



**Mark Takahashi**  
Chair, PJM Board of Managers

2750 Monroe Blvd.  
Audubon, PA 19403

March 4, 2022

**VIA ELECTRONIC MAIL**

**Melissa Alfano**

Director of Energy Markets and Counsel  
Solar Energy Industries Association

**Robert Altenburg**

Senior Director, Energy and Climate  
Citizens for Pennsylvania's Future (PennFuture)

**Jeff Dennis**

General Counsel and Managing Director  
Advanced Energy Economy

**Danielle Fidler**

Senior Attorney  
Earthjustice

**Sari Fink**

Senior Director  
American Clean Power Association

**Mike Jacobs**

Senior Energy Analyst  
Union of Concerned Scientists

**Will Kenworthy**

Regulatory Director, Midwest  
Vote Solar

**Dave Kolata**

Executive Director  
Citizens Utility Board

**John Moore**

Director  
Sustainable FERC Project

**Casey Roberts**

Senior Attorney  
Sierra Club

**Tom Rutigliano**

Senior Advocate  
Natural Resources Defense Council

**Gabe Tabak**

Counsel  
American Clean Power Association

**Glen Thomas**

President  
P3 Group

**Gizelle Wray**

Senior Director of Regulatory Affairs and Counsel  
Solar Energy Industries Association

**Re: Effective Load Carrying Capability (ELCC) and Capacity Interconnection Rights (CIRs)**

Dear Stakeholders:

This letter is in response to the recent letters to the PJM Board of Managers relating to capacity accreditation, including the February 1, 2022, letter from the PJM Power Providers Group (P3 Group or P3), the February 11, 2022, letter from the Clean Energy Trades Organizations (Clean Energy Trades),<sup>1</sup> and the February 14, 2022, letter from Certain Public Interest Organizations (PIOs).<sup>2</sup> We appreciate the participation of your organizations and their respective members in the current stakeholder process related to Capacity Interconnection Rights (CIRs) for Effective Load Carrying Capability (ELCC) Resources. Thank you for presenting your concerns and views regarding this matter.

<sup>1</sup> The Clean Energy Trades Organizations include American Clean Power, Advanced Energy Economy and Solar Energy Industries Association.

<sup>2</sup> The Certain Public Interest Organizations include Citizens for Pennsylvania's Future, Earthjustice, Union of Concerned Scientists, Midwest Vote Solar, Citizens Utility Board, Sustainable FERC Project and Sierra Club Natural Resources Defense Council.

The Board takes seriously its obligations under the PJM governing documents to provide for the safe and reliable operation of the system, as well as to support a non-discriminatory electric power market. As set forth in the attached document, PJM has reviewed P3's claims regarding PJM's implementation of the ELCC methodology and accreditation of renewable resources, and has determined that its implementation of ELCC is compliant with the Reliability Assurance Agreement. Further, in studying the deliverability of existing renewable resources using the proposed new generator deliverability test,<sup>3</sup> PJM continues to determine that in-service generating resources are deliverable and that all generating resources with an Interconnection Service Agreement (ISA) but not yet in service will be deliverable, with the exception of a small number of megawatts (approximately 5 MW). That said, the Board continues to encourage participation in the ongoing stakeholder processes on these complex issues.

The Board also understands the Clean Energy Trades' strong desire for PJM to apply ELCC to all capacity resources. Evaluating the qualification and accreditation of all resources is a key work activity in the Resource Adequacy Senior Task Force. We understand that education for this issue is expected to begin in the near term. As the Board explained in its October 14, 2021, response to multiple parties (including certain of the Clean Energy Trades Organizations), we recognize that there is a correlated risk during peak times for thermal generation. PJM is further studying that risk to inform the stakeholder discussion.<sup>4</sup>

We appreciate the efforts of PJM's members and stakeholders to engage on these complicated issues as PJM continues the transition to the grid of the future.

Sincerely,

*Mark Takahashi*

Mark Takahashi  
Chair

cc: Board of Managers

---

<sup>3</sup> The proposed new deliverability test includes a number of modifications as described at the Planning Committee Special Session – CIRs for ELCC Resources. See presentation at <https://pjm.com/-/media/committees-groups/committees/pc/2022/20220223-special/20220223-item-03-generator-deliverability-proposal-education.ashx>.

<sup>4</sup> See <https://www.pjm.com/-/media/about-pjm/who-we-are/public-disclosures/20211014-board-response-to-elcc-for-thermal.ashx>.

**Attachment****I. PJM is Accrediting ELCC Resources Consistent with its Reliability Assurance Agreement**

In its February 1 letter, the P3 Group (P3) asserts that PJM is not enforcing the current Reliability Assurance Agreement (RAA)<sup>5</sup> requirements regarding certain intermittent resources, although P3 provides no citations to PJM's governing documents to support its allegations.

PJM's methodology for accrediting capacity for Effective Load-Carrying Capability (ELCC) Resources is not in violation of its RAA and other governing documents. PJM has correctly applied its rules with respect to capacity accreditation and deliverability of ELCC Resources.<sup>6</sup> For ELCC Resources (and in fact for all generators), the Unforced Capacity (UCAP)<sup>7</sup> eligible to offer into the capacity market is the lesser of the Accredited UCAP<sup>8</sup> or Capacity Interconnection Rights (CIRs).<sup>9</sup> PJM's rules do not permit any resource to provide capacity in excess of its CIRs. Any demand for an "immediate fix" to the capacity capabilities of such resources, or to remove them from the supply stack for the upcoming 2023–2024 auction,<sup>10</sup> is unwarranted for the reasons set forth below.

The procedures for establishing deliverability of Generation Capacity Resources<sup>11</sup> are set forth in RAA, Schedule 10. Under Schedule 10, "Generation Capacity Resources must be deliverable consistent with a

---

<sup>5</sup> [Reliability Assurance Agreement Among Load Serving Entities in the PJM Region](#) ensures that adequate resources will be planned and made available to provide reliable service to loads within the PJM Region, to assist other parties during emergencies and to coordinate planning consistent with Reliability Principles and Standards.

<sup>6</sup> In October 2020, PJM filed proposed revisions to its Tariff and RAA to create and implement an ELCC construct for determining the accredited capacity capability that a Variable Resource, Limited Duration Resource or Combination Resource ("ELCC Resources") may offer into PJM's capacity market. *PJM Interconnection, L.L.C.*, Initial ELCC Proposal, Docket No. ER21-278-000 (Oct. 30, 2020). The Commission rejected PJM's Initial ELCC Proposal. *PJM Interconnection, L.L.C.*, 175 FERC ¶ 61,084 (Apr. 30, 2021). On June 1, 2021, PJM filed the Updated ELCC construct, which was accepted by the Commission effective August 1, 2021. *PJM Interconnection, L.L.C.*, 176 FERC ¶ 61,056 (July 30, 2021) (July 30 Order).

<sup>7</sup> "Unforced Capacity" shall mean installed capacity rated at summer conditions that is not on average experiencing a forced outage or forced derating, calculated for each Capacity Resource on the 12-month period from October to September without regard to the ownership of or the contractual rights to the capacity of the unit. See RAA Article 1 – Definitions.

<sup>8</sup> "Accredited UCAP" shall mean the quantity of Unforced Capacity, as denominated in Effective UCAP that an ELCC Resource is capable of providing in a given Delivery Year." See RAA Article 1 – Definitions.

<sup>9</sup> CIRs are defined to mean "the rights to input generation as a Generation Capacity Resource into the Transmission System at the Point of Interconnection where the generating facilities connect to the Transmission System." Tariff, OATT 1. Definitions – OATT Definitions C-D. See also, Manual 21: Rules and Procedures for Determination of Generating Capability (Rev. 16) at section 1.1.7 (CIR Calculations for Wind and Solar Resources) (Effective Date: Aug. 1, 2021).

<sup>10</sup> In its February 1 letter, P3 proposes a "self-help" remedy whereby PJM would remove megawatts from the supply stack for an upcoming capacity auction. Such action would be a violation of the RAA, as the capacity value of these resources have been accredited in accordance with PJM's current tariffed process. PJM does not have the authority to unilaterally apply a different method that is contrary to its tariff.

<sup>11</sup> "Generation Capacity Resource" is defined in the RAA to mean "a Generating Facility, or the contractual right to capacity from a specified Generating Facility, that meets the requirements of RAA, Schedule 9 and RAA, Schedule 10, and, for Generating Facilities that are committed to an FRR Capacity Plan, that meets the requirements of RAA, Schedule 8.1. A Generation Capacity Resource may be an Existing Generation Capacity Resource or a Planned Generation Capacity Resource."

loss of load expectation as specified by the Reliability Principles and Standards<sup>12</sup> to the total system load, including portion(s) of the system in the PJM Region that may have a capacity deficiency at any time.”

Because ELCC Resources are unable to maintain output at a stated capability continuously on a daily basis without interruption, RAA Schedule 9.1(D) provides that PJM shall determine the capability of ELCC Resources to meet a Load Serving Entity’s obligations under the RAA using an ELCC analysis, as set forth in RAA Schedule 9.1, with additional implementation details provided in the PJM Manuals. The ELCC analysis, as accepted by the Commission, is detailed in RAA Schedule 9.1(H).

PJM’s long-standing capacity value accreditation framework has been effective across a diversity of resource capabilities. Even before FERC accepted the current ELCC construct, the UCAP value for intermittent resources was based on an average of the peak hour output for the period June through August over three calendar years (as set forth in then applicable Manual 21).<sup>13</sup> So to be clear, such averaging occurred even pre-ELCC.

Nonetheless, given the recent influx of new technology types, PJM proposed an ELCC construct for determining the accredited capacity capability that ELCC Resources may offer into PJM’s capacity market, which the Commission accepted in July 2021.<sup>14</sup> In accepting the ELCC construct, the Commission understood that the ELCC analysis would “implicitly account for historically binding transmission constraints by considering each Variable Resource’s historic performance, including instances of curtailment due to transmission constraints.” In addition, even though an ELCC Resource may deliver more than its CIRs during hours when the transmission system is not constrained, the Commission found PJM’s approach to be reasonable, recognizing that after PJM determined an ELCC Resource’s Accredited UCAP, such resource’s capacity may be no greater than its CIRs.<sup>15</sup>

Thus, PJM is properly determining capacity value for ELCC Resources, and any proposal to not consider the actual output of an ELCC Resource is inconsistent with the Commission’s determination in this area.

---

<sup>12</sup> “Reliability Principles and Standards” is defined in the RAA to mean “the principles and standards established by NERC or an Applicable Regional Entity to define, among other things, an acceptable probability of loss of load due to inadequate generation or transmission capability, as amended from time to time.”

<sup>13</sup> For new resources, class averages were applied. For example, the class average would be applied to a new wind or solar capacity resource with fewer than three years of data. However, wind or solar capacity resources with three years or more of actual performance data would replace the averaging value with the historical operating data.

<sup>14</sup> See *infra* at n. 5.

<sup>15</sup> July 30 Order at P 53.

## II. The Historic ELCC Resources Are Deliverable

PJM is currently working with stakeholders under the Planning Committee Special Session – CIRs for ELCC Resources to (i) identify improvements to the ELCC methodology for accrediting capacity resources given CIR levels (and their relationship to tested transmission deliverability levels) and (ii) examine the appropriate tested deliverability levels such resources should be eligible to receive, given the rapidly evolving resource mix and the variable output capability of new resource types.<sup>16</sup> Statements made by PJM in the stakeholder meetings related to future scenarios of projected increased penetration of ELCC Resources have been misinterpreted to conclude that PJM is allowing ELCC Resources that cannot deliver all of their accredited capacity during peak periods to acquire a capacity obligation.<sup>17</sup> That conclusion is not correct.

All capacity from ELCC Resources meets PJM's current deliverability standards, which is adequate given current and near-term system conditions.<sup>18</sup> Furthermore, all existing, in-service wind and solar capacity meets PJM's proposed new deliverability standards. In an effort to address concerns specific to the deliverability of ELCC Resources, PJM provided data at the February 23, 2022, Special Session of the Planning Committee demonstrating that all wind and solar capacity with an executed ISA are fully deliverable under the current deliverability standards and meet PJM's proposed new deliverability standards, but for a *de minimis* 5 MW at a cost of approximately \$7 million.<sup>19</sup>

Moreover, the Commission found PJM's proposed accreditation of renewable resources to be just and reasonable given that the ELCC construct limits the amount of capacity an ELCC Resource can provide to the lesser of its capacity as determined by the ELCC analysis (i.e., its Accredited UCAP) or CIRs.<sup>20</sup> Specifically, the Commission stated that:

[T]he first step of the ELCC analysis, which determines the UCAP of the entire set of ELCC Resources, does not need to account for the locational nature of resources and transmission

---

<sup>16</sup> See Problem Statement <https://www.pjm.com/-/media/committees-groups/committees/pc/2021/20210420-special/20210420-item-02a-cirs-for-elcc-resources-problem-statement.ashx> and Issue Charge <https://www.pjm.com/-/media/committees-groups/committees/pc/2021/20210420-special/20210420-item-02b-cirs-for-elcc-resources-issue-charge.ashx>.

<sup>17</sup> For example, P3's claim that "69 percent of the energy being delivered from intermittent resources was not deliverable" appears to be based on a chart filed by LS Power in the Updated ELCC Construct Docket No. ER21-2043. See February 1 letter at n. 2. LS Power used the chart to conclude that PJM's ELCC analysis significantly overestimate[d] the reliability contribution of wind and other intermittent resources. See *PJM Interconnection, L.L.C., Motion to Lodge and Motion for Leave to Answer and Answer of LS Power Development, LLC*, Docket No. ER21-2043-000 at 4 - 5 (July 16, 2021). Despite LS Power's request that the Commission require PJM to change the ELCC modeling methodology for the 2026/2027 BRA, the Commission declined to impose the directives requested. July 30 Order at P 55.

<sup>18</sup> Importantly, the initial award of CIRs to Variable Resources now in service was not necessarily based upon a limitation of the actual capability of the transmission system. Rather, at the time, CIRs were assigned to such resources based upon such resources' class averages that were determined by PJM to represent the amount of generating capacity, expressed in MWs, that such resources could reliably contribute during summer peak hours. Consequently, theoretical arguments that the Variable Resources are not deliverable may lack merit inasmuch as the initial grant of CIRs accorded to those resources was not a measure of system capability, but instead was the application of an administrative rule tied to such resource's class average.

<sup>19</sup> The 5 MW number refers to generators with signed ISAs using the new test. However, the results of the analysis do not include 174 MW of solar generation in the 2023/2024 Base Residual Auction as such generators do not have a signed ISA. See February 23, 2022, PC Special Session at <https://www.pjm.com/-/media/committees-groups/committees/pc/2022/20220223-special/20220223-item-04-generator-deliverability-proposal-analytical-results.ashx>.

<sup>20</sup> Both the practice of setting the UCAP value of wind and solar to the average of those hourly peak summer outputs with no cap on those outputs in the computation and the setting of CIR value equal to that same average output were unanimously endorsed by stakeholders. See *PJM Interconnection, L.L.C., Initial ELCC Construct*, Docket No. ER21-278-000 at 23 (Oct. 30, 2020).

constraints within the PJM footprint, or limit resources' modeled output to their CIRs. As PJM explains, its existing resource adequacy study, the Reserve Requirement Study, does not consider transmission constraints within the PJM region because the RTEP is designed to ensure that specific areas of the PJM footprint have the necessary transmission infrastructure to receive the required level of energy imports. Additionally, PJM states it will implicitly account for historically binding transmission constraints by considering each Variable Resource's historic performance, including instances of curtailment due to transmission constraints. Given the fact that a Variable Resource may deliver more than its CIR quantity to the PJM system during hours when the transmission system is not constrained, we find PJM's approach reasonable in contrast to artificially limiting a Variable Resource's output to its CIRs within the ELCC model. Finally, after PJM has determined ELCC Resources' Accredited UCAP, PJM will limit an ELCC Resource's capacity market offer to be no greater than its CIRs, ensuring that the capacity market clearing process will not give an ELCC [R]esource a capacity supply obligation that exceeds the capacity the resource can physically deliver.<sup>21</sup> [Citations omitted]

In addition to identifying enhancements to its ELCC methodology ahead of an expected rapid increase of wind and solar in the near future,<sup>22</sup> PJM is also proposing modifications to its generator deliverability test to consider, among other changes, higher output levels for wind and solar to maintain and allow for their deliverable UCAP levels, respecting their resource and physical merits.<sup>23</sup>

PJM values all stakeholder input. Given that these issues are currently being reviewed and discussed with stakeholders, PJM encourages members to continue to engage in those discussions. It is through the stakeholder process that we can best reach a decision that addresses the various interests of all stakeholders.

### ***III. Cost Responsibility and Equitable Considerations***

The stakeholders are working on the question of who should pay for the costs of any upgrades associated with changes to PJM's planning assumptions to better reflect the expected output of existing ELCC Resources. Some stakeholders have argued that the answer is governed by the PJM Tariff, the *pro forma* ISA and Commission precedent. Stakeholders further assert that under the Tariff, cost responsibility associated with a generator is required to be specified in the ISA.<sup>24</sup> Based on PJM's *pro forma* ISA, it is not clear that there is a provision that allows PJM to unilaterally change an executed ISA to impose additional costs on an Interconnection Customer.<sup>25</sup>

<sup>21</sup> July 30 Order at P 53. PJM noted that this approach ensures that a resource "cannot offer more capacity than it is capable of providing nor more capacity than it is capable of delivering." See Updated ELCC Construct Filing at 51.

<sup>22</sup> See Energy Transition in PJM: Frameworks for Analysis, dated Dec. 15, 2021, at <https://pjm.com/-/media/library/reports-notices/special-reports/2021/20211215-energy-transition-in-pjm-frameworks-for-analysis.ashx>.

<sup>23</sup> See Problem Statement <https://www.pjm.com/-/media/committees-groups/committees/pc/2021/20211102/20211102-item-09b-generator-deliverability-problem-statement.ashx> and Issue Charge <https://www.pjm.com/-/media/committees-groups/committees/pc/2021/20211102/20211102-item-09c-generator-deliverability-issue-charge.ashx>.

<sup>24</sup> Tariff, Section 217.5

<sup>25</sup> ISA, Section 5.0, provides that the "Interconnection Customer acknowledges that its ultimate cost responsibility in accordance with [Tariff, section 217] will be based upon the actual Costs of the facilities described in the Specifications [section of the ISA]."

Consequently, given that the change in planning assumptions is due to projected system needs, PJM is engaging stakeholders through its stakeholder processes to determine how to address system deliverability and appropriately allocate the costs of any needed upgrades.

#### **IV. Conclusion**

Based on the foregoing, PJM is properly implementing its ELCC methodology for determining the accredited capacity capability that ELCC Resources may offer into PJM's capacity market. And, while CIRs serve as an offer limit under the ELCC methodology, the calculation of the Accredited UCAP for an ELCC Resource is not artificially limited by that resource's CIRs. Finally, PJM's assignment of cost responsibility associated with changes to the planning assumptions is an important question for ongoing stakeholder discussions.