

# Approach and Deployment of gridSMART<sup>SM</sup> at AEP

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10/13/2010

# Presentation Overview

- AEP's approach to gridSMART<sup>SM</sup>
  - Strategy
  - Focus
  - Participation
- AEP's gridSMART<sup>SM</sup> Deployments

# gridSMART<sup>SM</sup> Strategy

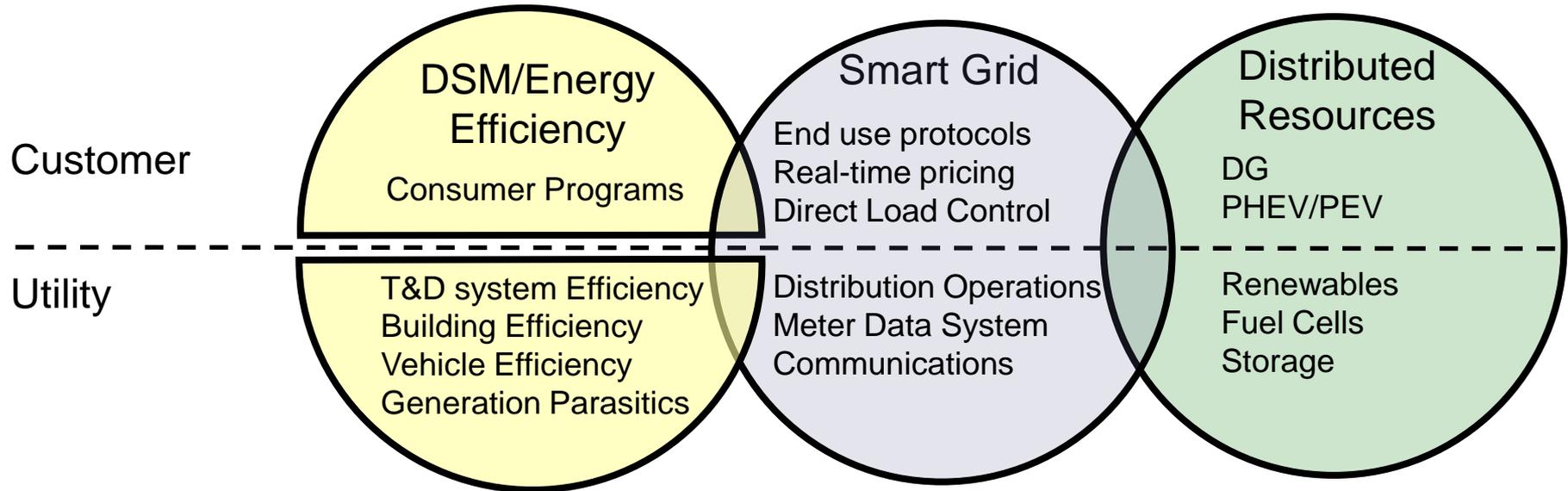
- Understand and influence public policy on Smart Grid at State and Federal levels
- Participate in Standards and Interoperability development and testing
- Build gridSMART<sup>SM</sup> Deployment Plans in alignment with State Regulatory “appetite”
- gridSMART<sup>SM</sup> Plans work toward EISA Section 1301 characteristics of a Smart Grid \*
- Operating Company projects with Corporate support for consistency and knowledge sharing
- Metrics to support business case for expansion

\* Appendix A - Energy Independence and Security Act

# gridSMART<sup>SM</sup> Strategy: Back-Office Interoperability

- CIM
- Metering (IEC 61968-9)
  - AMI, MDM, portal, CIS
  - Working directly with IEC to propose extensions
- Energy Markets (IEC 62325)
  - Real-time pricing

# AEP's gridSMART<sup>SM</sup> Focus Areas



- Meet Energy Efficiency Goals
- Update Infrastructure to meet future Smart Grid expectations
- Reduce operating costs
- Earn a fair return on investment

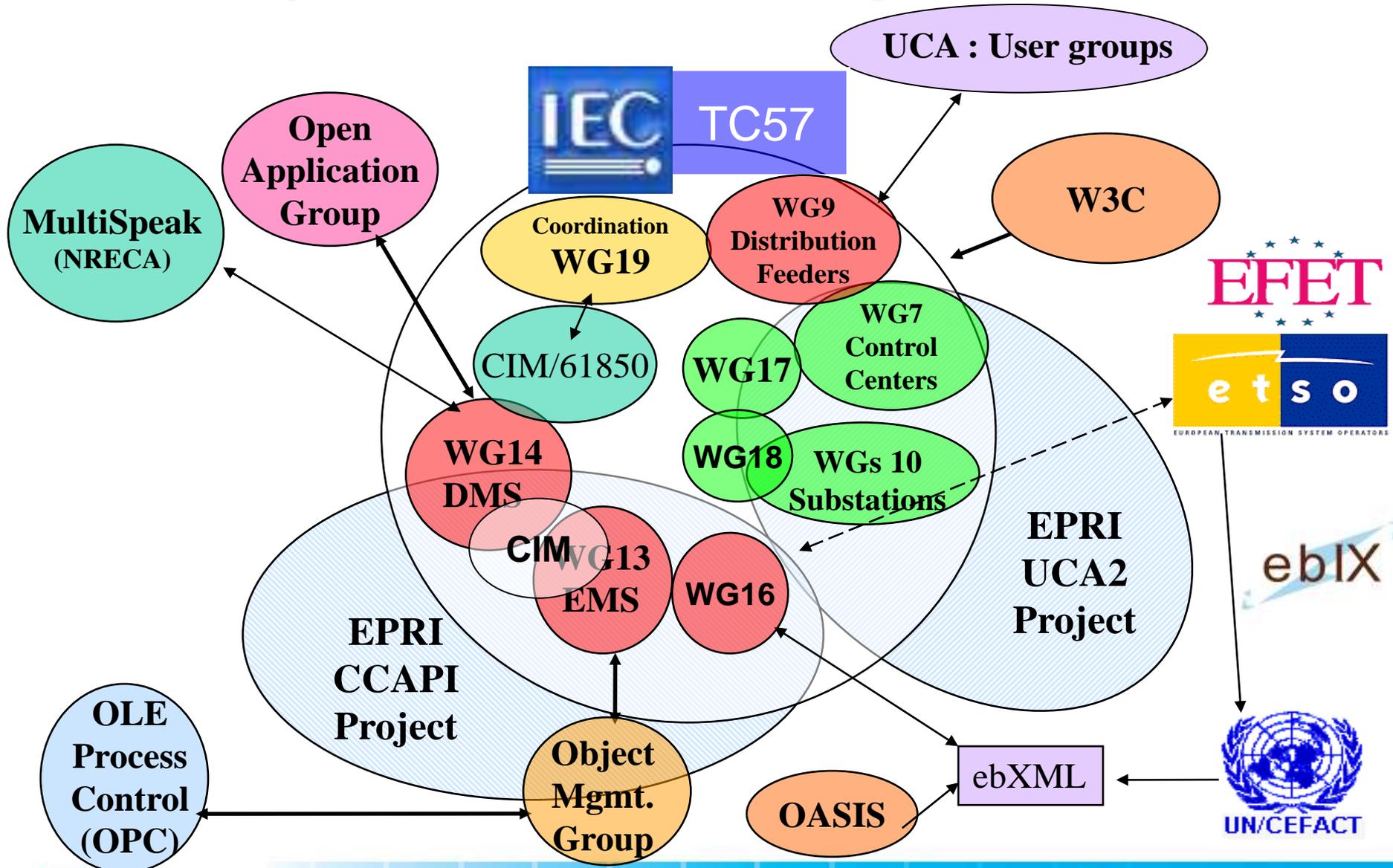
# Basic AEP gridSMART<sup>SM</sup> System Building Blocks

- **Distribution Grid Management**
  - DSCADA to monitor and control equipment
  - Fixed and switched capacitor banks with neutral sensing
  - Voltage regulator banks
  - Volt Var Optimization Schemes – demand and energy reduction
  - Automatic circuit reconfiguration schemes with Switches and Reclosers
  - Distributed generation and renewable energy sources
- **AMI and Customer Programs**
  - Automated meter reading
  - Automated connect and disconnect
  - Time of use rates and real time pricing
  - Demand reduction and energy efficiency
  - Home area network
- **Cyber Secure Communications Infrastructure for AMI and DMS**
- **Integrating DMS with existing GE OMS and AMI infrastructure to improve outage restoration**
- **Software integration utilizing Common Information Model (CIM) in coordination with EPRI & NIST**

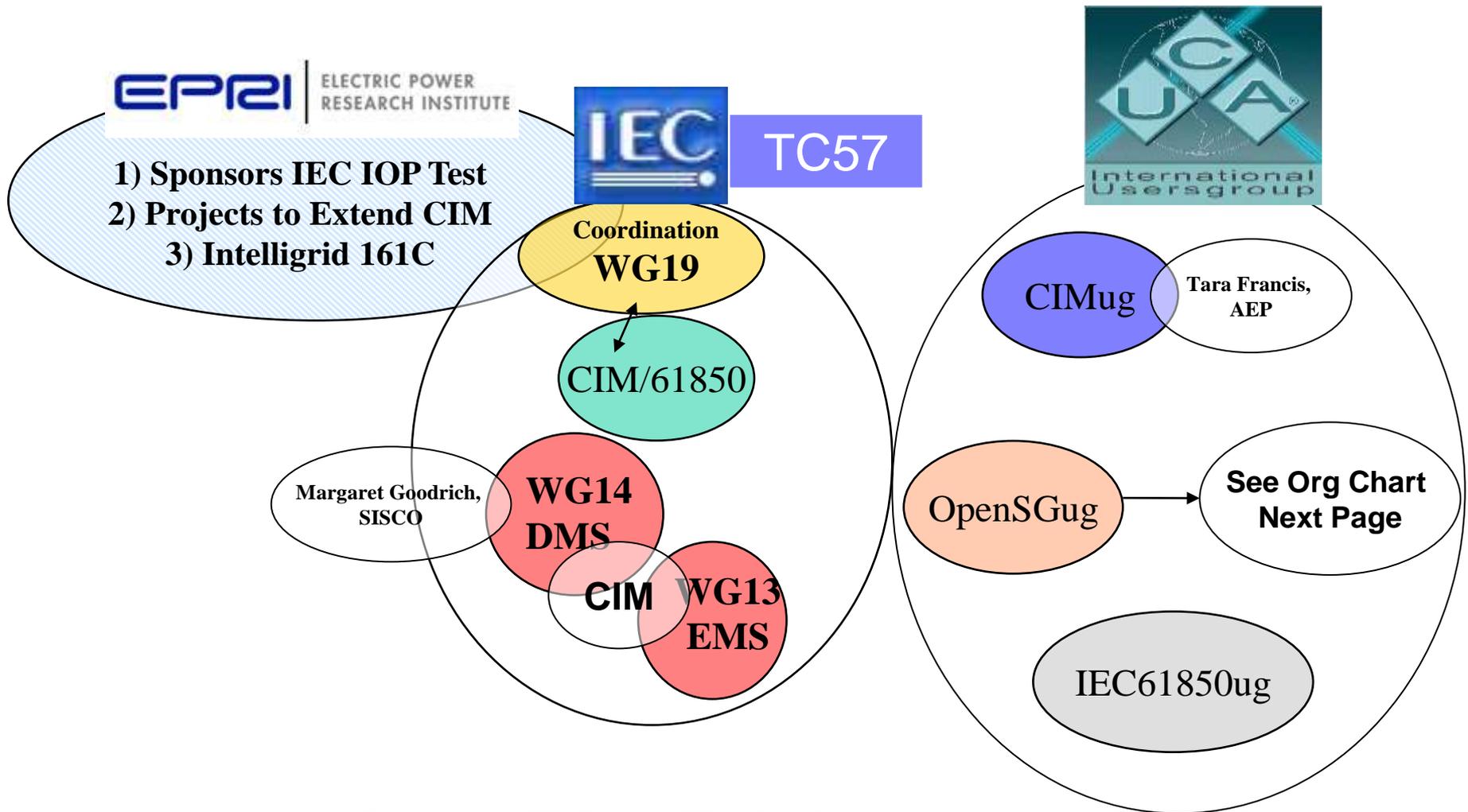
# Participation:

- AEP utilizes its participation in user groups, standards bodies, working groups, testing, etc to assist, lead and influence the industry in developing and maintaining better and more mature standards and products

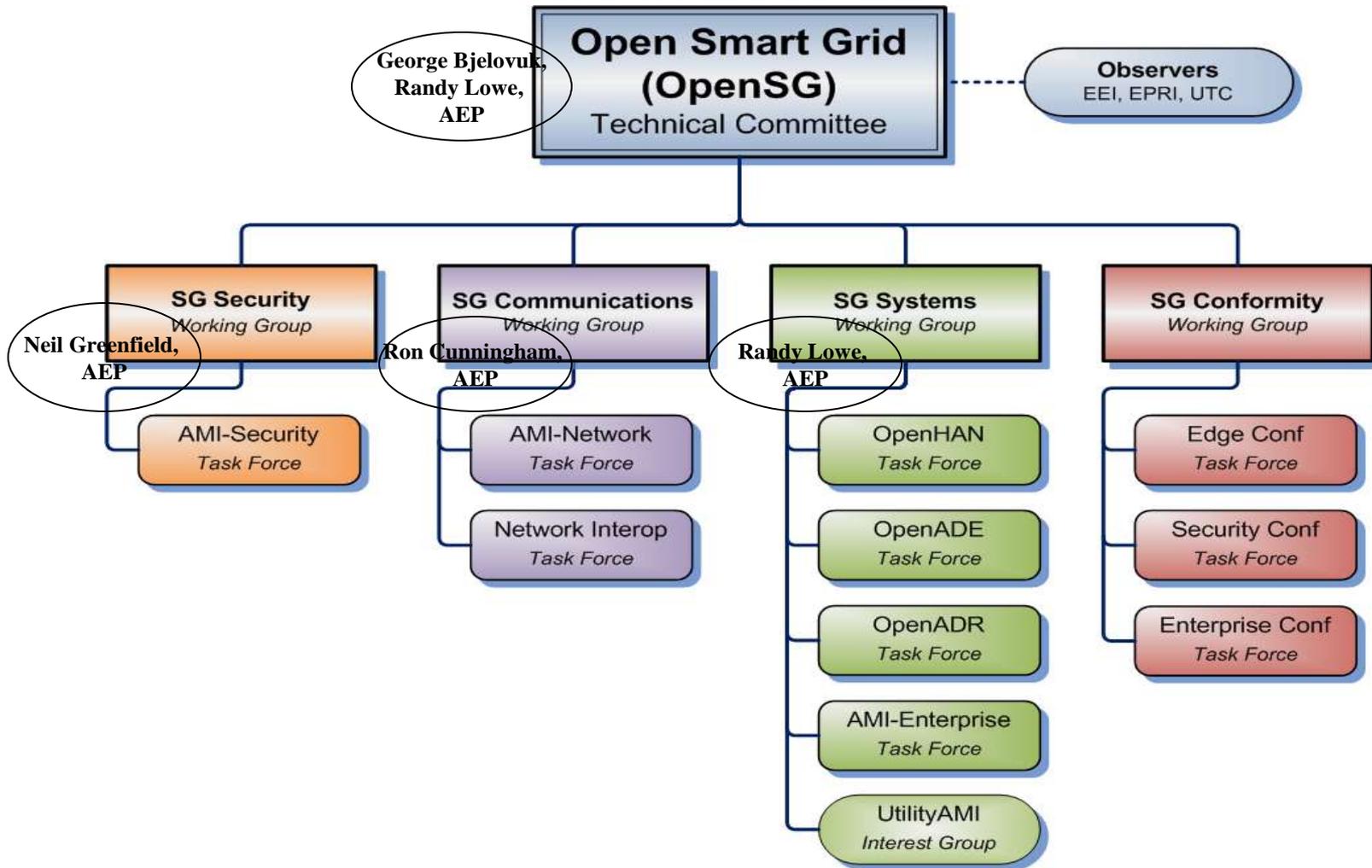
# Key Standards & Related Organisations



# AEP Participation in CIM Key Standards & Related Organisations



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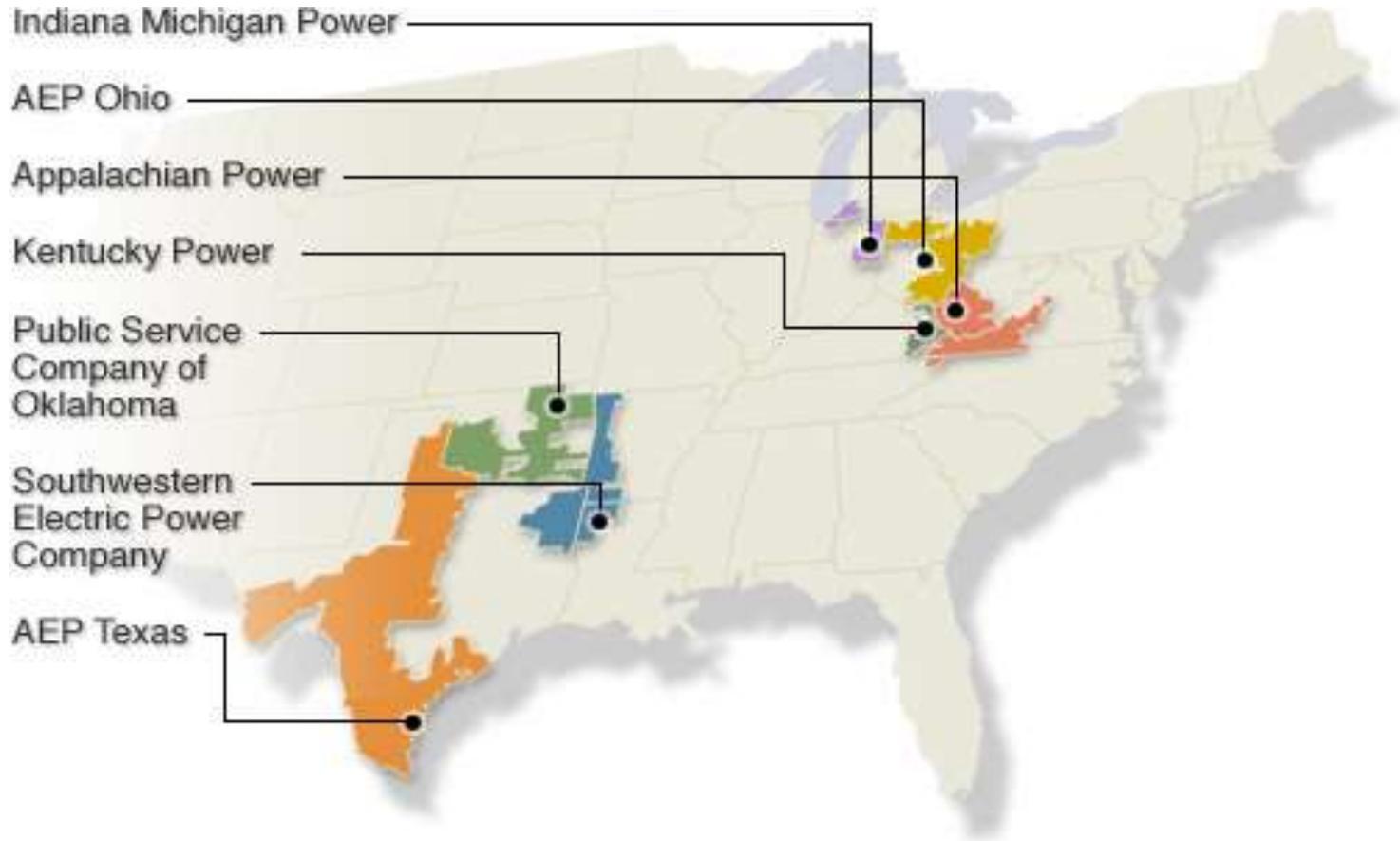


# Participation:

- CIM is a work in progress at AEP. Below are some of the efforts AEP is making to utilize CIM in our development efforts:
  - Standardizing development utilizing the CIM
  - Governance of the CIM model
  - CIM Roles and Responsibilities
  - Continue to educate and train employees involved in gridSMART<sup>SM</sup> efforts

# gridSMART<sup>SM</sup> Deployments

# AEP's Operating Companies



# gridSMART<sup>SM</sup> Deployment Status

## Indiana Michigan Power (AEP) – In Service

- 10,000 AMI pilot program (GE meters)
- Distribution automation
- Programmable communicating thermostats
- Enhanced time-of-use tariffs
- Customer web portal for monitoring & management

## Public Service Company of Oklahoma (AEP) – In Progress

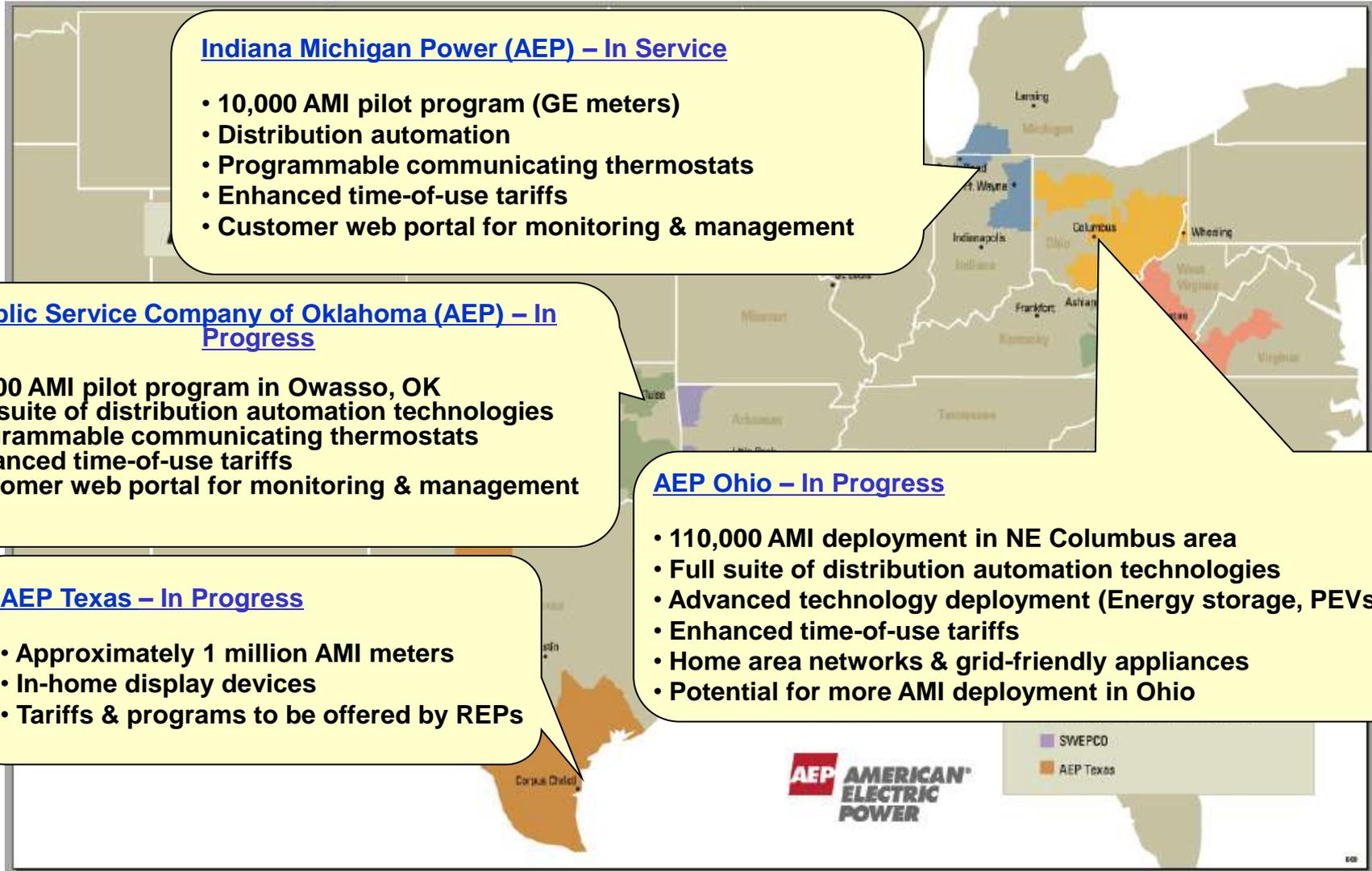
- 15,000 AMI pilot program in Owasso, OK
- Full suite of distribution automation technologies
- Programmable communicating thermostats
- Enhanced time-of-use tariffs
- Customer web portal for monitoring & management

## AEP Texas – In Progress

- Approximately 1 million AMI meters
- In-home display devices
- Tariffs & programs to be offered by REPs

## AEP Ohio – In Progress

- 110,000 AMI deployment in NE Columbus area
- Full suite of distribution automation technologies
- Advanced technology deployment (Energy storage, PEVs)
- Enhanced time-of-use tariffs
- Home area networks & grid-friendly appliances
- Potential for more AMI deployment in Ohio



# QUESTIONS?

# APPENDIX A: Characteristics of Smart Grid\*

- Increased use of digital information and controls technology to improve reliability, security, and efficiency of the electric grid.
- Dynamic optimization of grid operations and resources, with full cyber-security.
- Deployment and integration of distributed resources and generation, including renewable resources.
- Development and incorporation of demand response, demand-side resources, and energy-efficiency resources.
- Deployment of “smart” technologies (real-time, automated, interactive technologies that optimize the physical operation of appliances and consumer devices) for metering, communications concerning grid operations and status, and distribution automation.
- Integration of “smart” appliances and consumer devices.
- Deployment and integration of advanced electricity storage and peak-shaving technologies, including plug-in electric and hybrid electric vehicles, and thermal-storage air conditioning.
- Provision to consumers of timely information and control options
- Development of standards for communication and interoperability of appliances and equipment connected to the electric grid, including the infrastructure serving the grid.
- Identification and lowering of unreasonable or unnecessary barriers to adoption of smart grid technologies, practices, and services.

\* Cited from Energy Independence and Security Act (EISA) Section 1301