



**JCP&L/FirstEnergy  
EPRI Demonstration Host Site Project**

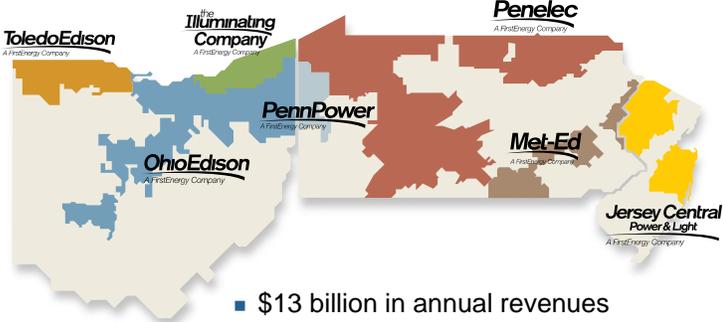


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Eva Gardow**

EPRI Smart Grid Advisory Meeting  
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### FirstEnergy/JCP&L Profile



- \$13 billion in annual revenues and \$32 billion in assets
- 4.5 million customers, 1.1 in New Jersey
- 18 generating plants; more than 14,272 MW
- Approx. 133,000 transmission and distribution circuit miles
- Approx. 14,500 employees

Rankings Among Electric Utilities (12 mos. ended 12/31/2007)	
Assets	11
Customers	5
Revenues	11
Market Cap (as of 2/29/08)	7

Source: EEI



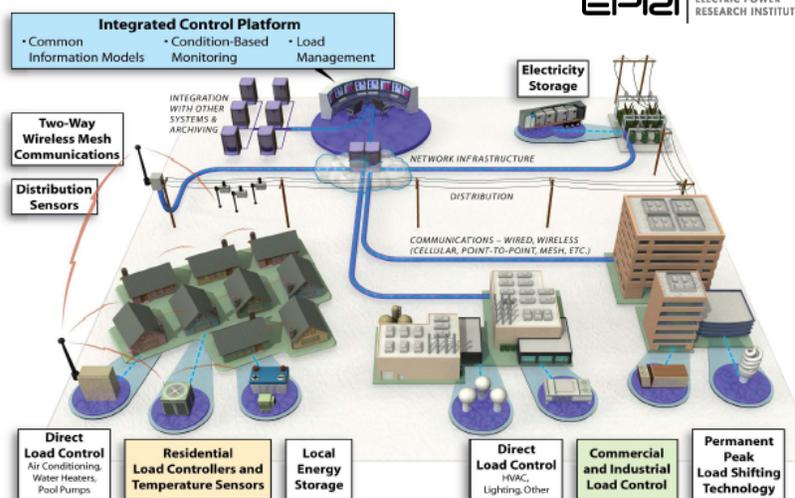
JCP&L/ FE Smart Grid Host Site Demonstration Project

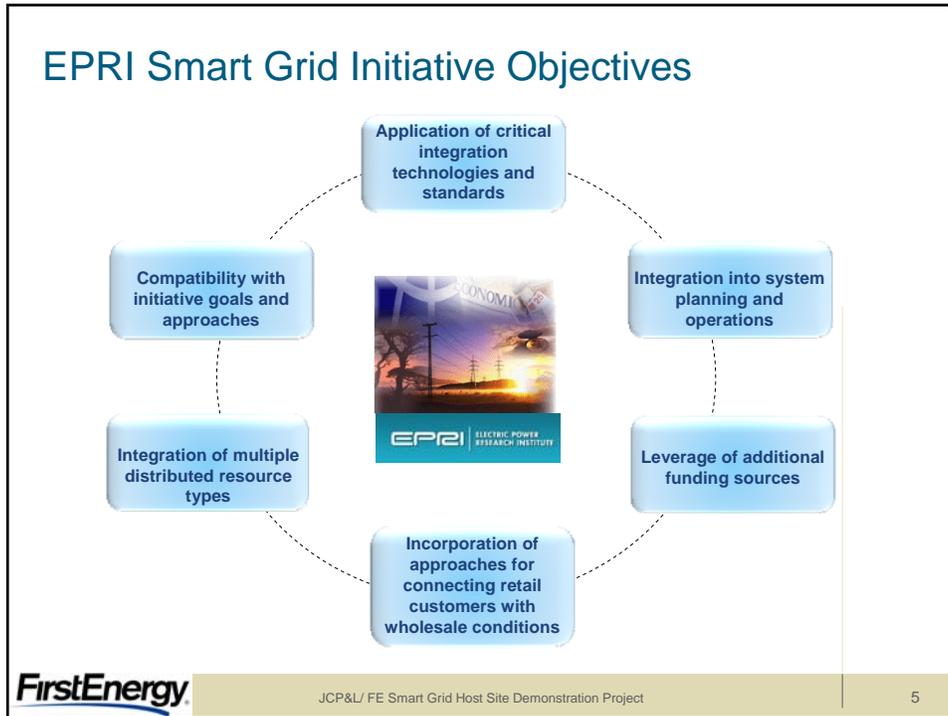
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## Demonstration Host Site Project Overview

- Integrated Distributed Energy Resources (DER) Management to enable Operational and PJM market benefits
- Integrated Smart Grid Control Platform
  - Real-time system monitoring and status for utility operations
- Direct Load Control
  - NJBPU approved deployment of the Integrated Distributed Energy Resources Management Pilot and Expansion
  - 23 MW Residential and Commercial & Industrial customers with control by the integrated control platform
- Permanent Peak Load Shift devices at commercial customers
- Electricity Storage in substations
- Electrical Distribution Sensors on distribution circuits

## FirstEnergy Smart Grid Demonstration Project "Integrated Distributed Energy Resources (IDER) Management"

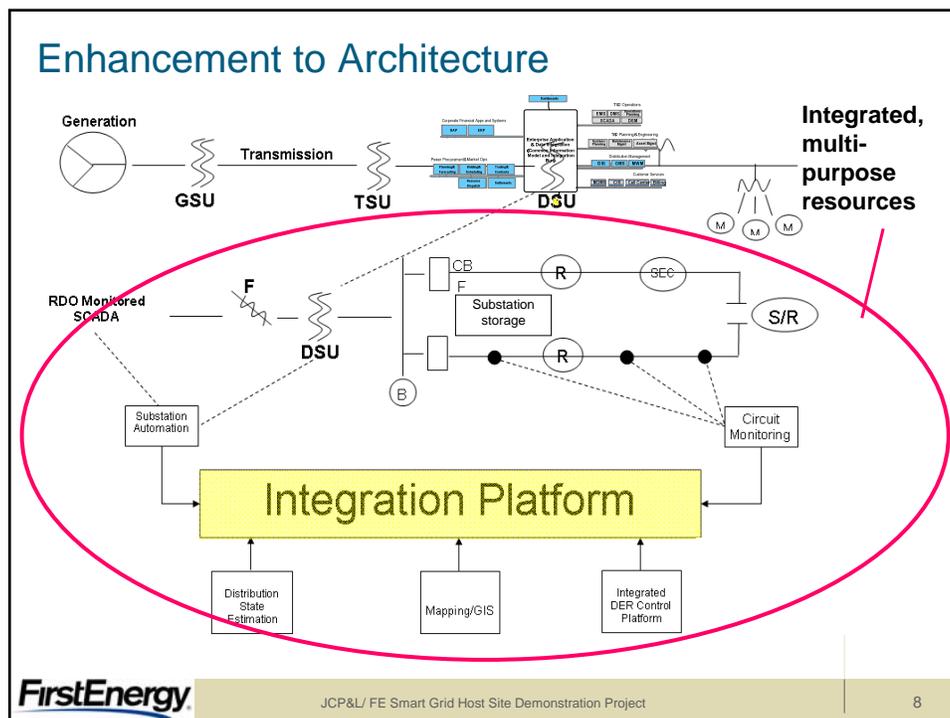
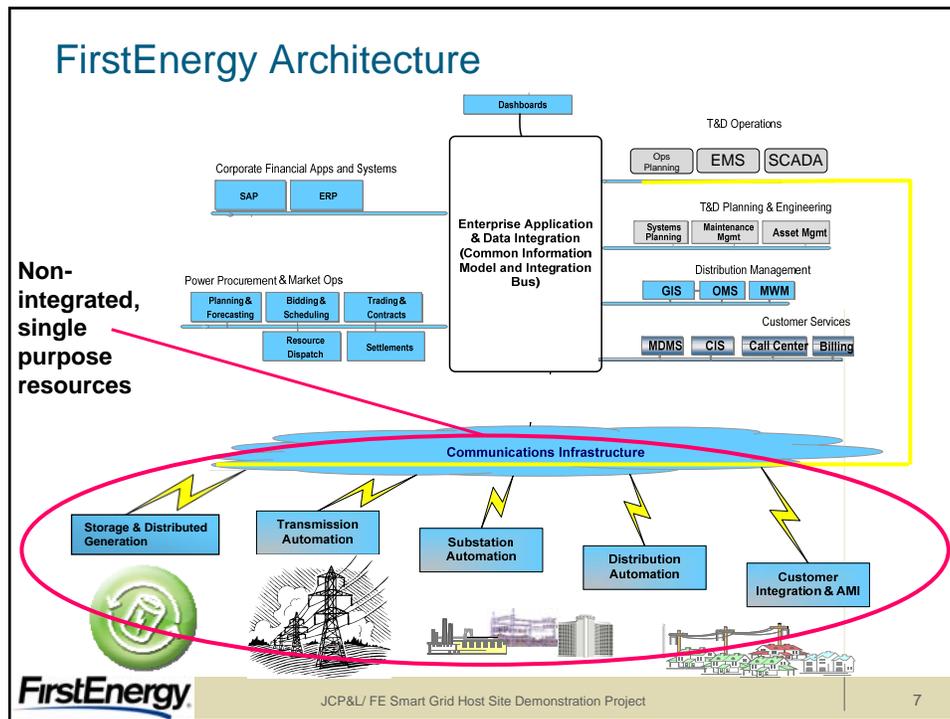




### FE Project Plan and EPRI Alignment

Plan	FE Objective	EPRI Objective
<i>Launch of Easy Green® customer portal</i>	<b>Enhanced interaction with program participants; insights into system use</b>	<b>Connecting retail customers with wholesale conditions</b>
<i>Integration of distribution line sensors</i>	<b>Progress toward condition monitoring and assessment</b>	<b>Integration into system planning &amp; operations, Leverage funding</b>
<i>Integration of DER; PPLS - ice storage, substation electricity storage</i>	<b>Coordination between DER</b>	<b>Integration of multiple DER types</b>
<i>Integration Strategy development and documentation</i>	<b>Integration of multiple vendors DER and for system enhancements</b>	<b>Application of critical integration technologies and standards</b>
<i>Use Case Models development, requirements definition, and operations plan</i>	<b>Create integrated cross-functional relationships</b>	<b>Smart Grid Program compatibility</b>
<i>NJ BPU DR Program Decision; Decisions on SGIG/SGDP</i>	<b>Leverage funding</b>	<b>Leverage funding</b>

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## Integration Levels

### ■ Physical integration

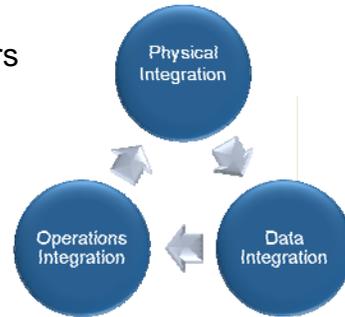
- Device deployment
- Flexible communications infrastructure at multiple layers

### ■ Data integration

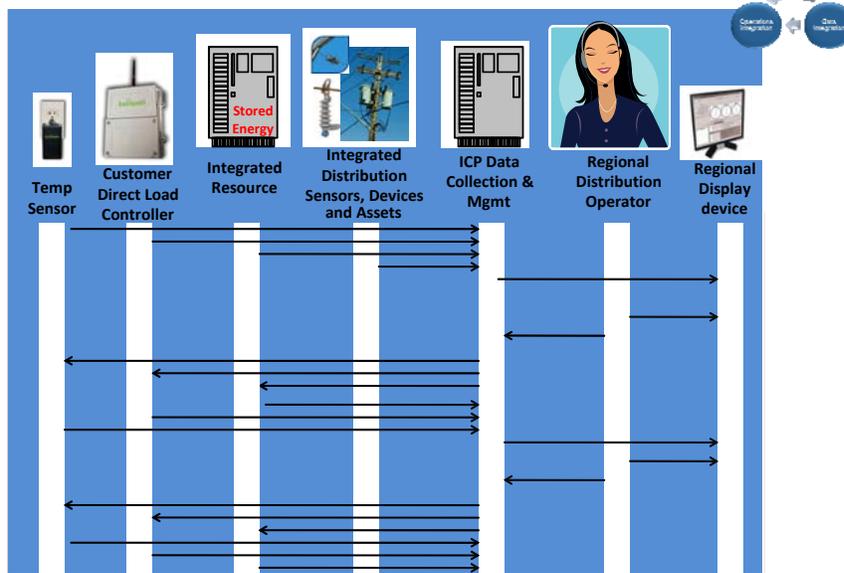
- Data bases
- Process information

### ■ Operations integration

- ICP installed in RDO
- System and asset visualization



## Device, Data Exchange, and Operations

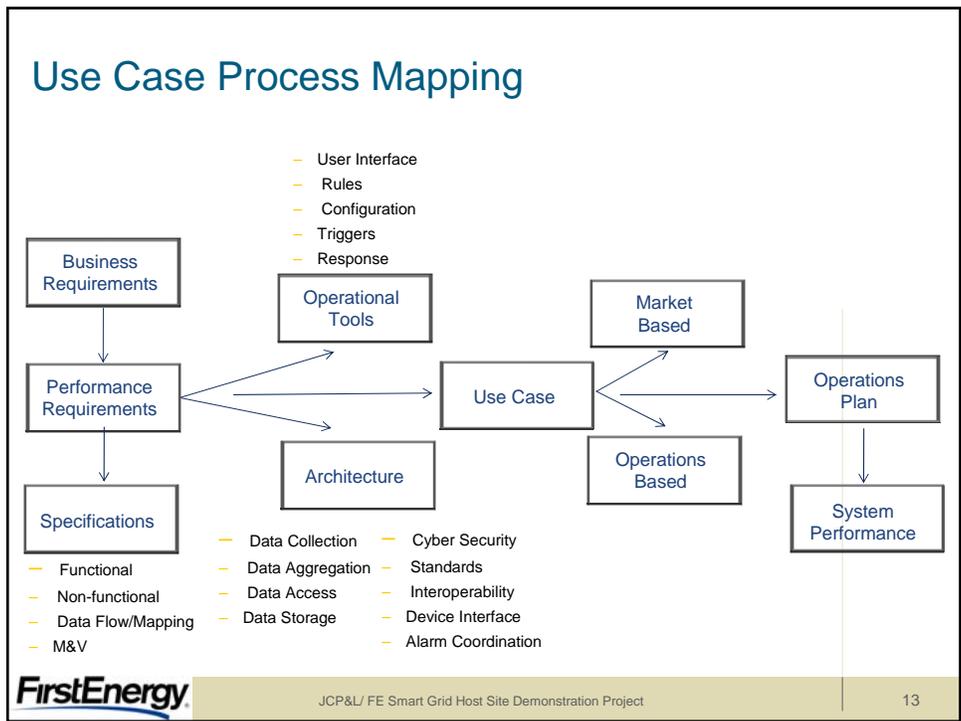


## Device Deployment Experience

- Customer Solicitation
- Controller and Temperature Sensor Installation
- Communications Concentrator Siting and Installation
- Communications Repeater Design, Siting and Installation
- Integrated Control Platform Station Set-up

## Operational Experience

- Operations Design
  - Hierarchy
- System Tests
- Market-based Use
  - PJM Program Test



### Use Case Development

**Use Case #3:** The **system shall enable** operation of system integrated distributed energy resources (DER) as **part of the RDO response to system alarms.**

**Function Name:** IDER System Activation by Alarm

**Description of Function:** The IDER system needs to **respond to critical needs** quickly. The ICP uses a **rules based engine** to configure numerous aspects that govern the operation of the IDER System. This Use Case describes how the system shall respond to configured operational alarms to **meet optimal performance objectives.** The IDER System should be able to 1) allow operators to configure and classify equipment profiles based on anticipated system loads and **operational thresholds;** 2) classify thresholds into **alarm categories;** and 3) apply **rules based logic** to assess asset status based on **alarms in near real time.**

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## Future Activities

<b>System Integration Activities</b>
Data Mapping and Integration
Information Management Requirements
Information Layer Documents
<b>System Integration Requirements Document</b>
<b>System Integration Report</b>
<b>Benchmarking Project to Existing Methodologies and Standards</b>
Standards Gap Analysis
Applicable Common Information Models
<b>Performance and Integration Requirements</b>
Hardware Performance Requirements
Software Performance Requirements
Operations Integration
<b>IntelliGrid Use Case Models</b>
<b>Business Case Scenarios</b>
<b>Cost-Benefit Analysis Scenarios</b>
<b>Test Plan</b>