

A Utility Perspective on the SGIP and The Standards Process Going Forward

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SGIP MEMBERSHIP

As of 10.4.10

- **Total # of Member Organizations: 624**

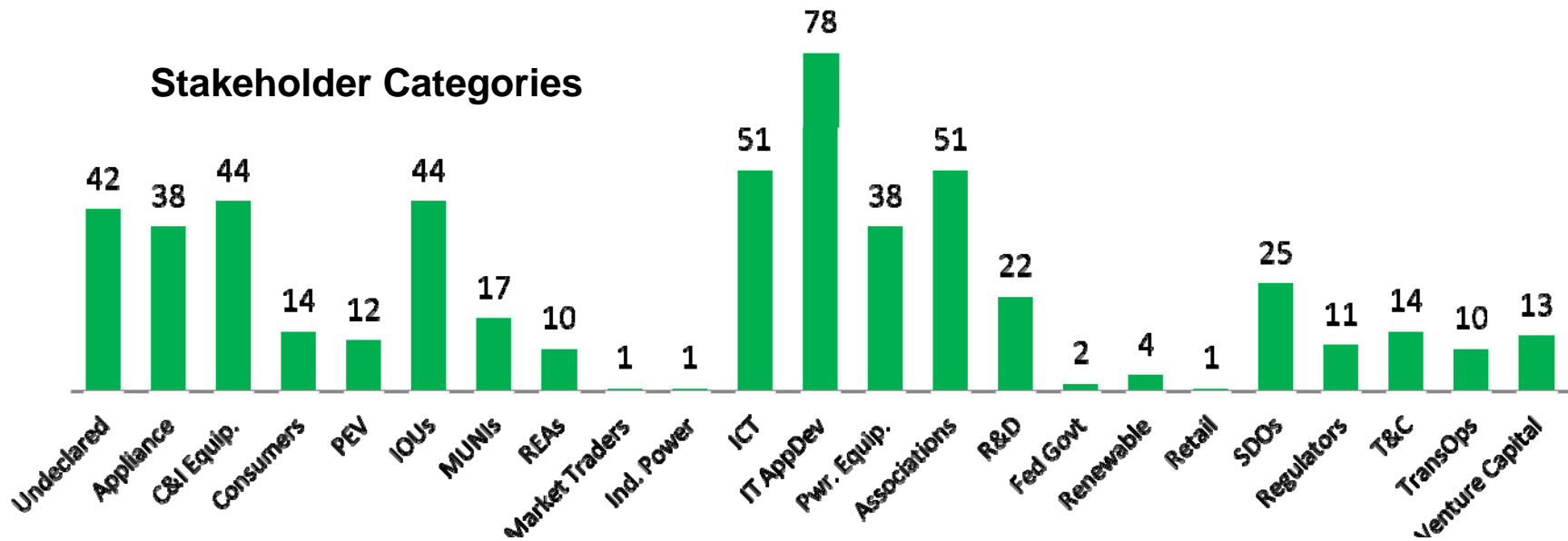
- # of Participating Member Organizations: 542
- # of Observing Member Organizations: 82
- # of Organizations who joined in September: 3

- **Total # of Individual Members*: 1,729** * Omits Signatory Authorities who aren't also cited as a representative.

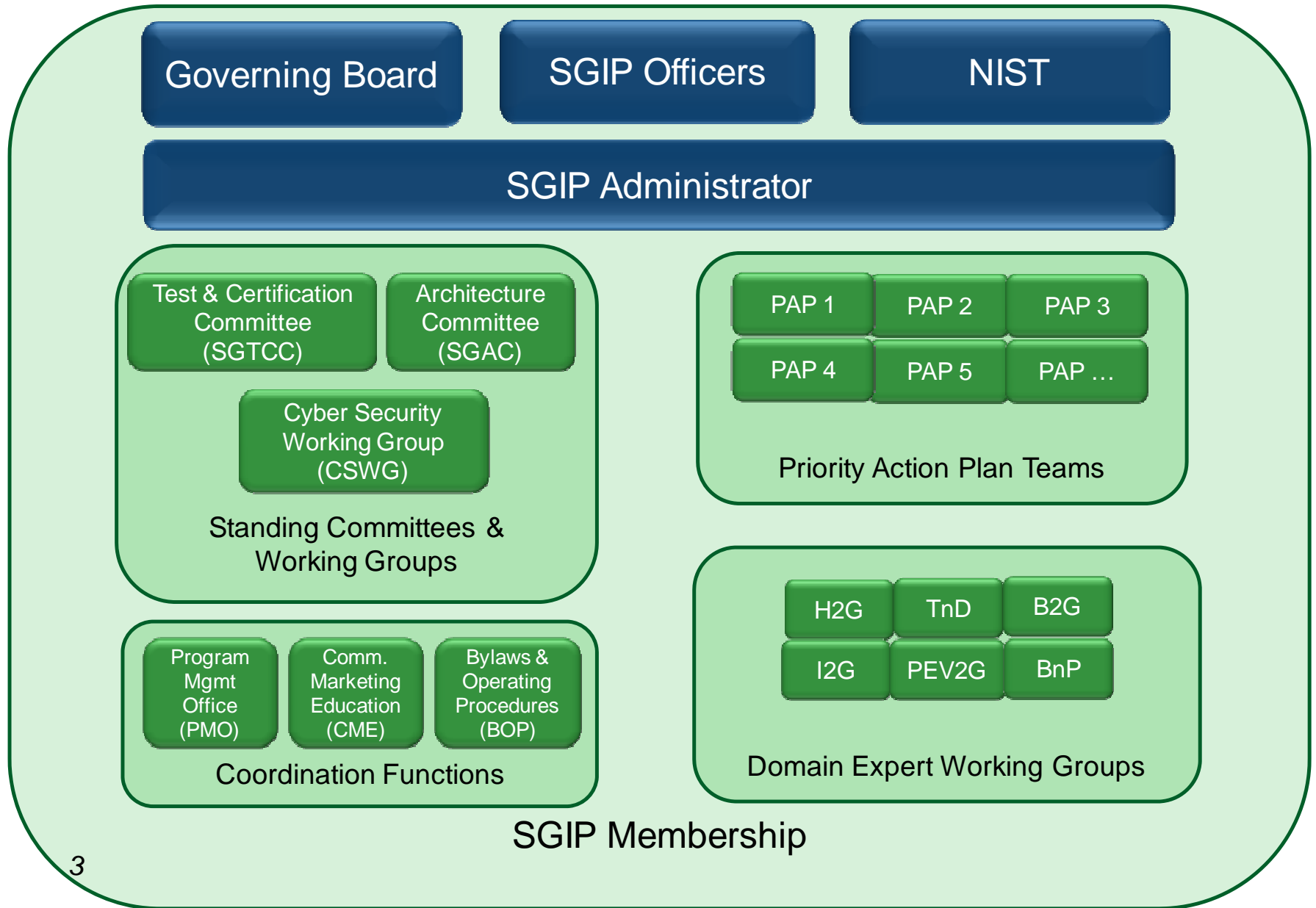
of Organizations by Country

- **USA: 562**
- **Canada: 28**
- **International: 34**

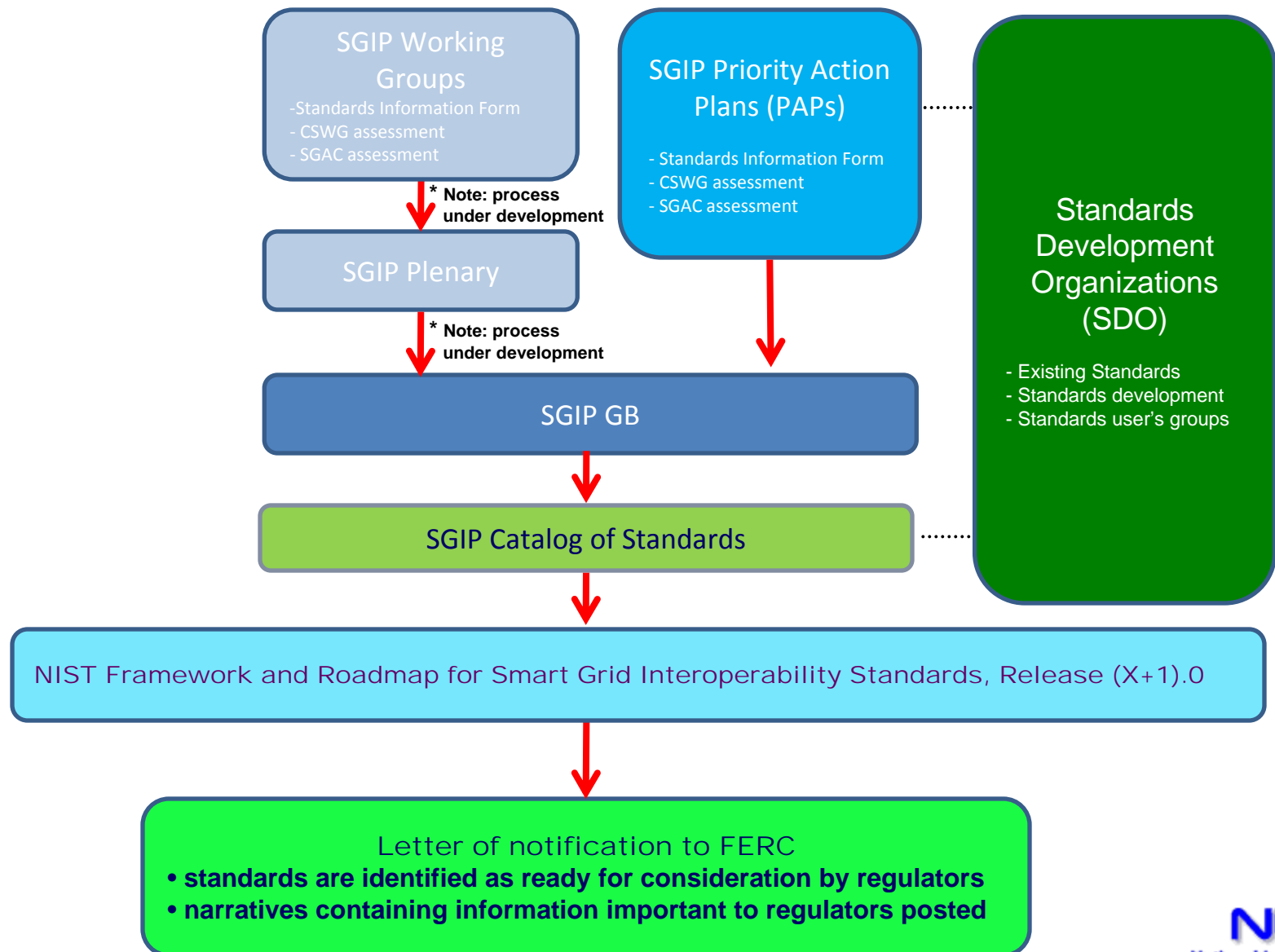
of Participating Member Organizations by Declared Stakeholder Category



SGIP Operating Model



Proposed NIST Process – Future Identification of SG Standards

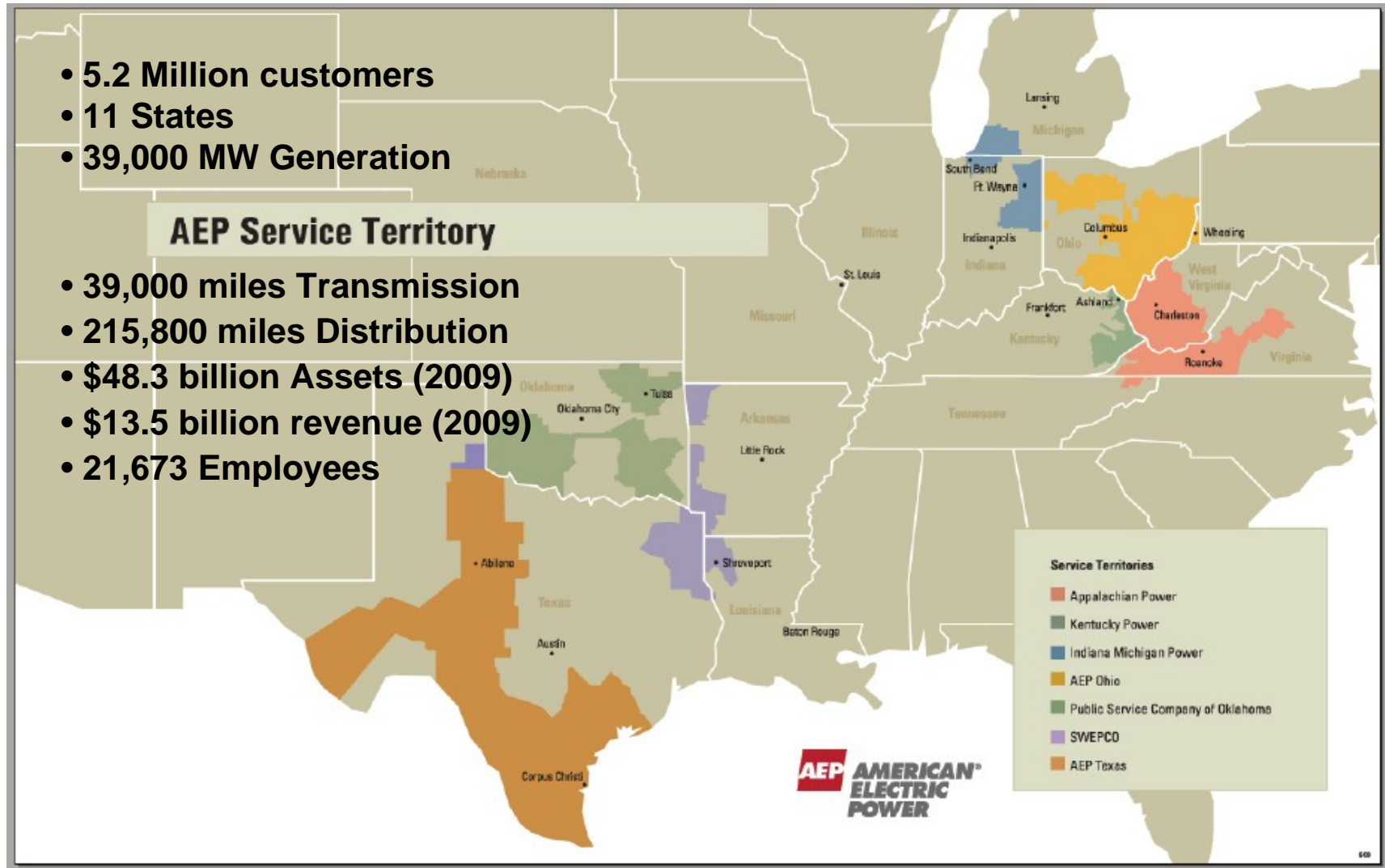


American Electric Power: Company Profile

- 5.2 Million customers
- 11 States
- 39,000 MW Generation

AEP Service Territory

- 39,000 miles Transmission
- 215,800 miles Distribution
- \$48.3 billion Assets (2009)
- \$13.5 billion revenue (2009)
- 21,673 Employees



AEP's "Smart Grid" Deployment Status

Indiana Michigan Power (Completed, 12/2008)

- 10,000 AMI pilot program (GE meters, Silver Spring AMI Network)
- Distribution automation (GE ENMAC Distribution Management System and Integrated Volt-Var Control, IVVC)
- Two-tiered, two-season time-of-use tariffs
- Customer web portal displaying 15-minute interval data up-to-previous day
- Field testing direct load control using programmable communicating thermostats

Public Service of Oklahoma (Final Planning)

- Applied for and approved for \$7 million low interest loan from OK Department of Commerce (ARRA source)
- Planned scope is 15,000 meters
- Increased penetration of In Home Display devices for usage monitoring
- Distribution technologies include DA and IVVC

AEP Texas (underway)

- Legislature enabled and commission directing TDSPs to deploy advanced metering
- Enables REPs to innovate around electricity pricing and consumer technologies
- Filed and received approval from PUCT for 4-year deployment of 970,000 meters, \$270 million project
- AEP Texas to collect a surcharge over 11 years
- Includes 10,000 in-home displays for low income customers
- Landis & Gyr Meters and AMI network

AEP Ohio (underway)

- PUCO-Approved 110,000 AMI deployment in NE Central Ohio
- Selected by DOE as a Smart Grid Demonstration Project for \$75 million in federal funding, 42-month deployment/evaluation
- Partnered with Battelle
- Full suite of distribution grid management technologies on over 70 distribution circuits
- Advanced technology deployment (Energy storage, PHEVs)
- Enhanced time-of-use tariffs, critical peak pricing, and direct load control, including a field trial of real-time pricing
- Home area networks & grid-friendly appliances

Perspectives on Standards

- AEP selected the well-established IEC standards as the basis for many of its system deployments
 - AEP Transmission Operations Control Center Systems are based on IEC 60870-6 (Inter-Control Center Communications Protocol, ICCP) and IEC 61970 (Energy Management System, EMS)
 - AEP smart meter deployments based on IEC's Common Information Model (CIM) – IEC 61968
- NIST's selection of five IEC standards are among the most mature in the industry
- Where harmonization opportunities exist, IEC standards can become the basis for SDO formalization
 - Distribution applications using IEC 61850, IEC 61968, DNP 3.0 and Multispeak
 - Potential for "Lightweight" version to be used in narrowband networks

Perspectives on Standards (continued)

- The nation's electric system has had limited interoperability requirements until now
 - Bulk power system has been the exception, driven largely by development of NERC reliability regions and wholesale market design
 - Utility distribution systems are by their nature operationally independent
- Smart grid deployment prioritizes interoperability of consumer interaction with the grid
 - Common methods of communication with consumer and building energy management systems
 - Consistent integration of distributed generation
 - Electric vehicle charging implications

Perspectives on Standards (continued)

- The smart grid is being deployed in advance of formalization of standards
 - Cyber security standard selection is critical
 - Regulatory approvals will precede NIST standard formalization, and standards co-existence will be required
 - Standards development and adoption must enable innovation to occur, especially the at consumer interface to the grid
- Implications for regulators and utilities
 - Regulatory grandfathering of technology installed prior to NIST standards selection and notification to regulators
 - Consistency of standards interpretation by State Commissions will be important for multi-state utility operations
 - Flexibility of standards application will be critical, as technology evolution will create opportunities for co-existence



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