

Distribution Management System Applications and Development Needs

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Topics – Distribution Management Systems

1. What is a Distribution Management System (DMS)?
2. What are the applications?
3. Importance of the Distribution Model
4. Industry Coordination and Development Needs
 - Model development issues
 - Role of advanced metering systems
 - Integration issues (Common Information Model)
 - Integration of distributed resources and customer systems



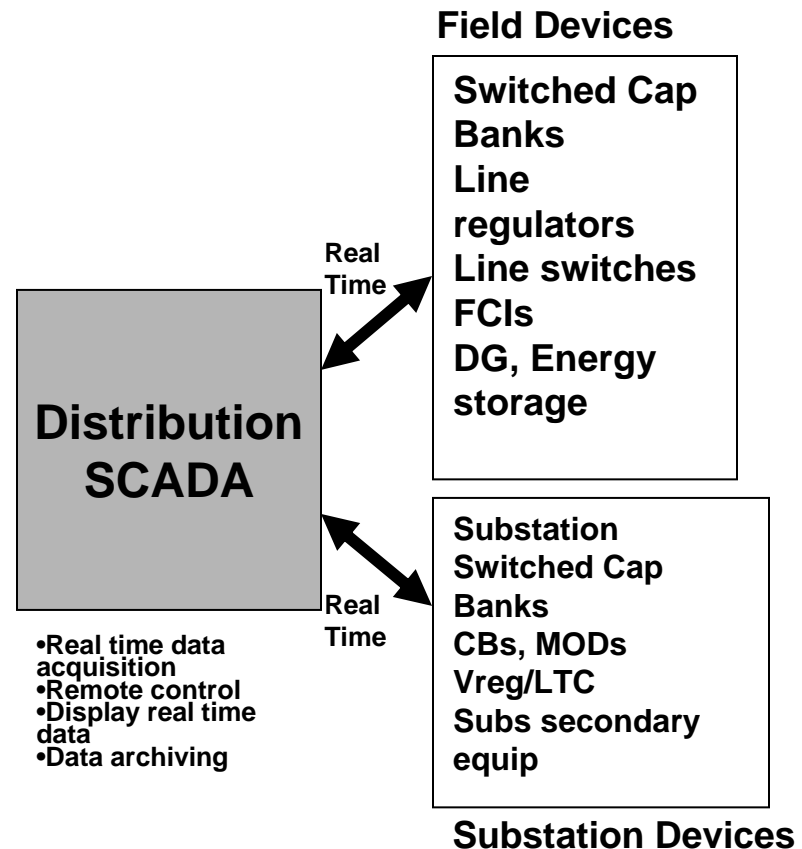
Distribution Management System (DMS)

A Decision Support System to assist the control room and field operating personnel with the monitoring and control of the electric distribution system in an optimal manner without compromising safety and asset protection



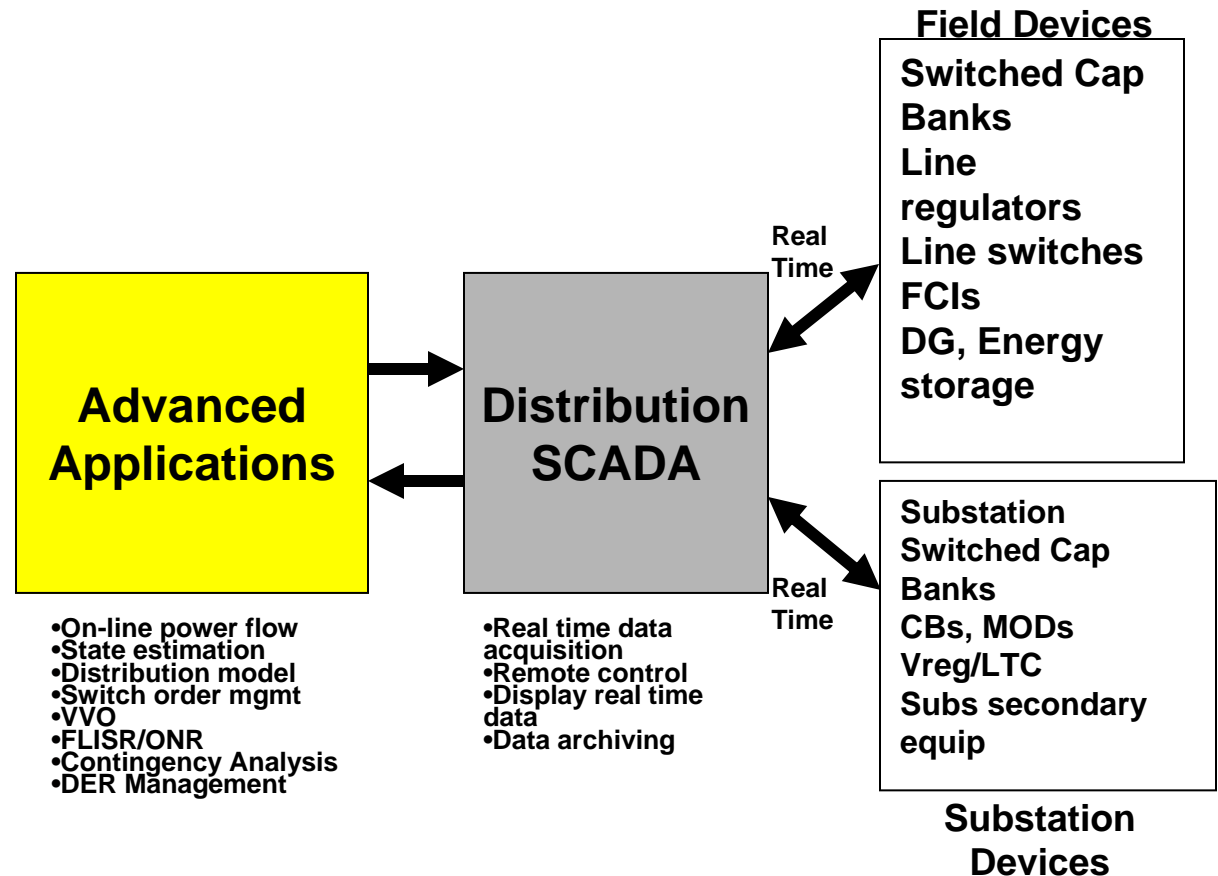
Distribution Management System Components

SCADA provides the foundation



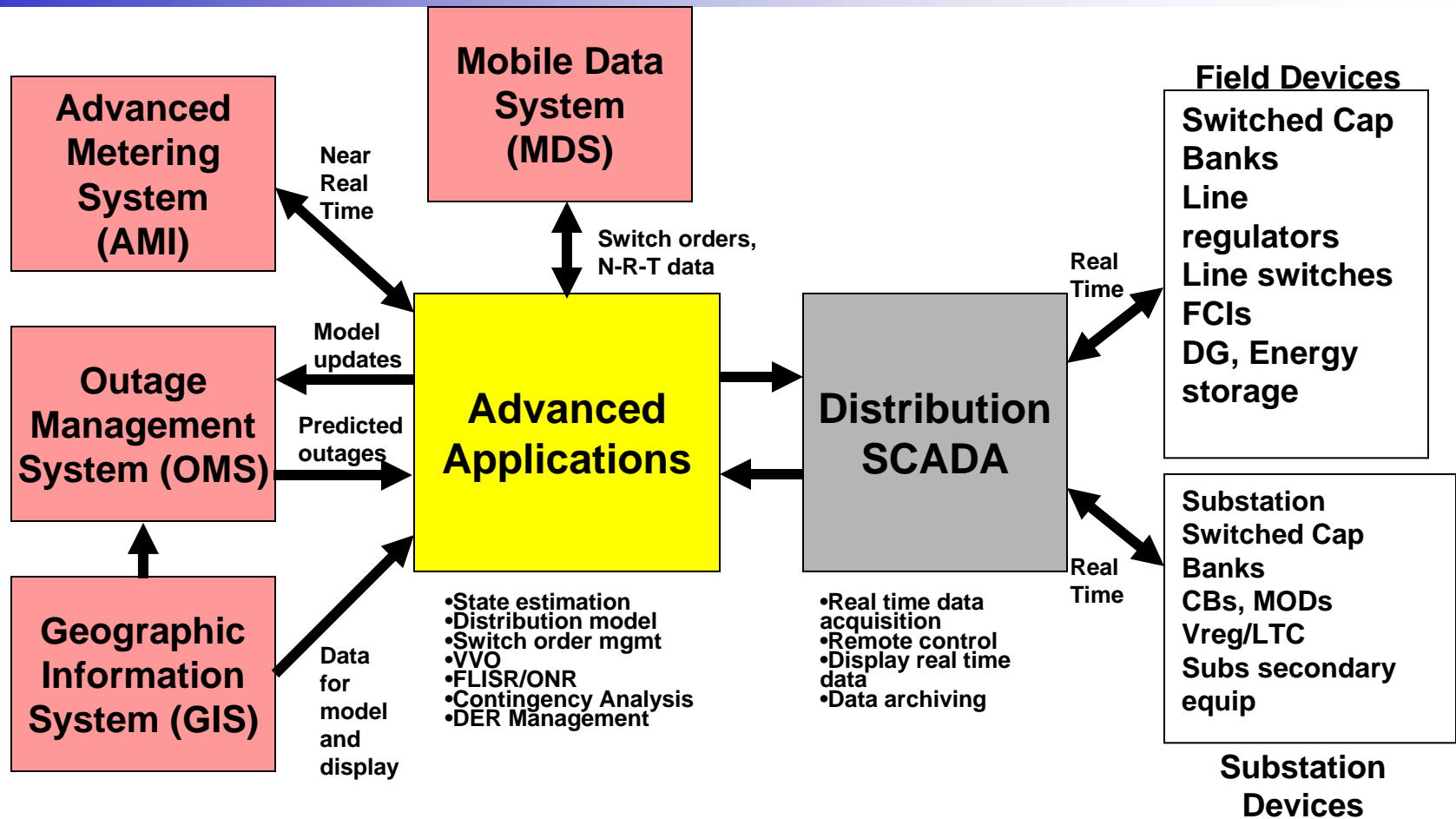
Distribution Management System Components

DMS Applications Use SCADA Capabilities

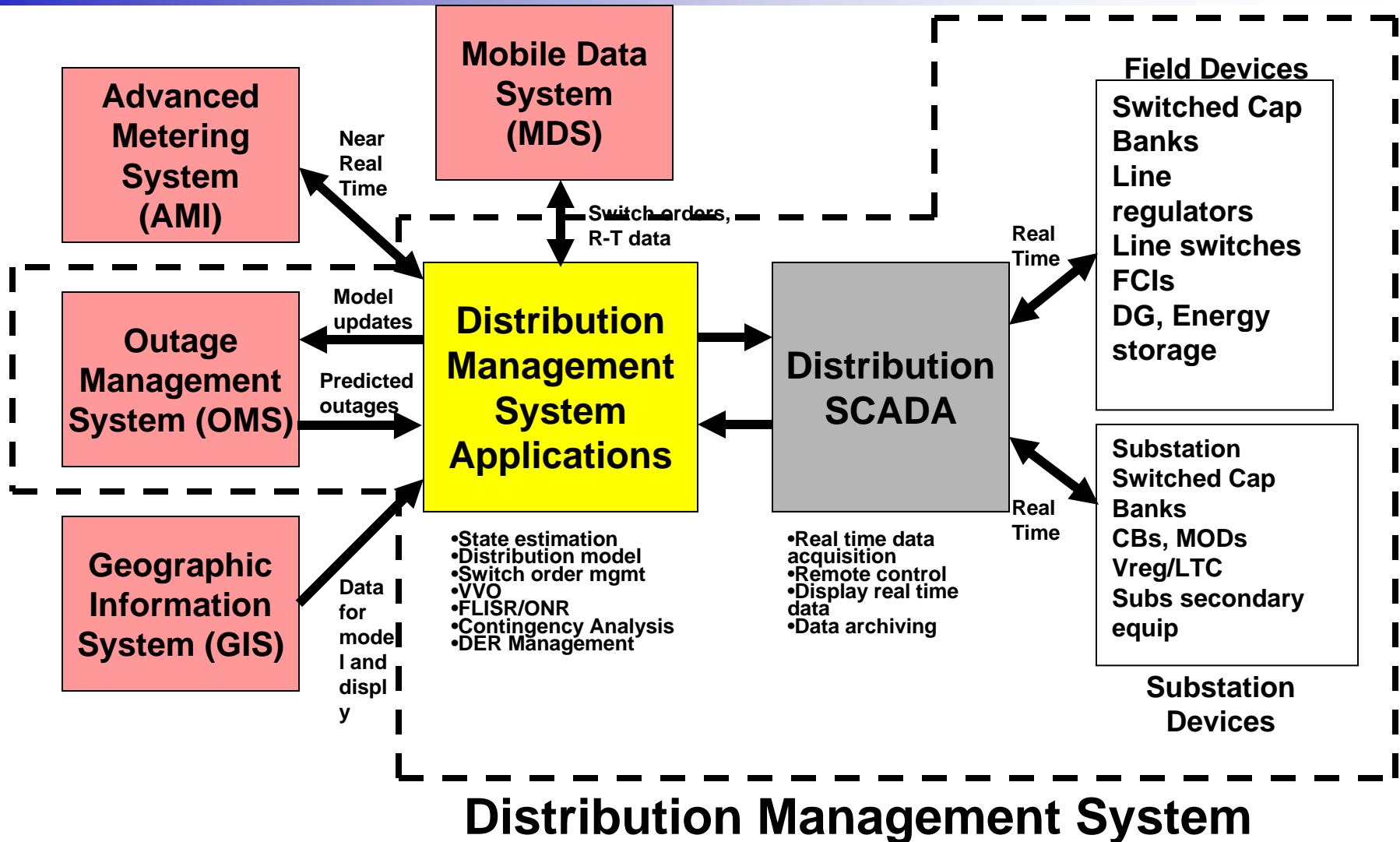


Distribution Management System Components

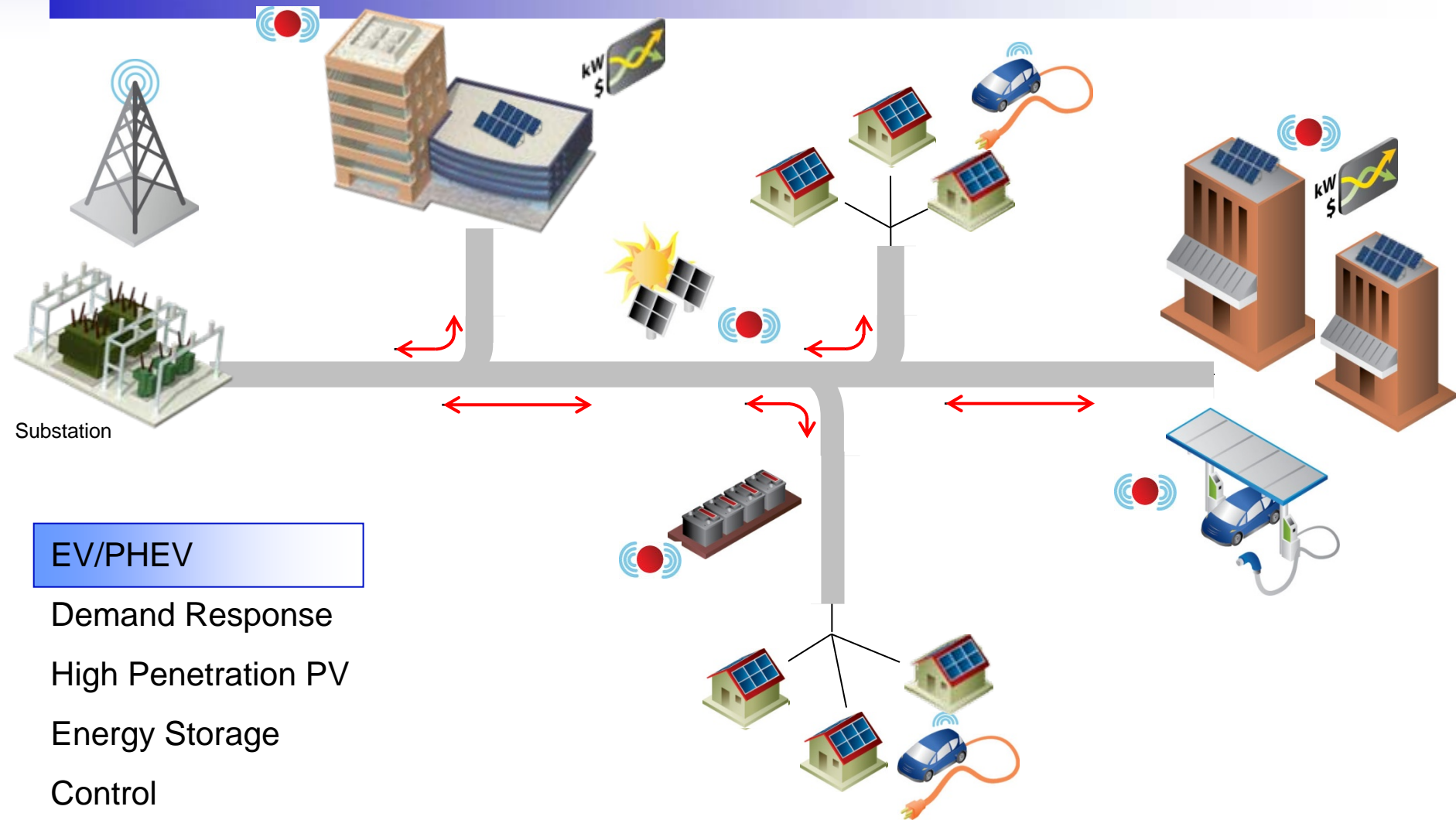
Interactions with Operational Support Systems



Combined DMS/OMS System



Why do we need a Distribution Management System?



EV/PHEV

Demand Response

High Penetration PV

Energy Storage

Control

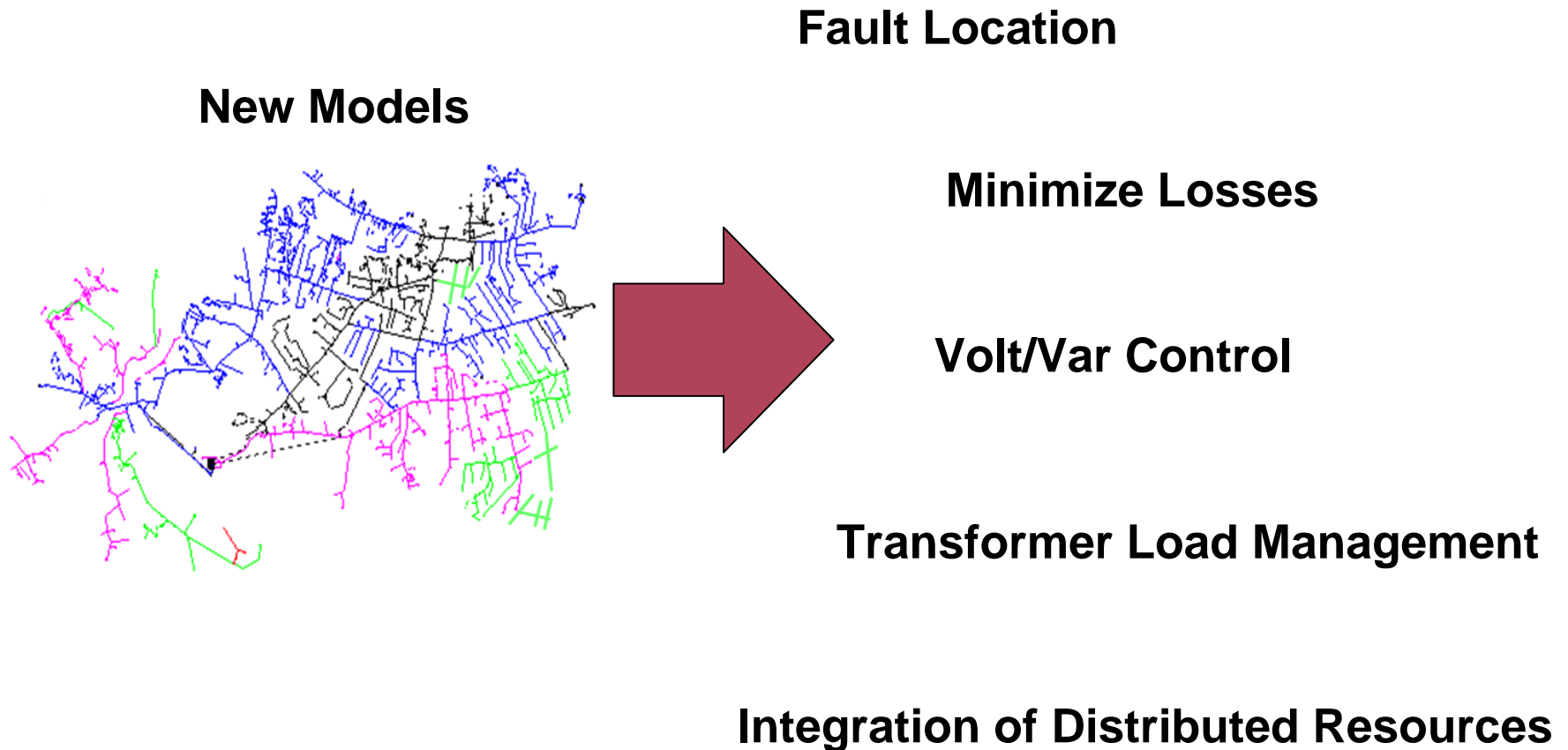
Applications that are driving the deployment of Distribution Management Systems

1. Reliability improvement – Fault Location, Isolation, and Restoration
2. Fault location for faster repair and maintenance applications
3. Voltage and var control for voltage optimization

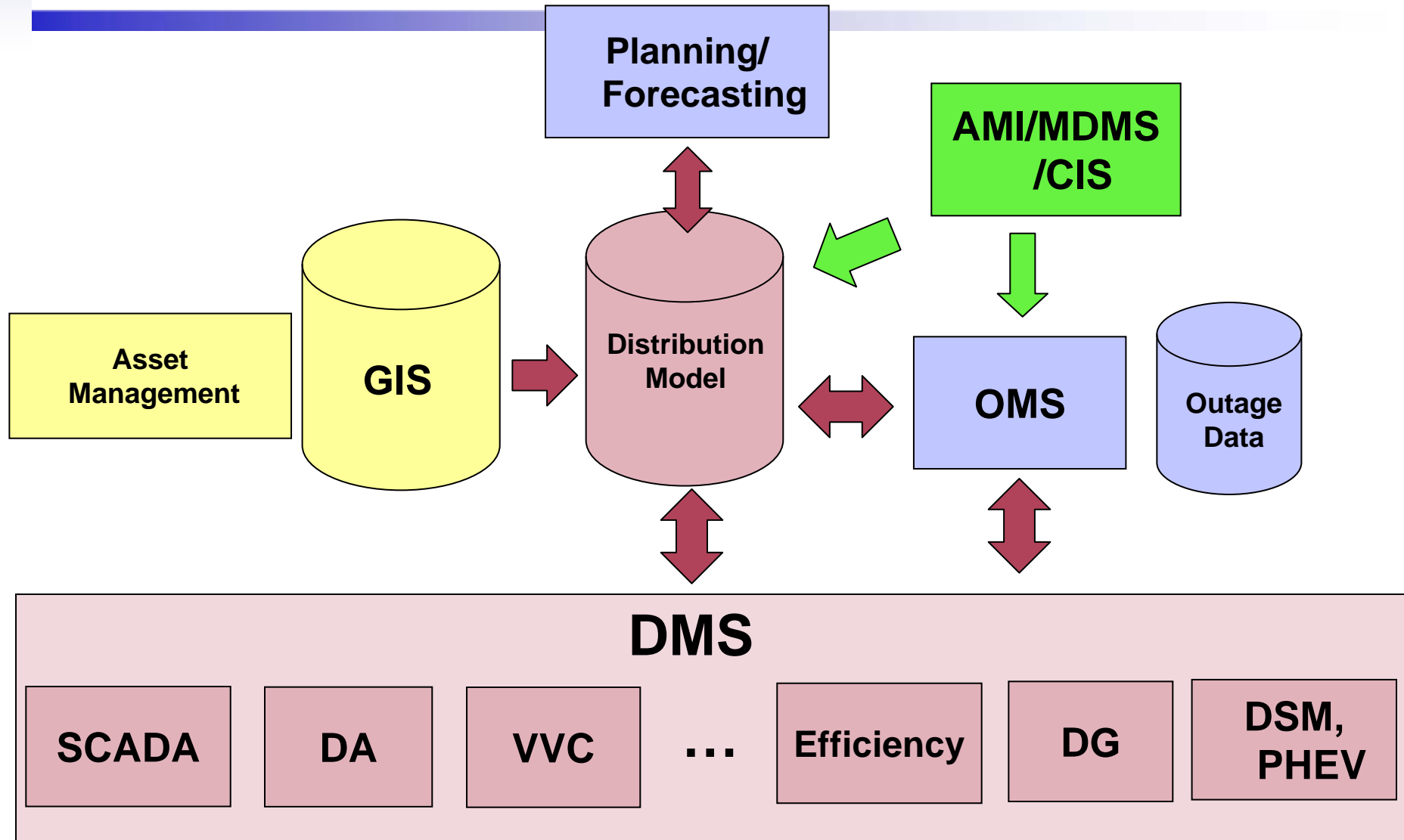


4. Integration of load control and demand response
5. Integration of renewables and other distributed generation
6. Integration of distributed storage
7. Integration of smart electric vehicle charging

Improved Distribution Models Open Up New Applications



New requirements for distribution system model



The customer model is becoming very complex

Advanced Meters

- Energy Mgmt
- Security

Display Device

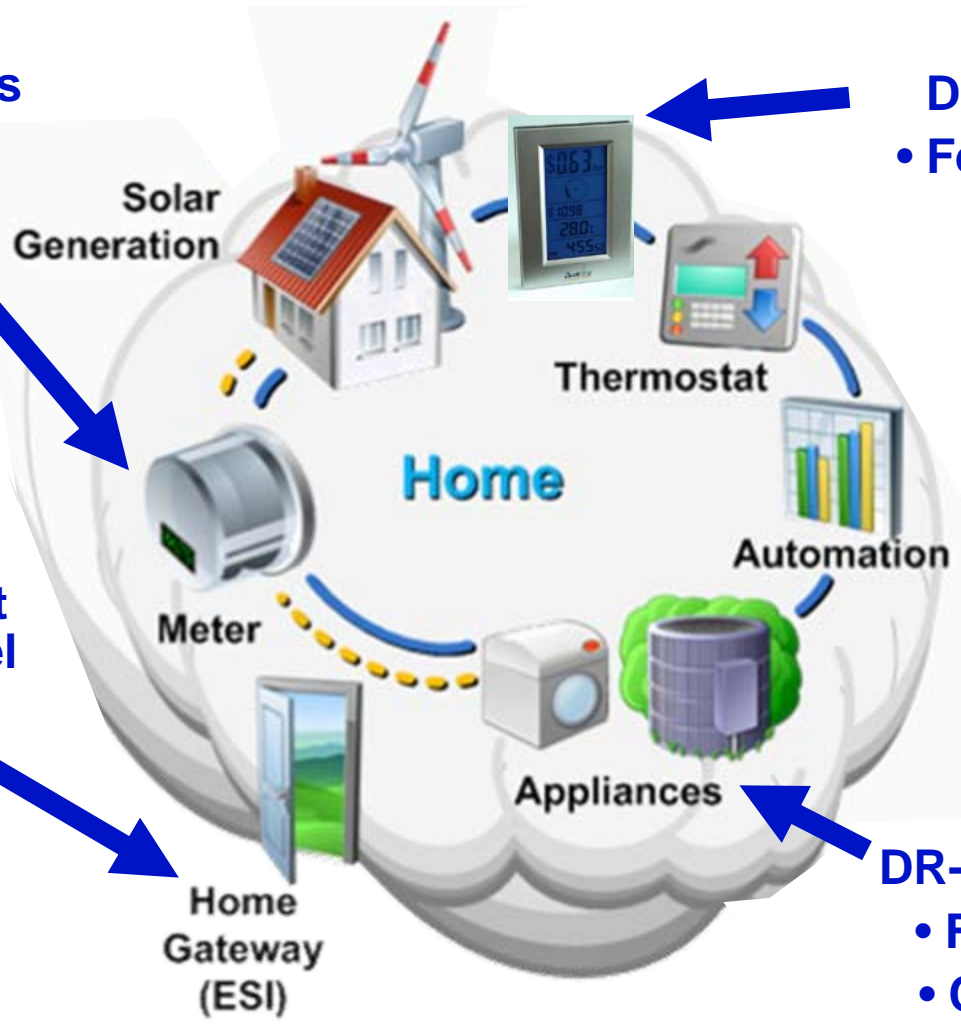
- Feedback Effect

Gateways

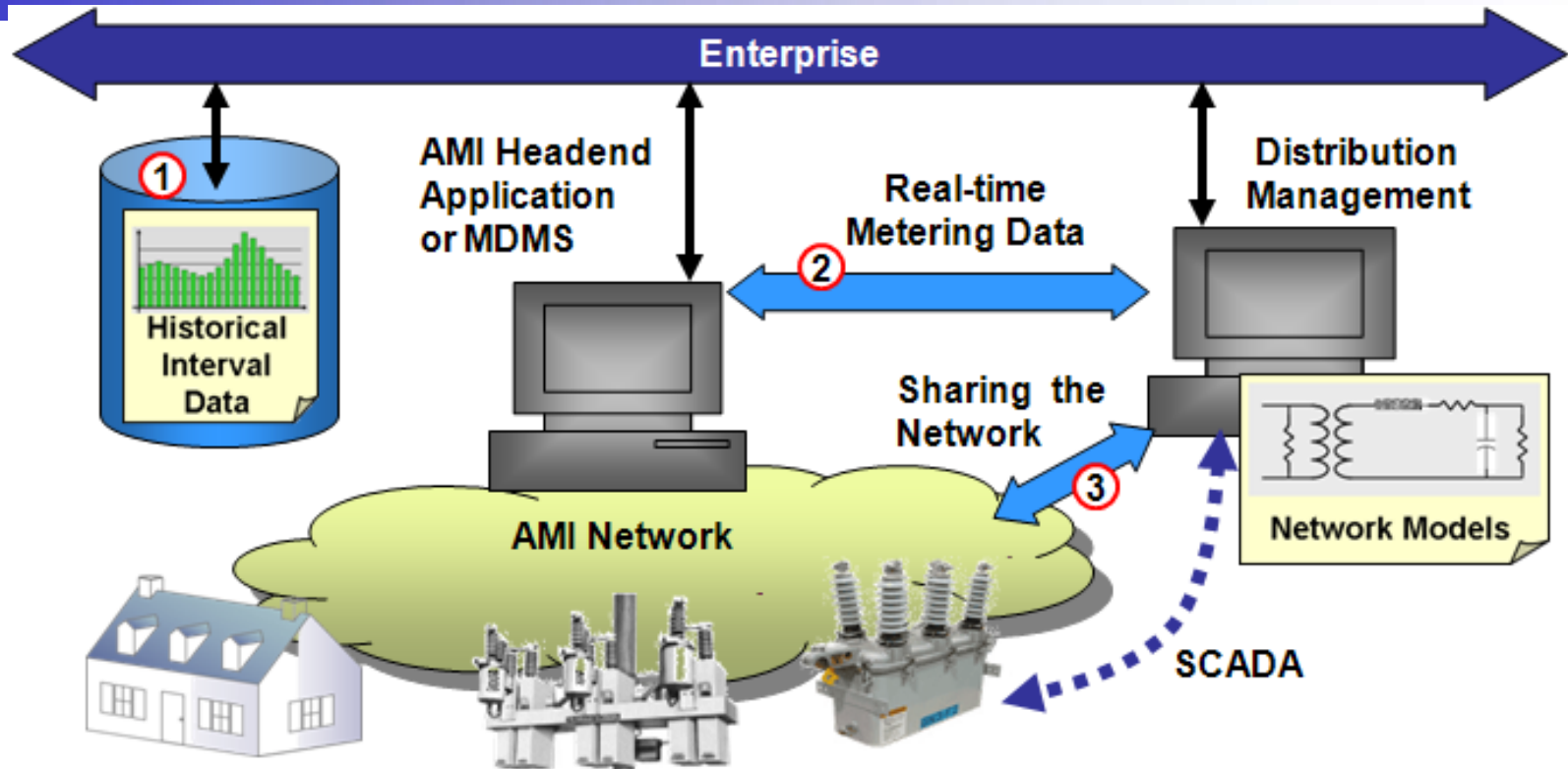
- Custom Box
- Smart Circuit Breaker Panel
- PC/Router

DR-Ready Appliances

- Functional Specs
- Communications



Advanced Metering can help understand the load model and conditions



1

After the Fact Use of AMI History Data

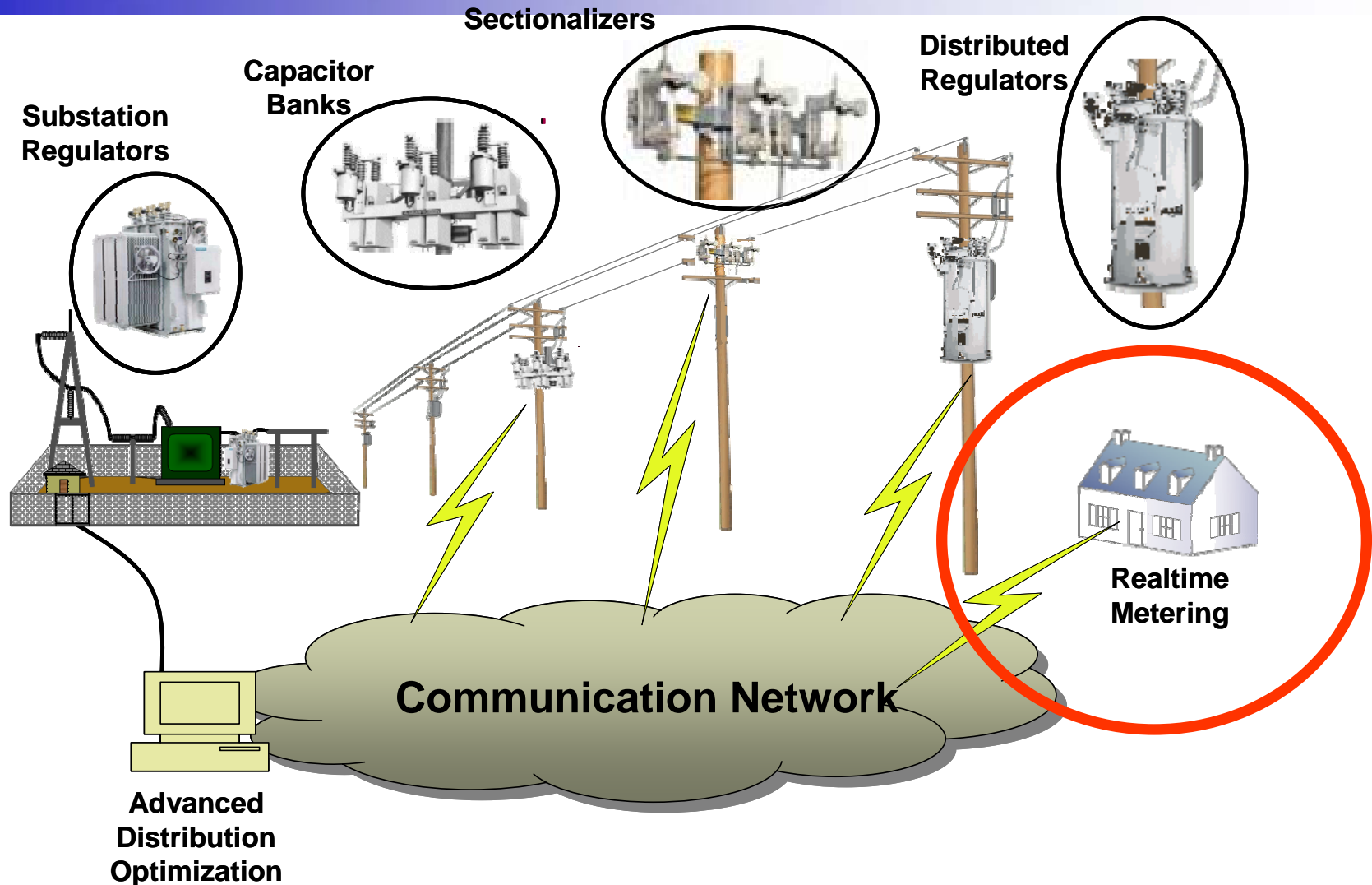
2

Real-Time Use of AMI Data (Energy, Voltage, etc.)

3

Leveraging of the AMI Network to Connect with Distribution Devices

Load model development for voltage optimization



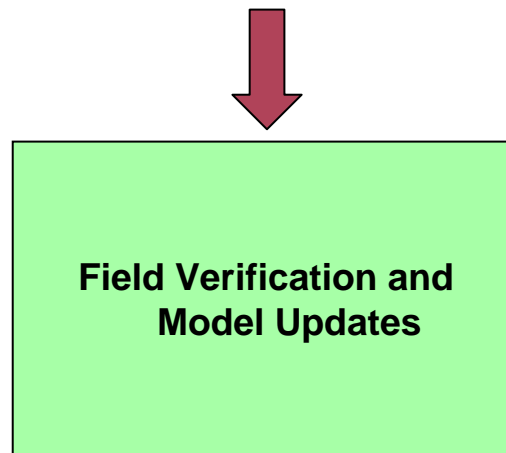
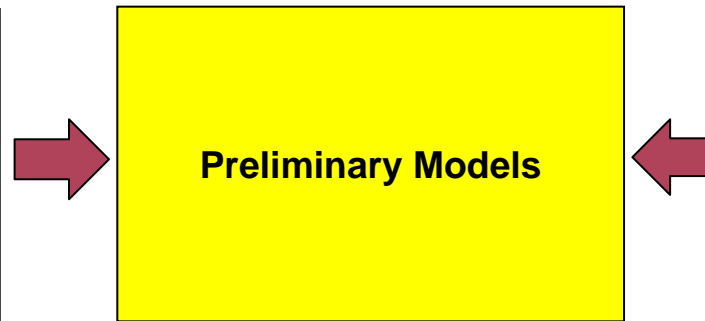
Voltage Optimization Next Step – Industry Standard Load Models

Project kicked off with one day workshop in Quebec City – 06/2010

Equipment Testing



Customer Categories



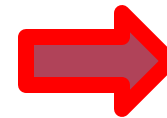
Summary of Development and Industry Coordination Needs

1. Model Development Coordination

- Standard load models
- Integrating of Advanced Metering Systems
- Impact on voltage control systems
- Demand response and load control systems
- Integrating electric vehicles intelligently

2. Integration with Enterprise Systems

- Common Information Model Development
- Geographic Information Systems (GIS)
- Real time applications (SCADA and OMS)
- Planning systems
- Harmonization with communications standards (61850)



Standards

3. Integration of Distributed Generation and Storage

- Renewables with smart interfaces
- Distributed storage
- Other distributed generation