

Effective Load Carrying Capability for Limited Duration Resources and Intermittent Resources

Issue Source

PJM staff is bringing this issue forward for consideration based on two sources:

- 1) The Planning Committee has been discussing switching to an Effective Load Carrying Capability (ELCC) method to calculate the capability of wind and solar units in the capacity market.
- 2) In response to a paper hearing FERC initiated in Docket No. EL19-100 regarding the capability of energy storage resources, stakeholders have proposed, and PJM supports, switching to an ELCC method to calculate the capability of energy storage resources.

Issue Content

The work will develop the provisions necessary to establish an ELCC method for calculating the capability of all limited duration resources, such as energy storage resources, and all Intermittent Resources, such as wind, solar, hydroelectric power with and without storage reservoirs, and other renewable resources. Because there are nearly 10,000 megawatts of generation + storage hybrids in the PJM interconnection queue, the capability of hybrids will also be addressed in this effort. The provisions to be considered include, among other things:

- a. Timing of ELCC analysis for a given delivery year
- b. Allocation of ELCC capability of a resource class to a specific unit
- c. The simulated dispatch of energy storage resources and hybrid resources
- d. Determination of resource classes

Definitions for Scoping Purposes

The below definitions are solely for the purposes of clarifying the scope of this issue charge.

Limited duration resources have limited duration capability. These include, but are not limited to, energy storage resources that receive energy from the grid and store the energy for later injection to the grid (e.g., pumped storage hydro units, compressed air energy storage units, flywheel energy storage units and battery storage units) and hydroelectric generating units with reservoir storage capability.

Intermittent Resources are generating units with output that varies as a function of an energy source that is non-continuous and that cannot be directly controlled. Such resources are unable to provide a stated level of output on demand and are unable to maintain a stated level of output for any specified period of time. Intermittent resources include, but are not limited to, wind units, solar units, run-of-river hydroelectric units (without reservoir storage capability) and landfill gas units (without alternate fuel capability).

Together, the categories of Intermittent Resource and limited duration resource encompass all resources that do **not** have the ability to maintain output at stated capability continuously on a daily basis without interruption. ~~Generating units that do have the ability to maintain output at stated capability continuously on daily basis without interruption include, but are not limited to, nuclear and fossil-fired steam units, combined cycle units, combustion turbine units, reciprocating engine units, and fuel cell units.~~

Hybrids are generating units that host both an energy storage resource and a different type of intermittent resource or limited energy resource at the same site, both behind a single point of interconnection.

Key Work Activities and Scope

Phase I of the task force will focus on solar, wind, and energy storage resources. The PJM Tariff definition of the term energy storage resource is technology neutral—any technology that withdraws, stores, then injects electric energy would have its capability calculated using ELCC-based rules for energy storage resources. Phase II of the task force covers all other limited duration resources and Intermittent Resources. The task force shall draft manual language (and, if applicable, governing document language) for limited duration resources that could be applicable to any technology with a limited duration characteristic.

Work activities that this group will need to perform to accomplish its work in resolving the issue:

Phase I

1. Brief review of existing education on ELCC provided recently at the Planning Committee and the MIC Special Session on Capacity Market Capability of energy storage resources. As needed, additional education on ELCC.
2. Education on the status quo for retaining, increasing, and transferring capacity interconnection rights.
3. Education on the interaction of resource capability, the Installed Reserve Margin study, and other features of resource adequacy planning and the capacity market.
4. Consider the general provisions necessary to establish the ELCC method for determining the capability of all intermittent and limited duration resources.
5. Consider the ~~resource-specific~~ provisions necessary to establish the ELCC method for determining the capability of wind, solar, and energy storage resources (including batteries and pumped hydro).
6. PJM to present an analysis of the impact of large-scale limited duration resource and Intermittent Resource deployment on the other aspects of resource adequacy apart from capability rules, assuming an ELCC framework. This analysis would include, among other things, the reliability requirement and forecast pool requirement, and any impacts due to shifts in the daily hours of peak risk relative to today.

Phase II

7. Consider the ~~resource-specific~~ provisions necessary to establish an ELCC method for ~~calculating determining~~ the capability of all other intermittent resources and limited duration resources, including, among other things, hybrids and resources for which part of the capacity is limited duration and part is unlimited, intermittent non-pumping hydroelectric power with and without storage reservoirs, landfill gas units (without alternate fuel capability), and hybrids of wind storage and solar storage.
- 7-8. Discuss other rules or rule changes that may be necessary for participation of limited duration resources in the energy and ancillary services markets and either develop such rules in this Senior Task Force or such other group as the stakeholders may determine is appropriate at that time.

Out of Scope

Changes to provisions in the following domains are **out of scope** of this effort:

- The interconnection process

- Demand response resources, i.e., resources that reduce load to participate in PJM markets using PJM demand response rules.

Expected Deliverables

Changes to applicable governing documents and PJM Manuals resulting from the respective phases

Decision-Making Method

Tier 1 consensus

Stakeholder Group Assignment

A new Capacity Capability Senior Task Force (CCSTF) reporting to the Markets and Reliability Committee. This issue warrants a senior task force because it is a specific, well bounded, and complex, and it spans planning, markets, and operations.

Expected Duration of Work Timeline

Given the pending FERC paper hearing on the capability of energy storage resources in FERC Docket No. EL19-100, for which PJM – as supported by various stakeholders – has asked FERC to hold in abeyance for a limited period to engage in this stakeholder process, and given that there are several forthcoming Base Residual Auctions, this issue is high priority with an immediate start. Meetings should be at least monthly as meeting availability allows. It is anticipated that any governing document revisions will be set for voting in the December or January time frame – at least as to Phase I -- to support a filing of any such revisions with FERC by January 29, 2021. Work on Phase II is estimated to take 12 months, and will begin after the Senior Task Force completes its work on Phase I.

Start Date	Priority Level	Timing	Meeting Frequency
4/1/2020	<input checked="" type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low	<input checked="" type="checkbox"/> Immediate <input type="checkbox"/> Near Term <input type="checkbox"/> Far Term	<input type="checkbox"/> Weekly <input checked="" type="checkbox"/> Monthly <input type="checkbox"/> Quarterly

Charter

(check one box)

<input checked="" type="checkbox"/>	This document will serve as the Charter for a new group created by its approval.
<input type="checkbox"/>	This work will be handled in an existing group with its own Charter (and applicable amendments).



More detail available in M34; Section 6