Future of the Grid
Evolving to Meet America’s Needs

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Overview

• Who we are – GridWise Alliance
• Background on Future of the Grid Report
• Key insights
• Recommendations
• Q&A
GridWise Alliance

The GridWise Alliance is a consortium of passionate stakeholders focused on modernizing our electric grid. The alliance collaborates to transform the nation’s electric power grid to achieve a sustainable energy future.

- **Thought Leadership**
  - **LEAD THE CONVERSATION:** Continue as the pre-eminent cross-industry collaborative to transform the electric grid and create value for all through policy development.

- **Advocacy**
  - **ADVOCATE FOR INVESTMENT AND INNOVATION:** Advocate policies to promote investment in infrastructure, innovation, and modernization of the electric grid.

- **Engagement**
  - **ENGAGE KEY CONSTITUENCIES:** Build the framework that supports the continued development of a sustainable energy future through active engagement with key stakeholders.
Building an Ecosystem

Utilities
- CenterPoint Energy
- APS
- FPL
- VELCO
- SDGE
- ONCOR
- PJM
- ISO
- MISO

Service Providers
- Duke Energy
- PG&E
- Pepco
- New West Technologies, LLC
- Ingersoll Rand
- NAVIGANT
- Davies Consulting
- Landis+Gyr
- DNV GL

Other Stakeholders
- Ernst & Young
- Lockheed Martin
- IBM
- HP
- Accenture
- Cisco
- Rockport Capital Partners
- NREL
- CCET

Energy Intelligence – The Coming Value Revolution
Future of the Grid - Process

- Partnership - GridWise Alliance and the Office of Electricity Delivery and Energy Reliability
- Four Regional Workshops
  - Challenge of Balancing Supply and Demand as Grid Complexity Grows
  - Challenge of Involving Customers and Their Electrical Loads in Grid Operations and Planning for Empowered Customers
  - Challenge of Higher Local Reliability through Multi-customer Microgrids
  - Challenge of Transitioning Central Generation to Clean Energy Sources
- National Summit in Washington, DC
- Final report – Issues
Characteristics of the Electric System of the Future:

- Centralize and distributed generation sources
- Dispatchable and non-dispatchable resources
- Energy storage will be a key, but will not replace the need for dispatchable generation
- Multi-consumer and single-consumer microgrid operations will be complementary
- Grid will be a central component
- Balancing supply and demand will continue and be expanded as a primary role of grid operator
Characteristics

Electric System of the Future

- Consumers will use the grid in different way
- More consumers will become “prosumers”
- Market for services
- Mix of regulated and competitive services
- New third-party unregulated players
  - Need to develop new roles and responsibilities
  - Need to define future regulated and unregulated components
Evolving Grid Operations

- Key Themes from Workshops
  - Will still want and need a grid
  - No longer just a delivery “pipe” => two way power flow
  - Must be agile and “fractal” - flexible, adaptable, responsive
  - Enabling platform for very dynamic and complex system
  - Enabling a robust retail market
  - Distribution grid will look and act more like transmission grid
  - Balancing supply and demand will be increasingly complex and important
  - Connecting wholesale and retail markets will be essential
Evolving Business Model

- Grid owners and operators should be fairly compensated for the value they deliver
  - Integrating all types of generations
  - Being agnostic as to where supply comes from
  - Increasing grid efficiency
  - Enabling customers to provide services back to grid
  - Facilitating a retail market for consumers to buy and sell services
  - Optimizing assets utilization
  - Supporting/implementing public policies
  - Maintaining a safe and reliable grid
  - Enabling highly reliable and resilient energy services to end consumers
  - Identifying most cost-effective way to achieve outcomes
Evolving Business Model

- Offer a portfolio of selectable services
  - Basic service
  - Enhanced service
  - High-reliability services
  - Microgrid services
  - Financing services
  - Buying/selling ancillary services, such as:
    - VAR Support
    - Voltage Support
    - Frequency Response
    - Spinning Reserve
    - Backup Power Support
Evolving Regulatory Model

- New challenges for regulators
  - Providing regulatory clarity in time of significant change
  - Align regulatory process to embrace speed of change and technology innovation
  - Balancing public good with the needs and desires of individual consumers
  - Addressing consumers’ obligations to the grid as well as utilities’ obligations to consumers in the future
Recommendations

- Establish clear and comprehensive guiding principles
- Develop a unifying architecture to ensure interoperability across the entire grid
- Create a framework for guiding investments and the development of state/regional roadmaps.
- Drive solutions through stakeholder engagement and education.
- Address technology challenges and limitations through robust research and analysis.
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