Determination of Capacity Value for Advanced Storage Resources

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• These slides outline two possible approaches to determine a capacity value for Advanced Storage Resources.
• Procedure 1 is based on the existing DR model
• Procedure 2 is based on LOLE analysis
Two Categories

• **10 Hour Advanced Storage**
  – Capacity Value is total MWh of storage capability/10 hours

• **6 Hour Advanced Storage**
  – Capacity Value is total MWh of storage capability/6 hours
  – May be classified as a limited product in the RPM Auction and may receive a lower price than a less limited product
Procedure 1

• The Capacity Value of all resources at a given location must be determined as either 10 Hour Advanced Storage or 6 Hour Advanced Storage.

• Multiple resources may be aggregated provided they are of similar design and technology and are electrically similar (of equal capacity values and residing on the same bus).

• The selection is applicable for an entire Delivery Year.

• UCAP value of the resource will be the Capacity Value reduced by an unavailability rate.

• Resource will be required to perform a summer and winter capability test (may use actual operating data).
Net Max Capacity = 10 MW

1. **Storage: 100 MWh.** Max Output Duration = 10 hours. This is a 10 MW “10 Hour Advanced Storage Resource”.

2. **Storage: 60 MWh.** Max Output Duration = 6 hours. This is a 10 MW “6 Hour Advanced Storage Resource”. This resource has an option to be offered as a “10 Hour Advanced Storage Resource” at 60/10 = 6 MW.

3. **Storage: 48 MWh.** Max Output Duration 4.8 hours. This resource can be:

   “6 Hour Advanced Storage Resource” at ICAP value = 48/6 = 8 MW; or

   “10 Hour Advanced Storage Resource” at ICAP value = 48/10 = 4.8 MW.
Remaining Issues

- Coordinate with PJM Operations and Markets to define dispatch and capacity market rules and energy bidding requirements.
- Develop performance metric to convert from Capacity Value to UCAP Value.
Procedure 2

- Same requirements as set forth under Procedure 1 with one change: the capacity value of the resource is based on LOLE analysis of its runtime duration
- Use LOLE tools to calculate the Effective Load Carrying Capability (ELCC) of a resource available for X hours per day every day. (X can be varied from 1 to 6.)
- A Capacity Discount Factor could be calculated for a storage resource based on its runtime duration. The Discount Factor would be equal to (ELCC/Rating of resource).

* ELCC is the amount of peak load that an incremental resource can serve at an LOLE of one day in ten years.
• Say the LOLE analysis produces the following Discount Factors for various durations:

![Impact of Load Management Duration](image)

- A 1 hour duration resource would receive 26% credit, 2 hour would receive 47%, 3 hour 67%, etc.