Effective Load Carrying Capability provides a means to calculate the capacity contribution of all resources, as it captures the expected performance of resources during tight RTO-wide system operation hours that can be caused by high loads and/or poor resource performance.

As correlated outages/unavailability of resources has become an important risk factor in the operation of the power grid, the method to measure the capacity contribution of resources and to estimate how much capacity the system needs to remain reliable must evolve.

Measuring the Reliability of Resources

To recognize the unique operating characteristics and contributions of resources, PJM and its stakeholders adopted an approach called the Effective Load Carrying Capability (ELCC).

The ELCC method allows PJM to measure how much capacity may be provided by resources while ensuring resource adequacy.

PJM's ELCC method was accepted by the Federal Energy Regulatory Commission in January 2024. PJM adopted a marginal ELCC approach (as opposed to an average ELCC approach).

ELCC Sets the Capacity Value of All Resources

ELCC sets the capacity value of all resources that offer into the capacity market, except for Energy Efficiency, and went into effect for the 2025/2026 Delivery Year. Previously, in 2021, PJM had implemented a more limited version of ELCC only impacting renewable and storage resources.

Key Points

- A system with increased risk due to correlated outages/unavailability requires new approaches to adequately assess the reliability value of each resource and the system as a whole.
- The Effective Load Carrying Capability (ELCC) approach allows PJM to gauge how much capacity it may accept from providers of resources while ensuring resource adequacy.
- ELCC for all resources was accepted by FERC in January 2024 and started with the 2025/2026 Delivery Year. A previous, more limited version of ELCC that only applied to storage and renewable resources had been approved by FERC in July 2021.

In general, a resource that contributes a significant level of capacity during high-risk hours (i.e., hours with very high electricity demand and low resource output) will have a higher capacity value under ELCC than a resource that delivers the same capacity during low-risk hours. These risk hours may vary as the resource mix changes (e.g., more wind and solar is installed) and hours of high demand evolve (e.g., wide-scale electric car charging at night).

PJM's ELCC methodology also considers the simultaneous reliability contribution of all resources and recognizes both complementary and opposing interactions among resources expected to provide capacity in a given delivery year.

For example, increasing one intermittent resource alone, such as solar, leads to saturation, reducing the resource's capacity contribution. Solar paired with an energy storage resource, however, could have a higher combined contribution.

Sept. 3, 2024

(866) 400-8980 | (610) 666-8980