NIST
National Institute of Standards and Technology
U.S. Department of Commerce

The U.S. Perspective on Electric Grid Modernization

SPIEF 2011: Emerging Leadership for a New Era
Smart Grids – Projects of the Future

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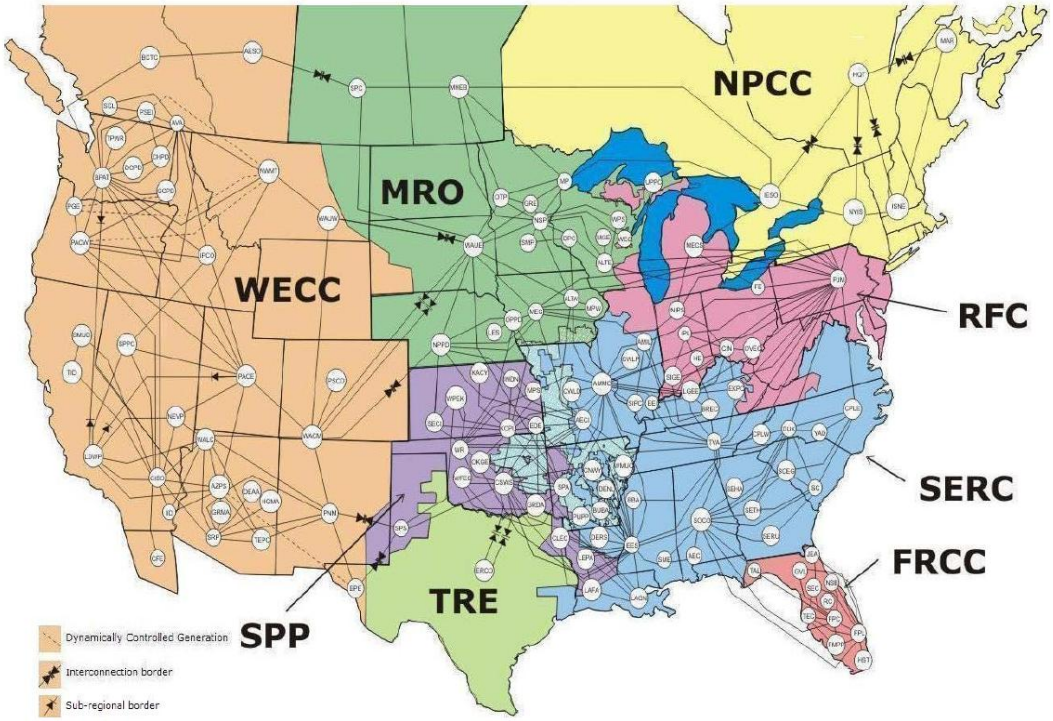
16 June 2011

The North American Electric Grid

U.S. figures:

- 22% of world consumption



- 3,200 electric utility companies
- 17,000 power plants
- 800 gigawatt peak demand
- 165,000 miles of high-voltage lines
- 6 million miles of distribution lines
- 140 million meters
- $1 trillion in assets
- $350 billion annual revenues

Smart Grid – A U.S. National Policy

- The 2007 Energy Independence and Security Act (EISA) lays out a national policy for the Smart Grid in the U.S.
  - The Act assigned NIST the primary responsibility to coordinate development of standards for the Smart Grid.
  - NIST is also supporting future FERC and State PUC rulemaking to adopt Smart Grid standards.

- The White House National Science and Technology Council has established a Smart Grid Subcommittee
  - The Subcommittee will produce a report to lay out the Administration's policy on Smart Grid.
- Key Federal policy recommendations include
  - Enabling cost-effective smart grid investments
  - Unlocking innovation
  - Empowering and informing consumers
  - Securing the grid

Goals of U.S. Grid Modernization

U.S. Smart Grid goals include:

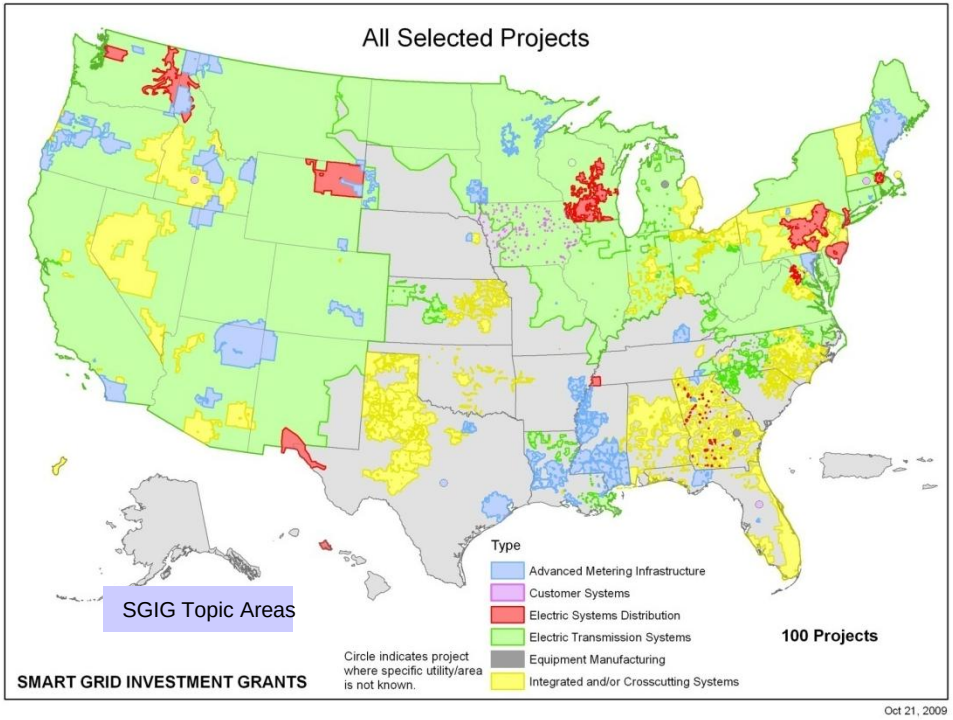
- Increase system efficiency and cost effectiveness
- Improve reliability, resiliency and power quality
- Provide customers tools to manage energy use
- Enable use of innovative technologies including renewables, storage and electric vehicles

U.S. Smart Grid Investment Grants

Category	$ Million
Integrated/Crosscutting	2,150
AMI	818
Distribution	254
Transmission	148
Customer Systems	32
Manufacturing	26
Total	3,429

18 million smart meters
1.2 million in-home display units
206,000 smart transformers
177,000 load control devices
170,000 smart thermostats
877 networked phasor measurement units
671 automated substations
100 PEV charging stations

Geographic Coverage of Selected Projects



U.S. Smart Grid Examples

- Premium Power Corporation Smart Grid Storage Demonstration Project
  - Demonstrating a battery-based energy storage system for load shifting, peak shaving, renewable system integration, and support for micro-grid operations.

courtesy: Imre Gyuk (DOE OE)

- Phasor Measurement Units Deployments
  - Deploying PMUs across the electrical grid to collect data for real-time situational awareness.

- City of Tallahassee Smart Grid Project
  - Implementing a comprehensive demand response program that will target residential and commercial customers to reduce peak power.

Source: Enphase Energy

More information is available at: www.sgiclearinghouse.org

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Global Collaboration is Key to Success

- The laws of physics do not differ from country to country – the electric grid must obey them!
- There are many technical challenges to solve – sharing knowledge helps all
- Global standards avoid unnecessary adaptations for different markets, resulting in lower costs and greater innovation
- Forums for Collaboration:
  - Smart Grid Interoperability Panel (SGIP)
  - International Smart Grid Action Network (ISGAN)
  - Asia Pacific Economic Cooperation (APEC)

Thank You!

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