UGVCL Smart Grid Approach

18th October 2014, UDAIPUR

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Agenda

- RAPDRP and there-after
- Smart Grid Initiatives
- Pilot Area Overview
- Proof of Concept (PoC) Experience
- Technological Experience
- Key Challenges
- Benefits

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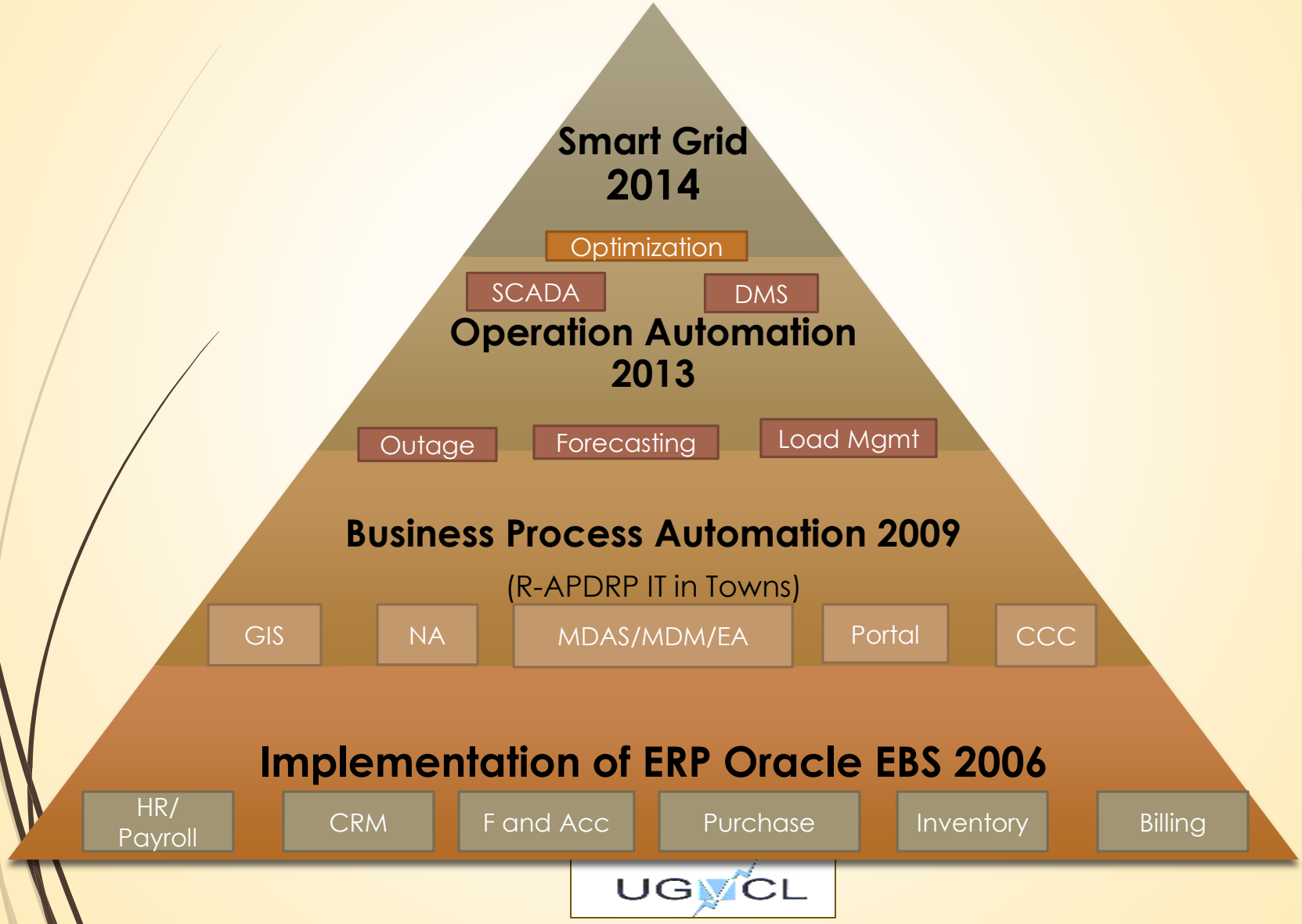
Smart Grid
2014
Optimization
SCADA
DMS
Operation Automation
2013
Outage
Forecasting
Load Mgmt
Business Process Automation 2009
(R-APDRP IT in Towns)
GIS
NA
MDAS/MDM/EA
Portal
CCC
Implementation of ERP Oracle EBS 2006
HR/
Payroll
CRM
F and Acc
Purchase
Inventory
Billing

R-APDRP Experience

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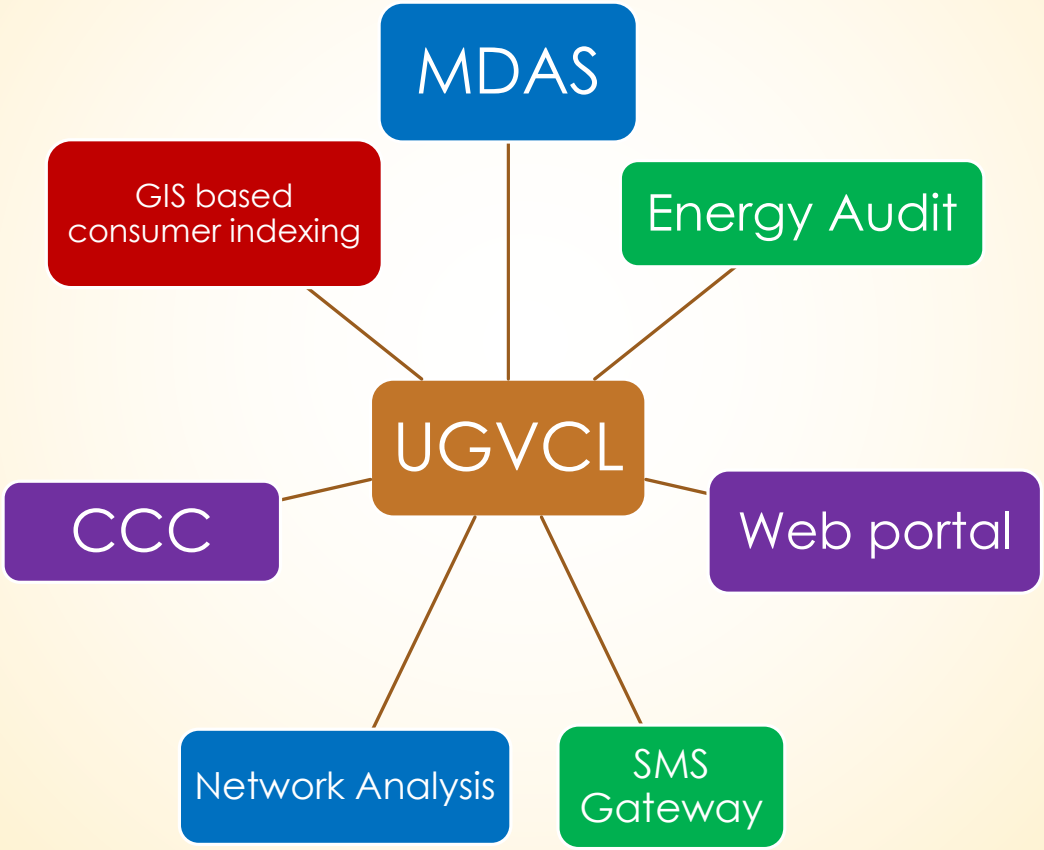
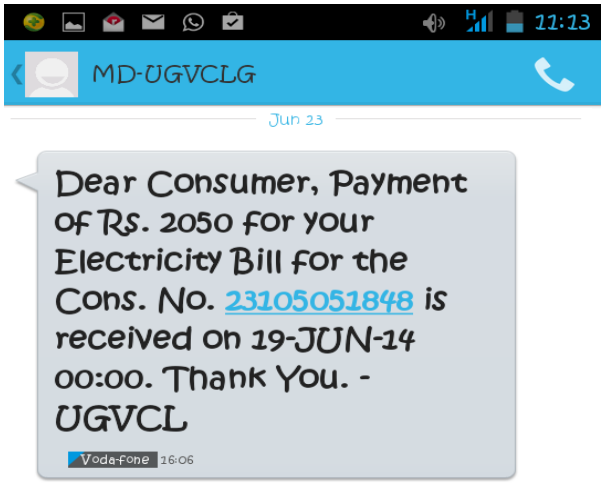
R-APDRP Modules Implemented

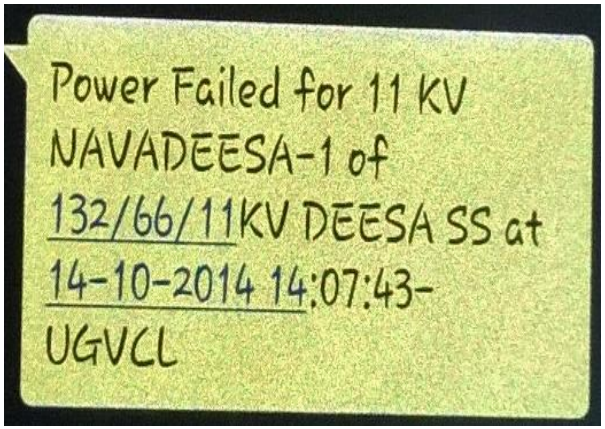


RAPDRP – Consumer Benefits

- Enterprise wide Centralized Customer Care Centre with toll free no support to about 31 Lac consumer



- Enterprise wide Web Portal support
  - Bill Payment
  - Complaint Registration & status
  - New Connection related services



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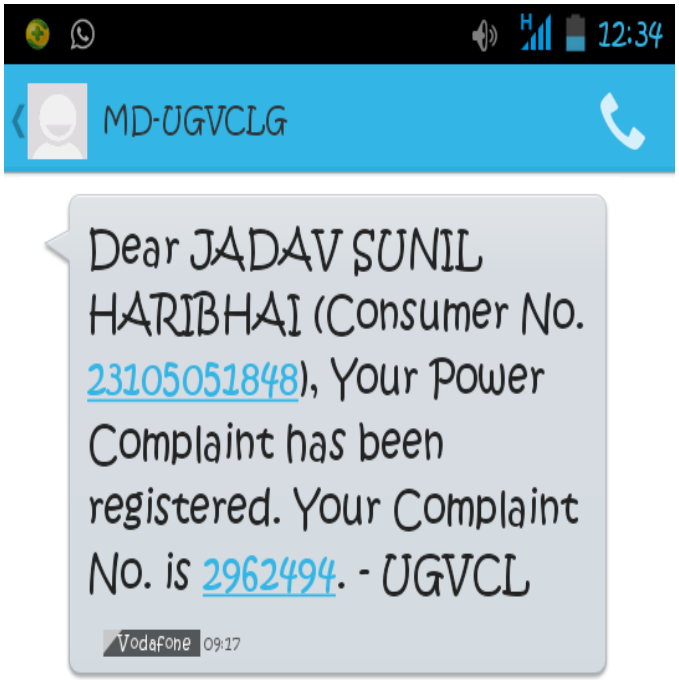
RAPDRP – Consumer Benefits

- SMS Gate way support
  - Bill Date / Amount / Payment Alert
  - Complain Registration status
  - Consumer application alert
  - Planned Outage information Alert to consumer



RAPDRP – Utility Benefits

- Distribution Transformer (DTR) wise data usages
  - Utilization factor – results in reduction of total KVA Demand
  - Current imbalance – Phase wise current balancing helped to reduce DTR failure
- Sub-Station data usages
  - Interruption alerts helped to reduce total outage duration
  - Feeder wise energy audit
- HT Consumer data usages
  - Hourly data available
  - Monthly billing done on AMR data, no site visit required
  - Timely and fast billing
- GIS
  - All consumer and assets are indexed
  - Network analysis for reduction of technical losses

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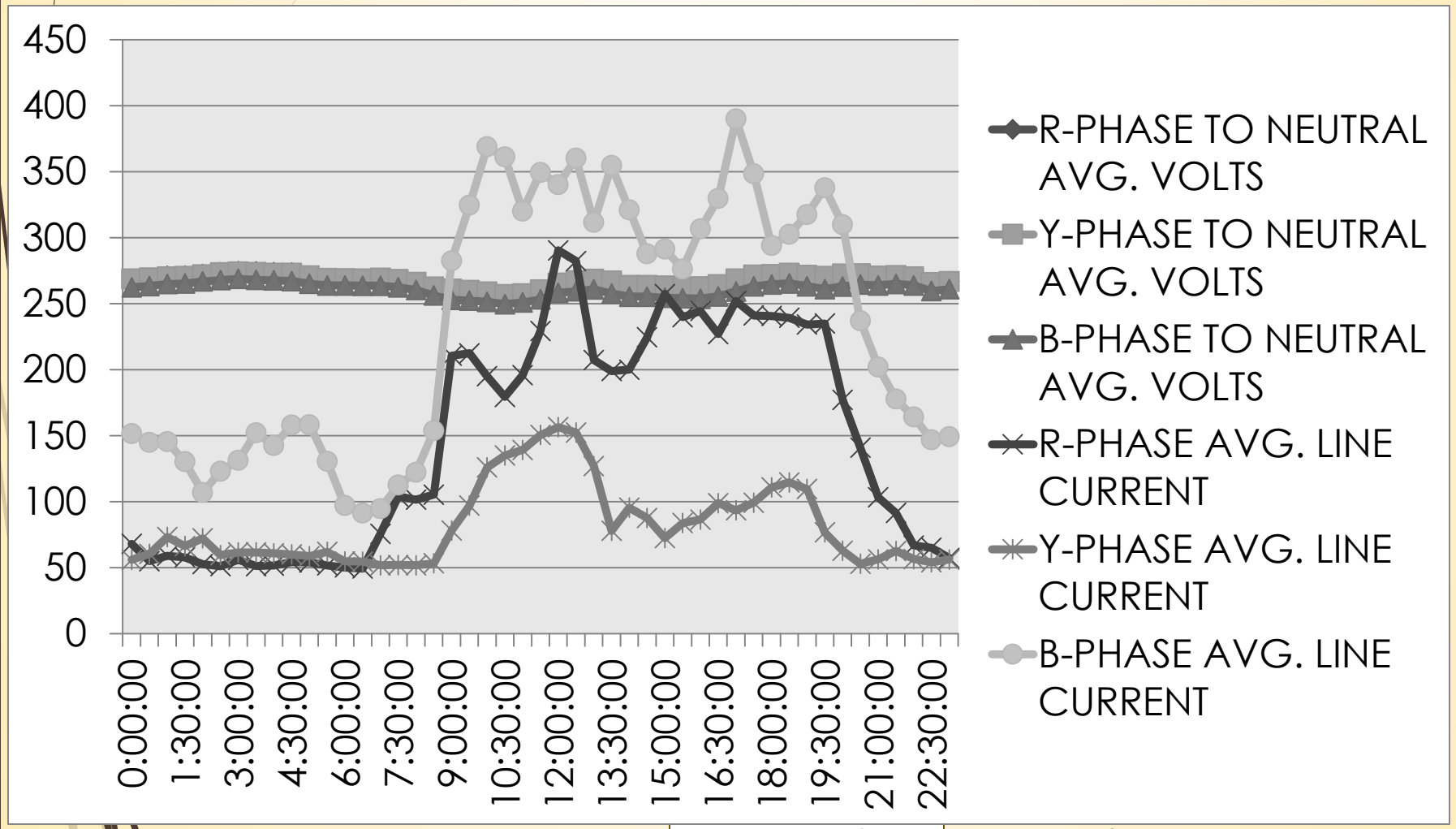
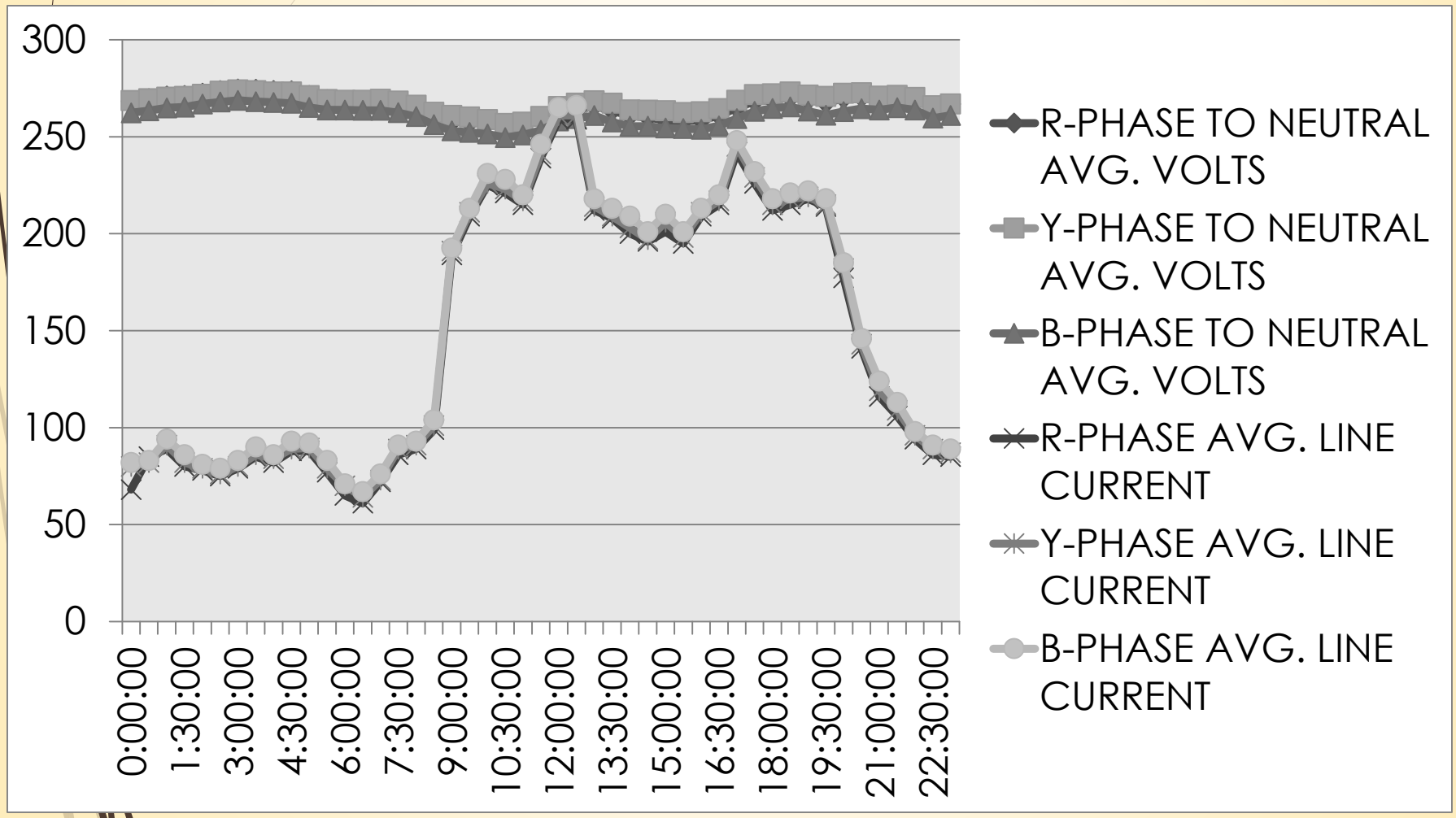
DTR POSITION BEFORE BALANCING (Mandal Road-Viramgam)



DTR POSITION AFTER BALANCING (Mandal Road-Viramgam)



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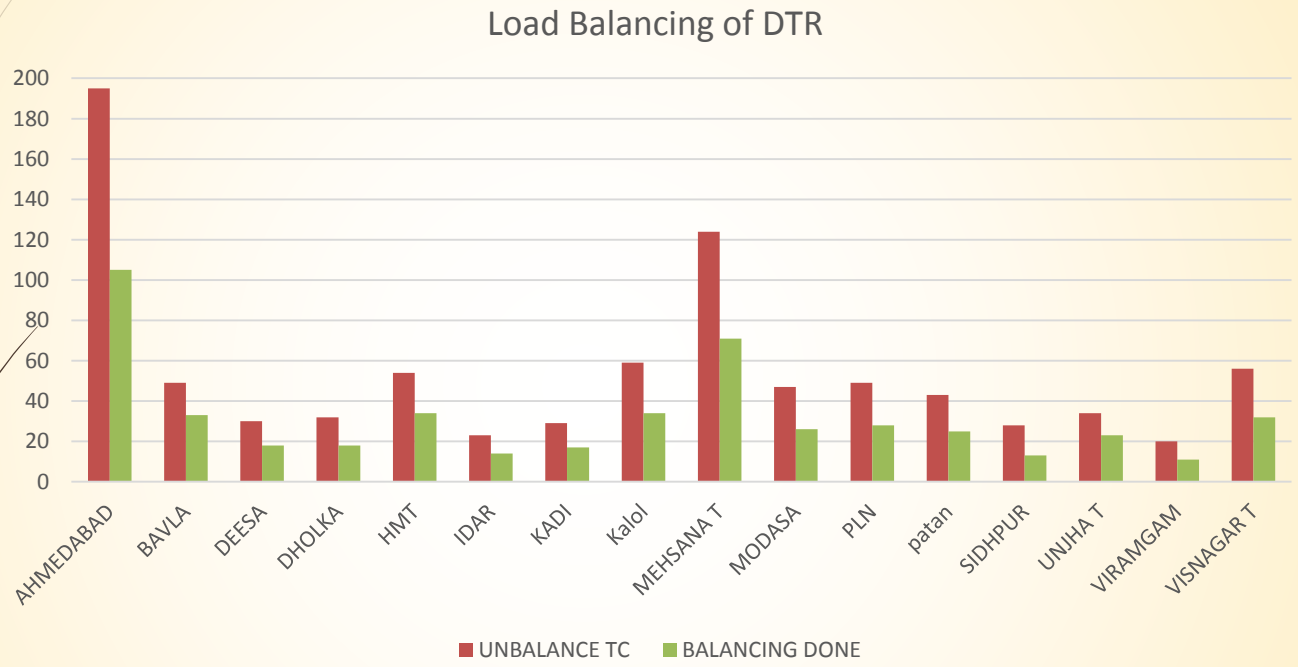
RAPDRP – Utility Benefits (Load Balancing)



Benefits:

Results in 0.5% reduction in technical loss

Results in reduction in investment of CAPEX toward new X'mers

Voltage regulation improves which results in consumer satisfaction

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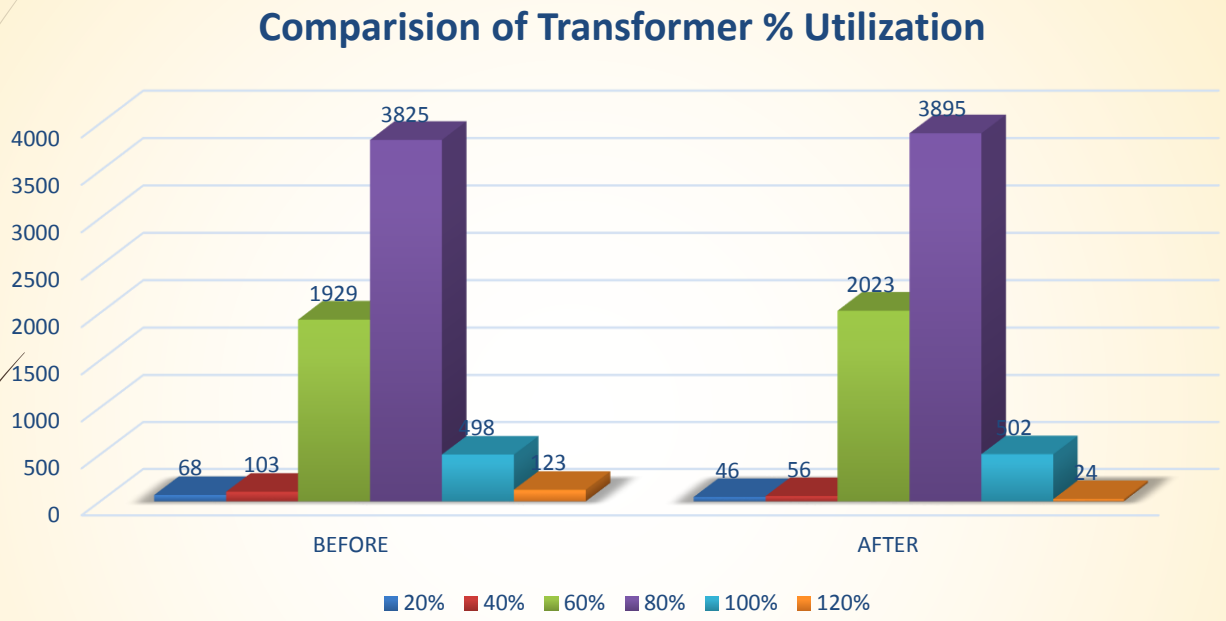
RAPDRP – Utility Benefits (Utilization of DTR)



Benefits:

- Maximum utilization of DTR capacity
- Reduction in transformer failure upto 0.5%
- Overall reduction in transformer failure cost
- Results in reduction of technical loss

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Pilot Area Overview

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Project at a Glance

- Sub Station Covered: 346
- Consumers in Naroda : 21,730
- Distribution transformers in Deesa : 19,620
- Quantum of Energy : 1700MUs

Area of Saving

- Peak load Management/DSM and DR
- AT & C loss reduction
- Reduced transformer failure
- Accurate and timely meter reading

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Major Events in the project

Sr No	Name of Event	Date
1	MoP has inform GoG for participate of DISCOM in Smart Grid pilot project	3-Nov-11
2	Submission of approach document by UGVCL to MoP	3-Dec-11
3	DPR submission to MoP	30-Jan-12
4	UGVCL is shortlisted among all submitted DPR to MoP	13-Sep-12
5	Principal approval given by GERC for dynamic tariff	11-Feb-13
6	RFP floated for UGVCL smart grid pilot project	11-Sep-13
7	Pre-bid conference with all the vendors	25-Sep-13
8	Tender opened on	02-Jan-14
9	Technical evaluation expected to complete	28-Feb-14
10	Selection of vendors for PoC	28-Feb-14
11	Submission of Second price bid	17-July-14
12	PoC commencement	1-August-14

Tender Methodology

Bidder's Response

- Consortia doing Proof of Concepts (PoC) :

Sr No	Lead Bidder	Meter	System Integrator
1	Wipro InfoTech	JnJ Powercom, Nation Power	Wipro
2	Reliance Infra	EDMI, L & G	Accenture
3	L & T Automation	EDMI, L & T	L & T
4	Crompton & Greaves	ZIV & SOGECAM	Infosys
5	Tapesh Energy	Corinex & Genus	Tapesh Energy

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Project Updates

- Installation of meters
- Establishing communication network for data flow
- Evaluation has been started from 1st Aug-14.

PoC Experience

POC Evaluation Parameters

- Consistency of meter data
- Data acquisition time (speed) from meter to application
- Validation of meter data with MRI
- Approach & methodology
- Interoperability

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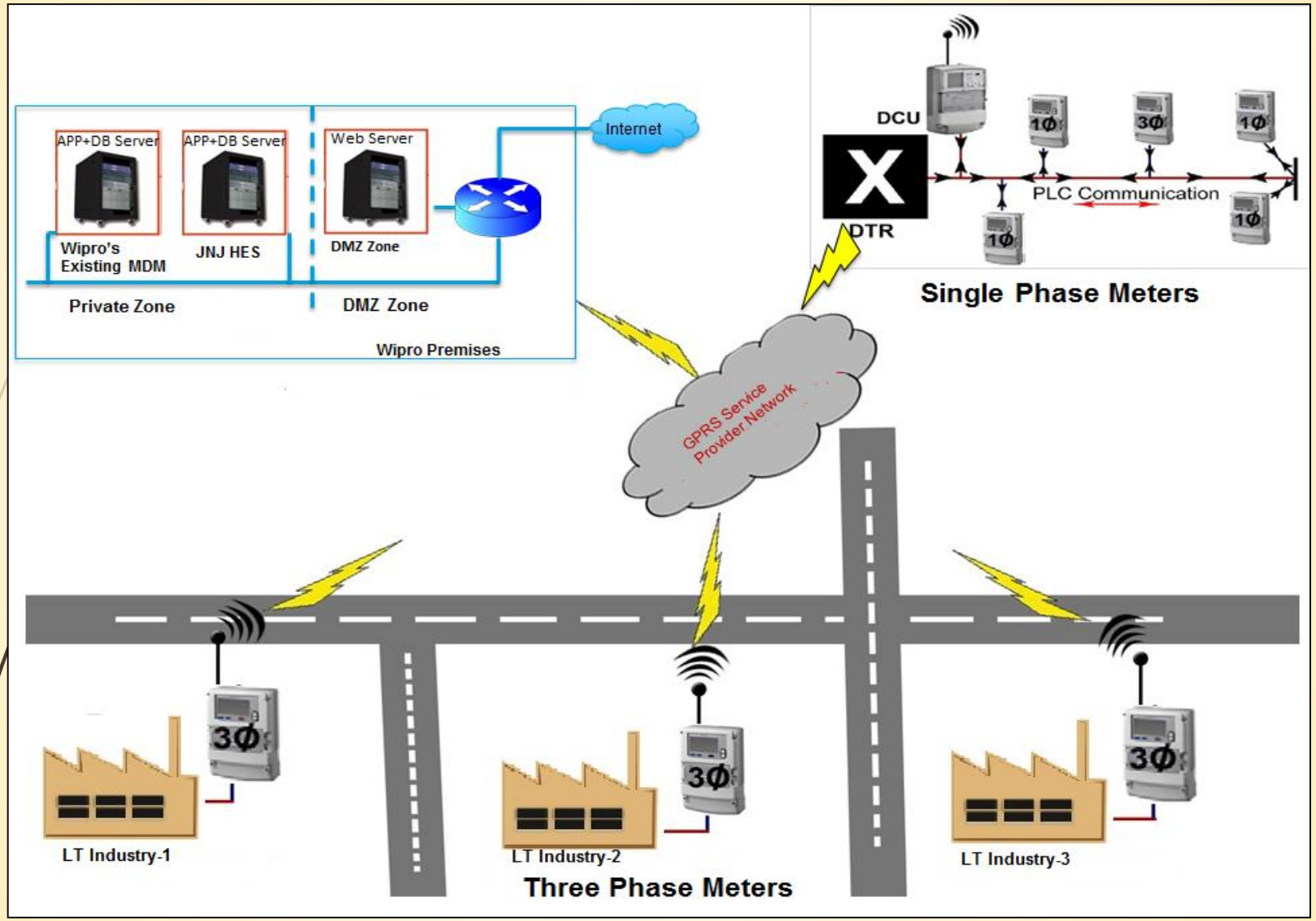
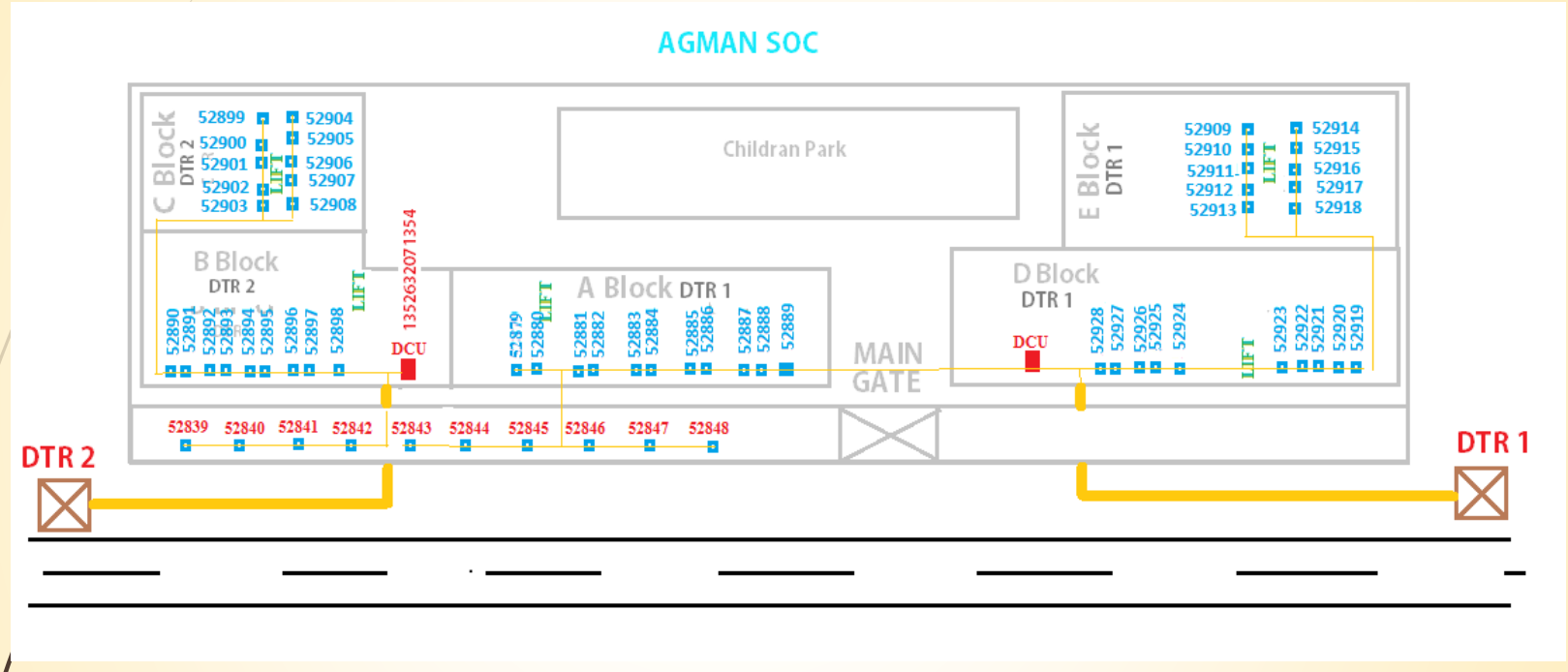
Solution Architecture – 1 Ph PLC & 3 Ph GPRS meters



Installation SLD – Agman Society



2 DCUs installed for 60 nos. Smart Meters

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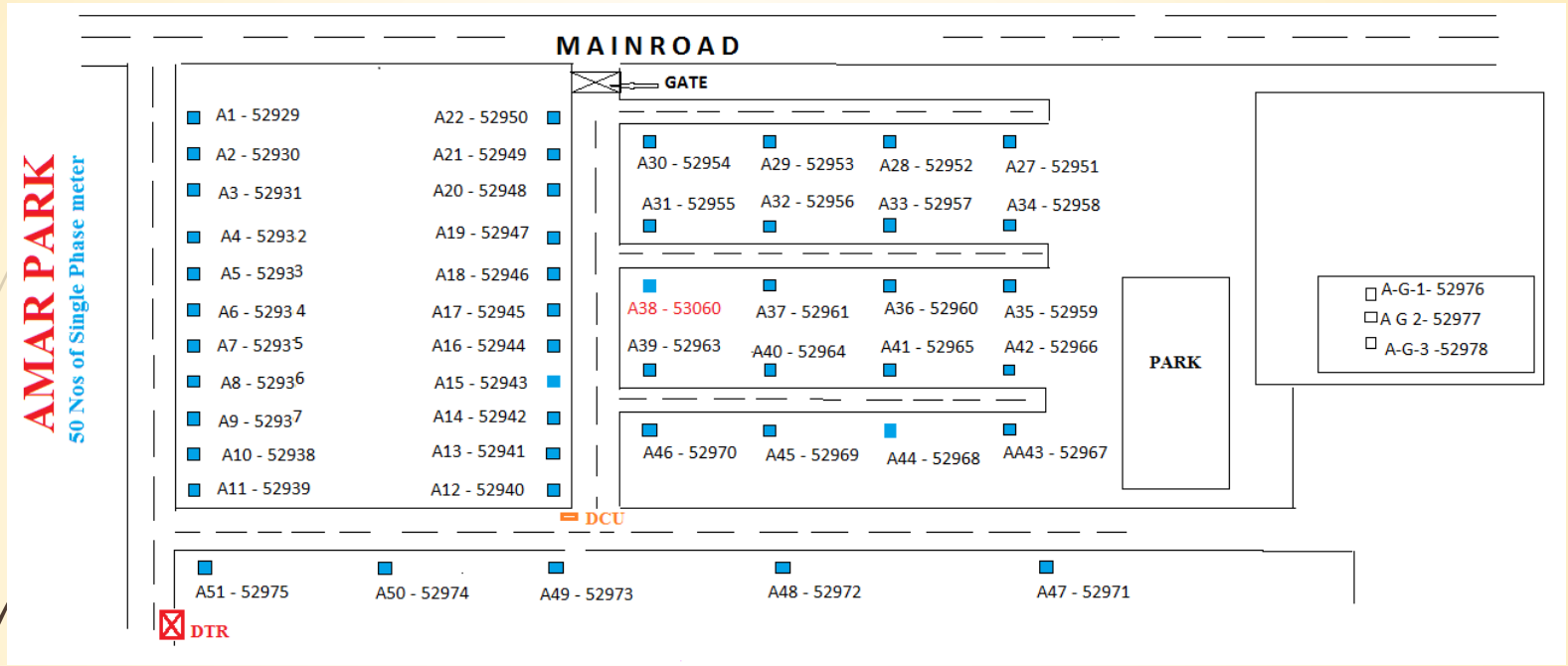
Installation SLD – Amarpark Society



1 DCUs installed for 50 nos. Smart Meters

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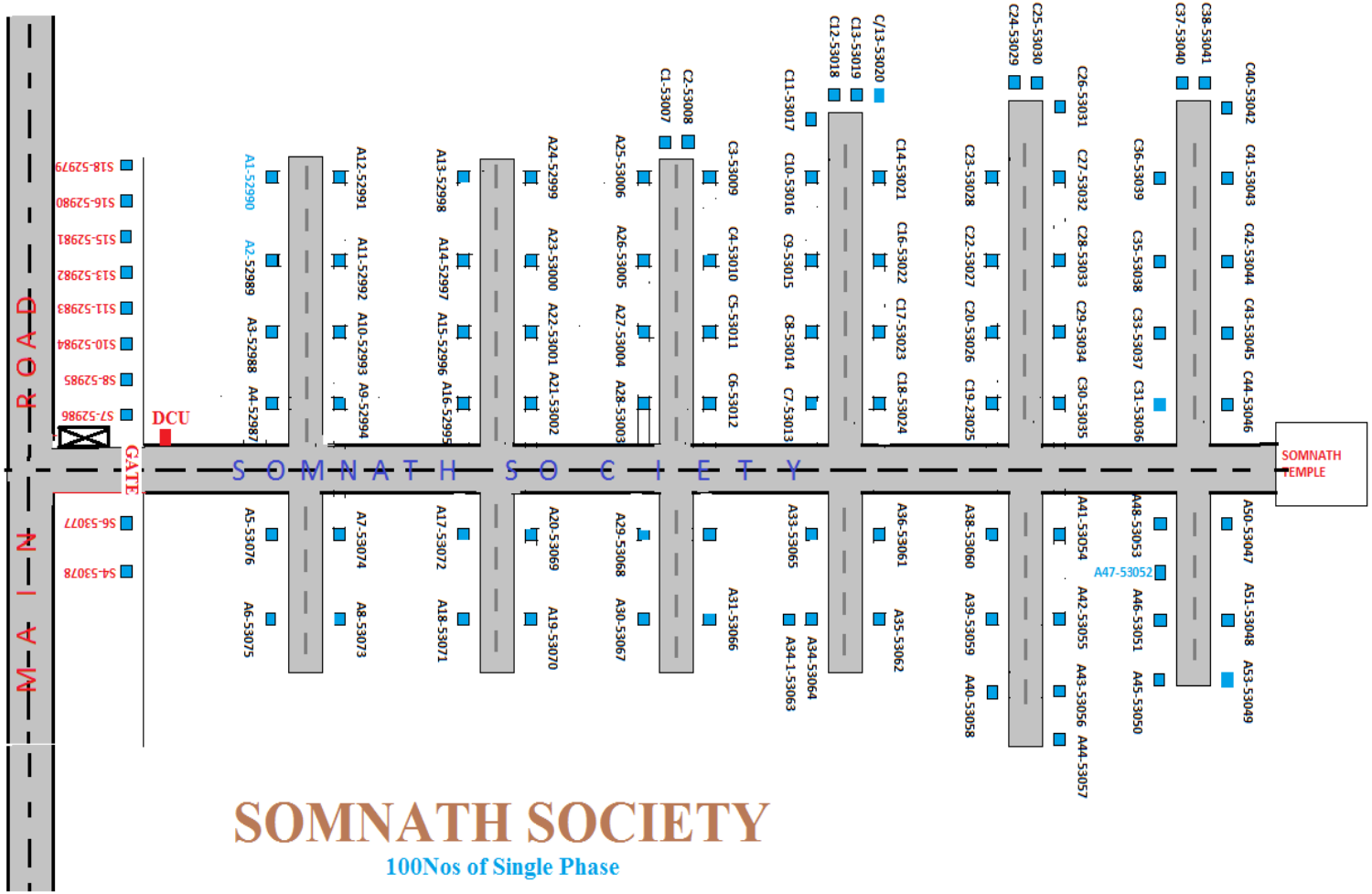
Installation SLD – Somnath Society



100Nos of Single Phase

1 DCUs installed for 100 nos Smart Meters

Installation SLD – Asopalav Flats

1 DCUs installed for 85 nos. Smart Meters

PoC : Shreyansh

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UGVCL – SG PoC :Samarpan & Shivsakti

UGVCL – SG PoC :Rushvina Park (RF Mesh)

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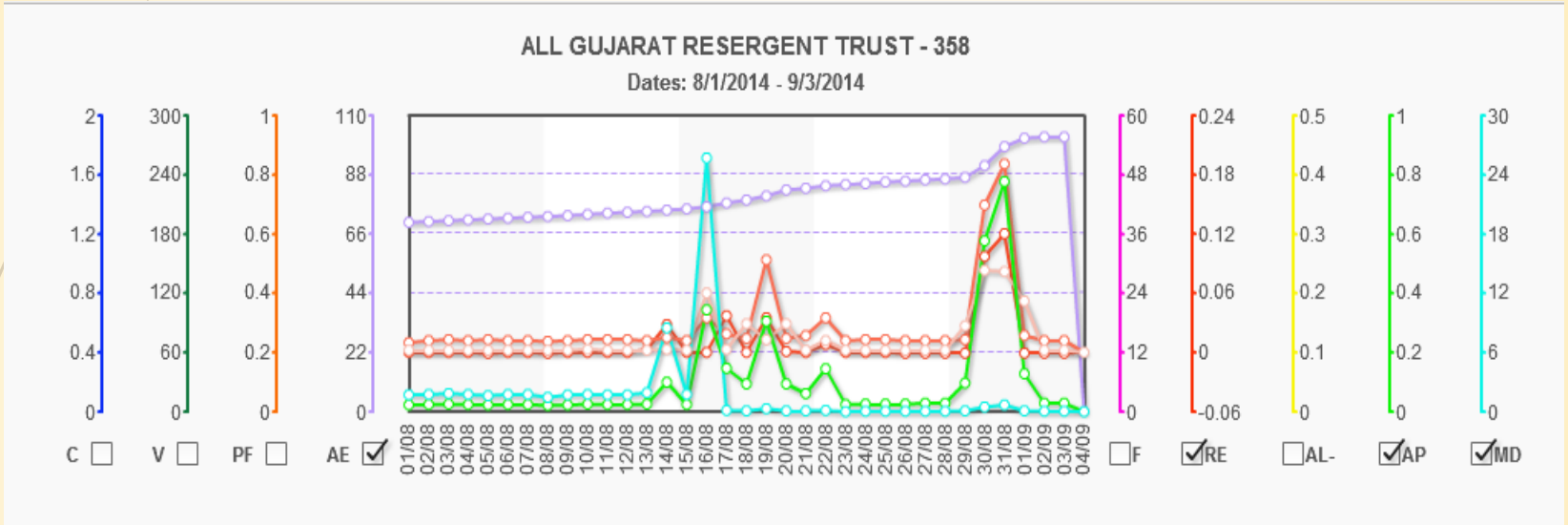
Sample Load Curve for a 3Ph LTCT meter



Load Curve from 1st Aug till date

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Technological Experience

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Technological Experience - PoC

- PLC (Power Line Communication)
  - Dependent on nature of Power Distribution infrastructure
  - Excellent performance in Under ground and secure electrical network
  - Diagnosis of fault is done on trial and error basis
  - DCU pulls meter at regular interval only etc.

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Technological Experience - PoC

- RF (Radio Frequency 865-867 MHz)
  - Healthy communication in specific range of area
  - Metal, concrete structure will reduce the penetration of signals
  - Meter addition/ replacement is auto detected
  - Works in Mesh Topology
- GPRS (General Packet Radio Service)
  - Point to point communication
  - More dependency on signal strength in the area

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Key challenges:

- Ageing of electrical network
- Limited expertise of Indian Companies
- Imported technologies of Technical collaborators are not tested in India
- Inter-operatibility
- Most of the meters used in PoC are without BIS marks

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Functionality Opted

- AMI for Residential & Industrial
- Peak load Management
- DTR health monitoring
- ToU tariff implementation
- Asset health management
- Load forecasting
- Consumer participation through DR
- Power Quality Management

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Strategy to be formed by MoP/ISGF

- Common protocols and standards for various hardwares to be formed
- Large opportunity for Indian companies to participate as technical collaborators with foreign companies
- Some innovative decision required to be taken by MoP for Smart Grid development in India like:
  - Smart Meter Specification
  - BIS standards for Smart Grid
  - Common application standards
  - Rollover funding mechanism

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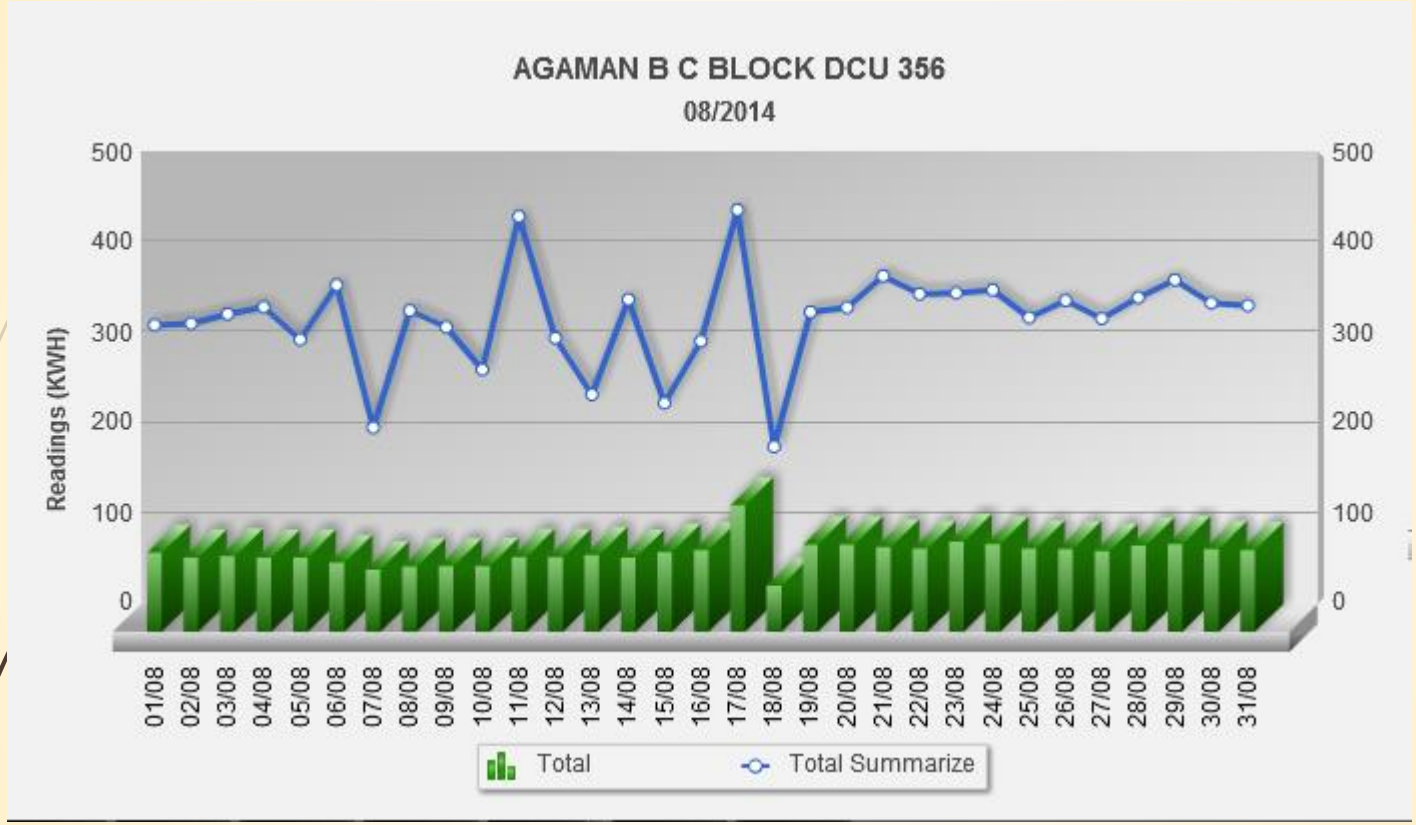
More Challenges

- Integration with ERP, RAPDRP, SCADA/ DMS and other IT application
- Scalability
- Aging network
- Fast change in technology due to new innovation

Sample Consumption graph for 1 Ph Agman BC block meters



Load Curve from 1st Aug till date

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R-APDRP Modules Implemented

Module	Covered under RAPDRP
Meter Data Acquisition	RAPDRP
Energy Audit	RAPDRP
GIS based consumer Indexing & Asset Mapping	RAPDRP
GIS based Integrated Network analysis Module	RAPDRP
Centralized Customer Care services	RAPDRP
Development of commercial Data Base of consumers	Existing ERP Solution
Metering	Existing ERP Solution
Billing	Existing ERP Solution
Collection	Existing ERP Solution
Asset Management	Existing ERP Solution

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