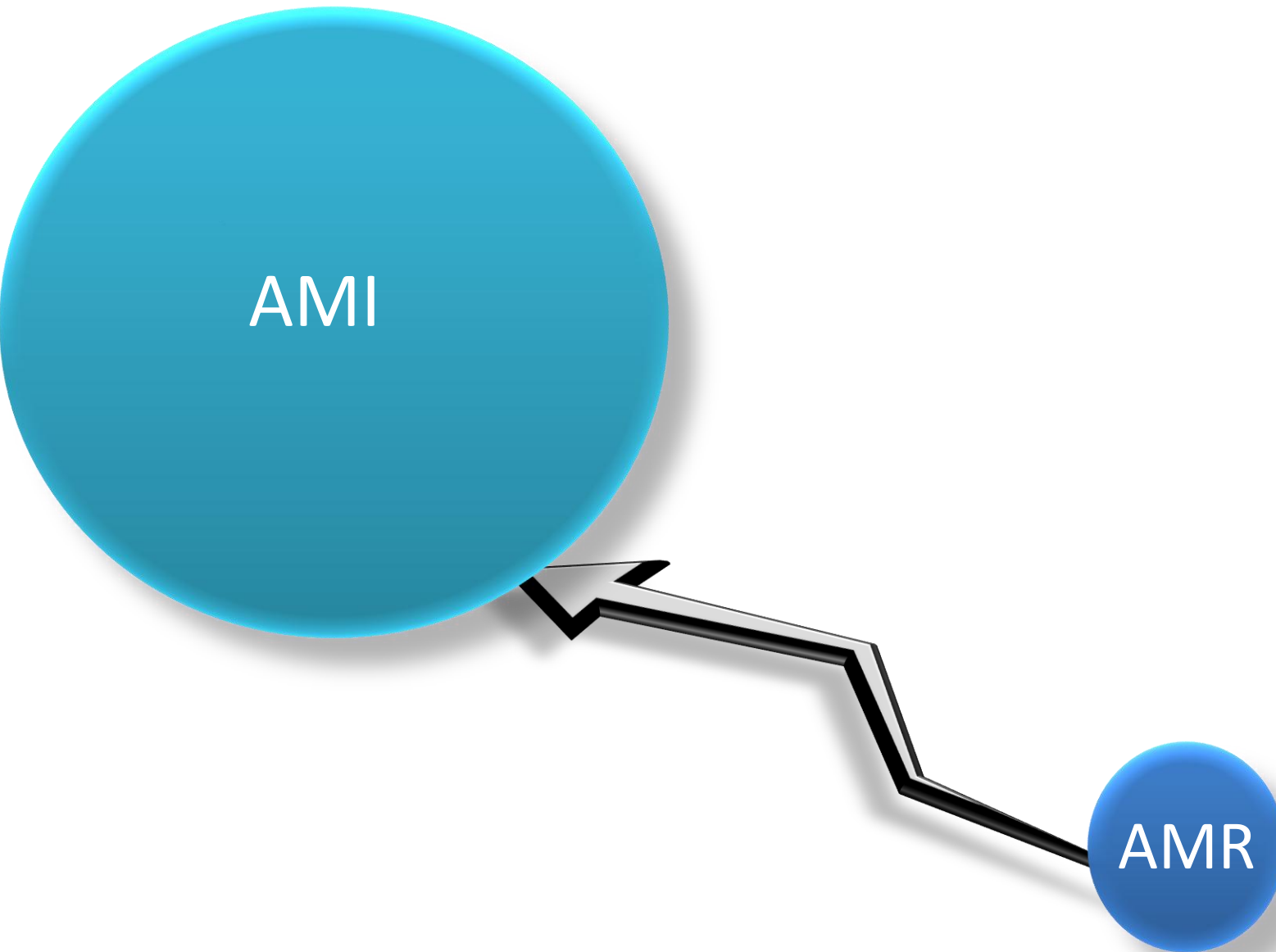




CESC
LIMITED

AMI: The Concept



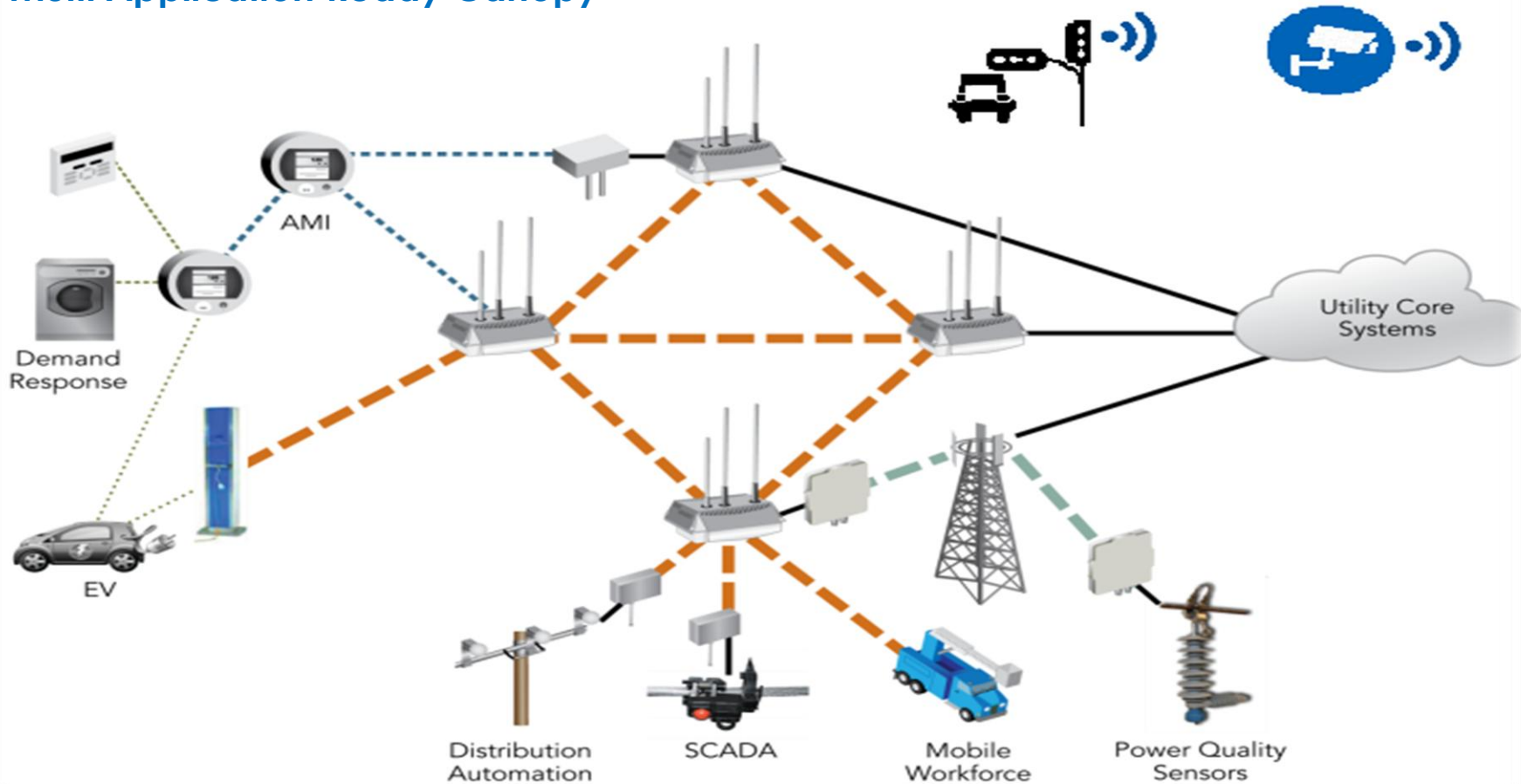
Components of AMI

Smart meters

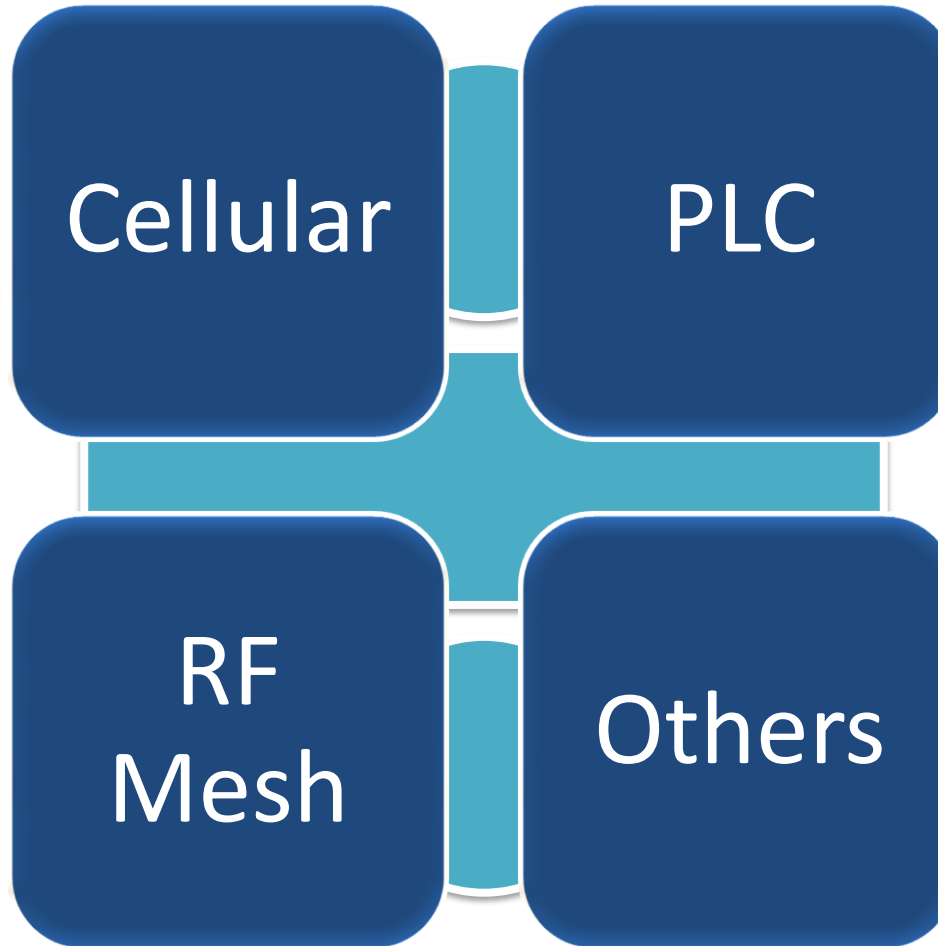
Communication Network/Canopy

Head End System (HES) & Analytics

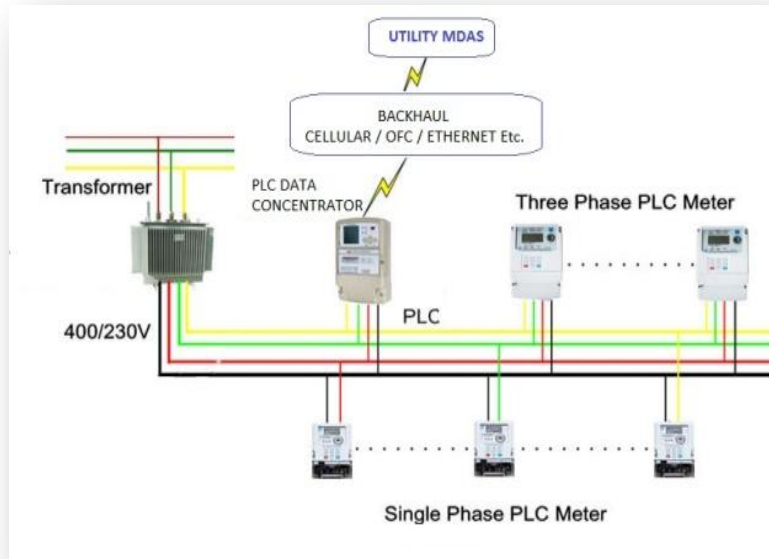
Multi Application Ready Canopy



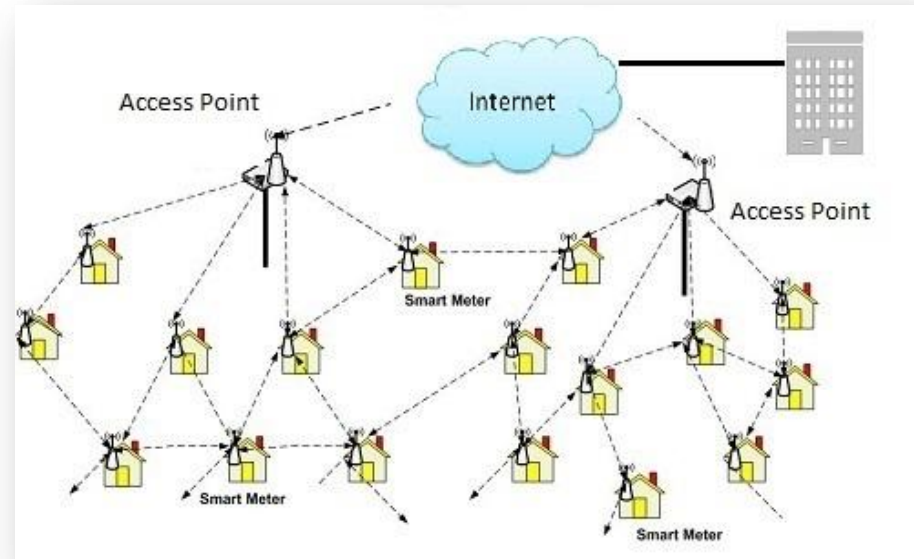
Choice of Communication Technology



Power Line Communication



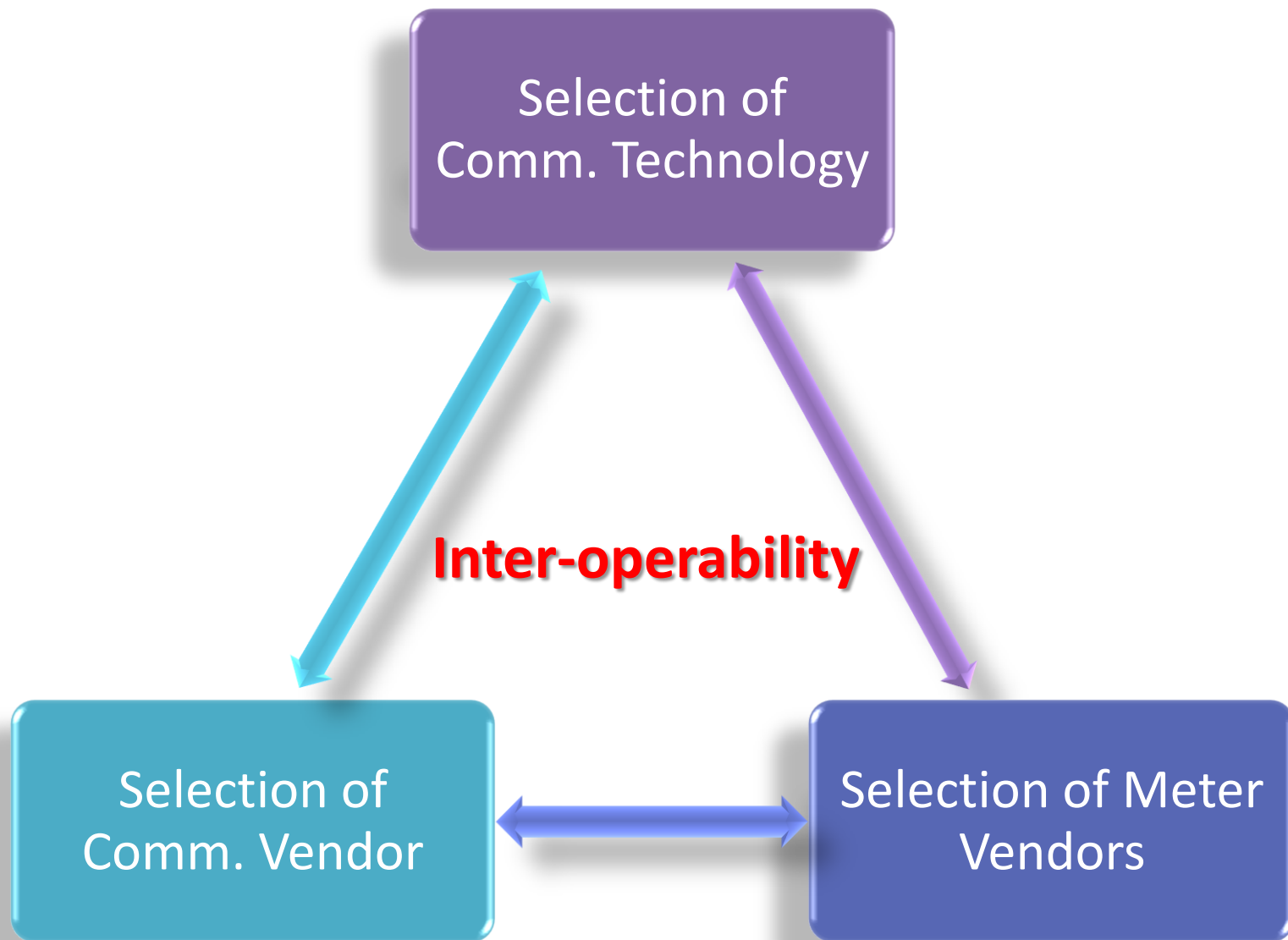
RF Mesh Communication



Point to Point GPRS / 3G



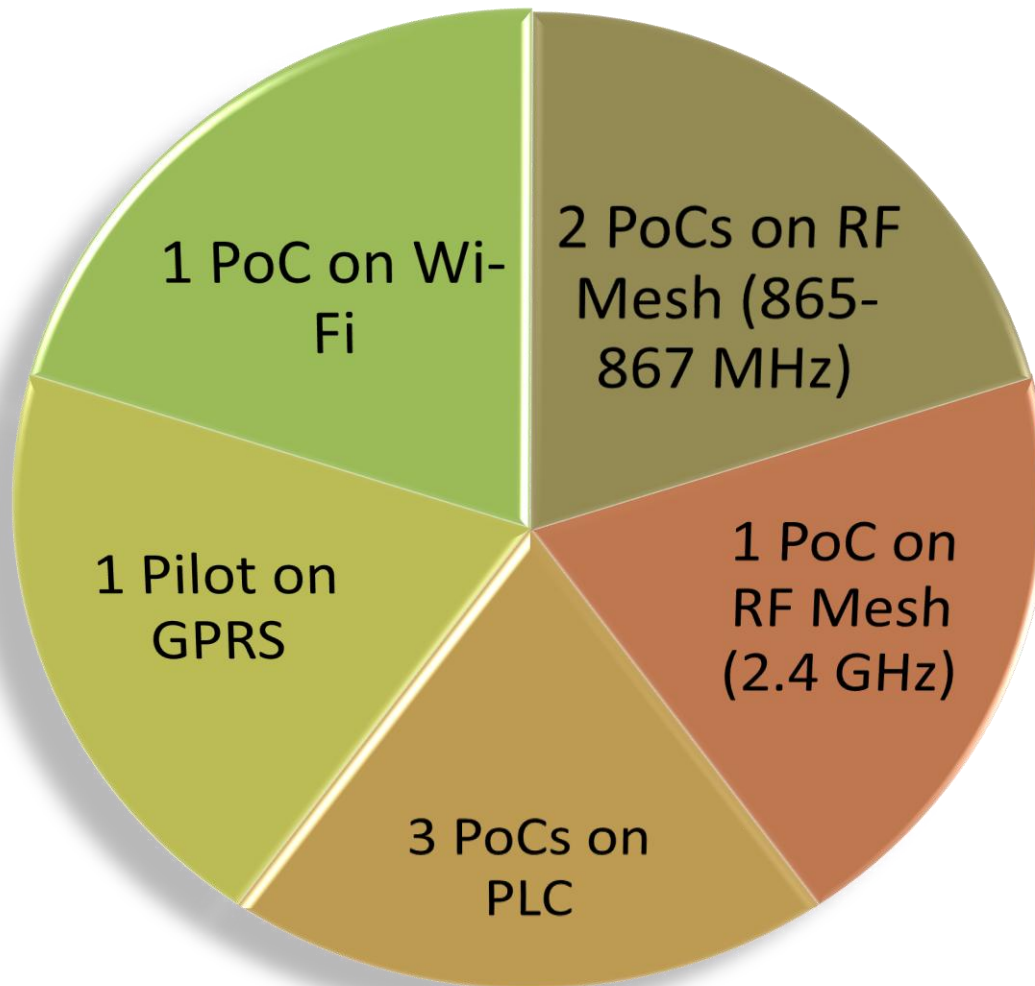
Choice of Vendors





**Multiple make of meters –
communicating over the same
communication Network**

Pilots & PoCs



Pilots & PoCs

TECHNOLOGY	WHAT WE OBSERVED	BEST SUITED FOR
PLC	<ul style="list-style-type: none"> • Works through our own Network • Highly dependent upon quality of LT Network • Noise Interference 	<ul style="list-style-type: none"> • Clustered Meters (multi-storied condominiums)
CELLULAR	<ul style="list-style-type: none"> • Scattered Deployment Possible • Manageability Difficult • No SLA based Services from NSP 	<ul style="list-style-type: none"> • Scattered Deployment • Network Coverage is good at every nooks & corners
WIFI	<ul style="list-style-type: none"> • SECURITY : A BIG CONCERN 	
RF MESH ✓✓	<ul style="list-style-type: none"> • Scalability • Self healing • Auto re-configuring • Lesser no. of Network Devices 	<ul style="list-style-type: none"> • Mass Rollout of Smart Meters • DA & Home Automation • Future Smart City Applications

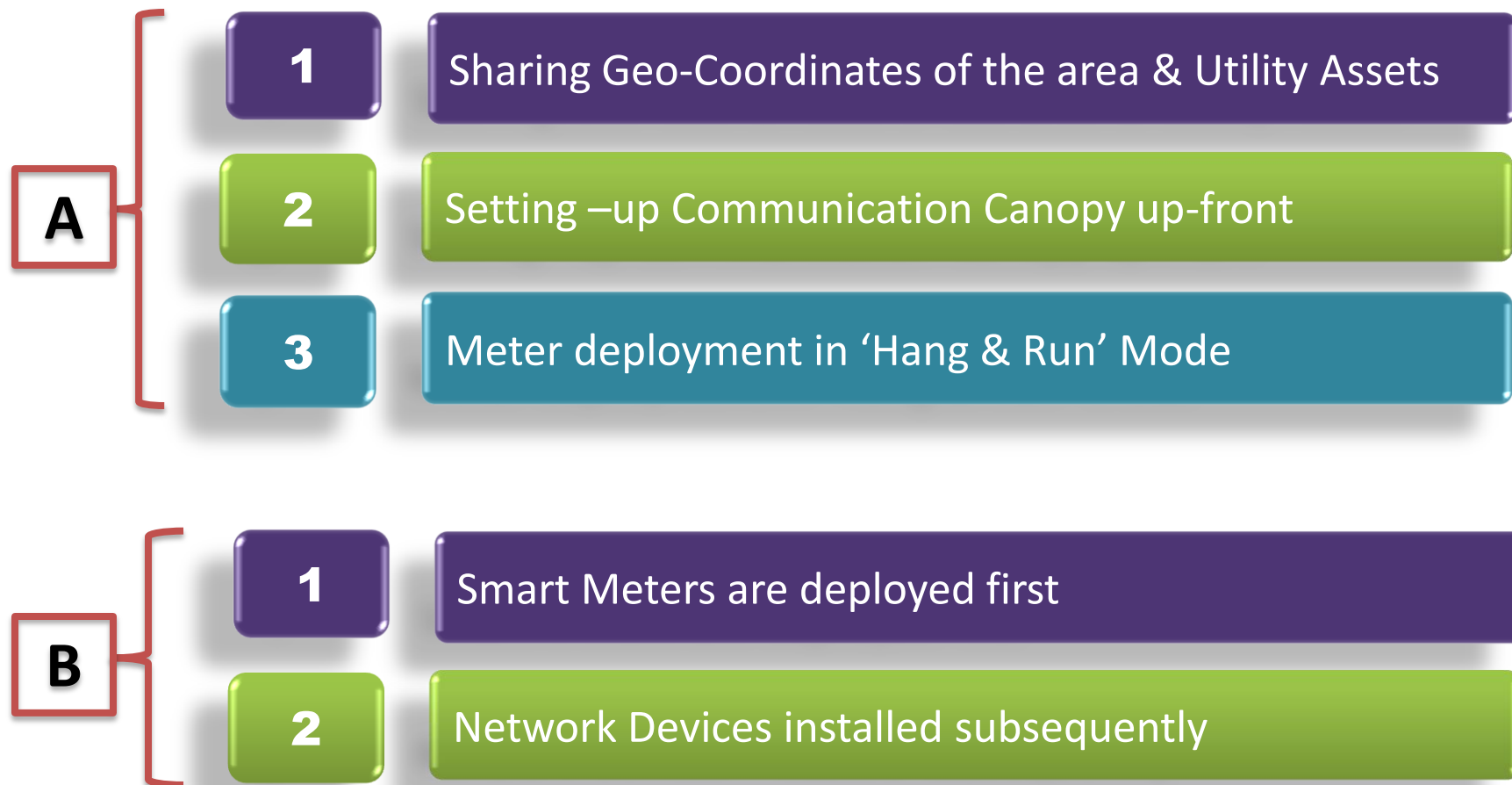
>RF Mesh (865-867 MHz) was selected for AMI <

Deployment Models



***Utility skill & Expertise
matters.....***

Setting-up RF Mesh Network & Deployment Modalities



Option A gives more flexibility to the Utility

Back-haul

OFC

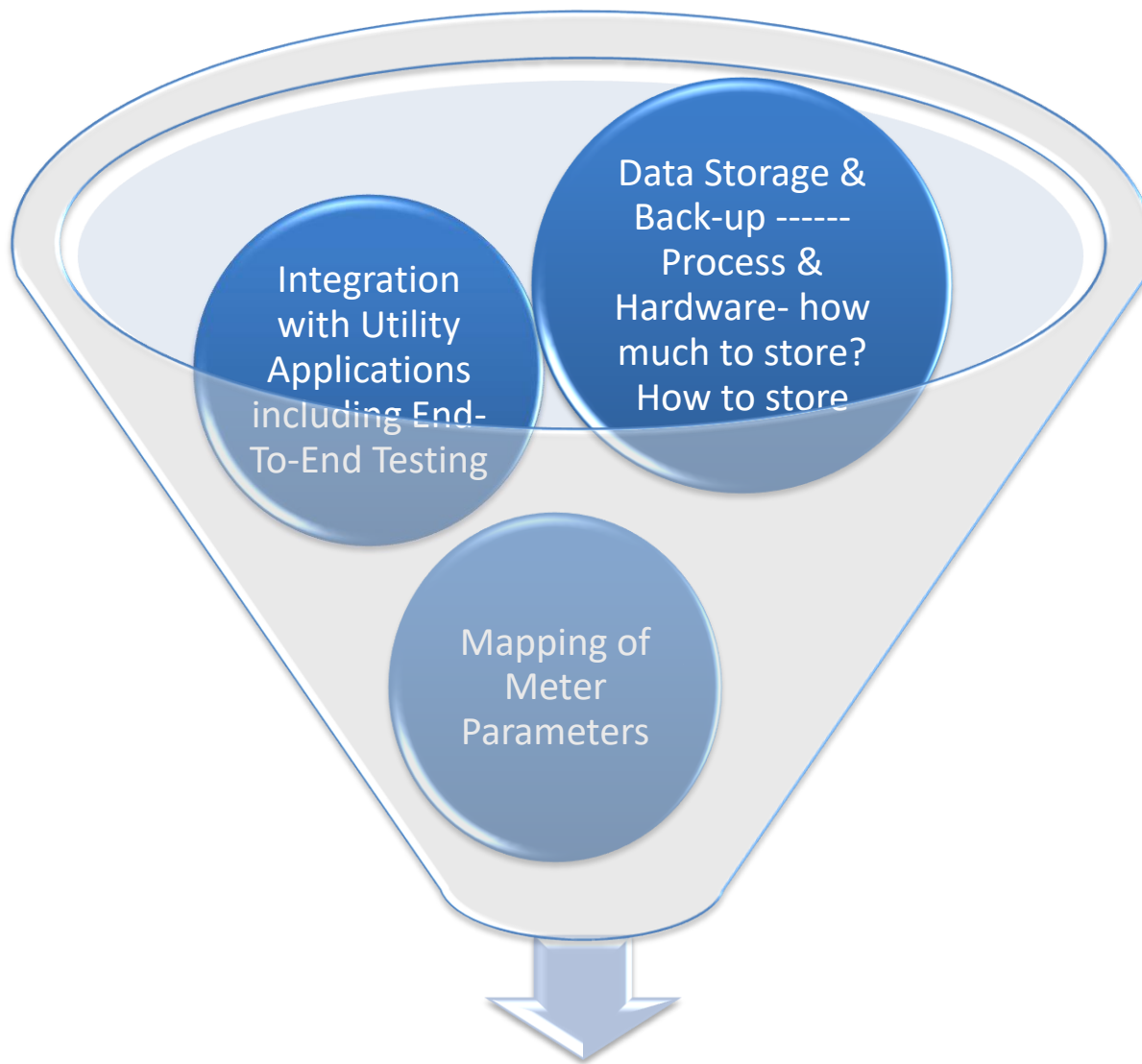
Gives
Reliability

Costly
Proposition

Cellular

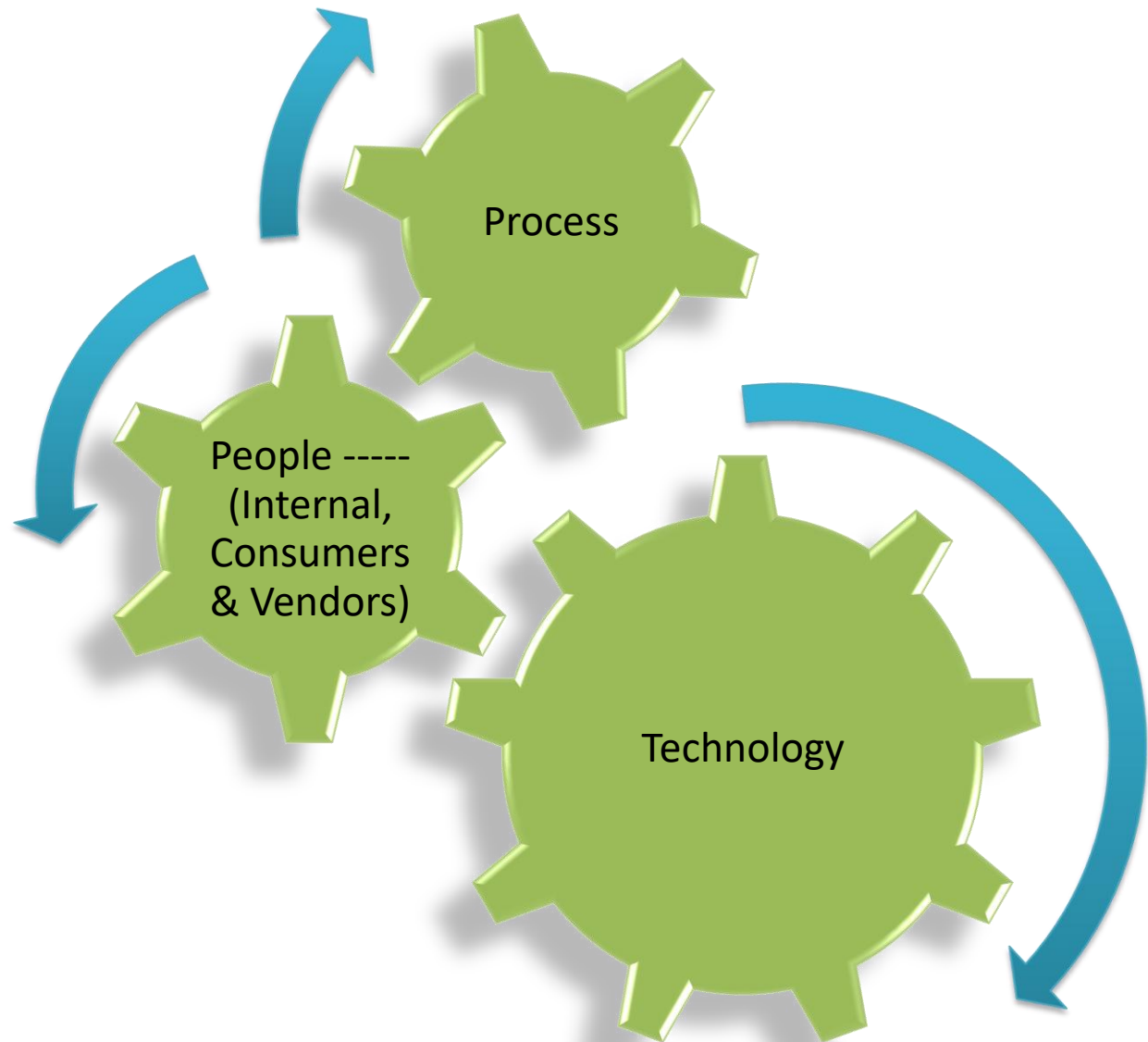
Cost Friendly
& Easy to
deploy

Reliability
Issue



Data Ready for Billing & Analysis

AMI –Involvement & Challenges



AMI –The People, Process & Technology

1

Negative Reaction from Consumers

2

Space Constraint – Bigger dimension

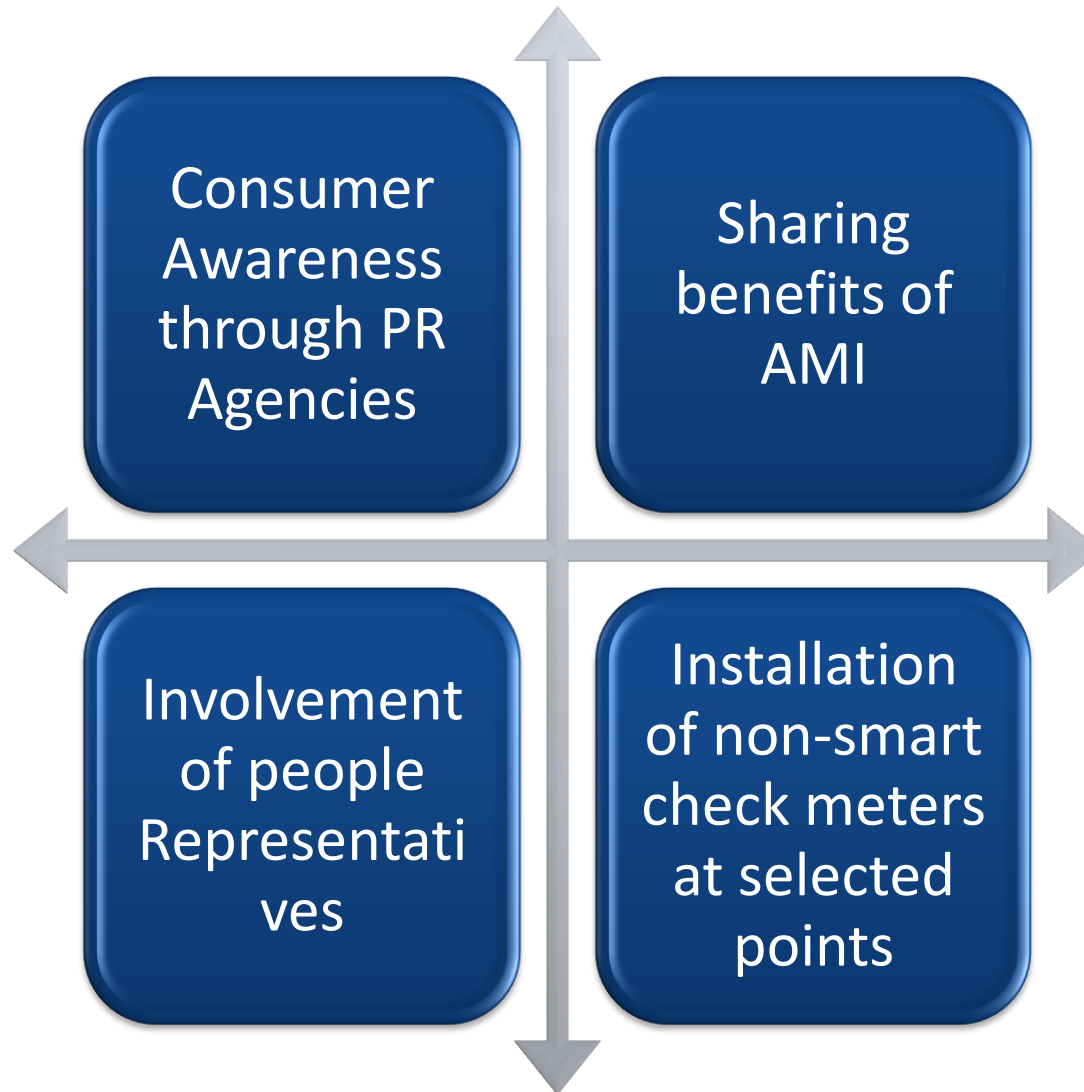
3

Initial Teething trouble

4

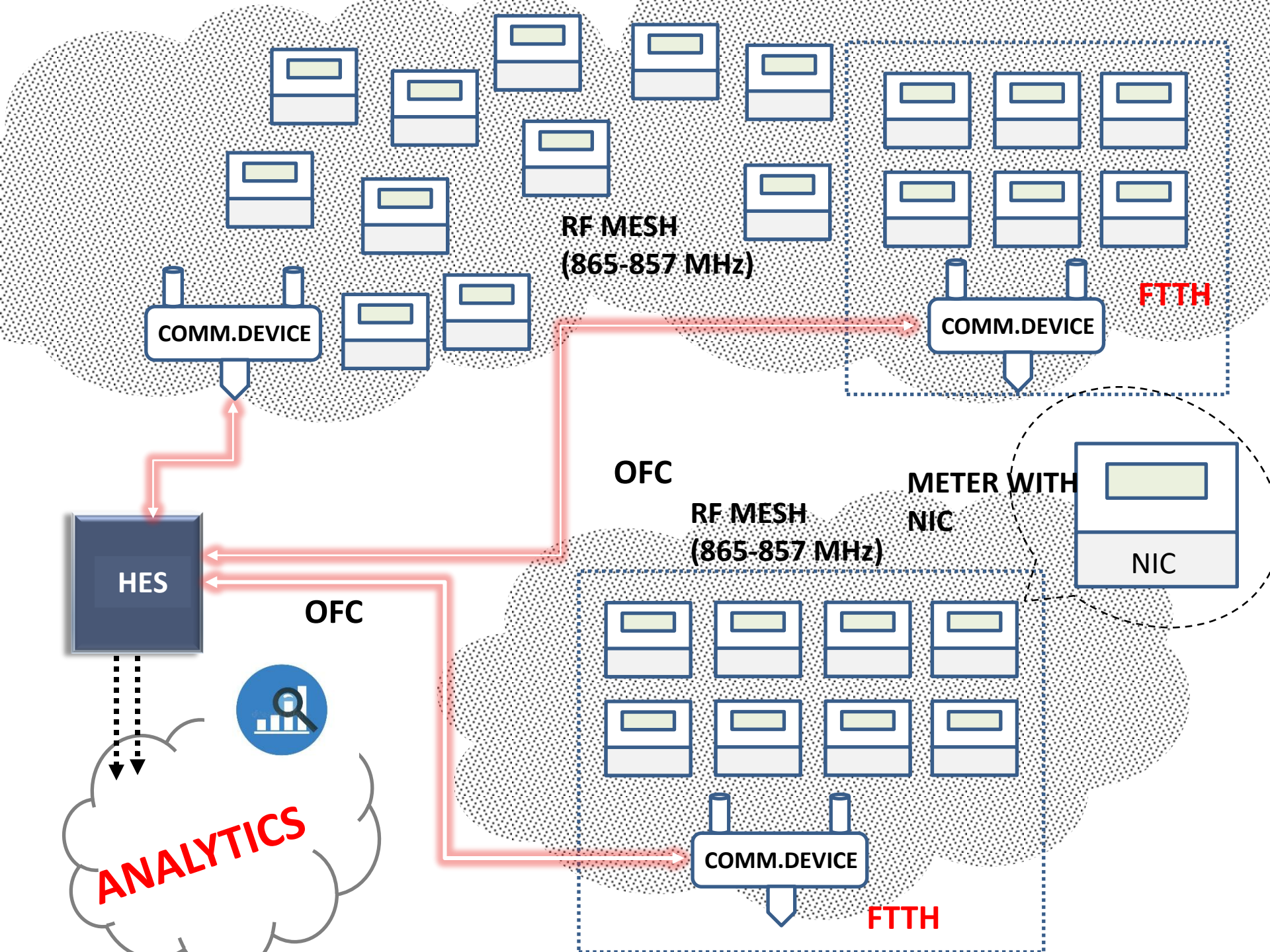
Implementation/change of Process from new meter management to off-circuit meter/NIC management

Aggressive & Strategic Approach



RF Mesh Pilot in Kolkata

- Meter : Different Makes
- Multi Application Comm. Canopy: RF Mesh (865-867 MHz)
- Backhaul:
 - ✓ OFC (Primary)
 - ✓ Cellular (Secondary)
- Back End S/W:
 - ✓ Head End System
 - ✓ Analytics



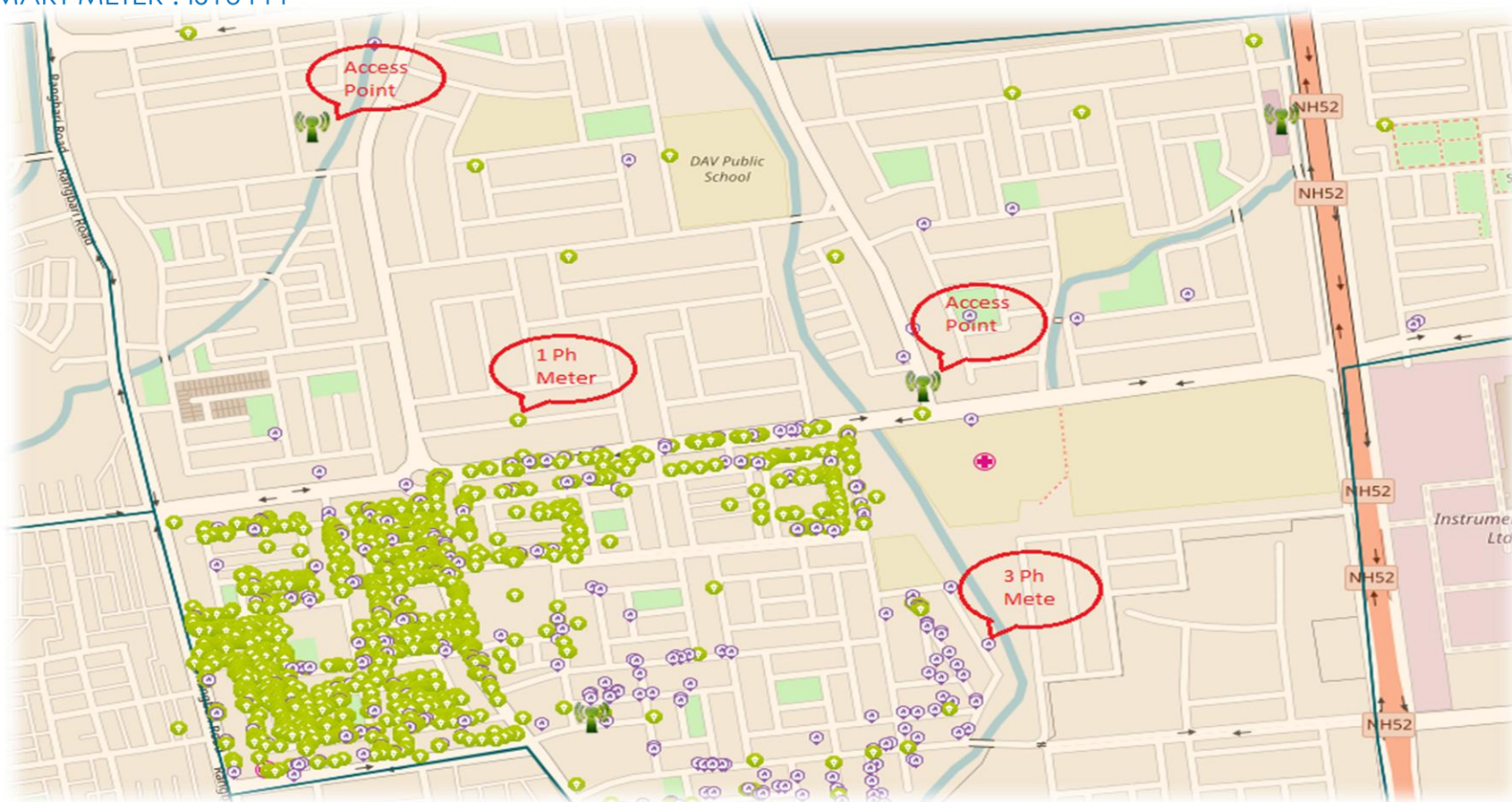
AMI PILOT AT KOLKATA: THE STATUS

- Meters Installed so far
 - At Consumer Premises
 - ✓ 1-ph: 7500
 - ✓ 3-ph: 850
 - Street Lights : 4
- **Daily Read Success: > 99.5 %**

COMMUNICATION NETWORK : Meter Vendor Agnostic RF Mesh (865 – 867 MHz)

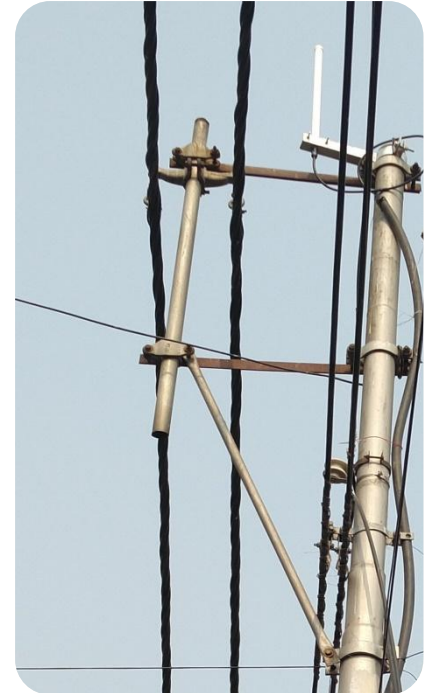
SMART METER : IS16444

TECHNOLOGY



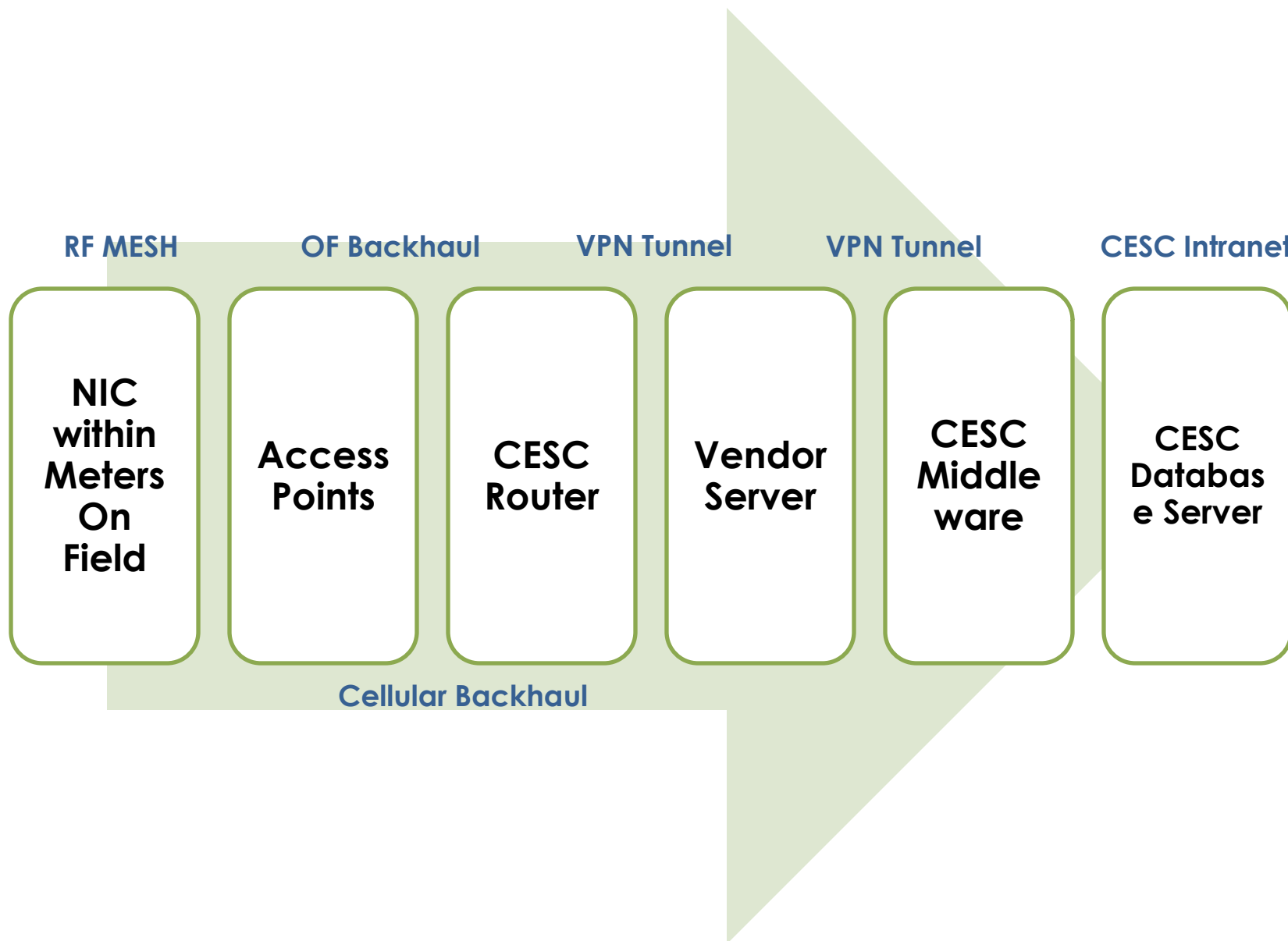


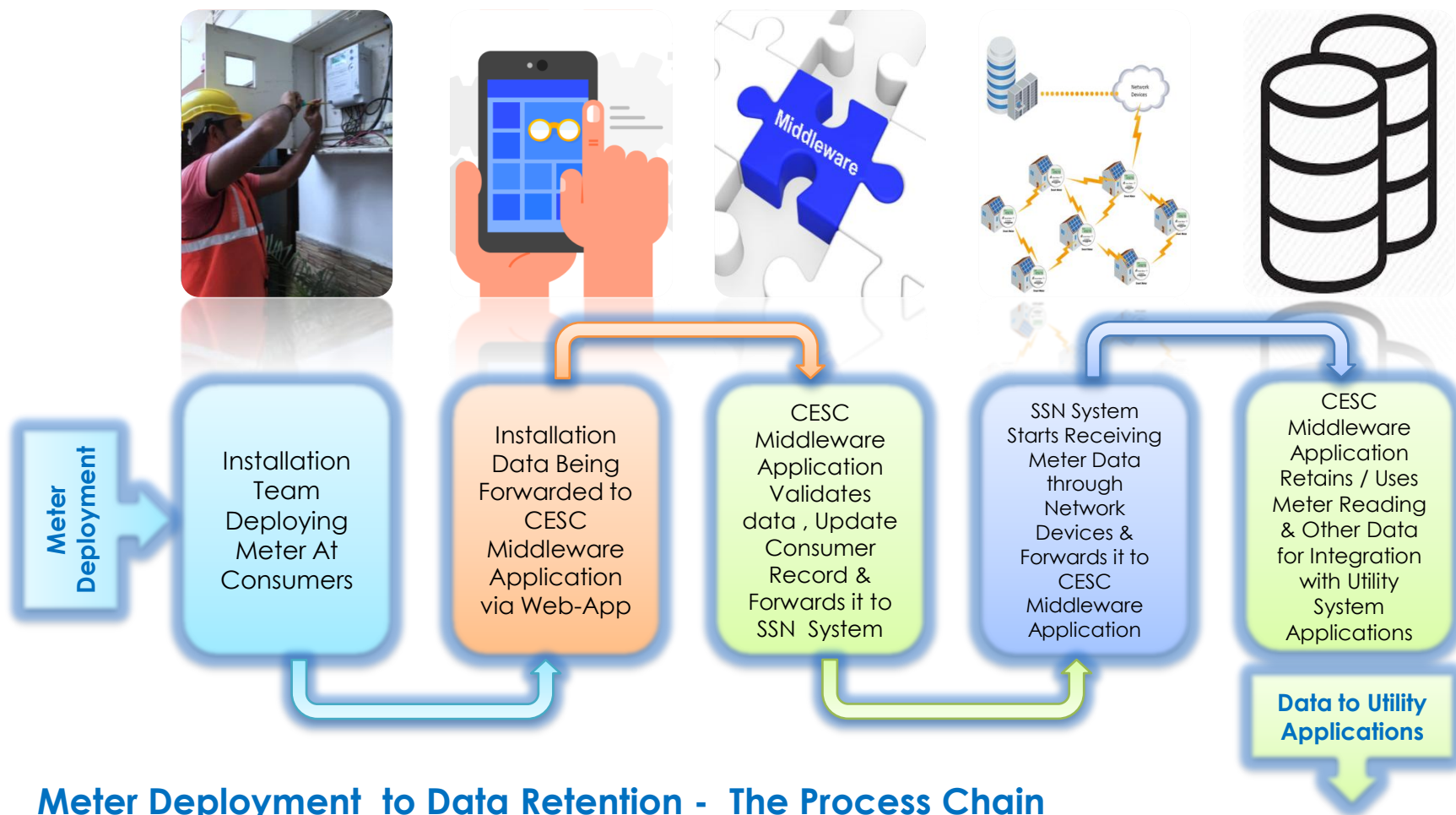
Smart Meters at Site



Communication Devices at Site

AMI DATA FLOW





DA DATA FLOW

RF MESH

OF Backhaul

**CESC Router &
Firewall**

CESC Intranet

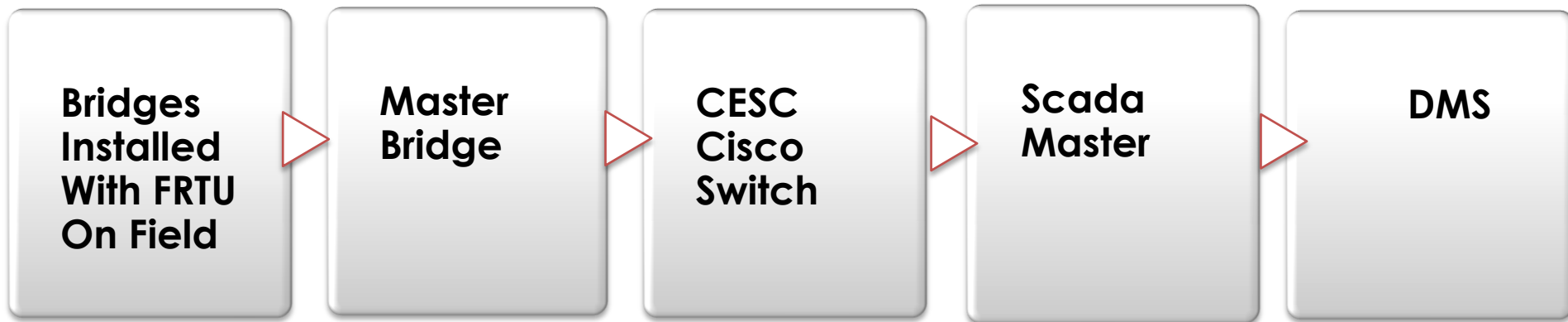
**Bridges
Installed
With FRTU
On Field**

**Master
Bridge**

**CESC
Cisco
Switch**

**Scada
Master**

DMS



AMI – The Benefits

- Error Free Transparent Billing
- Near Zero Provisional Bills
- Coming to Know of Tariff Violations
- Over-drawl by Consumers
- Electrical Consumer Indexation
- Loss Profile/Real Time Energy Audit

AMI – The Benefits

- Net Metering on the Same Hardware
- Early Detection of Meter Defects
- Objective Resolution of Consumer Grievances
- Watch Dog Features – Installation & Disconnection
- Remote Surveillance
- Power Quality Issue Resolution

AMI – The Benefits

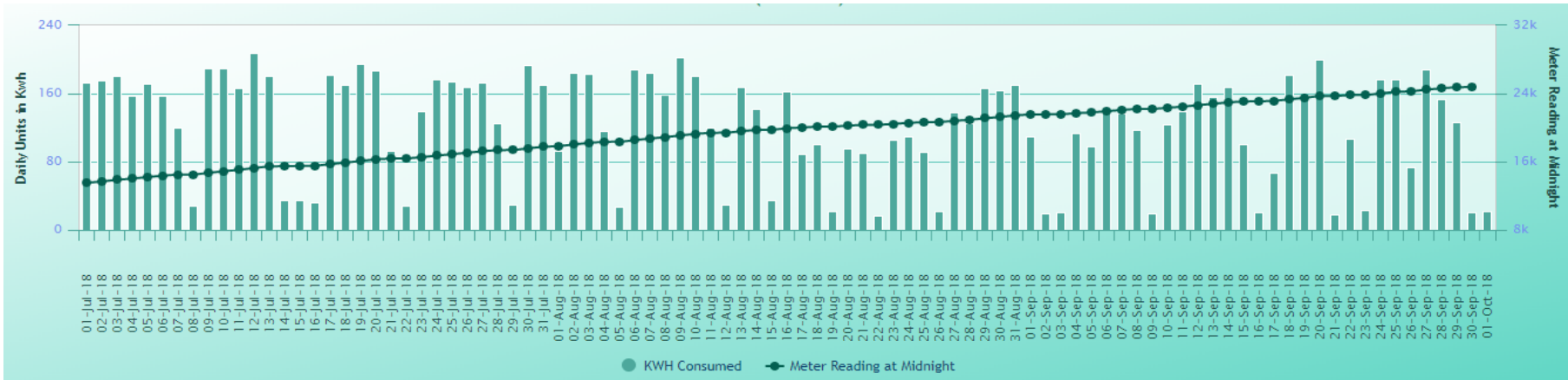
- Proactive Outage Management
- Consumption Profile Viewing By Consumers
- Remote Disconnect & Reconnect
- **Future Prepayment Readiness**

Demo

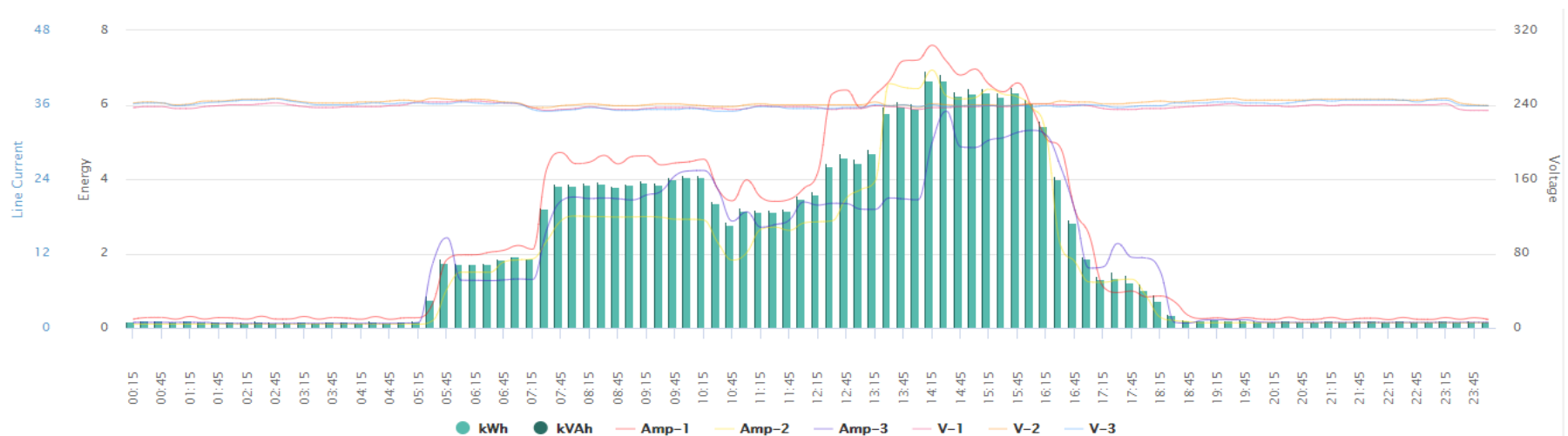
Demo

DIGITAL INTERVENTIONS

Daily Consumption Pattern



15- Min Interval Consumption Pattern



DIGITAL INTERVENTIONS

Real Time DTR Energy Audit

DTR ENERGY AUDIT PROFILE

JODHPUR PARK O/T NO.1 (01 06500)
05-Sep-18
[Loss : 5.4 % ; Interval Read 252 of 255 indexed]



19:15
● 15 Min KWH Delivered by DTR: 24.3
● 15 Min Sum KWH at all Consumer Meters: 23.09
● Loss in Percent: 5

● 15 Min KWH Delivered by DTR ● 15 Min Sum KWH at all Consumer Meters -- Loss in Percent ● Metered Kwh ● Kwh Lost

The Conclusions

Only compliance shall not pay back

Utility has to own, manage & maintain

Utility has to harness the benefits

Capability for Business Transformations

***Benefits over-justifies the cost
of AMI Implementation.....***

Thank You...