



Energy Storage Participation in RPM

Options Matrix

Number	Design Components ¹	Status Quo (Advanced Storage, Storage in PJM Today)	Status Quo (Resources in Capacity Market)	Solution Options ²								
				A	B	C	D	E	F	G	H	I
1	Must offer requirement in day ahead market	N/A (Batteries), Required (Storage)	All resources in Capacity market have a Must Offer Req in Day ahead	As other generation: must offer can be met through DA market, self schedule, or optional hydro optimizer	Self-scheduling	PJM optimization (e.g. pumped hydro)	Standard DA/RT, respecting max run time/max energy limits	same as conventional generation - with dynamic capability to determine cost	must offer req, market must match output req to be cap resource (10 hours)			
2	Minimum continuous electricity time capability	No Current Standard, Regulation ;market is hourly; cannot be out for XX mins, or else forfeit bid (Batteries), 10 hours (Storage)	10 Hours	N/A, 330kWh to provide 100kW of UCAP (Proposed as Minimum Energy Capacity)	1 hour	keep current products - limited, extended summer consistent with shortest duration of current DR products	10 hours	15 mins/shorter than 1 hour	4 hours	6 hours		
3	Minimum continuous electricity production capability	Continuous Capability for a certain period, 0.1 MW for existing resources (Batteries and Storage)	Continuous Capability for a certain period, 0.1 MW for existing resources	100kW	status quo							
4	Test requirements		- 1-2 hours based on resource type, Steam 2 hrs, Hydro 1 hr - Qualifying test - Seasonal test - Equivalent to duration	Option A to verify power rating. Once per year, full charge/discharge cycle at rated UCAP to verify MWh.	initial test - CIR, annual/seasonal test qualification test similar to regulation							
4A	rating methodology			as other generation	min instantaneous output for duration of test							
5	Metering requirements	As Defined by Regulation market rules; Energy Market in Load Response Manual, LM Outlines in M11(Batteries), As outlined in M14D (storage)	As outlined in M14D	Comply with rules in Manual 14D and 1	Comply with rules in Manual 14D and 1							
6	How does a PJM Resource make itself available/Method of Availability to PJM	Enter through queue process, Register as part of Markets Database, make themselves available through eMarket- Traditional generators - daily must offer - DR - have to register prior to delivery year - if EO - 20 mins notice, self schedule	Enter through queue process, Register as part of Markets Database, make themselves available through eMarket- Traditional generators - daily must offer - DR - have to register prior to delivery year - if EO - 20 mins notice, self schedule	Must offer requirement applies to UCAP. Emergency procedures extend to full ICAP.	energy market must offer obligations							

	Immature resources/transitions mechanisms for determining capacity value		Class average values are blended with actual values on a monthly basis to produce EFORd values for future auctions	Class average EFORd determined by review of storage currently in service; may be technology dependent.							
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Directions:

¹Design Components - each is an "attribute" or "component" of any proposed solution. Consensus of the group should be sought on selection of a set of solution criteria.

²Solution Options - each is a solution alternative elicited from the stakeholder group that meet one of the specific solution criteria.

To complete the matrix:

1. Elicit from the stakeholder group a set of components (attributes) desired for any proposed solution. Enter a short label for each in the Design Components column.
2. If needed, enter a more detailed description of each criteria on the "Component Details" tab.
3. Using informal/non-binding voting, rate each component's priority in the final solution as "high/medium/low"
4. Elicit from the stakeholder group potential solution alternative(s) for each component. Enter a short label for each in the Solution Options columns.
5. If needed, enter a more detailed description of each potential solution option on the "Solution Details" tab.
6. Once the matrix is filled out, the group will attempt to select a single solution alternative (column) for each component (row) to form a solution "package".
Example: cells 1B, 2C, 3A, 4B, 5D could make up a solution package.
7. If consensus is achieved on a single package (Tier 1 decision-making method), this will be documented in a Consensus Proposal Report to the parent committee.
8. If not, the group will identify up to 3 possible solution packages in a comparative Proposal Alternatives Report to the parent committee (Tier 2 decision-making method).