

Capacity Interconnection Rights for Variable Resources

Issue Source

The rapidly evolving resource mix, the variable output capability of new resource types, and PJM's recent adoption of effective Effective Load Carrying Capability (ELCC) analysis to determine the capacity market capability of resources that cannot run at their maximum output for 24+ hours (ELCC Resources) raises questions and opportunities to address concerns related to the permissible-appropriate amount of Capacity Interconnection Rights (CIRs) requested-required for existing and planned ELCC-Generation Capacity Resources, the interrelationship between CIRs and the amount of capacity offered into the capacity market, the role CIRs should play in determining ELCC resource adequacy considerations, and CIR retention policies that may strike a proper balance between continuing to support the reliable output of the resource while not resulting in unnecessary baseline upgrades to support CIR levels that are never or rarely attained in the energy market. In addition to addressing these questions and opportunities, this effort will be used to address concerns expressed in FERC's response to PJM's ELCC filing on October 30, 2021 (ER21-278) related to the interplay between ELCC Unforced Capacity (UCAP) and CIRs.

Issue Content

The Recently, stakeholders in the Capacity Capability Senior Task Force (CCSTF) developed-applied an the ELCC method to establish a cap-limit on the amount of capacity that ascribed to variable resources and limited duration resources, which can in turn be offered-sell in the PJM's capacity market. The interconnection process was considered out-of-scope in these discussion, as were issues around CIRs by implication. In fact, that effort did not change the amount of CIRs that such ELCC Resources are eligible to request and retain. That effort did not change the amount of CIRs that such ELCC Resources are eligible to request and retain.

PJM is proposing to initiate a new stakeholder process to review and modify existing CIR request and retention policies, with an emphasis on ELCC Resources, as well as consider the application of CIRs to the ELCC methodology and UCAP valuation. PJM will begin the process with CIR education on the status quo CIR policies with a primary focus on the purpose of CIRs and the application of CIRs to Generation Capacity Resources starting from the initial request for interconnection through post-commercial operation. This initial education will be followed by a stakeholder discussion to establish a consensus on fundamental, consistent and equitable principles for the treatment, testing and application of CIRs. PJM, through the stakeholder process, will address these issues prior to year-end 2021, to provide certainty around ELCC resource CIR values in time for the 2024/25 Base Residual Auction.

On the one hand Currently, for Unlimited and some types of ELCC Resources Limited Duration Resources such as storage and potentially hydro, the initial allocation of CIRs is based on the unit's Installed Capacity (ICAP). CIR requests for planned units and the retention of CIRs is based on their Installed Capacity (ICAP). CIR retention for these resources is either based on adjusted test output during particular summer afternoons, or based on the amount of power that can be provided continuously over 10 hours. On the other hand, for other resource types such as wind and solar resources, CIR requests for planned units are administratively set at generic, pre-defined values based on the class average summer capacity factor set forth in the PJM manuals. Resource developers have the option to unless the developers of the resources submit meteorological data supporting higher outputs. CIR retention for these resources is based on their average outputs during the afternoon window from 3 PM – 6 PM in each of the most recent 3 summer periods.

Today there are several key relationships between CIRs and ICAP that are helpful to consider before investigating revisions to CIR policies. CIRs currently provide an upper bound on the amount of ICAP ascribed to a Generation Capacity Resource. This is an essential relationship that must continue in order to ensure sufficient transmission to support generation output levels up to the amount of ICAP ascribed to a resource. Because of this relationship, CIRs are not considered in resource adequacy studies. However, ICAP for certain resource types such as wind and solar is based on average resource outputs over the summer period, and the associated assignment of CIRs and design of the transmission system only support these average output levels. A fundamental concern is that the ICAP for these resources is comprised of output levels above the average and below the average. Since CIRs do not support the full spectrum of output levels that makeup the ICAP for these resource types, not including CIRs as an upper limit to the resources' outputs in resource adequacy studies may overstate resource adequacy levels. In addition, the effective ICAP when considering CIRs may be significantly lower than the assigned ICAP without considering CIRs because transmission limitations that prevent outputs beyond the average summer output are not considered. This is an issue that exists today and will continue to exist under the current ELCC proposal and that this stakeholder process provides the opportunity to fix.

In addition to setting an upper bound on the amount of ICAP ascribed to a Generation Capacity Resource, today CIRs are generally identical or closely related to the ICAP. There is a very stable relationship between these values and because of this, the attributes and function of CIRs and ICAP are often conflated during discussions of these terms. The relationship between CIR and ICAP values will become much more dynamic for Variable Resources such as wind and solar under the ELCC methodology. Also, under the ELCC proposal, in recognition of their unique performance risk profile under Capacity Performance, Capacity Storage Resources and Intermittent Resources (which together are the main types of ELCC Resources) may choose the level of capacity that they offer or otherwise provide (that is, they are exempt from the Capacity Market Must Offer policy). This results in a mismatch between the CIRs and the amount of capacity offered. Because ELCC accreditations can change with time, ELCC magnifies this issue. As a result, it is important to achieve stakeholder consensus on what the appropriate relationships between CIRs and ICAP values should be moving forward. While CIR values for all resources today (generally based on ICAP) are not expected to be the same value as the amount of capacity a resource can sell (unforced capacity, or UCAP), ELCC highlights existing concerns for certain ELCC Resources related to their firm deliverability and introduces new potential discrepancies. First, basing CIRs on average resource outputs will not ensure that higher than average outputs will be deliverable. As a result, the effective UCAP may be significantly lower than the assigned UCAP because transmission limitations are not considered. Further, under the current ELCC proposal, CIRs are not accounted for in the determination of the accredited UCAP, and there is a question about the extent to which the ELCC analysis should take CIRs into account in order to not overstate the accredited UCAP. These concerns will likely increase under higher renewable penetrations and merely considering historic transmission limitations may not be sufficient. Second, in recognition of their unique performance risk profile under Capacity Performance, Capacity Storage Resources and Intermittent Resources (which together are the main types of ELCC Resources) may choose the level of capacity that they offer or otherwise provide (that is, they are exempt from the Capacity Market Must Offer policy). This results in a mismatch between the CIRs and the amount of capacity offered. Because ELCC accreditations can change with time, ELCC magnifies this issue.

PJM is proposing to initiate a stakeholder process to address these issues prior to year-end 2021, to allow ELCC resources to achieve appropriate CIR values in time for the 2024/25 Base Residual Auction.