Incorporating Energy Storage into Resource Planning
November 13-14
Atlanta, GA

NOTE: AGENDA SUBJECT TO CHANGE

DAY 1, NOVEMBER 13: INTRODUCTION TO THE VALUE AND COSTS OF STORAGE

Lunch (12:00 pm to 1:00 pm)

Introduction and agenda setting (1:00 pm to 1:30 pm): Presenters provide an overview of the agenda, and the objectives of the workshop. Participants introduce themselves and briefly describe the extent to which storage is currently incorporated into their resource plans, and one key challenge they've faced in the process.

The current landscape of storage in IRPs and relevant regulations (1:30 pm to 2:00 pm): ESA presents its survey of current practices for incorporating storage into IRPs, based on an update of its recent paper on the topic.

Storage costs (2:00 pm to 2:45 pm): Brattle presents on storage costs, their relevance in IRPs, and what comprises project costs. The discussion includes a review of recent cost estimates (including projected cost declines) and discussion of how costs vary based on project size, duration, component (pack vs BoS), etc. Prior to the workshop, participants will be asked to provide estimates of storage costs that they have recently observed in in their market, and those results will be aggregated and reported back to the group as a current snapshot of utility storage cost.

Break (2:45 pm to 3:00 pm)

Quantifying the benefits of storage for IRPs: What are they, and under what regulatory/market structures do they apply? (3:00 pm to 5:00 pm): Brattle presents the various benefits of storage, illustrated with real-world examples from various jurisdictions and how each type of benefit can be modeled within the IRP. The discussion then turns to the regulatory and market type conditions under which these benefits apply. For instance, how should utilities operating in jurisdictions with and without wholesale markets account for benefits differently, and must some categories of benefits, e.g. T&D value, be excluded? To what extent should IRPs account for distribution-level benefits and/or customer-side benefits of BTM storage? The session concludes with a roundtable discussion of current practices among the workshop participants.

Day 2, NOVEMBER 14: MODELING STORAGE WITHIN RESOURCE PLANS

Modeling the generation value of storage within resource plans (8:30 am to 11:00 am): Brattle presents top issues to consider when modeling the generation value of storage in a resource planning context. The discussion highlights various tools that are available for modeling storage economics. The session concludes with a roundtable discussion of current modeling practices among the workshop participants. Key topics include:

- Modeling storage's ability to provide all generator services (e.g. energy, ancillary services, capacity)
- How to value storage participation in ISO/RTO wholesale energy and ancillary service markets
- Modeling and choosing among a portfolio of storage technology options (e.g. standalone storage of different types, solar+storage)
- Limitations of load duration curve-based modeling
- Whether to treat storage as a supply-side resource or as a modification to the load forecast
- Parameterization of storage characteristics within IRP models
- Benefits of sub-hourly modeling of storage operations

Georgia Tech Strategic Energy Institute's assessment of energy storage scenarios for the Southeast (11:00 am to 11:30 am) SEI will present their work to evaluate the benefits, costs and implications for grid-scale energy storage opportunities for southeastern stakeholders. The Georgia Tech research team has conducted analytical modeling for a range of scenarios, including behind the meter, and customer-sited/utility operated energy storage projects. The team has developed novel optimization algorithms to assess value-stacking in consideration of future cost projections for lithium ion battery systems. Included in the scope are public source data to evaluate various rate classifications and generation mixes to assess their impact on project value and social impacts, such as CO2 emissions. The objective of the study is to inform decision-makers with guidance and metrics for optimizing project value for residential, commercial and industrial, and grid-services use cases. The final phase of work scheduled to conclude at the end of the year will evaluate additional siting, ownership and operation modes for deployment in Georgia and other regulated Southeastern states with vertically-integrated utilities.

Break (11:30 am to 11:45 am)

Utility presentations on storage modeling and lessons learned (11:45 am to 12:45 pm): A representative from a utility advanced in their representation of storage in IRP modeling (invited) describes their approach. Discussion includes both a high-level introduction to benefits considered and modeling approaches/tools. Specific emphasis is placed on modeling the ability of storage to provide peak capacity needs. Utilities also share successes and lessons learned regarding navigating the regulatory approval process.

Lunch (12:45 pm to 1:30 pm)

IRP regulatory hearing simulation (1:30 pm to 3:00 pm): Brattle facilitates an interactive session involving small group breakouts. First, Brattle presents an illustrative IRP, with a focus on the storage component of that IRP. Then, participants are divided into small groups; each group is assigned the role of a specific intervenor, given time to discuss the illustrative IRP, and then asked to present their intervenor perspective on the storage component of the IRP back to the broader group. The session

concludes with a discussion among all participants about how a utility might respond to the issues that were raised by each intervenor group. This gives the participants an opportunity to "sit on the other side of the table" and think about storage from a different perspective.

Break (3:00 pm to 3:15 pm)

The frontier of storage in resource planning (3:15 pm to 4:15 pm): Brattle presents innovative approaches to quantifying the benefits of storage, with a focus on issues that are often complementary to core resource planning activities, drawing on real-world examples from cutting edge utilities. Topics include:

- Valuing flexibility within IRPs and quantifying storage's flexibility benefits
- Quantifying the transmission and distribution value of storage
- Quantifying the risk management/option value of storage
- Storage's role in distribution planning and distribution resource plans
- Storage pilot project evaluation

Wrap up (4:15 pm to 4:30 pm)