UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Improvements to Generator Interconnection Procedures and Agreements	))	Docket No. RM22-14-000

COMMENTS OF THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

The Pennsylvania Public Utility Commission ("PAPUC") submits these comments in response to the Federal Energy Regulatory Commission's ("FERC's" or "Commission's") Notice of Proposed Rulemaking ("NOPR") proposing reforms to address interconnection queue backlogs, improve certainty, and prevent undue discrimination for new technologies.

I. COMMUNICATIONS

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II. INTRODUCTION

A quarter-century ago, Pennsylvania enacted its Electricity Generation Customer Choice and Competition Act,[1] which began the process of divesting traditional utilities of generation. As a result, the Commonwealth of Pennsylvania and its citizens rely on competitive regional markets and interconnection processes to provide for resource adequacy. In addition,

[1] 66 Pa.C.S. § 2801 *et seq*.

Pennsylvania is home to much of the generation PJM Interconnection, LLC (PJM) relies on to serve the region. In the 2022/2023 Base Residual Auction, 45,886 MW of Pennsylvania-based resources cleared that auction,[2] representing almost a third of the total unforced capacity clearing the auction.[3] The PAPUC submits these comments in response to the Commission's proposals regarding the speed and structure of processing interconnection queues. As Pennsylvania is served almost entirely by generation interconnected to PJM member Transmission Owners, we focus these comments on issues with PJM's current interconnection queue processes and the effects the Commission's proposal may have on them.

III. COMMENTS

A. The Reasonable Efforts standard may not effectively control interconnection delays.

The PAPUC believes that the reasonable efforts standard may not be effective for evaluating transmission providers'[4] efforts to process interconnection project requests. The *pro forma* LGIP currently requires transmission providers to use reasonable efforts, defined as "actions that are timely and consistent with Good Utility Practice and are substantially equivalent to those a Party would use to protect its own interests,"[5] to process interconnection requests in a timely manner.[6] However, the PAPUC is concerned that "reasonable efforts" as defined provides insufficient parameters for transmission providers to adhere to when reviewing

[2] https://www.pjm.com/-/media/library/reports-notices/state-specific-reports/2021/2021-pennsylvania-state-infrastructure-report.ashx, slide 4.
[3] https://www.pjm.com/-/media/markets-ops/rpm/rpm-auction-info/2022-2023/2022-2023-base-residual-auction-report.ashx, slide 1.
[4] A transmission provider is "any public utility that owns, operates, or controls facilities used for the transmission of electric energy in interstate commerce." 18 C.F.R. § 37.3.
[5] Order No. 2003, 104 FERC ¶ 61,103 at P 67; *pro forma* LGIP section 1.
[6] NOPR, ¶161.

interconnection projects. To ensure efficient and timely queue processing, transmission providers should be compelled to follow uniform procedures and benchmarks and be subject to appropriate oversight when they do not meet those standards.

There is significant evidence that the reasonable efforts standard may be inadequate for ensuring timely processing of the interconnection queue. Based on reporting by transmission providers in compliance with Order No. 845, more than 1,900 interconnection studies were delayed as of the end of Q4 2021.[7] Further, in February of 2022, sixteen transmission providers, including PJM, reported failing to meet interconnection study deadlines for more than 25% of any study type for two consecutive quarters. *Id.* In its recent interconnection process reform filing,[8] PJM explained that large numbers of interconnection requests cause study delays both because of the sheer amount of study resources expended, and because speculative projects withdraw and cause restudies for lower-queued projects.[9] Those restudies cause further delays, and because of the delays, interconnection customers have an incentive to enter the queue earlier just to save their queue position even if the customers' projects have uncertain prospects. This causes a death spiral of delays, withdrawals, and restudies. Given the number of electric customers and the amount of load represented by the sixteen transmission providers,[10] action must be taken to reduce and prevent interconnection queue backlogs going forward.

Once generation developers meet the minimum requirements set forth in the *pro forma* LGIP, they should have a reasonable expectation that their project will be timely reviewed by the

[7] NOPR, ¶165.
[8] *PJM Interconnection, L.L.C*, Docket No. ER22-2110-000 (June 14, 2022) (*PJM Interconnection Reform*).
[9] *Id.* at 5-6.
[10] ISO-NE, NYISO, PJM, and MISO alone represent 31% of the North American 1,027,063 MW peak summer load. See NERC 2021 Electric Supply and Demand Report, available at https://www.nerc.com/pa/RAPA/ESD/Pages/default.aspx.

transmission provider. As such, unreasonable delay in processing interconnection requests can create an unreasonable barrier for generation developers attempting to get generation projects developed and into the markets. Stakeholders agree: in PJM's survey of stakeholders for its Interconnection Policy Workshop, "Studies"[11] and "Schedule"[12] were the first and third most common high priority responses.[13]

Further, the existing PJM queue process is delaying generation projects, both by virtue of the number of interconnection studies failing to meet deadlines and the duration of time to complete the studies. As of July 2022, the number of currently delayed Feasibility Studies increased from 1 to 1,216 over the last two years.[14] That is, PJM has not completed any Feasibility Study from January to June 2022.[15] Given that the Feasibility Study is the first of the three required interconnection studies, all generation projects that are delayed at this point in the queue may not progress further in the interconnection process. As to the second and third studies, the number of currently delayed System Impact Studies increased from 53 to 186 and completion time increased from 186 days to 624 days over the same period, while the number of currently delayed Facilities Studies increased from 135 to 453 and completion time increased from 747 days to 798 days over the same period.[16] From January to June 2022, only 76 System

[11] Described as "All study phases and assumptions used to conduct studies".
[12] Described as "Queue window frequency and duration. Also duration of study phases".
[13] *See* https://www.pjm.com/-/media/committees-groups/task-forces/iprtf/2021/20210423/20210423-item-06-process-education.ashx at 40-41.
[14] *See* https://www.pjm.com/-/media/planning/services-requests/interconnection-study-statistics.ashx; *see also* https://pjm.com/-/media/committees-groups/committees/pc/2022/20220809/item-07---interconnection-queue-status-update.ashx
[15] *Id.*
[16] *Id.*

Impact Studies and Facilities Studies were completed.[17] Of these, only one was completed on time.[18]

For all these reasons, the PAPUC believes that the current reasonable efforts standard should not remain the status quo and that it is prudent to implement changes to the *pro forma* LGIP to create a more structured and uniform interconnection queue process. The PAPUC is hopeful that soon after implementation, many of the proposed changes in this proceeding will reduce or even eliminate the study delays currently experienced by interconnection customers.

B. The PAPUC generally supports a clustered first-ready, first-served interconnection process.

Ultimately, the Commission's reforms should be focused around decreasing unreasonable barriers to the processing of interconnection requests. As the PAPUC describes above, PJM's current interconnection queue is significantly backlogged by the serial study process. Generally, the PAPUC applauds FERC's attempt to reduce barriers to entry by consolidating studies into clusters, which should have the effect of reducing the total number of studies needed to put competitive resources into operation. While, the PAPUC supports the cluster study approach, the PAPUC has some concerns with FERC's proposal.

1. Cluster studies have the potential to reduce study times.

The implementation of a cluster study process will be an important change that addresses some of the causes of the serial interconnection process. Presently, the seemingly endless study and restudy process resulting from interconnection customers withdrawing their requests is causing significant delays in the overall process. This is partly caused by speculative projects submitting interconnection requests that are not ready to interconnect. It is also partly caused by

[17] *Id.*
[18] *Id.*

the serial nature of the interconnection process and the large number of small projects that have overwhelmed transmission provider resources. By way of example, in the PJM "H" queue opened in 2001, the average maximum facility output of resources that ultimately entered service was 663 MW.[19] In PJM's AB2 queue, the last queue window to be fully processed, 15 of 30 in-service resources had a maximum facility output of 50 MW or smaller, with an average maximum facility output of 122 MW. Conducting individual studies for single resources in a serial manner made sense when interconnection requests involved primarily larger generators. With the influx of numerous small projects seeking interconnection, the current interconnection review process is no longer viable. Clustering interconnection requests on a first-ready, first-served basis can combine interconnection request studies so that engineering resources are used in a more economical and efficient manner as compared to the first-come, first-served basis under the current process in PJM.

FERC defines the general contours of its proposed cluster study process as "(1) an interconnection request window; (2) a customer engagement window; (3) cluster studies including (a) a power-flow and voltage study, which is similar to a feasibility study under the *pro forma* LGIP, and (b) a stability and short circuit study, which completes the traditional system impact study; (4) a facilities study; (5) re-study, if needed; and (6) LGIA execution or filing of an unexecuted LGIA."[20] The PAPUC supports the Commission's proposal to require transmission providers to conduct first-ready, first-served cluster studies under the general structure laid out above, with refinements.

Specifically, FERC requests comment on whether to conduct cluster studies on subgroups of interconnection customers based on areas of geographic and electric relevance.[21] The PAPUC

[19] https://www.pjm.com/planning/services-requests/interconnection-queues
[20] NOPR, ¶61.
[21] NOPR, ¶77.

supports conducting cluster studies based on electric relevance or based on factors which will lead to clusters that are likely to contain resources needing the same network upgrades. Clustering by itself may decrease study times simply be requiring fewer overall studies

However, decreasing the number of studies is not the only problem that clustering should try to solve. The goal of clustering is two-fold, to reduce study times and to minimize the current first-mover disadvantage by sharing network upgrade costs among the interconnection customers that cause the need for the same upgrades.[22] The purpose of limiting clusters to interconnection customers that will share network upgrades is to properly align the signal created by network upgrade cases with all the requests that contribute to the need for the upgrade so that resources are incentivized to avoid those costs. If interconnection customers are included in clusters with other customers that do not share similar network upgrades, then that signal becomes muddled, and the incentive toward disciplined interconnection is lost. Ultimately, undisciplined interconnection leads to higher costs to consumers.

In the context of PJM, it is highly unlikely such an RTO-wide cluster will accomplish the second goal of logically grouping interconnection requests which are likely to cause the same network upgrades. In practice, interconnection customers rarely cause network upgrades beyond the immediate transmission system to which they are interconnecting. As such, there is little reason to cluster requests for interconnection in New Jersey with those in Indiana. PacifiCorp's 2020 interconnection reform proposal is illustrative. PacifiCorp's service area covers 141,000 square miles.[23] In their reform proposal, PacifiCorp explained that it "will cluster projects by electrical relevance, preventing interconnection customers from bearing the costs of upgrades in

[22] NOPR, ¶61, n. 124 (citing May Joint Task Force, statement of Chairman Dutrieuille).
[23] https://web.archive.org/web/20181120180238/http://www.pacificorp.com/about/co/cqf.html

distant areas of the system."[24] Likewise, PJM's service territory covers about 200,000 square miles. It would be similarly appropriate to cluster projects by electrical relevance over such a large service territory. Thus, in any final rule, the Commission should allow variation to allow for clustering by electrical relevance, particularly for large transmission providers.

2. The allocation of Network Upgrade costs should follow the cost-causation principle.

While limiting the scope of cluster studies is an appropriate avenue to share network upgrades among similarly situated interconnection customers, another method might be to use cost allocation to study how costs should be shared. In the NOPR, the Commission discusses options of allocating network upgrade costs within a cluster by: (1) the proportional capacity method, which is based on the proposed generating facility's MW capacity in proportion to the cluster's total MW capacity; or (2) the proportional impact method which is determined based on a distribution factor analysis.[25] The Commission further defines the proportional impact method as "a technical analysis conducted by the transmission provider to determine the degree to which each generating facility in the cluster contributes to the need for a specific network upgrade."[26]

Of the two options, FERC proposes requiring transmission providers to adopt the proportional impact method.[27] The PAPUC supports that proposal. As discussed in more detail above, the alignment of network upgrade costs among the interconnection customers who cause those costs is an important feature that cluster studies must actively seek to retain. Thus, the PAPUC generally agrees with FERC's goal, memorialized in the definition of proportional impact method, to determine the degree to which each generating facility in the cluster contributes to the

[24] PacifiCorp, Transmittal, Docket No. ER20-924-000, at n.107 (filed Jan. 31, 2020).
[25] NOPR, ¶85.
[26] NOPR, ¶88, n.150.
[27] NOPR, ¶88.

need for a specific network upgrade and to allocate the costs of a network upgrade in proportion with that contribution.

In contrast, in a broad cluster approach like that proposed by the Commission, the proportional capacity method would dampen the price signal that network upgrades send and reduce interconnection discipline. Large resources would continue to bear high network upgrade costs and would have an incentive to interconnect wisely. The small resources, which are becoming the norm in the interconnection queues, would not.[28] This would create a subsidy whereby large resources pay a share of unnecessary network upgrade costs caused by poor siting of smaller resources. For these reasons, the PAPUC supports the use of the proportional impact method to share network upgrade costs among the interconnection customers in the same cluster.

Finally, we note that limiting the scope of each cluster to those interconnection customers most likely to share the same network upgrades may reduce the need for the proportional impact method. Instead of determining the degree to which customer requests cause specific upgrades on the back end through cost allocation, clustering by electrical relevance may accomplish the same goal, making sure that interconnection customers are sharing the costs of network upgrades that they cause and from which they benefit. The Commission should examine whether limiting the scope of a cluster or cost allocation, or a combination of both, is the best method to share costs among interconnection customers causing the same network upgrades.

3. Reimbursing Network Upgrade costs incurred in earlier clusters may add complexity without commensurate benefit.

In addition to determining how to define the scope of a cluster and how to share costs within a cluster, FERC requests comment on later clusters that benefit from prior network upgrades

[28] See supra at 5.

being required to reimburse the members of the prior cluster.[29] The PAPUC is open to reimbursement of network upgrade costs by later customers for network upgrade costs incurred by previous clusters. However, while testing network upgrades already in service to determine if a later project should share in the cost might be appropriate, FERC should examine whether this additional testing slows the interconnection process. Given the scope of other changes, sharing between clusters may increase complexity without commensurate benefits. As such, FERC should not implement an inter-cluster sharing requirement as part of its final rule.

If FERC chooses to adopt an inter-cluster sharing requirement, sharing reimbursement should flow only from later clusters to earlier clusters. Once a customer signs a final agreement fixing its network upgrade costs, those costs should not be amended by FERC's sharing proposal. Later customers would be aware of the costs they are signing up for, whereas earlier customers might not. Unexpected imposition of costs may cause unnecessary queue dropouts leading to further delays.

FERC's other proposals may substantially accomplish the goals of inter-cluster sharing without the added complexity. Inter-cluster sharing will require an additional examination to determine if a new cluster should contribute to the cost of a prior cluster, and if so, by how much. Yet, by clustering according to electrical relevance and allocating costs through the proportional impact method, the benefits of cost-sharing may already be substantially obtained. The Commission should consider whether the added marginal fairness of inter-cluster sharing is worth the delay additional complexity causes.

[29] NOPR, ¶¶90-101.

4. Transmission Providers should provide access to information to allow disciplined interconnection planning.

Once incentives are aligned so that disciplined interconnection customers bear the costs they contribute to, it becomes important to provide them with the data to make informed decisions. To that end, the Commission proposes to require an "optional interconnection information study,"[30] which may precede a feasibility study. For each interconnection customer, the Commission limits the number of informational study requests to five and would require a $10,000 deposit, subject to true-up for actual study costs.[31]

The PAPUC recognizes the Commission's attempt to limit the use of these studies for speculative purposes by establishing request limits and study deposits. However, these protections do not fully alleviate the concern that that additional studies preceding the queue will merely move speculation and study delays forward in the process. Because the optional study is not binding on any party, the informational study accomplishes little to move an interconnection request through the queue. Further, the optional study may take limited resources away from interconnection request studies for projects in the interconnection queue. PJM, for its part, has likewise expressed that a factor contributing to the problem of queue delays is finding qualified engineers and consultants.[32] Adding a new study has the potential to exacerbate that issue.

While an optional study may be appropriate for some transmission providers, it may be inappropriate for others. Considering the breadth of the changes proposed in this NOPR and being adopted voluntarily by transmission providers,[33] the Commission should evaluate the results of those changes before engaging in requiring any new study processes which may serve to slow

[30] NOPR, ¶41.
[31] NOPR, ¶43.
[32] *PJM Interconnection Reform*, at 22, n. 68.
[33] See, e.g. *PJM Interconnection Reform*.

interconnection queues. Simply, FERC should not require transmission providers to bite off more than they can chew.

5. Public interconnection information may be a better use of resources than an optional informational study.

Alternatively, or to supplement the interconnection informational study, FERC proposes requiring transmission providers to publish public interconnection information in order to assist interconnection customers to make disciplined and efficient interconnection decisions, but limiting that information to avoid information security and grid vulnerability concerns.[34]

Specifically, the Commission proposes that the information include, at a minimum:

> [A] heatmap of estimated incremental injection capacity (in MW) available at each bus in the transmission provider's footprint under N-1 conditions, as well as providing a table of results showing the estimated impact of the addition of a proposed project (based on the user-specified MW amount, voltage level, and point of interconnection) for each monitored facility impacted by the proposed project on: (1) the distribution factor; (2) the MW impact (based on the proposed project size and the distribution factor); (3) the percentage impact on the monitored facility (based on the MW values of the proposed project and the monitored facility rating); (4) the percentage of power flow on the monitored facility before the proposed project; and (5) the percentage power flow on the monitored facility after the injection of the proposed project.[35]

Notably, PJM is in the process of implementing an interactive screening tool, which is scheduled to initially go live by the end of 2022, with geospatial features online by 2023.[36] In a stakeholder meeting held on September 28, 2022, PJM stated that the tool would have the ability

[34] NOPR, ¶¶49-52.
[35] NOPR, ¶51.
[36] https://www.pjm.com/-/media/committees-groups/subcommittees/ips/2022/20220928/item-05---overview-of-queue-scope.ashx.

to assess all types of generation, including batteries and merchant transmission, and would provide impacts and headroom for each point of interconnection.[37] Thus, transmission providers are already in the process of implementing tools like that proposed by FERC. And, while the exact nature of the data provided to interconnection customers may need adjustment, the PAPUC believes data such as the proposed heatmaps may provide good information to interconnection customers without the accordant costs to PJM and Transmission Owners caused by allowing interconnection customers to request the proposed optional interconnection information study.

Unlike the informational study process, it is less likely that public reports or databases will divert transmission providers' already limited resources away from conducting interconnection studies for resources that are already in the queue, moving those other resources forward. That is, once heatmaps, congestion information, or other public informational databases are established, fewer ongoing resources from transmission providers may be needed. This could free up engineering resources for conducting additional studies in the active interconnection queue, while still informing interconnection customers of points of interconnection requiring lower network upgrade costs. That transmission providers are already implementing these tools further illustrates the point: public interconnection information will not likely cause further delay in already-stressed queues.

6. Increased financial commitments and readiness requirements will serve to reduce speculative projects.

FERC proposes to implement reforms that would impose "more stringent financial commitments and readiness requirements for interconnection customers to remain in the interconnection queue to discourage speculative interconnection requests and allow transmission

[37] *Id.* at Slide 2.

providers to focus on processing viable interconnection requests and to better approximate the cost of the interconnection study process."[38] These proposed reforms pertain to: "(1) increased study deposits, (2) demonstration of site control, (3) commercial readiness, and (4) withdrawal penalties."[39] FERC also proposes to revise the existing system impact study and facilities study agreements to be consistent with the new cluster studies process.[40]

The PAPUC is generally supportive of these proposals that would mandate enhanced financial commitments and readiness requirements, which should disincentivize speculative and ill-prepared interconnection customers from submitting projects and thereby decrease congestion within the interconnection queue. This will permit transmission providers to devote their limited financial and staff resources to processing interconnection requests that have a greater chance of timely completion and placement into service. Notably, PJM's June 14, 2022 filing with FERC at Docket No. ER22-2110-000, which proposed reforms to its own queue process, included similar commitment and readiness requirements.[41] As a member of the Organization of PJM States, Inc. (OPSI), the PAPUC likewise supported PJM's proposed queue reforms through OPSI's July 14, 2022 comments to the *PJM Interconnection Reform* proceeding.[42]

7. FERC should consider how the transition to any final rule will affect PJM's interconnection process reform.

FERC also proposes "to require transmission providers to offer existing eligible, interconnection customers the options, for each project in the queue, to either enter a transitional

[38] NOPR ¶103.
[39] NOPR ¶¶39, 103.
[40] NOPR ¶76.
[41] *PJM Interconnection, L.L.C*, Tariff Revisions for Interconnection Process Reform, Request for Commission Action .by October 3, 2022, and Request for 30-Day Comment Period, Docket No. ER22-2110-000 (June 14, 2022) (*PJM Interconnection Reform*).
[42] *PJM Interconnection Reform*, Comments of OPSI at 4-5.

serial interconnection facilities study or a transitional cluster study, with commercial readiness requirements, or to permit them to withdraw from the interconnection queue without penalty."[43]

The PAPUC agrees that a transition process is necessary to integrate FERC's proposed queue reforms to allow individual interconnection customers the opportunity to decide, based on the newly adopted minimum interconnection parameters, whether to remain in the queue. The PAPUC notes, however, that in the *PJM Interconnection Reform* proceeding, currently pending before FERC, PJM has proposed a transition process for its own interconnection queue. PJM's proposed reforms adopt many of FERC's proposals, including increased readiness requirements, financial commitments, and a first-ready, first-served cluster study process. *PJM Interconnection Reform* at §§ I.A and IV.B.4. As such, given the likelihood that the queue reform transition periods of FERC and PJM will overlap, the PAPUC advises that FERC strive to reduce the risk of confusion and uncertainty for interconnection customers, thereby averting related delays in the interconnection queue.

[43] NOPR, ¶156.

IV. CONCLUSION

The PAPUC respectfully requests the Commission to consider its comments.

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Dated: October 13, 2022

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that I am on this date serving a copy of the foregoing comments upon each person designated on the official service list compiled by the Federal Energy Regulatory Commission in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure.

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