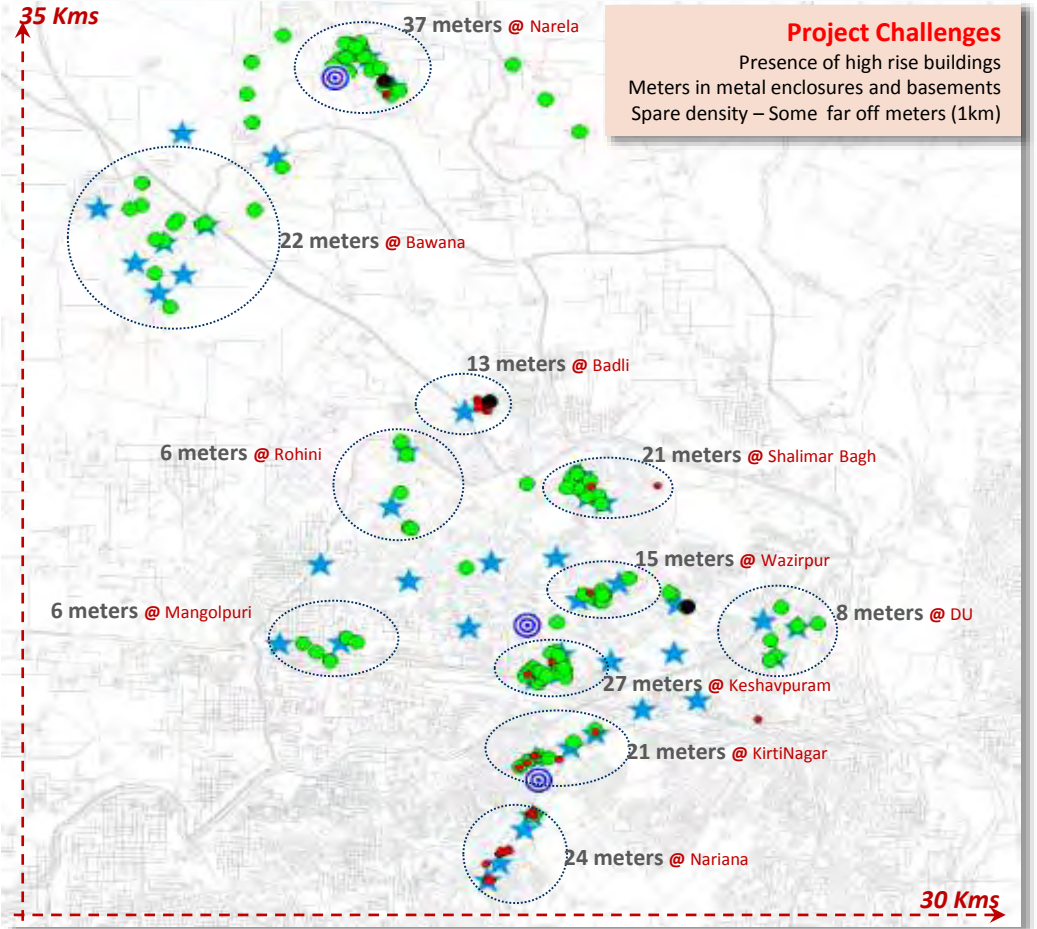
- Reduction of 34MW of power during the peak demand
- Communication Canopy

L+G Scope of work

Complete end-2-end AMI solution

- HT meters with modular RF module (865-867Mhz) – 250 no's
- Network (Router + Collector) – 70 no's approx
- Head End Software
- MDM
- Consumer Portal
- Consumer Apps
- Integration of system with SAP, CIS, ADR, OMS, etc

Tata Power : AMI Lighthouse Project



Highlights

- **34MW** of power reduction during peak demand
- Spread of **900sq kms**
- Meters present in basement of malls of factories **seamlessly communicating**
- **99.99%** run time data availability achieved
- **ZERO** manual intervention achieved

Consumer Engagement

- **Consumer apps** providing consumption information
- **Alerts** of Low PF and demand overshoot

Scalability

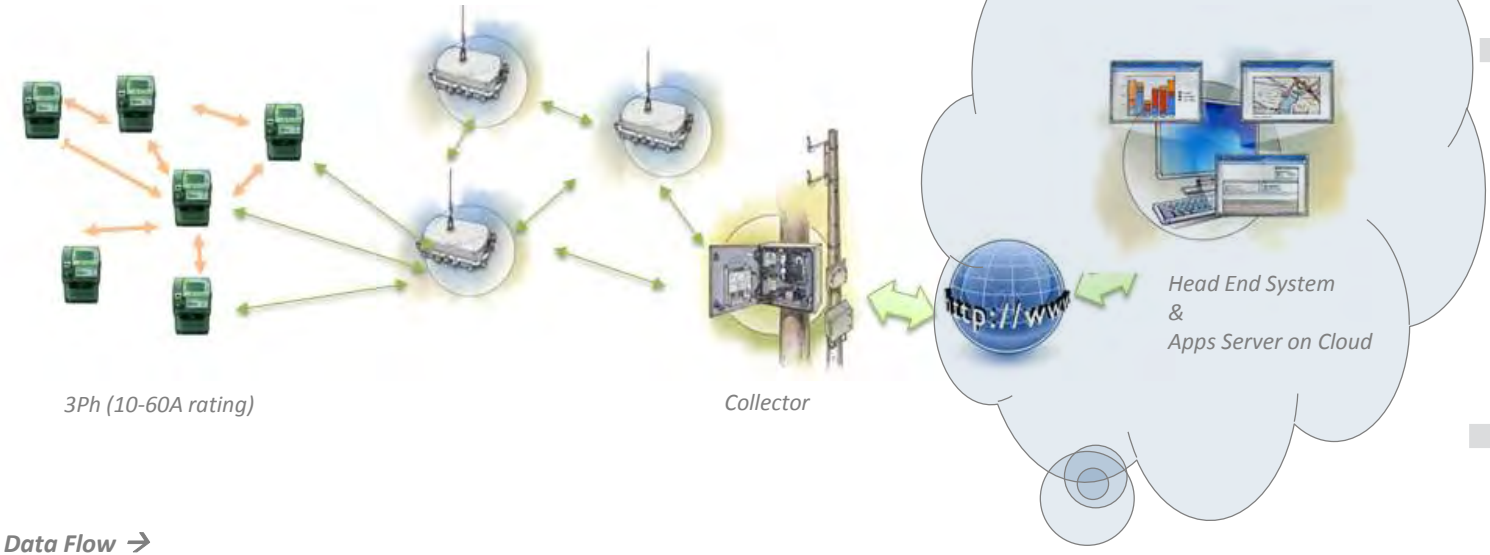
- Common **Communication Canopy** that can be leveraged for additional few lakhs meters
- All Utility systems are **integrated**, with common repository

Pilot at BYPL *(Patparganj Industrial Area)*

20-30 Consumer in the consumption range of 20kW to 30 kW (3ph meters 10-60A rating)

Collector Installed at Patparganj Grid. Collector sends meter data to HES installed in the cloud.

System Layout at BYPL



3Ph (10-60A rating)

Collector

Consumers

Apps for Consumers to monitor their consumption

Data Flow →

Meters

Installed at Patparganj Industrial Area

Router / Collector

Installed at Patpargang Grid Sub station

Head End System

Installed on cloud @ Landis + Gyr office in Noida

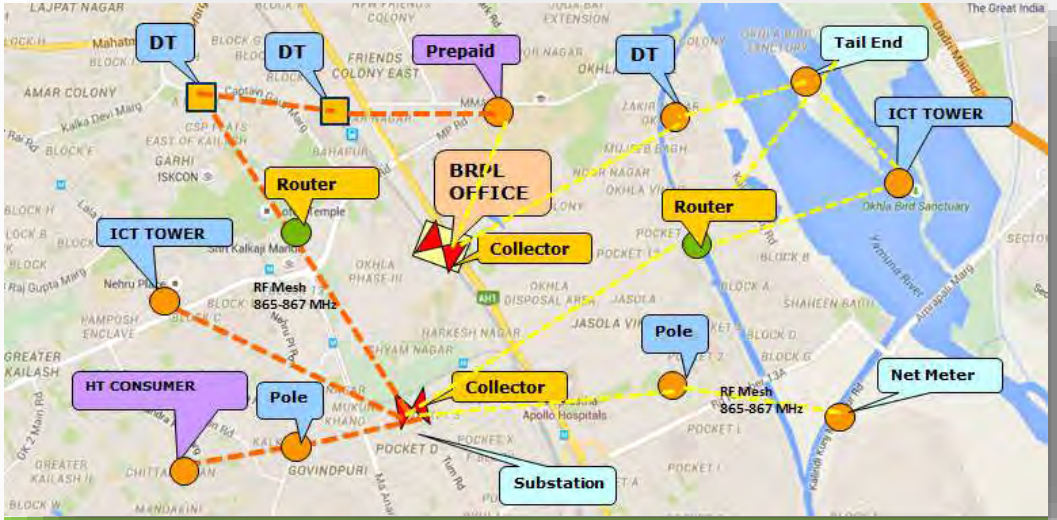
Utility

Analytics and control for Utility

Smart Canopy Approach for Utility Challenges

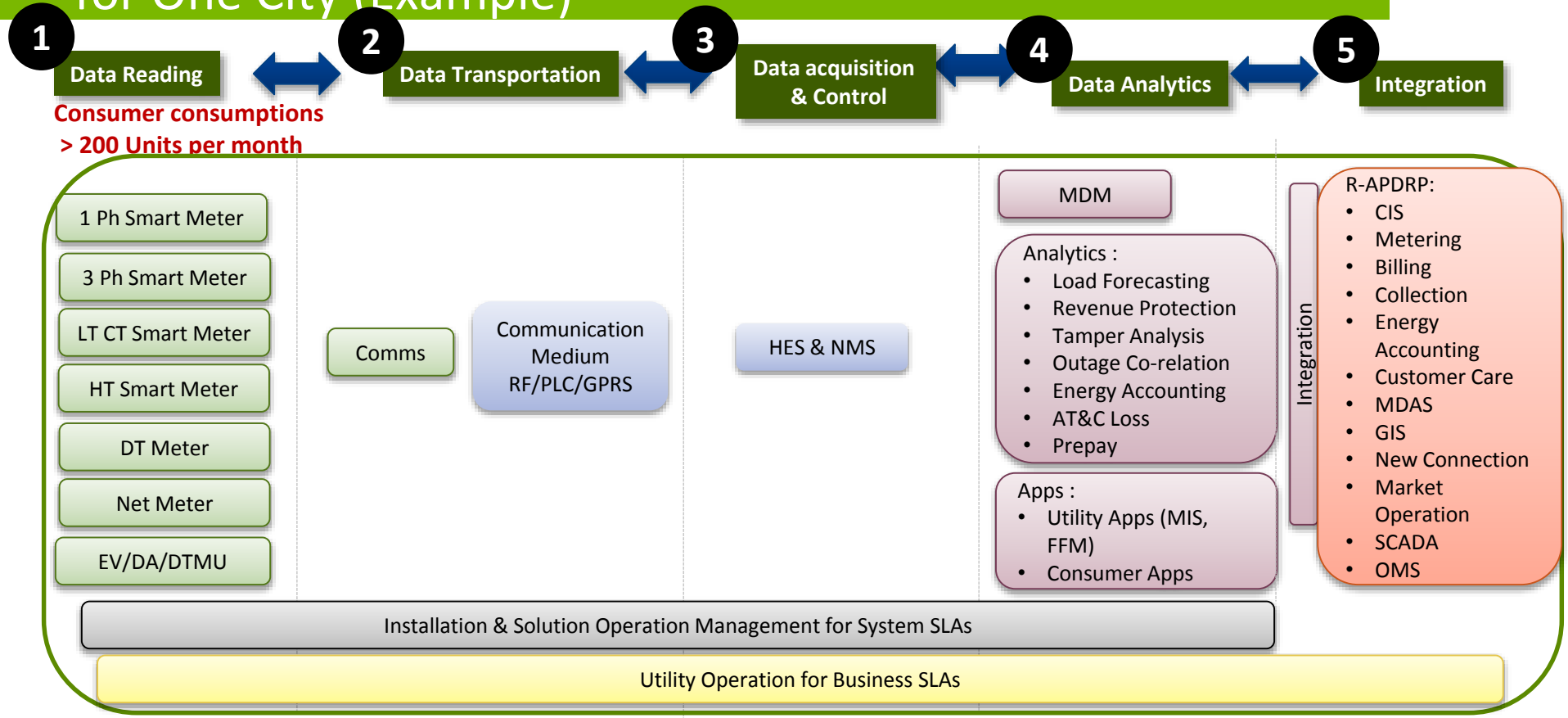
Design Canopy and Install smart meters/applications at the following points..

- High End Consumer Metering
- DT Metering
- Consumer Metering, TOU Consumers, Tail End
- Prepaid Metering
- Net Metering
- Mobile Tower, Street Light
- EV, DTMU, Distribution Automation



#Reduction in Losses, #Proper Forecasting for Input power, # Outage Management, #Consumer Engagement

Overall Solution Required – Improve Operation Efficiency for One City (Example)



#Interoperable, #Scalable, # Security, #Futuristic

Thank You!!