

PJM Response to Questions Received Regarding CIRs for ELCC Resources and Generator Deliverability Test

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1	Issue/Topic:	Provide a time line, and what led PJM to the realization there was an issue with intermittent resources being accredited too high due to the inclusion of energy not demonstrated to be deliverable?
	Raised By:	LS Power
	<p>PJM Response: PJM does not agree that there is presently an issue “with intermittent resources being accredited too high due to the inclusion of energy not demonstrated to be deliverable [.]” as the question suggests. Rather, PJM offers that accreditation methods will need to change in the future to take better account of tested deliverability levels.</p> <p>Please refer to the 2/23/2022 Special PC Session on CIRs for ELCC Resources for more background: https://pjm.com/committees-and-groups/committees/pc.</p> <p>The term Accredited UCAP is discussed throughout this document so the definitions of this term is provided below for reference.</p> <p>Accredited UCAP is the quantity of Unforced Capacity, as denominated in Effective UCAP, that an ELCC Resource is capable of providing in a given Delivery Year.</p>	
2	Issue/Topic:	PJM stated it made commitments to project developers that erroneously overstated the project’s accreditation: was the error made in the Interconnection Agreements or some other document? (We do not want confidential information but want to understand if there is some other contractual relationship that isn’t obvious or necessarily available to all units or in the Tariff besides the PJM that PJM has executed.) What agreements address accreditation as opposed to the level of CIR and associated deliverability (Pre-ELCC and post ELCC tariff changes).
	Raised By:	LS Power
	<p>PJM Response: Please identify when PJM made this statement. PJM disagrees that “PJM stated it made commitments to project developers that erroneously overstated the project’s accreditation[.]” Interconnection Service Agreements identify the amount of Capacity Interconnection Rights (CIRs) to be awarded to an interconnection project. CIRs are not the same as accredited capacity values. PJM shares accreditation information directly with resource owners via capacity exchange.</p>	
3	Issue/Topic:	How did the ELCC impact PJM’s accreditation, e.g. it would be helpful to understand whether the implementation of the ELCC caused this problem of recognizing energy output from intermittent generation capacity resources in

		excess of their tested deliverability. In looking we believe this problem has always existed and ELCC just made the problem more transparent.
	Raised By:	LS Power
		PJM Response: Contrary to what the question seems to imply, under current standards, there is no “problem of recognizing energy output from intermittent generation capacity resources in excess of their tested deliverability.” Today, all wind and solar resources are deliverable under the current standard. The current generator summer deliverability tests are very conservative. They examine a generator’s CIRs under over 14,000 single contingency (N-1) conditions, as well as a generator’s maximum facility output under over 17,000 common mode (N-2) conditions. Moreover, recent PJM studies show the energy output up to the new proposed deliverability level is deliverable.
4	Issue/Topic:	How does the need for upgrades to demonstrate deliverability differ for the resources we are discussing versus other resources? Will other resources automatically have increased deliverability if they demonstrate output in excess of their current deliverability? Will such output be included in the ELCC modeling?
	Raised By:	LS Power
		PJM Response: Deliverability for traditional thermal resources is tested at their Installed Capacity (ICAP), whereas deliverability for intermittent resources is tested at their UCAP. ICAP is the summer rating of a unit, and UCAP is the average availability. Thermal resource deliverability is outside the scope of this stakeholder process.
5	Issue/Topic:	How many facilities are impacted by LDA and which ones have actually cleared the BRA or will be entered into the supply stack for the up-coming BRA and how many have signed ISAs.
	Raised By:	LS Power
		PJM Response: The vast majority of generators that participate and clear in the BRA have ISAs. Currently, there are over 600 ISAs for wind and solar units. The nameplate capability of solar resources that cleared in the 2022/2023 BRA as annual CP capacity and/or summer seasonal CP capacity is 3,242.8 MW. This corresponds to 1,511.6 MW capacity. The nameplate capability of wind resources that cleared in the 2022/2023 BRA as annual CP capacity and/or winter seasonal CP capacity is 8,518.3 MW. This corresponds to 1,728.1 MW capacity. https://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2022-2023/2022-2023-base-residual-auction-report.ashx

6	Issue/Topic:	What type of intermittent resources are impacted and what are the Mws associated with each (e.g. solar, on-shore wind, off-shore wind) Perhaps aggregated by wind and solar by LDA.
	Raised By:	LS Power
		PJM Response: Please clarify what is meant by “are impacted” (e.g., “impacted by [XXX]”) so that PJM can provide an appropriate answer.
7	Issue/Topic:	It appears that PJM is proposing to triple the deliverability of these units, or at least the wind (solar not clear). This is from a current default of 13% to 38%. Is that accurate?
	Raised By:	LS Power
		PJM Response: PJM identified specific deliverability thresholds for a full list of proposed deliverability values by technology type. Please see slide 37 of the 11/2/2021 PC presentation: https://pjm.com/-/media/committees-groups/committees/pc/2021/20211102/20211102-item-09a-generator-deliverability-test-modifications-m14a-14b.ashx For class average wind capacity factors, please see the following: https://www.pjm.com/-/media/planning/res-adeq/class-average-wind-capacity-factors.ashx?la=en
8	Issue/Topic:	We understand that this will be coupled with the recognition of only energy up to the deliverability level (about 90% of total energy). Is this Correct.
	Raised By:	LS Power
		PJM Response: If the question is asking whether PJM will be recognizing energy only up to the deliverability level tested in the ELCC calculations, that is part of the ELCC methodology change in the PJM proposal. PJM’s proposal only accounts for hourly output up to the applicable tested deliverability level.
9	Issue/Topic:	How did you come up with the 90% criteria and what was the objective.
	Raised By:	LS Power
		PJM Response: The objective was to strike a proper balance between avoiding identifying unnecessary upgrades corresponding to simultaneous maximum renewable outputs and avoiding degrading proven resource adequacy, which would occur towards lower tested output levels. To achieve that balance, we ran ELCC sensitivities to determine the minimum percentile that would not result in a material decrease in the ELCC Portfolio MW or ELCC Class UCAPs. The resulting percentage that met our objective was 90%. Please refer to the following slide presentation for more background:

	https://pjm.com/-/media/committees-groups/committees/pc/2021/20210921-special/20210921-item-02-generator-deliverability-study-for-new-deliverability-levels-status-update.ashx	
10	Issue/Topic:	Mr. Kern indicated this level of upgrade may be increased as needed. Is this correct?
	Raised By:	LS Power
	<p>PJM Response: If this question pertains to the potential future change of tested deliverability levels, PJM is proposing to link deliverability requirements to CIRs via a formula, capturing the targeted percentile of resource output (please see answer to issue/topic 9). The formula will accommodate differences in CIRs across units, such as CIR reductions and partial CIRs, and will have a CIR multiplier based on the regional default deliverability level and corresponding capacity factor for the resource type. As the system evolves including the installed resource mix, the relationship between deliverability requirements and CIRs may need to be adjusted. The mechanism through which this multiplier will be adjusted is an issue under consideration and will be brought forward for discussion as part of the stakeholder process.</p> <ul style="list-style-type: none"> Actual deliverability MW = CIR MW * (Default deliverability % MFO / CF %) <p>Please see slide 40 in the following presentation for more background: https://pjm.com/-/media/committees-groups/committees/pc/2021/20211102/20211102-item-09a-generator-deliverability-test-modifications-m14a-14b.ashx</p>	
11	Issue/Topic:	Have you estimated any costs for such upgrades, e.g. going from P90 to P100? What is the trigger for making such additional upgrades in the future and who will pay for them?
	Raised By:	LS Power
	PJM Response: No. Please refer to the answer to issue/topic 9.	
12	Issue/Topic:	How did PJM derive the approximate \$100MM upgrade amount, e.g. how many CIRs have been claimed and how many more must be made deliverable through the transmission upgrade proposal based on LDAs? We understand this \$100 million applies to only about 30% of the upgrades. Is this correct?
	Raised By:	LS Power
	<p>PJM Response: PJM stated the \$100M was a preliminary estimate for the combined summer and winter proposed generator deliverability changes. PJM also stated that it would present additional analysis results once they become available.</p>	

	<p>PJM presented the most up to date estimates at the 2/23 Special PC Session. Please see the following:</p> <p>https://pjm.com/-/media/committees-groups/committees/pc/2022/20220223-special/20220223-item-04-generator-deliverability-proposal-analytical-results.ashx</p>	
13	Issue/Topic:	How would you quantify the headroom planned to be given to other facilities in order to make them deliverable. (MW and the opportunity cost to reproduce that capability for the rest of PJM).
	Raised By:	LS Power
	<p>PJM Response: Currently, PJM is having internal discussions on the transition and no decisions have been made with regard to headroom. Any future discussions on the transition will be in the context of the stakeholder process.</p>	
14	Issue/Topic:	How will the prioritization of these upgrades impact other projects in the queue from a cost and timing perspective? E.g. will they be delayed or will their upgrade costs increase? What is the cost estimate for this impact on these facilities, how long will they be delayed?
	Raised By:	LS Power
	<p>PJM Response: PJM is in the process of reviewing transition options in the context of the stakeholder process to determine the cost and timing impacts of any required upgrades and intends on sharing its proposal with stakeholders in the future.</p>	
15	Issue/Topic:	PJM says it will use existing headroom instead of all new build upgrades, how would that impact the cost and timing of other projects in the queue (same detail as question above)?
	Raised By:	LS Power
	<p>PJM Response: Please see response to issue/topic 13.</p>	
16	Issue/Topic:	What is the percentage of energy delivered by each resource type (e.g. wind, solar): (i) during the 368 peak MWs that is above the CIR levels for each resource for the past 5-10 years and (ii) the percent of energy delivered above their CIRs for all hours for the past 5-10 year. Again we know this may be have to be aggregated by LDA for confidentiality reasons.
	Raised By:	LS Power

	<p>PJM Response: This level of analysis has not been performed by PJM. Monitoring Analytics compiled data that Joe Bowring presented at the 2/23/2022 Special Session of the PC - CIR meeting. PJM has not confirmed the accuracy of the data.</p> <p>Please see the following link:</p> <p>https://www.pjm.com/-/media/committees-groups/committees/pc/2022/20220223-special/20220223-item-05-imm-intermittent-output-and-cirs.ashx</p>	
17	Issue/Topic:	What would have been the level of accreditation for these resources (differentiate by wind and solar and LDA) if the energy used in accreditation for last 10 years had been limited to only energy that was deliverable.
	Raised By:	LS Power
	<p>PJM Response: PJM study results indicate that all in-service Generation Capacity Resources are deliverable today under the current standards. In addition, PJM includes the historical energy that was deliverable in the ELCC calculations.</p> <p>Please see the following link:</p> <p>https://www.pjm.com/-/media/committees-groups/committees/pc/2022/20220223-special/20220223-item-04-generator-deliverability-proposal-analytical-results.ashx</p>	
18	Issue/Topic:	For this upcoming BRA, using ELCC, how would the overall ELCC Class rating for wind and solar be modified if the energy recognized for wind and solar generation capacity resources was limited to the energy that was demonstrated to be deliverable?
	Raised By:	LS Power
	<p>PJM Response: Such an approach is not consistent with PJM’s FERC accepted process. Therefore, ELCC Class ratings will not be changed for the upcoming BRA.</p>	
19	Issue/Topic:	Have you looked at the average decrease in accreditation by individual unit if this were done? Can you explain the result to us?
	Raised By:	LS Power
	<p>PJM Response: Please see response to issue/topic 18.</p>	
20	Issue/Topic:	Since this is an area that very few people understand, provide examples for a 100 MW wind farm and a 100 MW solar farm with terms shown like nameplate, ELCC value, UCAP, CIR today and CIR with new methodology, ELCC value and deliverability amount

	Raised By:	John Horstmann
	<p>PJM Response: Please see examples from Feb 15 meeting:</p> <p>https://www.pjm.com/-/media/committees-groups/committees/pc/2022/20220215-special/20220215-item-02d-interactions-of-cirs-deliverability-and-elcc-studies.ashx .</p> <p>PJM would be happy to respond to additional questions if the above-referenced examples are insufficient.</p>	
21	Issue/Topic:	Which generators will be impacted by any changes and how will they be impacted
	Raised By:	John Horstmann
	<p>PJM Response: The educational material provided at the 2/15 and 2/23 Special PC Sessions provides background on how resources will be impact by the proposed changes. Please see the following:</p> <p>https://pjm.com/committees-and-groups/committees/pc</p> <p>PJM would be happy to respond to additional questions if necessary.</p>	
22	Issue/Topic:	We assume that none of the upgrades or allocation of head room for specific interconnections enhancements (e.g. increasing wind in MAAC from 13% to 38%) are in the current RTEP baseline, can you please confirm that?
	Raised By:	Roy Shanker
	<p>PJM Response: See response to issue/topic 13.</p>	
23	Issue/Topic:	Assuming PJM pursues this initiative that is being discussed in the CIR/ELCC group (e.g. package D) via a filing at FERC, when will you adjust the baseline; when will you recognize the new deliverability in the accreditation of the various facilities. (E.g. those facilities that now are bumped in some way because of the allocation of headroom or new upgrades)
	Raised By:	Roy Shanker
	<p>PJM Response: PJM is in the process of reviewing transition options in the context of the stakeholder process to determine the cost and timing impacts of any required upgrades and intends on sharing its proposal with stakeholders in the future.</p>	

24	Issue/Topic:	If there is an interaction between a given upgrade and multiple facilities, and the upgrade is incomplete, how will the deficiency in deliverability be recognized among the impacted parties? Will PJM simply wait until everything is completed to acknowledge the upgrade, do it in stages, allocate etc.
	Raised By:	Roy Shanker
	PJM Response: PJM is in the process of reviewing transition options in the context of the stakeholder process to determine the cost and timing impacts of any required upgrades and intends on sharing its proposal with stakeholders in the future.	
25	Issue/Topic:	If there is headroom associated in varying amounts associated with the upgrade referenced in question 3, how would that be allocated prior to the completion of the new facility upgrade?
	Raised By:	Roy Shanker
	PJM Response: Please see response to issue/topic 13.	
26	Issue/Topic:	Does PJM intend to allocate headroom and upgrades to provide effective increased deliverability and recognition of the new deliverability requirements prior to the completion of the upgrades? Or will PJM recognize that until this occurs the generation facility should have a lower cap on the recognition of its output consistent with its actual deliverability.
	Raised By:	Roy Shanker
	PJM Response: Please see response to issue/topic 13.	
27	Issue/Topic:	Will PJM modify the ISA's of the impacted parties to reflect the increased deliverability? Has anyone drafted anything about what such an amendment would look like? How about conforming Tariff changes?
	Raised By:	Roy Shanker
	PJM Response: PJM is in the process of reviewing transition options in the context of the stakeholder process to determine the cost and timing impacts of any required upgrades and intends on sharing its proposal with stakeholders in the future.	
28	Issue/Topic:	From PJM's comments it appears that this allocation of headroom as well as the upgrades go into the baseline, and just "go forward" independent of the queue position of other parties or for existing facilities, Is that correct?
	Raised By:	Roy Shanker

	<p>PJM Response: PJM is in the process of reviewing transition options in the context of the stakeholder process to determine the cost and timing impacts of any required upgrades and intends on sharing its proposal with stakeholders in the future.</p>