

EPRI Smart Grid Demonstration Host Site Project

FirstEnergy/JCP&L Host Site Overview/Update

Integrated Distributed Energy Resources Management



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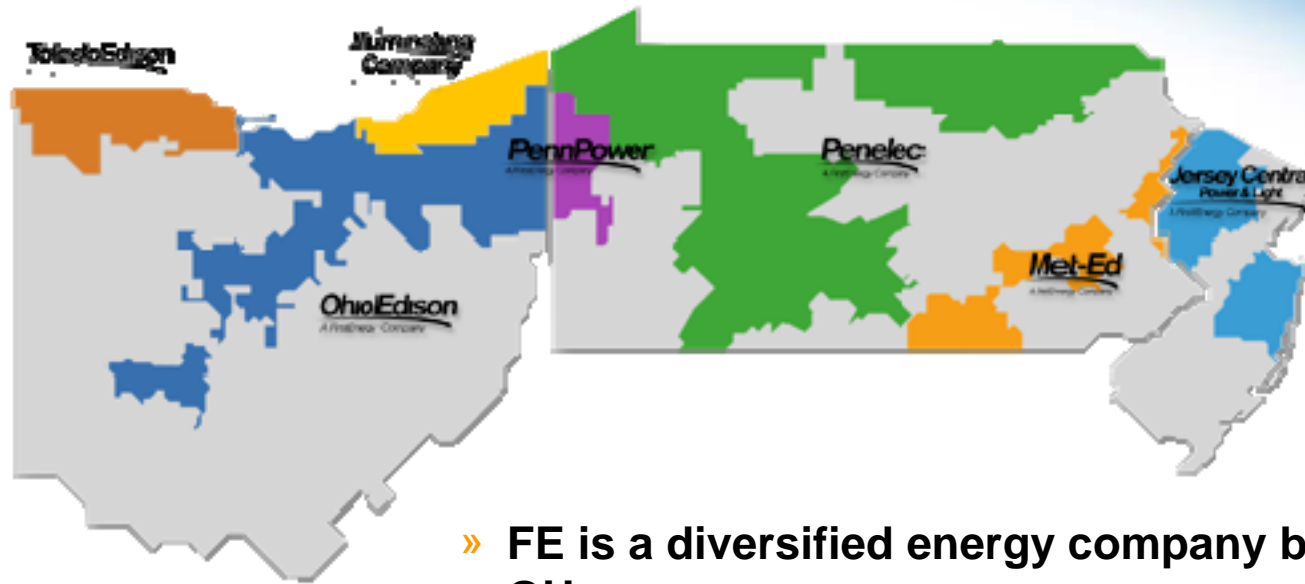
Project Manager – FE Technologies

February 3, 2009

Presentation Outline

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JCP&L/FirstEnergy Overview

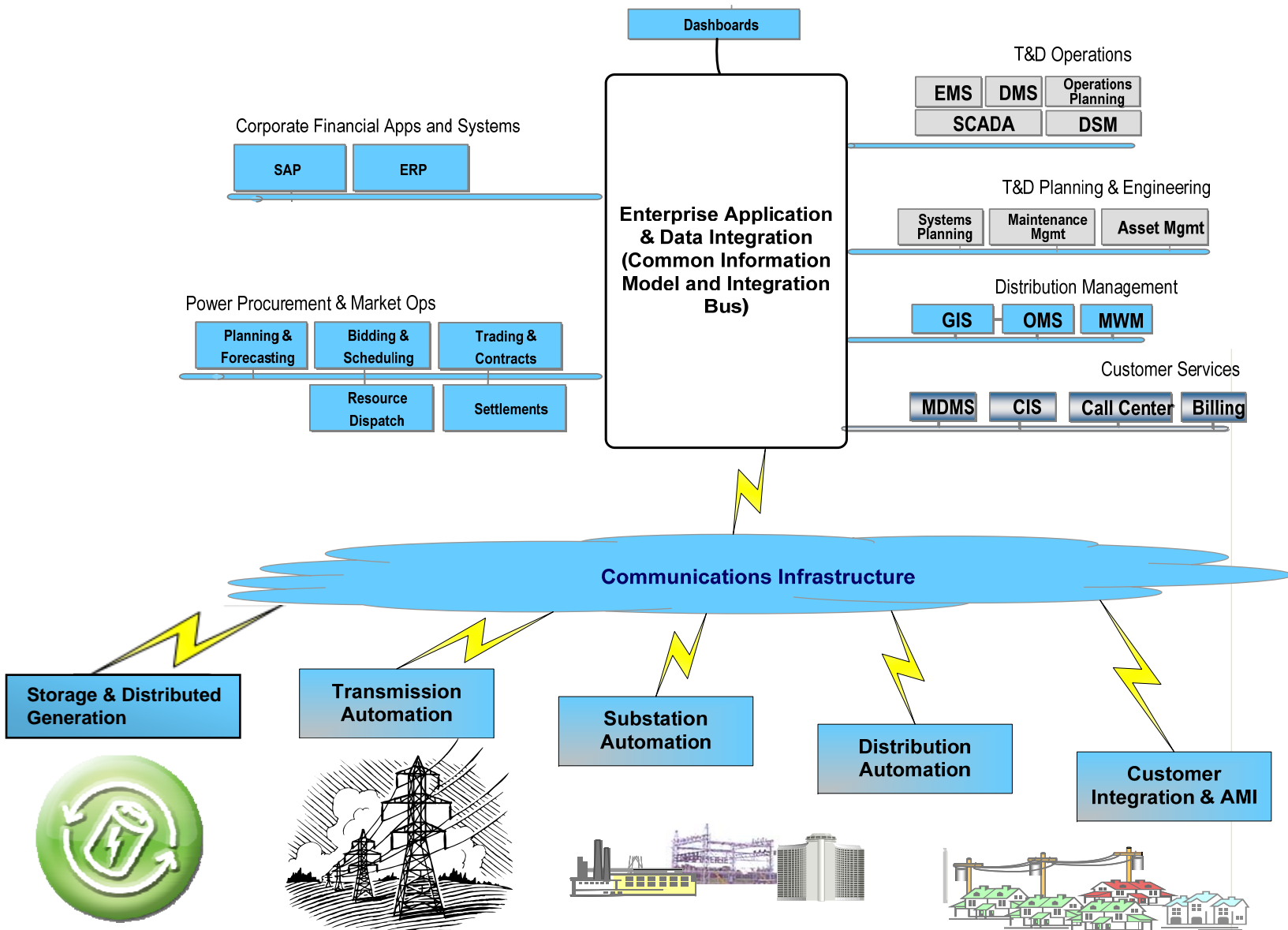


Rankings among Electric Utilities

Assets	9
Customers	5
Revenues	8
Market Cap	7

- » FE is a diversified energy company based in Akron, OH
- » JCP&L is one of FE's seven electric utility operating companies
- » Nation's 5th largest investor-owned electric system
- » JCP&L serves 1.1 million customers of 4.5 million FE customers
- » 128,000 miles of transmission & distribution lines
- » Nearly \$12 billion in annual revenues and more than \$31 billion in assets

FirstEnergy Integrated Grid Road Map



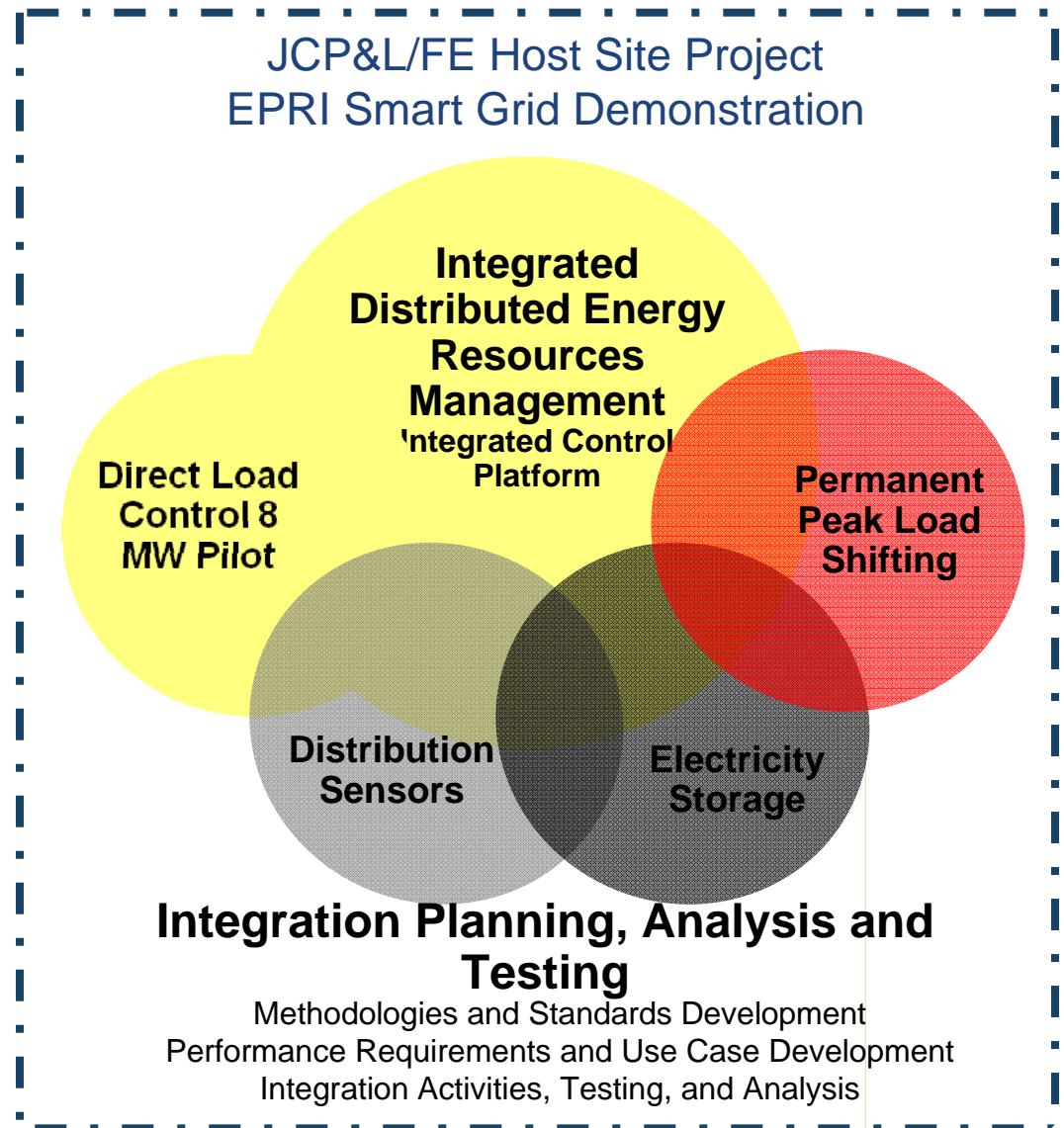
JCP&L/FE EPRI Host Site Demonstration Project

Comprised of:

- *Integrated Control Platform and 8MW Direct Load Control pilot*
- *15MW DLC Expansion*
- *5MW Permanent Peak Load Shift program*
- *3MW Electricity Storage program*
- *Distribution Sensors*
- *Other DER technologies*

Project aligns with FirstEnergy IGCA Strategy

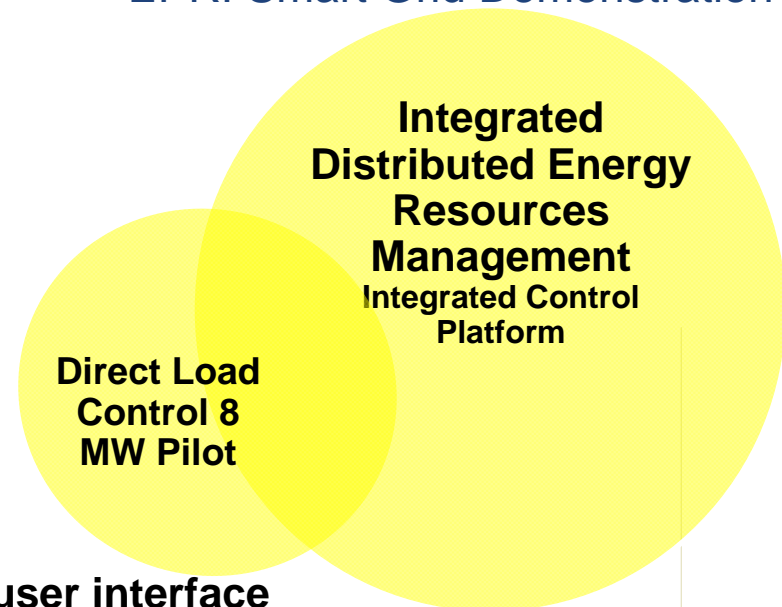
Project aligns with EPRI Smart Grid Strategy



Direct Load Control, Integrated Control Platform

JCP&L/FE Host Site Project
EPRI Smart Grid Demonstration

*Integrated Control Platform and 8MW
Direct Load Control pilot*



- **Premise information viewed by Operator on user interface**
 - Alarm triggers based on monitored device parameters
 - Individual & aggregated load information
 - Building temperature
- **Local Grid Sensing and Control**
 - Residential Load Controllers
 - Commercial & Industrial integration with energy management systems
- **Load management verification via reports and audit logs**
- **Customized load control programs**

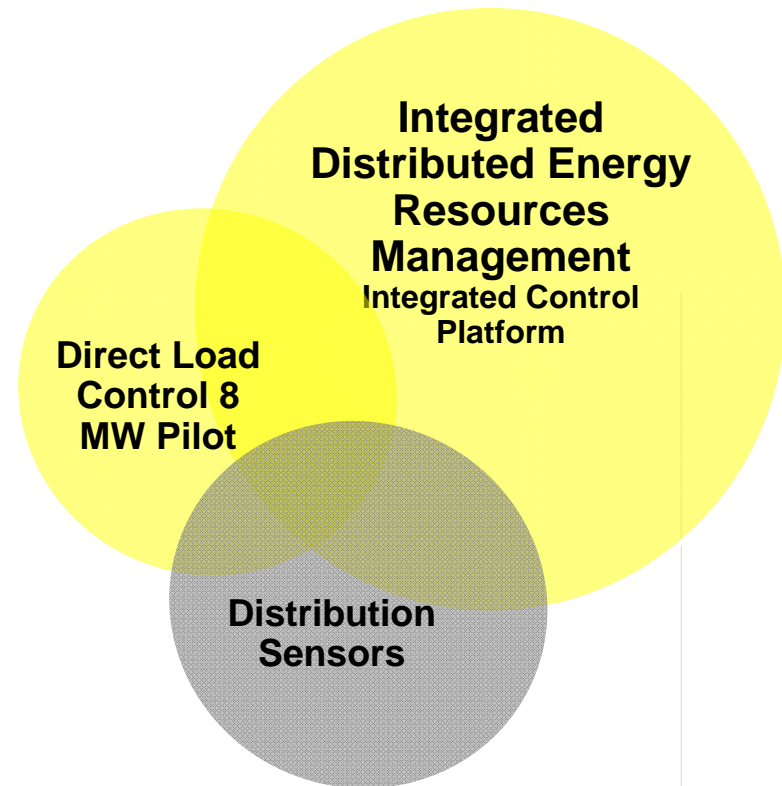
State Monitoring, Integrated Control Platform

JCP&L/FE Host Site Project
EPRI Smart Grid Demonstration

*Integrated Control Platform and 8MW
Direct Load Control pilot*

Distribution Sensors

15MW DLC Expansion



- **Monitor and visualize state transitions of individual devices**
 - Line mounted sensors
- **Action plans for state management**
 - Operator controlled
 - Real time verifiable
- **Customized verification reports**

Expanded Integration and Associated Benefits

*Integrated Control Platform and 8MW
Direct Load Control pilot*

Distribution Sensors

15MW DLC Expansion

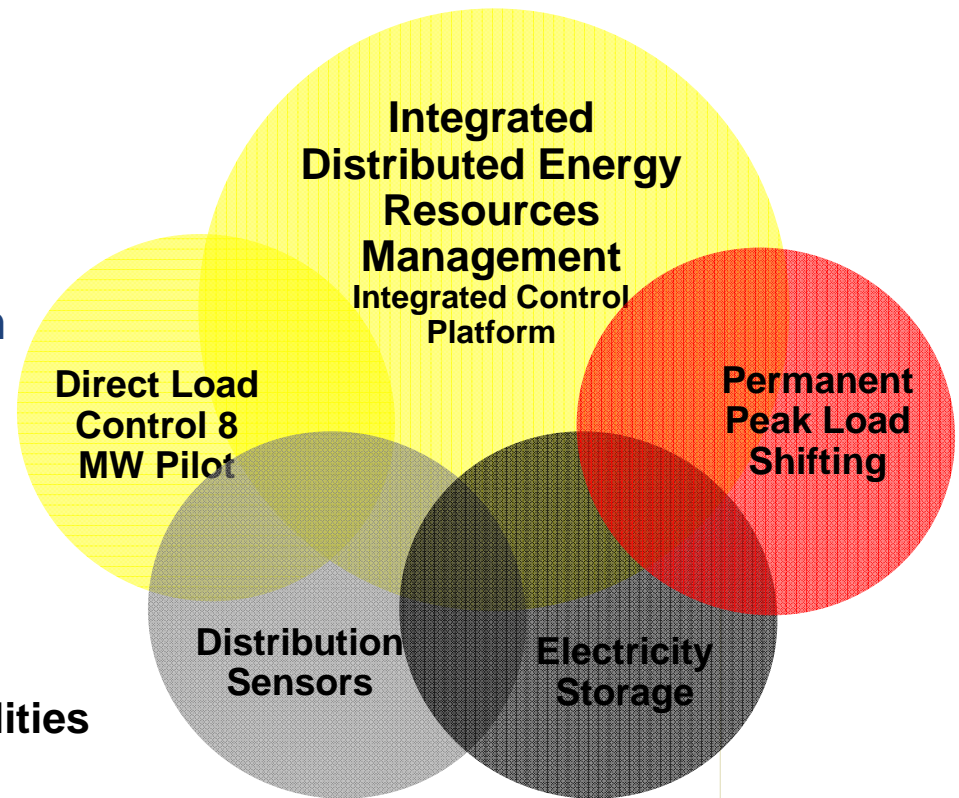
3MW Electricity Storage program

5MW Permanent Peak Load Shift program

Other DER technologies

- **Condition-based monitoring and state estimation via enhanced platform capabilities**
- **System alarm coordination**
- **Automated condition response**
- **Integrated Electricity Storage**
- **Integrated Permanent Peak Load Shifting**

JCP&L/FE Host Site Project
EPRI Smart Grid Demonstration



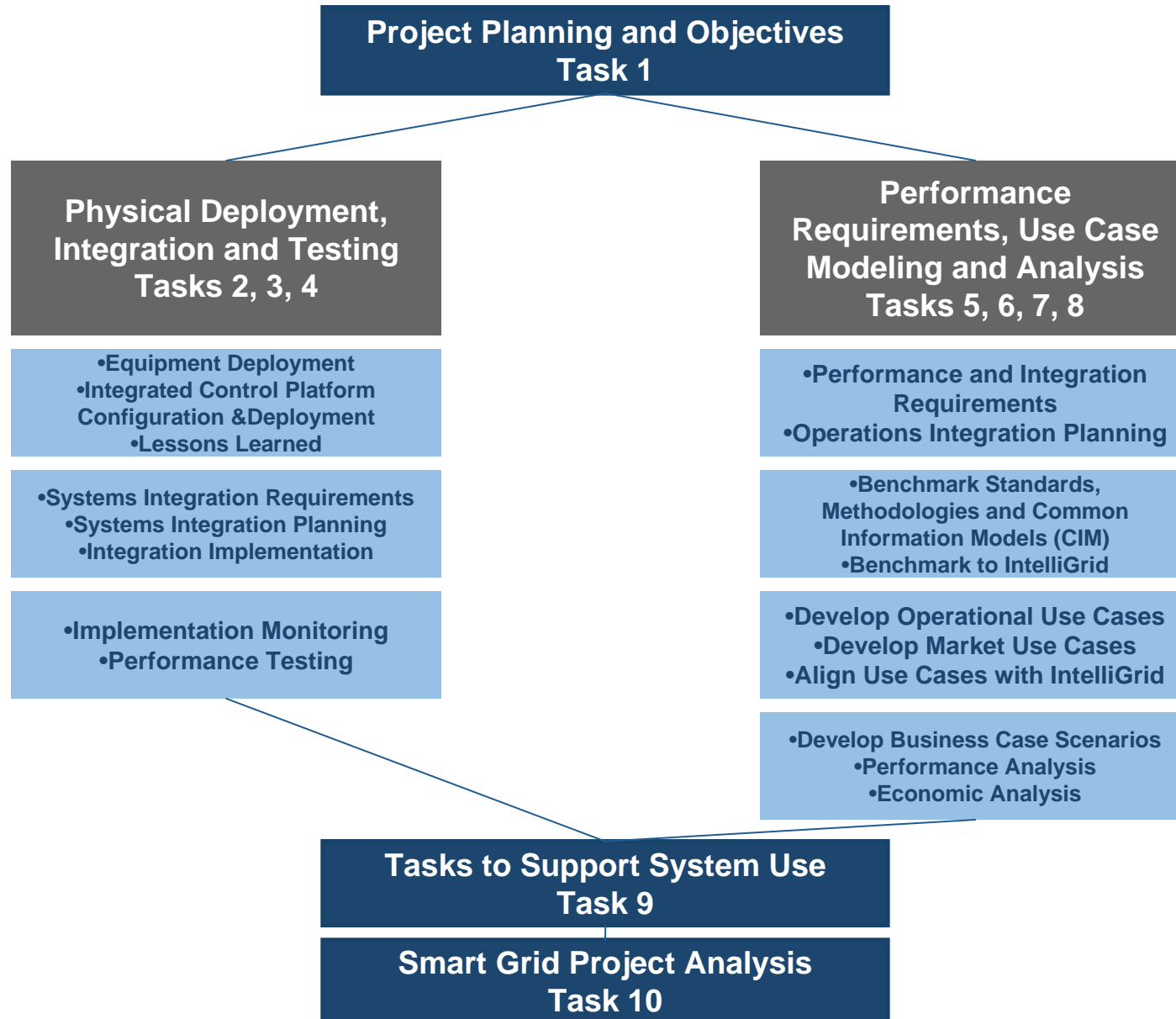
Integration Planning, Analysis and Testing

Methodologies and Standards Development
Performance Requirements and Use Case Development
Integration Activities, Testing, and Analysis

JCP&L/FE, EPRI Project Management Tasks

Task	Task Description
	JCP&L/FE EPRI Smart Grid Demonstration Host Site Project
1	Project Planning and Objectives Setting
2	Equipment Deployment (Installation)
3	System Integration Activities
4	Monitoring and Performance Assessment
5	Performance and Integration Requirements
6	Benchmarking Project to Existing Methodologies and Standards
7	Develop Use Case Scenarios
8	Develop Business Case Scenarios
9	Tasks to Support System Use
10	Smart Grid Demo Project Analysis Activities

JCP&L/FE Host Site Demonstration Project Task Alignment



Operations Integration Due Diligence & Planning

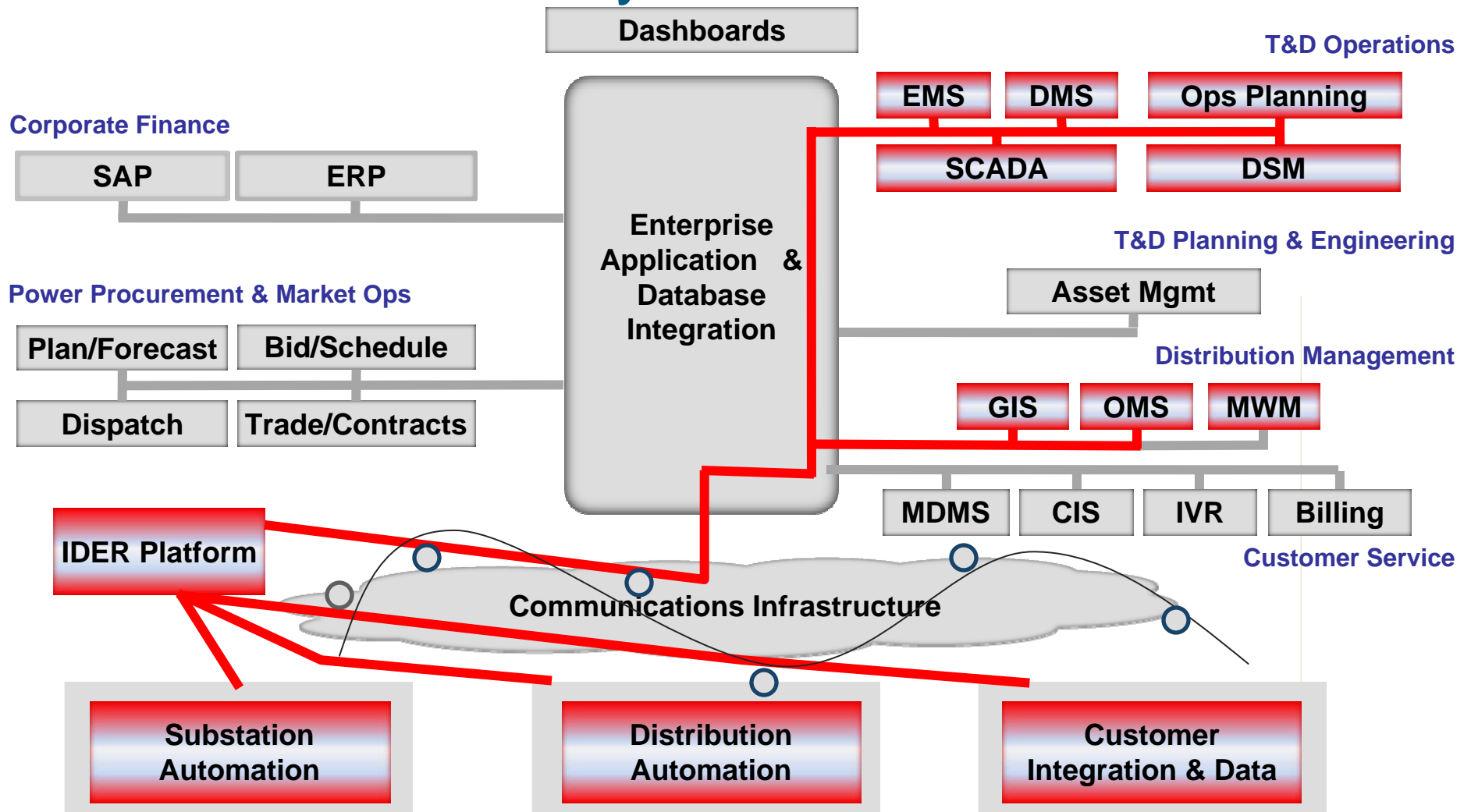
Meetings with JCP&L/FE and vendor teams to determine integration system performance requirements:

- **Feasibility of system use to support distribution operations**
- **Development of performance requirements for operational scenarios (system capabilities, visualization tools)**
- **Develop underlying Use Cases for operational scenarios**
- **Develop Cost Benefit Analysis for each Use Case**

Use Case Development Process

- **Integration of IntelliGrid Methodology into Project Framework**
- **Determine Operations and Planning Use Cases for Development**
- **Develop Data Collection and Verification Plan**
- **Conduct Testing and Use Case Model Analysis**
- **Refine Use Cases**
- **Develop Business Case and Cost Benefit Analysis**
- **Publish Final Analysis and Report**

Integration of DER into JCP&L/FE Control and Communications Systems



JCP&L/FE EPRI Smart Grid Host Site Project Participants

- EPRI
- JCP&L/FirstEnergy – prime contractor
- BPL Global, Ltd. – subcontractor
- Dynamic Energy Group – subcontractor
- Distribution Sensor vendors
- Electricity Storage vendors
- Permanent Peak Load Shifting vendors
- Other DER vendors

Status

Milestone	Delivered
Launch Residential Deployed	9/08/08
1 st 1,000 customers Deployed	10/25/08
4,000 A/C units Deployed	1/31/09
Initial Communications Network Deployed	11/25/08
Final Network Deployed	3/13/09
Network Startup/Burn-in Complete	3/20/09
BPU Approval, Large Business Solicitation	10/22/08
Launch Large Business Solicitation	11/24/08
Large Business Solicitation Complete	2/28/09
BPU Approval, Small Business Solicitation	10/22/08
Launch Small Business Solicitation	12/05/08
Small Business Solicitation Complete	2/13/09
Form Stakeholder Teams to Focus Integration Efforts	2/11/09

Feedback Instructions

- On the phone, state your Name, Affiliation, and Question/Feedback
- To submit Questions or Feedback electronically, please email to Matt Wakefield: mwakefield@epri.com by Monday February 9th

Thank You!