

# Breakout group results

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# Different consumer perspectives

- Elderly consumer on fixed income
- Small business owner
- Manufacturing
- Typical residential consumer
- Large office building owner/manager
- Local government
- Single mother of two children

# Smart Grid Characteristics

<i>Characteristic</i>	<i>Today's Grid</i>	<i>Smart Grid</i>
<b>Enables Consumer Participation</b>	Consumers are uninformed and non-participative with the power system	Informed, involved and active consumers – DR and DER
<b>Accommodates Generation/Storage</b>	Dominated by central generation – many obstacles exist for DER interconnection	Many distributed energy resources with “plug and play” convenience – focus on renewables
<b>Enables New Markets</b>	Limited wholesale markets, not well integrated – limited opportunities for consumers	Mature, well-integrated wholesale markets, growth of new electricity markets
<b>Meets PQ Needs for 21st Century</b>	Focus on outages – slow response to PQ issues	PQ a priority with a variety of quality/price options – rapid resolution of issues
<b>Optimizes Assets &amp; Operates Efficiently</b>	Little integration of operational data with asset management – business process silos	Greatly expanded data acquisition of grid parameters – deeply integrated with asset management processes
<b>Self Heals</b>	Responds to prevent further damage – focus is on protecting assets following fault	Automatically detects and responds to problems – focus on prevention, minimizing impact to consumer
<b>Resists Attack</b>	Vulnerable to malicious acts of terror and natural disasters	Resilient to attack and natural disasters with rapid restoration capabilities

# Smart Grid Features

- **Consumer Benefits**
  - Access to information
  - Ability to manage energy consumption
  - Option to participate in demand response
  - Convenient interconnection of distributed generation
  - Option to bid (sell) into electricity markets
  - Reduction in outages (number and duration)
  - Fewer losses
  - Fewer inconveniences
  - Improved overall level of service
- **Societal Benefits**
  - Improved operating and market efficiencies leading to downward pressure on electricity prices
  - Improved reliability leading to reduction in consumer losses (~\$135B)
  - Increased grid robustness improving grid security
  - Integration of renewables and reduction in energy losses leading to a reduction of emissions
  - Other possible environmental benefits (e.g., PHEV)
  - Improved public and worker safety
  - Job and GDP growth
  - Opportunity to revolutionize the transportation sector
- **Utility Benefits**
  - **Operational Efficiencies**
    - Metering and billing
    - Outage management
    - Process improvement
    - Work force management
    - Reduced losses (energy)
  - **Asset Management improvements**
    - System planning
    - Maintenance practices
    - Engineering

# Questions

1. Referring to the handout (previous slides) of smart grid features, what questions does this raise in your mind about the smart grid and its capabilities?
2. Given the capabilities and characteristics of the smart grid as you understand them, and from the perspective of your group's role:
  - A. What new products and services might you value or desire in a future world that is smart grid enabled?
  - B. What information would be useful to receive in order to make those decisions?
  - C. Will improvements in electric reliability become more important to you in the future?
  - D. Will improvement in electric utility operational efficiencies benefit consumers?

# Question 1: Smart grid questions

- Business model-value proposition
- Funding of investment, allocation of costs
- Questions about the rollout process
  - Is the technology future-proof?
  - How extensive should the rollout be?
  - How much investment in enabling technologies is necessary/how complete does it need to be?
  - What are necessary rule changes as part of this framework?
  - Timing, things to do now?
- Consumer information/understanding
  - Educate customers so they can make informed choices
- Network security
- Reliability implications
- Effect of smart grid on prices (wholesale, retail)

## Question 2a: New products & services

- **Must be easy and user-friendly!!!!**
- Types of demand response products
- Grid-friendly appliances (+ smart meters)
- Dynamic pricing
- Peak-time pricing rebates, prepaid services
- Price notification lights
- Energy storage: thermal, batteries, etc.
- Transparent usage data to individual consumer
- Remote energy management
- Technologies for reducing phantom load: energy use + safety
- Technologies that reduce outages and their duration
- Distributed renewable generation

## Question 2b: Information

- Time scale differs by consumer type: cycles, minutes, hours, days
- Increased transparency to consumer
- Reduced outage rates, increased reliability
- What are benefits to local government of more granular information?
  - Aggregation
  - Impact on system, ways for consumers to reduce demand
- Abilities to change behavior exist; what's missing is access to markets and information flow
- Automate to reduce consumer costs

# Question 2c/d: Reliability/operational

- Is reliability worth the cost?
- Selling differential degrees of reliability: reliability insurance
- Use distributed generation as a reliability resource
  - Market processes change the economics of distributed generation, microgrids, PHEV, etc.
- Time scales
- Impact of outages on operating costs, public safety
- Growth and economic development
- How do customers “see” improved reliability?