Integrated Grid

Barbara Tyran
Director, Washington & State Relations
Center for Public Utilities
April 20, 2015
Electric Power Research Institute

Together...Shaping the Future of Electricity
Interconnected but Not Integrated

Interconnected Value of Grid Connectivity
- Reliability
- Startup Power
- Energy Transaction
- Voltage Quality
- Efficiency

Integrated Value of DER and Grid
- Resiliency
- Voltage Support
- Emissions Reduction
- Distribution Optimization
- Loss Reduction
- Demand Response

Integration Enables Values of all Resources
Integrated Grid…Timeline

Phase I
Integrated Grid (IG) Paper
Feb 2014

Phase 2
Benefit-Cost Assessment
Feb 2015

Phase 3
IG Pilots
2015-16

Extensive Stakeholder Coordination in All Phases
The Integrated Grid is about Enabling the Customer

The integrated grid allows Local Energy Optimization to become part of Global Energy Optimization.
Integrated Approach

Consistent, transparent framework for assessing benefits/costs of transitioning to an Integrated Grid.
The Power System

Dispatchable

Base Load Generation + Load Following Generation +/− Bulk Energy Storage = Customer Demand − Interruptible Load

Forecastable
The Power System – *Looking Forward*

- **Generation Becomes More Flexible**
- **T & D Becomes More Controllable and Resilient**
- **Consumers Become Energy Producers**
- **Loads Become More Interactive and Dynamic**

*A More Dynamic End-to-End Power System*
Steps to Apply Benefit-Cost Framework

1. Formulate Question
2. Define Scenarios and Assumptions
3. Evaluate Scenarios Using Benefit-Cost Framework
4. Compare Scenarios and Identify “Best” Option
Putting IG Framework to the Test
Demonstration Pilots

- Utility Scale Solar
- Utility Scale Solar with Energy Storage
- Distributed Energy Storage
- Microgrids
- Electric Vehicle Charging Infrastructure
- Customer-Side Technologies
Outcome of Integrated Grid Technology Pilots

Technology pilots demonstrate the value to all stakeholders of an integrated approach.

Expected Learnings
- Consumer behavior and acceptance
- Technology performance and life cycle costs
- Installation, O&M costs
- Grid integration and architecture
- Benefit/cost assessment
- End-of-life environmental impact assessment
Integrated Grid Success

Wide Coordination is Crucial

Standards Organization

Global R&D

Key Stakeholders

EPRI Members
Together…Shaping the Future of Electricity

For more information contact:

Barbara Tyran, btyran@epri.com