Utility Applications – Distribution Breakout Sessions
October 30, 2015
Flip Chart Notes

Session 1 (Morning)

A. Topic 1 Identify Drivers

The morning discussion focused on the key drivers and system needs from the perspective of the electric utilities, including investor-owned utilities and municipal utilities.

There was a combined discussion of drivers (external forces) facing energy storage and system needs (opportunities) for storage. This summary separates a combined discussion into 2 lists. Associated with these are the relative importance of the item, denoted by dots of different colors with a relevant weighting. 1st Priority = 4 points, 2nd Priority = 3 points, 3rd Priority = 2 points, 4th Priority = 1 point.

Drivers for energy storage were denoted below, along with dot voting received. These are provided for information only and did not directly influence subsequent discussions.

**Drivers for Storage (Points)**
- Economics of Storage (16)
- Reduction of Cost for Ratepayers (16)
- Optimization of Utilization of Existing Assets (also retirements) (9)
- Reliability/ Economic (5)
- External Time Pressure (4)
- ESS Capability Advancement (4)
- Ownership regulations (4)
- Policy and Regulation (2)

B. Market Opportunities Through Energy Storage Deployment

Topics identified that were related to system needs and associated opportunities for storage were identified by the stakeholder group and are summarized below.

**Opportunities for Storage (Points)**
- Reliability & Resiliency (42)
- Capacity & Transmission Payment Reduction (40)
- Renewables Integration (36)
- Deferred T&D Upgrades (21)
- Synthetic Inertia and Frequency Response (10)
- Enhancing Import Capabilities from Canada (10)
- Enhancing Capacity (6)
- Energy Arbitrage / Time-Shift (4)
- Avoided Transmission Congestion (3)
Equipment Life Extension (1)

The dot voting revealed that the participants found the top 3 topics of reliability & resiliency, capacity & transmission payment reduction, and renewables integration to be high priority topics for energy storage in the context of the utility perspective. Deferred T&D upgrades was not as highly ranked but still received twice as much priority as synthetic inertia and frequency response. This should be interpreted only as the general sentiment of the room, and not necessarily the final word on any of these topics. However, the top 3 items were prioritized for the afternoon discussion on barriers and challenges.

It should also be noted that the session consisted of both utility and non-utility participants. As a result, the results could be skewed by external views and require verification and further detail through interviews with an exclusive utility audience.

In initial follow-ups it was noted that the very high score for “Capacity and Transmission Payment Reduction” was somewhat surprising and may represent the sentiment of municipal utilities, rather than investor-owned utilities. There was additional discussion on this topic related to ISO-NE policies for resettlement of the capacity (ICAP) payment, which may be an issue but requires further follow-up.

An additional item brought up after the meeting, expanding the topic of “Reliability and Resiliency”, was the recognition that existing tools of distribution automation are helpful for intermittent, single point outages, they are less effective in extreme weather events that produce widespread outages. Storage and microgrids may offer a special opportunity in that regard.

A final key comment from follow-up discussion was that the T&D upgrade deferral opportunity is very important from the utility perspective and should have been higher in the opinion of some.

*Note: The list above is a compilation and summary of the topics and dot votes on the opportunities for storage. The raw results included additional topics that were drivers, not opportunities, or items that did not receive any votes or may have been misinterpreted by the EPRI-led summary process. To maintain completeness, other phrases captured include (with dot votes): Marketing (0), RPS (0), Energy Targets (0), Resiliency Initiatives (0), Emissions Reduction (3), Integration with GMP (0), Need to Provide Choices for Customers and Customer Engagement (0), Finance-ability (0), Capturing Value DER (0), Revenue Streams (0), Delay in Action (0)*

Session 2 Afternoon

A. Barriers and Challenges for Addressing High Value Opportunities for Utilities

The afternoon sessions focused on the key challenges that limit utility adoption of energy storage for the highest ranked opportunities in the morning session: Reliability & Resiliency, Capacity & Transmission Payment Reduction, and Renewables Integration. While the conversation was framed in this way, it should be noted that discussion covered general barriers for energy storage adoption as well.
Similar to the morning session, participants were asked to “vote” with dots that represented priority. For the point total below, 1<sup>st</sup> Priority = 4 points, 2<sup>nd</sup> Priority = 3 points, 3<sup>rd</sup> Priority = 2 points, 4<sup>th</sup> Priority = 1 point.

**Barriers and Challenges**
- Lack of clear valuation and metrics (28)
- Monetization of all value streams (27)
- Limitations for Modeling (13)
- Fire Safety (12)
- ESS High Cost (11)
- ESS Product Performance and Safety (8)
- ESS Definition & Lack of Clarity When Loads are Reconstituted (6)
- ESS Cycle Life Limitations (4)
- Lack of Locational Specific Information for Locational Incentive (3)
- Lack of Smart Grid / Control Monitoring (2)
- Ability to Rate Base Storage (1)
- Lack of Price Signal (1)

The topics and voting show a clear focus on issues with understanding the sources of value for energy storage, and ability to clearly quantify and monetize that value. Other highly ranked topics include issues related to the complementary tools and infrastructure for grid communication and control, as well as modeling which can support both planning and operations of energy storage systems. A third category was focused on issues with the energy storage systems themselves, including fire safety, cost, and performance.

*Additional topics mentioned in the meeting are included here for completeness, though they did not receive any “votes”: IOU utilities need clarification on ownership of ESS in MA, intermittent generation, performance standards, O&M, lack of business models (tariff structure), lack of clarity on transmission peak timing, providing a service prevents other services, modeling tools don’t talk to each other.*

In follow-up discussions with utilities, there was a general acknowledgement of a lack of commercial operating experience for energy storage in the field to-date. Additionally, this lack of commercial experience leads to high soft costs of implementation in the field. Guidelines and standard practices for implementation are missing elements.

### B. Solutions / Mitigation Strategies

The final component of the discussion was brainstorming and prioritization of possible solutions to address key barriers. The suggested solutions are listed below with associated vote priorities.

**Solutions**
- Regulatory incentives for utilities to own/procure ESS where it makes sense (28)
- Clear legislative / regulatory framework for ESS to have its own classification (26)
- Establish clear valuation method (22)
- Implementation of MA grid modernization plans (20)
- Competitive bid for services (14)
o Clear determination that ESS/DER will not be reconstituted as loads (14)
o Real time tool sets / interoperability standards (8)
o Equity incentive for innovative solutions (7)
o National lab help on modeling (6)
o Increase awareness that ESS can mitigate interconnection costs (4)
o Apply performance standards, etc (1)
o Utilities need to provide locational incentives (1)

There were a cluster of highly ranked solutions that involve achievement of clarity regarding what energy storage is and how to value it. Regulatory and legislative ambiguity of storage as an asset class is a major theme. Some participants also thought that the implementation of the Massachusetts Grid Modernization Plans is an important solution to mitigate barriers for energy storage implementation. Other items that received votes dealt with the issue of modeling and real time operational controls that will be important for optimally operating energy storage systems. Also, the clarification and implementation of performance and interoperability standards.

A specific item mentioned, and also prioritized relatively high, is the request for a “clear determination that ESS/DER will not be reconstituted as loads.

This concludes the notes from the utility breakout session. As previously mentioned, these notes will be further refined through interviews with electric utility departments and personnel.