

## Energy Storage System (ESS) Roadmap Items for Discussion

Category	Sub-Category	Summary	ITWG Priority Level <i>(Highest to Lowest)</i>	Status:	Outstanding Questions or Discussion Topics	Conclusions:
Operating Characteristics	Additional Document Requirements Throughout Interconnection Process	Utilities require additional documents throughout the interconnection process to ensure operating requirements that are studied can be met. Industry want to ensure that only essential documents are required so that undue burden isn't placed on developers during interconnection process.	1	1 - Open	(a) What documents are required in the interconnection process specific to ESS? (i) Power-Curtailment Document for UL Listing (ii) Transformer Cutsheet (CHG&E) - Not Available (iii) Testing Plan Requirement (CHG&E mostly) (iv) Sizing of Grounding Transformers in Initial Application (CHG&E) (v) Control Schematics for Grounding Transformers (CHG&E) (b) What impacts do requiring these documents have on the industry? (c) Can any of these document requirements be required later in the interconnection process? (d) EV Charging Stations paired with ESS - Document requirements for the land owner which adds time to process. Are there other documents that can provide the same level of certainty?	
Operating Characteristics	Verification of System Operation	Utilities want to ensure that systems adhere to the operating terms identified in their interconnection agreements.	2	1 - Open	(a) What method of validation is required to confirm operating characteristics? Monitoring or Relaying? (b) Are the utilities concerned with protection of the system or market validation? (c) Why are protection related devices required to monitor operating modes? (d) How do obligations in Contractual Agreements play a role in verification? (e) How will the IEEE 1547 Controls CRD and NYSEDA PON impact these requirements?	
Operating Characteristics	Prevention of System Operation Changes	Utilities want to prevent systems from modifying their operating characteristics post PTO.	3	1 - Open		
Operating Characteristics	Formal Process for Review of Operating Changes per SIR	Utilities want to ensure that formal process for informing utilities about operating or system changes is followed (per SIR)	4	1 - Open		
Metering Requirements	Criteria for Separate Metering of Auxiliary Loads	Determine criteria for when separate service metering is required for the auxiliary loads on a ESS	5	2 - Partially Closed	(a) What loads are considered aux loads? PV inverter power draw in the night time? HVAC? Controls? Transformers? (b) Under what conditions would JU require revenue-grade metering for aux loads? Is this based on the peak or total aux loads? Is it based on the absolute aux loads or as a percentage of the system nameplate capacity? (c) Under what conditions would JU require a separate service for aux loads? Why? (d) Also, what is the definition of auxiliary loads? What loads are included? Does it include control system, SCADA system, lighting, ventilation, safety systems, pumps, cooling, transformer and inverter losses, etc? (e) What is the definition of 'significant' regarding the size of auxiliary loads for various ESS sizes?	<b>2/6/2020 ITWG Meeting</b> - DPS stated that they'd like to see a joint response to Auxiliary Metering requirements by the JU - JU to determine Auxiliary Transformer Thresholds using Minimum CT Accuracy - JU to review queued applications to determine which projects exceed these limits then contact developers - Industry to provide background on impacts that separate services would have on development
Metering Requirements	Installation Requirements for Separate Service Metering of Auxiliary Loads	Installation requirements for separate service metering of auxiliary loads	6	2 - Partially Closed	(a) Will there be a standardization effort across utilities on installation practices for secondary services? (b) How do we minimize the impact to projects already in the queue?	
Technical Review	Modeling Limitations	Identification of modeling challenges associated with evaluating ESS	7	1 - Open	(a) How does the increase in scenarios impact study timelines? (b) Can the JU give some examples of how they have been modeling ESS profiles in the SIR engineering study? For example: (i) Does the JU currently perform 8760 analysis for ESS applications? (ii) Does the JU model multiple use cases for each application (e.g. load shifting + demand response)? (iii) or Does the JU only consider the maximum import and export as the worst case?	
Technical Review	Fast Tracking	Determine criteria for types of ESS projects that should be Fast Tracked due to limited export, load thresholds for behind the meter applications, or EV charging applications	8	1 - Open	(a) Focus initially on small systems <20kWh. Can agreement be found on Fast Track process for these types of projects?	
Technical Review	Other Hybrid ESS Projects	Evaluation standardization for 'Other' DERs paired with ESS (e.g. CHP + ESS, Fuel Cell + ESS, PV + CHP + ESS, PV + EV Charger, etc.)	9	1 - Open	(a) What are the technical considerations when studying the a hybrid project with 'Other' DERs? Does the JU model these assets separately or in combination? <i>This is evaluated more on a project by project basis. There have not been too many hybrid systems outside of battery storage and solar PV to date. The JU are open to studying specific applications to better understand if there are improvements to be made in how they are studied. There hasn't been many applications to date to speak at length on this.</i>	Originally brought up at ITWG but group decided that topic would be better handled by the IPWG. But there may be specific technical topics on hybrid projects that the ITWG should address.
SIR Templates	Interconnection Agreement	Development of a <b>standardized interconnection agreement (IA)</b> template for energy storage system (ESS) operating characteristics (Attachment 1 of Appendix A of the New York State Standardized Interconnection Requirements (SIR))	10	1 - Open	(a) What technical aspects of this document can be handled by the ITWG? (b) What policy aspects of this document must be passed onto the IPWG? (c) What ESS-specific items (e.g. specifying ramp rate limit or operating hours in the standardized template) need to be documented within the IA?	
SIR Templates	Standardized Application Form for ESS	Utilities need to receive a standardized deliverable containing all relevant information on ESS operating modes that will be evaluated during the interconnection process.	11	3 - Closed		Appendix K finalized and filed in the SIR-2019
Technical Review	Ramp Rate Considerations	Discussion on how ESS Ramp-Rate settings are evaluated.	12	1 - Open	(a) What is the "worst case" ramp-rate that will be assumed in the impact study? <i>The current "worst case" ramp rate is assumed to be on-off. The JU are interested to hear from industry on how less conservative assumptions could be used.</i> (b) How are utilities using ramp-rate during the impact study? (c) Do the utilities require testing to verify ramp-rate settings? (d) What are some challenges that the utilities foresee with evaluating ramp-rate controls? <i>The utilities see future challenges to coordinate with NYISO with the impacts of the ramp rates across many systems in aggregate.</i> (e) What concerns are specific to ramp-rate with ISO related market participation such as frequency regulation? (f) What concerns are specific to ramp-rate under normal system operation?	
Market Considerations	Market Requirements and System Capabilities	Understanding frequency regulation market requirements and necessary system capabilities in order to participate.	13	1 - Open		
Technical Review	ESS Coordination	Coordination of newly proposed projects with the operating profiles of existing ESS projects on a feeder or substation	14	1 - Open	(a) Additional clarity by the JU still required on this line item	
Market Considerations	NYISO & EDC Balance	Balancing of economic and reliability needs between NYISO and EDC for dual participation projects.	15	1 - Open		