



REV  
RENEWABLES

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# REV Renewables – Overview

- REV develops, owns, and operates clean energy and storage projects.
- Established in 2021 as a renewables and storage focused company out of LS Power
- 2.9 GW in operations across four different technologies
- 19 GW in development across the country, including several GW in PJM



# PJM ELCC Modeling of Storage – Status Quo

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- The current ELCC model dispatches resources in the following order - Unlimited, Variable, Demand Resource and Limited – to meet the projected load values.
  - The Limited Resources are dispatched in the following order: 10-hr Storage, 8-hr Storage, 6-hr Storage, Hydro with Non-Pumped, Solar-Storage (4-hr) Hybrid Open, Solar-Storage (4-hr) Hybrid Closed, 4-hr Storage.
- Storage, regardless of hour duration, is dispatched at the resource's ICAP MW for the duration of the modeled event or until the resource's energy is depleted.
- The model will charge Storage pro-rata equally across all hour durations.
  - Charging is only allowed in the model when the supply from Unlimited and Variable Resources are above the projected load levels.
  - Storage is not allowed to charge other storage resources.
- Class ratings for all resources are calculated based on benefit of reducing Expected Unserved Energy (EUE), but performance for ELCC purposes is only assessed during a Loss of Load Expectation (LOLE) event.
  - Frequency (LOLE), Magnitude (EUE) and Duration (Loss of Load Hours [LOLH]) are different ways to assess outages and reliability.
  - PJM and Stakeholders have not explicitly prioritized LOLE, but the model appears to optimize for this metric over EUE and LOLH.

# ELCC Modeling Scenario Requests

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1. **Determine the impact of dispatching storage at values less than the resource's ICAP**, especially during longer duration events to reduce the magnitude (EUE) or duration (LOLH) of event. This shift should provide a more realistic dispatch of resources during an event.
  - **Sensitivity Scenario Requests:** If the model anticipates a multi-day event, dispatch storage at 75% of ICAP and calculate EUE, LOLH, and LOLE along with ELCC values. Conduct another sensitivity using 50% ICAP.
  - This approach would optimize EUE, which might cause additional LOLE in first hour but overall lower magnitude of event (EUE). Do stakeholders (and society) have preference for long and shallow EUE vs. shorter and deeper EUE?
2. **Determine the impact of dispatching storage equally.**
  - **Sensitivity Scenario Request:** Dispatch all storage equally, regardless of hour duration. Maintain the rule to charge storage equally.
3. **Determine the impact of allowing longer hour duration storage to charge other storage resources**
  - **Sensitivity Scenario Request:** create a rule within the model to allow 10-hr and 8-hr storage to charge 6-hr and 4-hr storage and show ELCC impact.
    - For example, in a shorter duration event, long duration can charge short duration for high magnitude, low duration events.





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