GRIDWISE® ALLIANCE

Smart Grid Technology Seminar

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Agenda

- US & Smart Grid
- GridWise Background
- Sample US Projects
- International Collaboration
“It is the policy of the United States to support the modernization of the Nation's electricity [system]… to achieve…a Smart Grid.” Congress, EISA 2007

“We’ll fund a better, smarter electricity grid and train workers to build it…” President Barack Obama

“To meet the energy challenge and create a 21st century energy economy, we need a 21st century electric grid…” Secretary of Energy Steven Chu

“A smart electricity grid will revolutionize the way we use energy, but we need standards …” Secretary of Commerce Gary Locke
Despite numerous efforts, Congress has not passed comprehensive energy and climate change legislation. Recent activity includes:

- The House and Senate energy committees have passed several energy bills which invest in energy efficiency, conservation, renewable energy, and electric vehicles. None of these bills have advanced.

- Climate Change legislation is currently stalled.

**GridWise vision is the foundation of the Alliance**

GridWise vision is new way to think about how we generate, distribute and use energy - using advanced communications and up-to-date information technology, GridWise will improve coordination between supply and demand, and enable a smarter, more efficient, secure and reliable electric power system.

**GridWise Alliance**

The GridWise™ Alliance was formed in September 2003 by the signing of a joint declaration of six companies…Battelle, PJM Interconnection, Alstom, IBM, Sempra and Rockport Capital. The founders were committed to increasing knowledge among industry stakeholders, promoting understanding of the roles, benefits, and costs, and supporting R&D initiatives and public-private partnerships.

**GridWise Principles – collective thinking on evolution of the grid**

1) Empowered customers
2) Productive, secure and reliable system
3) Better customer rates and quality of service
4) Equitable markets and increased business opportunities
5) Environmental benefits
Alliance Structure

- Broad representation of the entire value chain; today’s and tomorrow’s
- Holistic view of smart grid
- Technology neutral
- Public interest rather than special interest
- Active involvement of members through working groups
About 140 members represent a broad cross-section of energy and electricity industry stakeholders.

We also have strategic alliances with other groups, both nationally and globally.
Work Groups

- LEGISLATIVE AND POLICY WORK GROUP
- STATE POLICY WORK GROUP
- IMPLEMENTATION WORK GROUP
- INTEROPERABILITY AND CYBER SECURITY WORK GROUP
- EDUCATION AND WORKFORCE WORK GROUP
Key Policy Messages

- Smart grid to enhance for efficiency and renewable energy
- Smart grid as enabler for electric vehicles and infrastructure
- Consumer access important
- Incentives necessary for smart grid equipment and energy storage
- NIST Interoperability Standards
GWA Accomplishments

2003
- GWA formed by 6 founding members
- Series of National Workshops held

2004
- US DOE Creates GridWise Program and launches GridWise Architecture Council
- MOU with DOE to create a coordinated framework for collaborative efforts
- End year with 13 members

2005
- Work for funding for smart grid projects
- DOE funds R&D efforts

2006
- Refocus efforts on building support and developing legislative policy agenda
- End year with 19 members

2007
- GridWeek 2007 – inaugural event
- EISA 2007 includes extensive SmartGrid provisions

2008
- Signed MOU with the GridWise Architecture Council
- Ends year with 41 members
- Advocated for full implementation of EISA 2007
- Charter three additional work groups
- Input to Obama Transition Team on proposed stimulus package and energy policy
- Lead sponsor and Co-Chair of GridWeek 2008
- Eight GWA members asked to serve on EAC
- EAC Smart Grid Subcommittee led by GWA Chair
- Hired full-time President
- End year with 79 members
GWA Accomplishments – cont’d

2009
- Created Smart Grid Job Reports
- Provide input to Congress on proposed new energy and climate legislation
- Expanded relationships with groups for which smart grid is, or should be, important for the interest they represent
- Expanded the dialogue and cooperation with international smart grid groups
- Produced two new smart grid reports
  - What is Missing in Our Fundamental Knowledge of Smart Grid Implementation
  - Handbook for Assessing Smart Grid Projects
- Expanded external smart grid communication efforts through national and trade press
- Successfully advocated for the inclusion of smart grid language in Senate and House energy and climate legislation
- End year with 110 members

2010 (to date)
- Announced Inaugural GridWise Global Forum (Sept 21-23), an international smart grid conference in Washington D.C. Co-Hosted with the Department of Energy
- Created Education and Workforce Work Group to address training and education issues facing the smart grid industry
- Successfully advocated to ensure smart grid investment grants would not be subject to federal income tax
- Engaged Congress in jobs bill discussion and advocated additional smart grid funding for Nation
- Founding member of the Smart Grid Consumer Collaborative
- Initiator of Global Smart Grid Federation, an association of national smart grid organizations
- Currently 140 members
Sample Projects in the US

California

➢ Southern California Edison’s SmartConnect™: Advanced Metering Infrastructure Program, install 5 million new meters and establish new customer service offerings including enhanced demand response programs.

Washington

➢ Pacific Northwest National Laboratory: Used intelligent measurement devices, smart appliances and a virtual marketplace to help manage stress in the electric grid, achieving a 50% reduction in short-term peak electricity distribution loads and a 15% reduction in overall peak loads.

Texas

➢ Centerpoint Energy: As part of an overall Smart Grid strategy deploying more than 2 million smart meters across its electric service territory in and around Houston

➢ Common Portal: Central data portal accepting 15-minute interval data from all smart meters already installed by the four investor-owned distribution utilities (CenterPoint Energy, Oncor, AEP-Texas, and Texas New Mexico Power). Data are collected and updated daily.
About SCE

• Serves 13 million people in a 50,000-square-mile service area within central, coastal and Southern California
• 5 million electric customers
• Award-winning energy efficiency & DR customer programs
• Industry leader in renewable energy, Smart Grid and smart metering

Source: SCE Smart Grid Strategy & Roadmap

IBM Activities with SCE

SmartConnect™ Advanced Metering Infrastructure Program

• Install 5 million new meters and establish new customer service offerings including enhanced demand response programs
• IBM provides project management, architecture, systems integration, and testing services
• Solution includes Rational, Tivoli, InfoSphere, and pSeries products

Smart Grid Strategy & Roadmap

• Customer Enablement, DER, DG, Workforce Effectiveness/Safety
• Published June, 2010
• Developing Smart Grid Reference Architecture

Customer Service Roadmap

• Web service, CRM, customer data warehouse, DSM, DR, CIS enhancements, service order management
Pacific Northwest Smart Grid Demonstration

- Significantly expands upon the 2005-2007 GridWise® Olympic Peninsula Demo project
- Spans parts of Idaho, Montana, Oregon, Washington, and Wyoming
  - 11 utilities; 5 technology partners plus Battelle
  - $178M over 5 years
- Team will implement a unique distributed Transactive Control system
  - Hierarchical communication and control
  - Dynamic incentive and feedback signals
- Scope of Research activities
  - Interoperability and system architecture lead
  - Cyber security co-lead
  - Transactive control programming framework
  - Modeling and analytics algorithms
  - Social computing techniques for engaging users
Centerpoint’s Path To Smart Grid

- **2010 Mid Grid Automation & Meter Acceleration**
- **2009 – 2014 Smart Meter Implementation**
- **Dec, 2008 PUCT Smart Meter Approval**
- **Oct, 2009 DOE $200mm Award**

**CNP Smart Grid**

**Diagnostics**
- Smart Grid detects overloaded substation grid and evenly distributes load to adjacent grids.

**Grid Loading**
- Normal
- Overloaded

**Self Healing**
- Outage Grid switches undamaged portions to adjacent substation grids.

**City power substation grids with thousands of homes in each grid make up the System Power Network.**
Smart Meter Texas (Portal Project)

- 7.1M meters
- 15-minute interval reads
- Home Area Network devices

**Highlights**

- Enable a competitive electric market by providing interval usage data directly to consumers and authorized third parties.
- Enable REPs to develop innovative offerings leveraging in-premise devices to monitor and control usage.
- First-of-a-kind system to aggregate usage data across utilities into a common database—IBM designed, built, operates, and maintains with IBM software.
GWA took an early leadership role in forging international smart grid relationships

Signed:
- Korea Smart Grid Association
- Smart Grid Australia
- SmartGrid Ireland
- Japan Smart Community Alliance
- India Smart Grid Forum
- Canadian Smart Grid Alliance (verbal)

In Discussion:
- Brazil
- China
- EU
- South Africa
Formalizing “Global Smart Grid Federation” (GSGF) is the next critical step in building a worldwide movement.

The Global Smart Grid Federation is committed to creating smarter, cleaner electricity systems around the world. By linking the major public-private stakeholders and initiatives of participating countries, the federation will share best practices, identify barriers and solutions, foster innovation, and address key technical and policy issues. These and other activities help member organizations initiate changes to their countries' electric systems to enhance security, increase flexibility, reduce emissions, and maintain affordability, reliability, and accessibility.

In addition, the Global Smart Grid Federation works with national and international government policymakers to address the broad challenges of deploying smarter grids. This nexus provides bidirectional communication and collaboration, which will advance Smart Grids around the world and facilitate consensus-building within the international community to address electricity system and climate change concerns.

website: www.globalsmartgridfederation.org/
GSGF will be a strategic partner to the International Smart Grid Action Network (ISGAN)

At the Clean Energy Ministerial in Washington, D.C. on July 19th and 20th, ministers launched an International Smart Grid Action Network (ISGAN) to accelerate the development and deployment of smart electricity grids around the world.

The United States pledged US$4 million in 2010 funding to help launch ISGAN, with additional funding anticipated from other participating governments. Ministers announced three initial activities under ISGAN:

- Partners will inventory global smart grid initiatives and needs and identify opportunities for collaborative technology and policy development efforts.
- They will establish a forum to discuss standards policy for infrastructure and charging related to plug-in electric vehicles, addressing a rapidly emerging need.
- The Partners will develop a series of in-depth, multimedia case studies, highlighting the experience of stakeholders such as regulators, utilities, SMEs (small and medium enterprises), local policymakers, and electricity consumers in early smart grid deployments.
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