



ELECTRIC POWER  
RESEARCH INSTITUTE

# AMI/HAN Group Meeting Agenda October 17<sup>th</sup> 2008

1. Introductory Remarks – Erfan (5 minutes)
2. AMI Security Acceleration Project – Darren Highfill, EnerNex (10 minutes + 5 min Q&A)
3. SAE J2836 Working Group Overview – Jose Salazaar, SCE (10 minutes + 5 min Q&A)
4. Zigbee+HomePlug Joint Steering Committee Marketing Group Overview – Brent Hodges, Reliant Energy (10 minutes + 5 min Q&A)
5. UCAIug Working Groups Overview – Erich Gunther, EnerNex (10 minutes + 5 min Q&A)
6. Zigbee+HomePlug Joint Steering Committee Certification Group Overview – Ray Hayes, AEP (10 minutes + 5 min Q&A)
7. Next steps & General Q&A – Moderator: Erfan, EPRI (10 minutes)

# Electric Power Research Institute

Collaboration.....Technical Expertise....Thought Leader



- Not for profit, collaborative electricity research organization with more than 450 participants in over 40 countries
- U.S. utilities placed approximately 72% of their R&D investment with EPRI in 2007.
- Independent electricity research in:
  - Generation
  - Environment
  - Power Delivery & Energy Utilization
  - Nuclear
- 1600+ R&D projects annually, ~\$300M R&D funding, more than 400 engineers and scientists

# IT R&D Activities at EPRI by Sector

1. Environment/Generation - Fossil O&M Excellence (OMX) Initiative
2. Nuclear - Plant Design & Maintenance
3. Power Delivery & Utilization
  - Smart Grid Demo (EPRI Board Initiative)
  - Advanced Metering Infrastructure
  - Interoperability & Standards Development
  - Smart Grid Systems Integration (Common Information Model)

# EPRI's IntelliGrid R&D Program

## Largest Funded Collaborative R&D Program in Smart Grid

### U.S. Utilities

- 2008 Membership includes 37 utilities in North America

### International Utilities

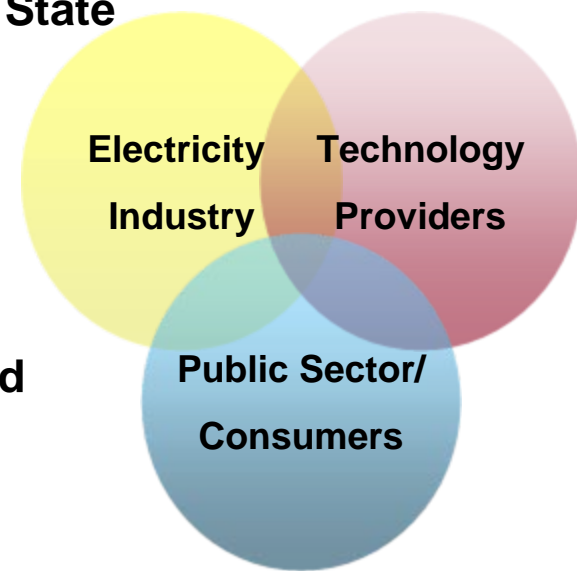
- Electricite de France
- Polish Power Grid Company
- Korea Electric Power

### Manufacturers

- IBM
- ABB
- Siemens
- Elster

### Public Agencies

- Association of State Energy Research and Technology Transfer Institutions
- International Brotherhood of Electrical Workers
- National Association of Regulatory Utility Commissioners
- National Association of State Energy Officials
- National Conference of State Legislatures
- National Governors Association
- State Energy Offices and Research Programs



# IntelliGrid: R&D to Develop the Foundation of Smart Grid

- Smart Grid Requirements gathering methodology
- Standards assessment and contribution
- Information model to facilitate systems integration
- Communication technology assessment
- Security Policy for smart grid applications



# Intelligrid Structure

**PS 161A – Tech transfer, Technology Watch, Industry Coordination**

**PS 161B – Infrastructure for Smart Transmission Systems**

**PS 161C – Infrastructure for Smart Distribution Systems**

**PS 161D – Infrastructure for Smart Customer Interface**

**PS 161E – Infrastructure Security**

# Intelligrid Program 161 D Deliverables for 2008

- Status update of activities within standards committees that are critical for smart grids – web content (EdF contract from EEI) – *PM Joe Hughes*
- Repository of status updates within key standards organizations – web content – *PM Joe Hughes*
- Develop a repository of use cases of smart grid applications – web-based repository (perhaps through IEEE) – *PM Don Von Dollen*

# PS 161D Deliverables for 2008 (Contd.)

- Develop database of utility pilots and deployments of key communications technologies – database – *PM Don Von Dollen*
- Develop database of utility advanced metering pilots and deployments – database – *PM Don Von Dollen*
- White paper – Analysis of ANSI C12.22 standard – *PM Brian Seal*

# PS 161D Deliverables for 2008 (Contd.)

- White paper – Issues associated with using IP for smart grid applications – *PM Joe Hughes*
- Develop common language for demand response and dynamic pricing – Industry Workshop – *PM Erfan Ibrahim*
- Zigbee Assessment – Protocol Stack & Smart Energy Application Profile – Technical Brief – *PM Erfan Ibrahim*

# PS 161D Deliverables for 2008 (Contd.)

- Develop Zigbee HAN test procedures – *Technical Brief* – *PM Erfan Ibrahim*
- Empirical test of 4-6 “off the shelf” Zigbee HAN Technologies in EPRI Living Lab – *Technical Update* - *PM Erfan Ibrahim*
- AMI-SEC Acceleration Project Supplemental – Technical Report – *PM Erfan Ibrahim*

# IntelliGrid: Key Focus in 2008

## Helping Developing Security Policy

**“Security Policies”**

**You Shall Protect  
Revenue Data**



**Intrusion  
Detection**

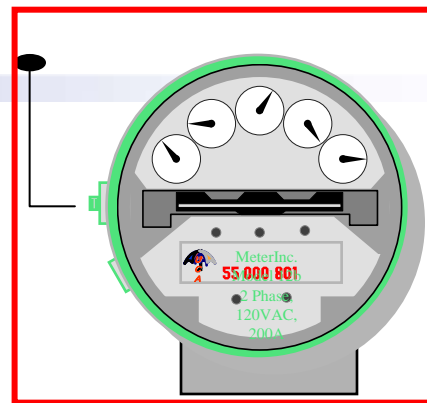
**Encryption  
Protection**

**Device  
Protection**

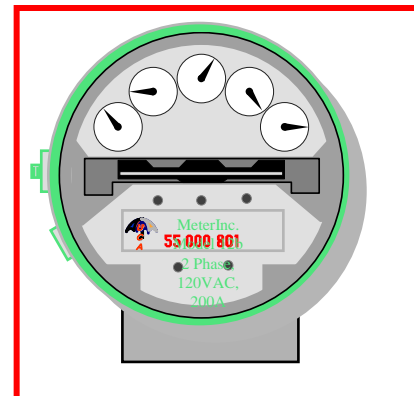
“Wireless”

“Fiber  
Optic”

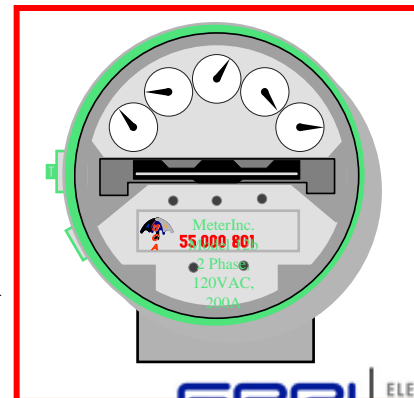
“Wired”



**Brand  
X**



**Brand  
Y**

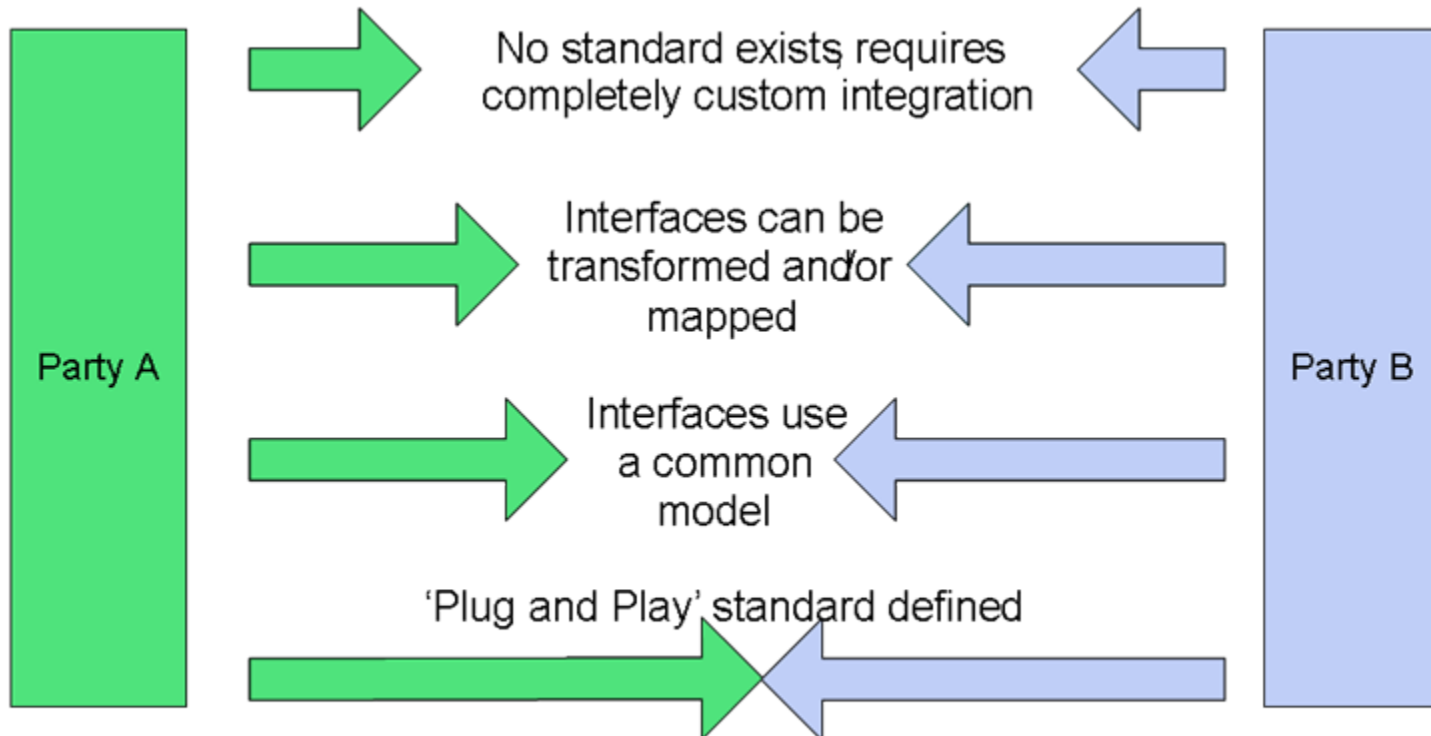


**Brand  
Z**

# Interoperability: Key to Exchanging Information

## *Levels of Interoperability*

Interoperability is the ability of two devices or systems to come together and work



Credit: Scott Neumann, UISol position paper

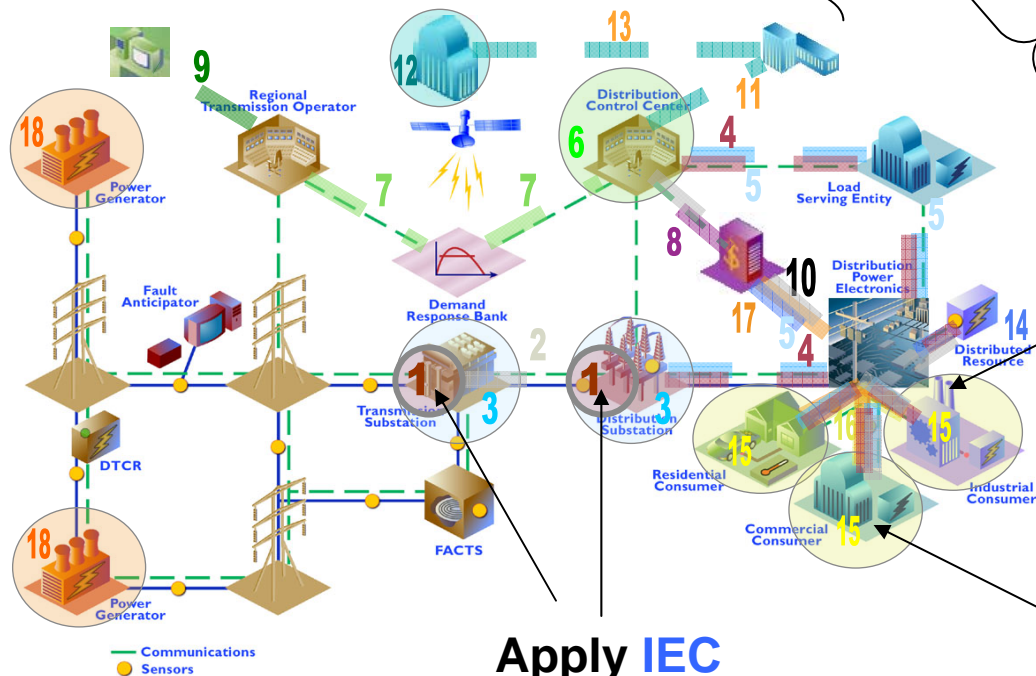
# IntelliGrid

## Standards Landscape Assessment / Contributions

Develop and implement consistent systems management and security policies

Apply IEC 61970 and 61968 (CIM, GID) for Enterprise Data Sharing

**R&D:**  
Integrate and Harmonize  
IEC 61850  
IEC 61968  
ANSI C12  
Standards



Apply ANSI C12 for Revenue Metering

Apply IEC 61850 for Real-Time Controls

Apply ASHRAE BACnet™ for Building Automation