

184 FERC ¶ 61,069
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Willie L. Phillips, Acting Chairman;
James P. Danly, Allison Clements,
and Mark C. Christie.

California Independent System Operator Corporation Docket No. ER23-2058-000

ORDER ACCEPTING TARIFF REVISIONS

(Issued August 1, 2023)

1. On June 2, 2023, the California Independent System Operator Corporation (CAISO) submitted, pursuant to section 205 of the Federal Power Act,¹ proposed revisions to its Open Access Transmission Tariff (Tariff) to amend its Generator Interconnection and Deliverability Allocation Procedures (GIDAP) provisions for queue cluster 14 (Cluster 14) and queue cluster 15 (Cluster 15). In this order, we accept CAISO's proposed Tariff revisions, effective August 2, 2023, as requested.

I. Background

A. CAISO Generator Interconnection Cluster Studies

2. In April of each year, CAISO opens an interconnection request application window and begins a new two-year interconnection cluster study process to identify the interconnection facilities and network upgrades that are needed to interconnect new generation resources to CAISO's transmission system, estimate the costs of those upgrades, and allocate those costs among interconnection customers sharing the upgrades.² The cluster study methodology layers the new cluster of generation upon

¹ 16 U.S.C. § 824d.

² CAISO Transmittal at 2, 4 (citing CAISO, CAISO eTariff, app. DD, § 3 Interconnection Requests (15.0.0), § 3.3.1). In addition to the cluster study approach, CAISO separately allows independent study and fast track interconnection processes, provided that the proposed resource satisfies the Tariff requirements for such requests. *Id.* (citing CAISO, CAISO eTariff, app. DD, § 4 (Independent Study Process) (11.0.0) *id.*, § 5 (Fast Track Process) (3.0.0)). CAISO states that it is not proposing any changes to the independent study process or the fast-track process. *Id.* at 2 n. 3.

all existing generation and previous interconnection requests and network upgrades approved through CAISO's transmission planning process.³ CAISO's interconnection cluster study consists of Phase I and Phase II interconnection studies,⁴ with annual reassessments to account for changes in the interconnection queue.⁵ The Phase II study refines the cost estimates provided in Phase I based upon changes in queue and deliverability allocation results.⁶ After the interconnection customer receives its Phase II study, it negotiates and executes a generator interconnection agreement (GIA) with CAISO and the relevant transmission owner.⁷

3. CAISO asserts that because the most common change in the queue is the withdrawal of some interconnection customers, the Phase II interconnection studies and annual reassessments typically remove no longer needed upgrades from interconnection customers' studies, thereby reducing remaining interconnection customers' cost responsibilities.⁸

B. Cluster 14

4. CAISO states that it received an unprecedented volume of interconnection requests for Cluster 14, representing a 241% increase above the previous record-high cluster.⁹ CAISO notes that the increase required CAISO to revise its interconnection study deadlines for Cluster 14, which the Commission approved in September 2021, shortly after Cluster 14 began.¹⁰ CAISO states that after CAISO and its transmission owners completed Cluster 14 Phase I studies on schedule in fall 2022, a new challenge emerged: due to the high levels of generation procurement in California and financial

³ *Id.* at 2.

⁴ Phase I Interconnection Study and Phase II Interconnection Study are defined in Tariff Appendix A, Definitions. CAISO, CAISO eTariff, app. A (Phase I Interconnection Study) (1.0.0) *id.*, Phase II Interconnection Study (0.0.0).

⁵ CAISO Transmittal at 3 (citing CAISO, CAISO eTariff, app. DD, § 2 (Scope and Application) (7.0.0), § 2.4.3).

⁶ *Id.* at 4.

⁷ *Id.* (citing CAISO, CAISO eTariff, app. DD, § 13 (GIA) (4.0.0)).

⁸ *Id.*

⁹ *Id.* at 5.

¹⁰ *Id.* (citing *Cal. Indep. Sys. Operator Corp.*, 176 FERC ¶ 61,207 (2021)).

strength in the industry, less than 40% of Cluster 14 interconnection customers withdrew after Phase I, compared to about 60% of interconnection customers that typically withdraw after Phase I.¹¹ CAISO asserts that this problem is intensified because the majority of the interconnection customers remaining in the queue are in the single transmission owner territory of Pacific Gas and Electric Company.¹² CAISO contends that in addition to impacting Cluster 15 (*see infra* section I.C), this is a problem for Cluster 14 because the current remaining Cluster 14 deadlines were premised on a typical withdrawal rate, which did not occur.¹³

5. CAISO states that its Tariff requires CAISO and each transmission owner to publish Cluster 14 Phase II studies by November 24, 2023, with deliverability results and second financial security postings due shortly thereafter.¹⁴ CAISO states that transmission owners have indicated that they cannot meet these deadlines based on the large volume of interconnection requests remaining in the queue.¹⁵

C. Cluster 15

6. CAISO states that prior to beginning Cluster 15, it implemented enhancements to reduce queue volumes, which included increased site exclusivity and third-party interconnection facility requirements.¹⁶ Despite those enhancements, CAISO states that Cluster 15 received 541 interconnection requests – a 45% increase above the Cluster 14 interconnection requests and a new record-high. CAISO asserts that it is not possible to study Cluster 15 interconnection requests based on CAISO's existing study timelines.¹⁷ CAISO explains that conducting both Phase II studies for Cluster 14 and Phase I studies for Cluster 15 is premised on a manageable number of requests going into Cluster 14 Phase II.¹⁸ CAISO asserts that the Cluster 14 Phase II requests were not manageable (*see*

¹¹ *Id.* at 5-6.

¹² *Id.* at 6.

¹³ *Id.*

¹⁴ *Id.* at 6-7 (citing CAISO, CAISO eTariff app. DD, § 16 (Cluster 14 Unique Procedures) (3.0.0), § 16.1).

¹⁵ *Id.* at 7.

¹⁶ *Id.* (citing *Cal. Indep. Sys. Operator Corp.*, 180 FERC ¶ 61,143 (2022)).

¹⁷ *Id.*

¹⁸ *Id.* at 8.

supra section I.B), and Cluster 15 is simply too large on its own. CAISO adds that conducting meaningful scoping meetings for 541 interconnection requests could take several months before Cluster 15 studies commence, diverting valuable resources from Cluster 14 study work.

II. CAISO's Proposal

7. CAISO proposes revisions to its Tariff to extend remaining Cluster 14 deadlines and pause Cluster 15. CAISO represents that the unprecedented volume of interconnection requests in both Clusters 14 and 15 require additional time and process to complete. CAISO asserts that pausing Cluster 15 will allow CAISO and its transmission owners to finish Cluster 14 interconnection studies and develop enhanced procedures in 2023 for the new reality of voluminous cluster studies, including Cluster 15.¹⁹ CAISO requests that the Commission approve the proposed revisions with an effective date of August 2, 2023.

A. Cluster 14 Extended Timelines

8. CAISO proposes to extend the remaining interconnection study deadlines for Cluster 14 by two months, as shown in the table below. CAISO states that these extended deadlines are based on CAISO's conversations with the transmission owners, adding that CAISO and the transmission owners believe that these deadlines are achievable without requiring further extensions. CAISO asserts that completing the Cluster 14 interconnection studies is a priority to ensure sufficient resources in both the near- and long-term future. CAISO also states that it and the transmission owners have made every effort to complete the Cluster 14 interconnection studies.²⁰

	Current Deadline	Proposed Deadline
Phase II Study Results	November 24, 2023	January 31, 2024
Transmission Plan Deliverability Results	March 23, 2024	May 31, 2024
Second Financial Security Posting Due	May 4, 2024	July 1, 2024

¹⁹ *Id.* at 1.

²⁰ *Id.* at 8.

B. Pausing Cluster 15

9. CAISO states that Cluster 15 consists of 541 interconnection requests totaling 354 GW, which it explains is an unprecedented volume in the interconnection queue, and seven times more capacity than CAISO's peak demand.²¹ CAISO asserts that it cannot begin to study Cluster 15 while completing the Cluster 14 Phase II studies. Furthermore, CAISO states that even without Cluster 14, CAISO and its transmission owners could not comply with the currently effective interconnection study deadlines. Therefore, CAISO proposes to revise its Tariff to pause Cluster 15 while it finishes the Cluster 14 interconnection studies. CAISO states that, similar to the Cluster 14 Tariff provisions approved by the Commission, CAISO proposes to revise the Cluster 15 schedule with five "express exceptions" to the current interconnection procedures.²²

10. First, CAISO proposes to validate Cluster 15 interconnection requests by September 26, 2024. CAISO notes that it has already finished the completeness review for Cluster 15. CAISO explains that validation is the process in which CAISO and the transmission owners review each interconnection request for technical deficiencies.²³

11. Second, CAISO proposes a new provision that will allow Cluster 15 interconnection customers to refresh their requests by making any necessary modifications between May 1, 2024, and September 26, 2024. CAISO states that this is a prudent step because the requests will have sat dormant for a year. CAISO explains that prohibiting modifications before May 1 will ensure that CAISO and the transmission owners can focus on completing Cluster 14 studies and holding meaningful results meetings. CAISO explains that interconnection customers may not increase their interconnection service capacity, but may increase generating capacity, change or modify fuel or technologies, or make other modifications currently permissible. CAISO states that it will assess any costs for processing the modification to the interconnection customer's interconnection study deposit. CAISO states that making these refresh modifications will not affect the interconnection customers' rights to modify their interconnection requests later in the study process.²⁴

12. Third, CAISO proposes a new provision to permit Cluster 15 interconnection customers that withdraw their interconnection requests before April 1, 2024, to receive a

²¹ *Id.* at 8-9.

²² *Id.* at 9.

²³ *Id.*

²⁴ *Id.*

refund of their study deposits and any site exclusivity deposits.²⁵ CAISO explains that this provision does not otherwise change an interconnection customer's rights to withdraw and receive applicable refunds once Cluster 15 restarts.²⁶

13. Fourth, CAISO proposes to clarify that interconnection requests in Cluster 15 will not progress or be subject to typical study requirements until CAISO validates them, which effectively puts Cluster 15 on hold until September 26, 2024. CAISO states that GIDAP provisions stating when CAISO and transmission owners must initiate and publish interconnection studies will not apply, nor will the deadlines, rights, and responsibilities under the GIDAP that are contingent on the publication of interconnection studies. CAISO explains that in the meantime, it will work with stakeholders in CAISO's interconnection process enhancements initiative to develop the remaining study deadlines and procedures for Cluster 15. CAISO explains that it believes this approach will be more effective for Cluster 15 than it was for Cluster 14, where CAISO and stakeholders quickly developed timelines immediately after the application window. According to CAISO, by pausing Cluster 15 now and submitting the timelines in a subsequent filing, CAISO and stakeholders will have more time to develop modifications to the GIDAP for prioritizing interconnection requests for study, consider workable timelines, and identify any other needed enhancements.²⁷

14. Fifth, CAISO proposes to include a provision stating that it will not accept independent study process (ISP)²⁸ interconnection requests until Cluster 15 has received its Phase I interconnection study results.²⁹ CAISO explains that it currently has many active interconnection requests in every study area. To prevent queue jumping and diverting planners away from the cluster studies, the Tariff already puts independent study requests on hold while cluster studies are in progress;³⁰ however, CAISO still

²⁵ *Id.* at 10.

²⁶ *Id.*

²⁷ *Id.*

²⁸ The ISP is a procedure for evaluating an Interconnection Request for a Generating Facility independently of the process applicable to a Generating Facility assigned to a Queue Cluster or the Fast Track Process. CAISO, CAISO eTariff app. A, (Independent Study Process) (0.0.0), app. DD, *id* § 4 (Independent Study Process) (11.0.0).

²⁹ CAISO Transmittal at 10.

³⁰ *Id.* (citing CAISO, CAISO eTariff, app. DD, § 4 (Independent Study Process) (11.0.0), § 4.1.5).

accepts independent study requests during the cluster studies. CAISO states that it holds these requests and then conducts the independent studies once the cluster results are finalized.³¹ CAISO contends that because so much time will pass to complete the Cluster 14 Phase II studies and the Cluster 15 Phase I studies, it is concerned that a large backlog of independent study requests will build up. CAISO notes that even though developers know that CAISO will not study the independent study requests, they may have an incentive to submit them to be first in a long line. CAISO explains that it would have to hold the independent study request and all deposits in the interim, and then lose significant time between cluster studies as it conducts each independent study serially. CAISO states that to avoid this unnecessary challenge, it proposes not to accept independent study requests until it is able to conduct the studies.³²

15. CAISO also proposes to include a provision clarifying that it will include Cluster 15 interconnection requests in the list of interconnection requests available on CAISO's website, as applicable.³³ CAISO states that it and its stakeholders believe that it is prudent to publicize the data even though Cluster 15 interconnection studies will not commence for some time. CAISO states that this will allow developers and load-serving entities (LSEs) to understand the level of interest at different points of interconnection and among different generating technologies.³⁴

III. Notice of Filing and Responsive Pleadings

16. Notice of CAISO's filing was published in the *Federal Register*, 86 Fed. Reg. 37,527 (June 8, 2023) with protests and interventions due on or before June 23, 2023. Calpine Corporation, Pacific Gas and Electric Company, Southern California Edison Company, Modesto Irrigation District, and the Cities of Anaheim, Azusa, Banning, Colton, Pasadena, and Riverside, California filed timely motions to intervene. Northern California Power Agency (NCPA) filed a timely motion to intervene and comments.

17. NCPA states that it understands the problem that CAISO is facing with an overwhelming number of requests in the queue, and that it does not oppose CAISO's proposed Tariff revisions even though the end result will delay opportunities for anyone

³¹ *Id.*

³² *Id.* at 11.

³³ *See* CAISO, CAISO eTariff, app. DD, § 3 (Interconnection Requests) (15.0.0), § 3.6.

³⁴ CAISO Transmittal at 11.

to propose projects in the immediate future.³⁵ However, NCPA states that it is concerned that the planned future adjustments to the interconnection process must provide an opportunity for all LSEs to submit applications to interconnect projects, including those that are not jurisdictional to the California Public Utilities Commission (CPUC) or parties to the memorandum of understanding between the CPUC, the California Energy Commission, and CAISO regarding transmission and resource planning and implementation. NCPA notes that CAISO has already initiated a stakeholder process to consider these future adjustments to the interconnection process and at least contemplates approaches that include attention to the needs of non-CPUC-jurisdictional LSEs. NCPA states that it expects to be actively involved in the process and believes that CAISO's adherence to this principle should obviate NCPA's concerns. NCPA also states that it is optimistic that the outcome of the stakeholder process will consider the resource needs of all CAISO LSEs.³⁶

IV. Discussion

A. Procedural Matters

18. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2022), the timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding.

B. Commission Determination

19. We find CAISO's proposed revisions to its Tariff to amend its GIDAP provisions for Clusters 14 and 15 to be just and reasonable and not unduly discriminatory or preferential and therefore accept them, effective August 2, 2023, as requested. CAISO explains why it is not possible to process Clusters 14 and 15 under the existing timeframe in its Tariff and proposes revisions that establish a transparent and reasonable approach for addressing the unprecedented challenges raised by Clusters 14 and 15.

20. Accordingly, we agree with CAISO that its proposal to extend the interconnection study deadlines for Cluster 14 will help ensure that, under the circumstances, CAISO and its transmission owners have sufficient time to study these interconnection requests. In addition, we agree with CAISO that it is reasonable for CAISO and the transmission owners to pause Cluster 15 while they finish the Cluster 14 interconnection studies. We also agree with CAISO that its proposal to not accept ISP interconnection requests until Cluster 15 has received its Phase I interconnection study results will prevent a large backlog of ISP requests. Additionally, under CAISO's Tariff, ISP interconnection

³⁵ NCPA Comments at 3-4.

³⁶ *Id.* at 4.

requests are evaluated using information from the most recent cluster study results.³⁷ Therefore, the proposal to not accept ISP interconnection requests concurrent with the delay in Cluster 15 will ensure the appropriate information is used in future ISP interconnection studies. We note that CAISO represents that its stakeholders support prioritizing the completion of Cluster 14 before diverting resources to study Cluster 15 and CAISO states that its proposed revisions will enable CAISO to work with stakeholders to develop meaningful reforms for processing Cluster 15.³⁸

21. We note that NCPA supports the proposal and that its comments regarding potential future enhancements are outside the scope of this section 205 filing.

The Commission orders:

CAISO's proposed Tariff revisions are hereby accepted, effective August 2, 2023, as requested,³⁹ as discussed in the body of this order.

By the Commission. Commissioner Clements is concurring with a separate statement attached.

(S E A L)

Debbie-Anne A. Reese,
Deputy Secretary.

³⁷ See, e.g., CAISO, CAISO eTariff, app. DD, § 4 (Independent Study Process) (11.0.0), § 4.2.

³⁸ CAISO Transmittal at 11.

³⁹ Although CAISO's transmittal stated that the revisions were filed under Section 205 of the FPA and requested an effective date that is 61 days from the filing date, CAISO entered 12/31/9998 into the Tariff Record Proposed Effective Date in eTariff. Commission staff will revise the effective date in eTariff.

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation

Docket No. ER23-2058-000

(Issued August 1, 2023)

CLEMENTS, Commissioner, *concurring*:

1. I support today's draft order granting California Independent System Operator Corporation (CAISO)'s requests to extend the timelines for its massive Cluster 14 interconnection queue cluster and to pause its (even more massive) Cluster 15 interconnection queue cluster. As discussed in the order, these measures will allow CAISO an opportunity to address the unprecedented challenges raised by Clusters 14 and 15.¹

2. The issues that CAISO is facing are emblematic of the unbearable queue delays and costs that interconnection customers and utilities are facing around the country. Order No. 2023, "Improvements to Generator Interconnection Procedures and Agreements," includes reforms that will improve interconnection processes across the country. However, as I noted in my concurrence, while the rule "can be expected to improve matters, more will be necessary to solve the problem."² Therefore, I urge all transmission providers to consider the additional reforms and improvements to generator interconnection processes that I discuss in detail in my concurrence to Order No. 2023, which I've appended below for convenience.

For these reasons, I respectfully concur.

Allison Clements
Commissioner

¹ Cluster 14 included 343 interconnection requests, a 241% increase above CAISO's previous record-high cluster. Cluster 15 included 541 interconnection requests, a 45% increase above Cluster 14.

² *Improvements to Generator Interconnection Procedures & Agreements*, Order No. 2023, 184 FERC ¶ 61,054 (2023) (Clements, Comm'r, concurring at P 3).

Appendix A

UNITED STATES OF AMERICA FEDERAL ENERGY REGULATORY COMMISSION

Improvements to Generator Interconnection Procedures
and Agreements

Docket No. RM22-14-000

(Issued July 28, 2023)

CLEMENTS, Commissioner, *concurring*:

1. As the findings of this final rule illustrate, our nation is facing a grid infrastructure crisis. Five years ago, the Commission issued Order No. 845 in an effort to improve interconnection queue delays, noting that “despite Commission efforts to improve the interconnection process . . . many interconnection customers experience delays, and some interconnection queues have significant backlogs and long timelines.”¹ Unfortunately, the same observation can be made today, only the problem has gotten far worse.² As of the end of 2022, a staggering 10,000 projects representing over 2,000 GW of potential generation and storage capacity are stuck in line to connect to the grid.³ That is nearly double the 1,250 GW of total installed capacity in the United States today.⁴ Wait times have “increased markedly,” with Lawrence Berkeley National Lab reporting that “[t]he typical project built in 2022 took 5 years from the interconnection request to commercial operations, compared to 3 years in 2015 and [less than] 2 years in 2008.”⁵ Meanwhile,

¹ *Reform of Generator Interconnection Procs. & Agreements*, Order No. 845, 83 FR 21342 (May 9, 2018), 163 FERC ¶ 61,043, at P 24 (2018), *order on reh’g*, Order No. 845-A, 166 FERC ¶ 61,137, 84 FR 8156 (Mar. 6, 2019), *order on reh’g*, Order No. 845-B, 168 FERC ¶ 61,092 (2019).

² *See Improvements to Generator Interconnection Procedures and Agreements*, Order No. 2023, 184 FERC ¶ 61,054, at PP 37-40 (2023) [hereinafter Final Rule].

³ Joseph Rand et al., Lawrence Berkeley Nat’l Lab’y, *Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection As of the End of 2022*, at 7-8 (Apr. 2023), https://emp.lbl.gov/sites/default/files/queued_up_2022_04-06-2023.pdf [hereinafter Queued Up 2023].

⁴ *Id.* at 10.

⁵ *Id.* at 3.

interconnection costs have increased significantly.⁶ Project completion rates are very low,⁷ and late-stage withdrawal is becoming more common.⁸ In addition, the typical timespan between the execution of a project's interconnection agreement and its commercial operations date has also increased, from roughly 17 months for projects built between 2007-2014 to around 22 months for projects built between 2015-2022.⁹

2. Ultimately, the dysfunction of the interconnection process harms consumers. It prevents low-cost generation from coming online that could have reduced the cost of electricity,¹⁰ and it harms reliability. Several of the nation's largest grid operators have stated that they could face resource adequacy problems if new resource entry does not occur rapidly enough to match the pace of resource retirements.¹¹ Given these challenges and their attendant impacts on consumers, I enthusiastically support this final rule, which includes a number of helpful reforms that will improve interconnection processes across the country. The bulk of these reforms will widely extend proven best practices to utilities around the country.

3. What we have learned through consideration of comments to and stakeholder engagement about the Commission's Notice of Proposed Rulemaking, however, is that while this rule can be expected to improve matters, more will be necessary to solve the problem. What was perhaps considered a straightforward kitchen renovation has become

⁶ See Final Rule at P 41 (detailing interconnection cost increases seen across different regions).

⁷ See Queued Up 2023 at 18-20.

⁸ *Id.* at 22.

⁹ *Id.* at 30.

¹⁰ See, e.g., T. Bruce Tsuchida et al., The Brattle Grp., *Unlocking the Queue with Grid-Enhancing Technologies: Case Study of the Southwest Power Pool* at 9 (Feb. 1, 2021), https://watt-transmission.org/wp-content/uploads/2021/02/Brattle_Unlocking-the-Queue-with-Grid-Enhancing-Technologies_Final-Report_Public-Version.pdf90.pdf (estimating that integrating 2,670 MW of new generation in the Southwest Power Pool would yield annual production cost savings of \$175 million).

¹¹ See PJM Interconnection, LLC, *Energy Transition in PJM: Resource Retirements, Replacements & Risks* at 2 (Feb. 24, 2023), [energy-transition-in-pjm-resource-retirements-replacements-and-risks.ashx](https://www.pjm.com/~/media/committees-and-panels/energy-transition-in-pjm-resource-retirements-replacements-and-risks/energy-transition-in-pjm-resource-retirements-replacements-and-risks.ashx); Midcontinent Indep. Sys. Operator, *2022 Regional Resource Assessment* at 4, 20 (Nov. 2022), <https://cdn.misoenergy.org/2022%20Regional%20Resource%20Assessment%20Report627163.pdf>; California Indep. Sys. Operator, *Summer Loads and Resources Assessment* at 20 (May 18, 2022), <https://www.caiso.com/Documents/2022-Summer-Loads-and-Resources-Assessment.pdf>.

more complicated. After we have removed the cabinets and taken out the drywall, we have discovered outdated wires, rusted pipes and cracks in the foundation. None of these additional challenges are insurmountable, but they are in some ways more fundamental to getting that modern, working kitchen up and running.

4. I therefore write separately to highlight some of the remaining issues and potential solutions parties have brought forward that may address the remainder of the full interconnection reform challenge, as well as to encourage stakeholders to remain focused on taking additional critical steps toward addressing these issues.

5. I do not suggest that solving the remaining challenges related to interconnection will be easy. The record reveals quite the opposite. A comprehensive solution set will require out-of-the-box thinking in some areas and continued incremental improvements in others.

6. Fortunately, we have received many thoughtful suggestions for further reforms, which serve as the seeds for future solutions. Below, I discuss two categories of promising ideas meriting further discussion: (1) deeper reforms that get at some of the remaining fundamental challenges with interconnection processes; and (2) additional nuts and bolts changes that could enhance the effectiveness of a variety of interconnection processes, but which were not part of the proposal giving rise to this final rule.

7. I urge stakeholders to examine these and related suggestions, and for transmission planners to adopt regionally appropriate solutions beyond those required by this final rule.

I. Deeper reforms

8. In considering interconnection processes across the country, twin challenges emerge as the most fundamental problems. First, interconnection studies initially examine clusters of projects that often bear little resemblance to what ultimately interconnects to the system. They rely on a long and painful process of attrition to arrive at a final set of projects along with corresponding network upgrades.

9. More specifically, processes that rely solely on interconnection applications to determine study scope, and which require substantial study work for each customer based on inputs that depend on other projects in the queue, have become overwhelmed. For example, S&P reports that the California Independent System Operator (CAISO) received more than 350 GW of projects in its latest application window, driving its total

queue to over 500 GW.¹² Meanwhile, the Midcontinent Independent System Operator's (MISO) queue has ballooned to 339 GW, while PJM Interconnection, LLC's (PJM) has risen to 298 GW, both comfortably greater than the present installed capacity of either region.¹³ According to a recent CAISO stakeholder presentation, “[t]he massive increase in interconnection requests seeking to meet the accelerated cadence of resource development . . . has overwhelmed critical planning and engineering resources across the industry. . . . The current generator interconnection processes simply cannot efficiently accommodate the latest level of interconnection requests received.”¹⁴ Other queues are similarly overwhelmed.¹⁵

10. Second, project developers face enormous cost uncertainty.¹⁶ Initial study results may be far different from final costs because the number of projects reaching the facilities study stage (the final stage before the execution of a generator interconnection agreement) can be far fewer than those earlier examined in the cluster study stage. As CAISO observed in a recent stakeholder presentation, its “[s]tudy results lose accuracy, meaning and utility when the level of cluster [Interconnection Resource] capacity [is] multiple times the existing or planned transmission capacity for an area.”¹⁷

¹² Garrett Hering, *California ISO Tackles ‘Broken’ Interconnection Process as Queue Tops 500 GW*, S&P GLOBAL (July 19, 2023); see also CAISO, *Cluster 15 Interconnection Requests*, <http://www.caiso.com/planning/Pages/GeneratorInterconnection/Default.aspx> (last visited July 26, 2023).

¹³ Queued Up 2023 at 9-10.

¹⁴ CAISO, *2023 Interconnection Process Enhancements: Summary of June 20 & 21 Track 2 Working Group Meeting – Revised Principles and Problem Statements 1 and 2*, at 4 (June 23, 2023), <http://www.caiso.com/InitiativeDocuments/Revised-Principles-and-Problem-Statements-Interconnection-Process-Enhancements-2023-Track%202-Jun%2020-212023.pdf>.

¹⁵ See Queued Up 2023 at 9 (showing very large amounts of queue capacity across several regions).

¹⁶ See Final Rule at P 43 (“Cost uncertainty poses an especially significant obstacle because interconnection customers may not be able to finance substantial increases in unexpected interconnection costs.”). For example, in one relatively recent interconnection cluster in MISO, the preliminary system impact study estimated \$3.2 billion in network upgrades for 31 projects, but that estimate was cut to only \$330 million by Decision Point I after more than half of the projects withdrew. See *Midcontinent Indep. Sys. Operator*, 169 FERC ¶ 61,173, at P 11 (2019).

¹⁷ CAISO, *2023 Interconnection Process Enhancements Track 2 Working Group*

11. Today's final rule will help to ameliorate these problems. In particular, the rule's site control requirements,¹⁸ requirement for an interconnection customer to select a definitive point of interconnection,¹⁹ commercial readiness requirements,²⁰ and withdrawal penalty framework²¹ will each contribute to more streamlined study clusters. As we have learned through this proceeding, however, they will likely be inadequate, on their own, to fully solve these deep challenges.²²

12. In my estimation, the record of this proceeding, as well as recent stakeholder initiatives, suggest several options for further improvement. They are not necessarily exclusive of one another, and appropriate application may depend on the particular regional context. They include: (1) linking the interconnection process to proactive transmission system planning; (2) in applicable regions, aligning the interconnection process more closely with competitive resource solicitations; and (3) transitioning to a "focused" interconnection process or "connect and manage" approach for all energy-only resources.

A. Link the interconnection process to proactive transmission system planning

13. Foundationally, it should be acknowledged that for interconnection reform to succeed, holistic, forward-looking transmission planning, as included in the

at 10 (July 11, 2023), <http://www.aiso.com/InitiativeDocuments/Presentation-Interconnection-Process-Enhancements-2023-Track-2-Working-Group-Jul112023.pdf>.

¹⁸ See Final Rule at PP 583-612.

¹⁹ *Id.* at PP 200-03.

²⁰ *Id.* at PP 690-707.

²¹ *Id.* at PP 780-813].

²² The Arizona Corporation Commission, for example, argues that "first-ready" queue reforms that are not explicitly linked to an effective rationing process will likely fail to help resolve the growing backlog. Some mechanism to prioritize projects and allocate scarce interconnection access to the highest quality projects is likely needed." Arizona Commission Initial Comments at 1-2. Similarly, a coalition of consumer groups and the R Street Institute argues that the Commission's notice of proposed rulemaking in this proceeding "leaves many critical reforms unresolved." R Street Institute et al. June 8, 2023 Comments in Support of Generator Interconnection Reform Under RM22-14, at 2. See also Cypress Creek Initial Comments at 12 (arguing that "a cluster-based approach alone, without further changes, will not provide adequate reform").

Commission's notice of proposed rulemaking on regional planning and cost allocation,²³ must also succeed. Interconnection processes are overloaded in part because they are being relied on to build out core transmission system infrastructure that should be considered in regional planning processes. We know interconnection processes were not intended for, and are ill suited to perform, this task. As a coalition of consumer groups and the R Street Institute argues in a recent letter to the Commission, "[t]he cost of network upgrades can be dramatically reduced through proactive regional transmission planning, which enables major reductions in [Generator Interconnection] requirements and delays."²⁴ Even prior to the adoption of any final rule in the Commission's regional transmission planning proceeding, individual transmission providers can make significant strides toward the cost-effective construction of new transmission infrastructure via regionally tailored proposals and initiatives.²⁵

14. There may also be opportunities to streamline the interconnection process by more closely linking it to the transmission system planning process,²⁶ or to carry out forward-looking interconnection studies driven by a more holistic assessment of interconnection needs.

15. Southwest Power Pool (SPP) and its stakeholders have embarked on a potentially promising initiative along these lines, which proposes a "Consolidated Planning Process" that would connect SPP's interconnection process to its regional transmission planning process.²⁷ Similarly, CAISO is seeking to "[p]rioritize interconnection in zones where

²³ See *Building for the Future Through Elec. Reg'l Transmission Planning & Cost Allocation & Generator Interconnection*, 179 FERC ¶ 61,028 (2022).

²⁴ R Street Institute et al. June 8, 2023 Comments in Support of Generator Interconnection Reform Under RM22-14, at 2.

²⁵ See, e.g., MISO, *MTEP21 Report Addendum: Long Range Transmission Planning Tranche 1 Executive Summary* at 1 (2022), <https://cdn.misoenergy.org/MTEP21%20Addendum-LRTP%20Tranche%201%20Report%20with%20Executive%20Summary625790.pdf> (describing a proposed "portfolio of 18 transmission projects located in the MISO Midwest Subregions with a total investment of \$10.3 billion, and benefit-to-cost ratios average of 2.6").

²⁶ See, e.g., AEE Initial Comments at 10-13 (advocating for a closer linkage between transmission planning and generator interconnection).

²⁷ See Southwest Power Pool, *Consolidated Planning Process Task Force*, <https://www.spp.org/stakeholder-groups-list/organizational-groups/board-of-directorsmembers-committee/consolidated-planning-process-task-force/> (last visited July 26, 2023); Southwest Power Pool, *Consolidated Planning Process: Phase 1*

transmission capacity exists or new transmission has been approved, while providing opportunities to identify and provide alternative points of interconnection or upgrades.”²⁸ Like SPP, CAISO aims to overhaul a bloated queue that requires initial studies that bear little relation to transmission system reality, and instead chart a course to a new process that produces “meaningful study results that take into account system capability, resource planning and procurement.”²⁹

16. The promise of a forward-looking approach is also becoming clear through the ongoing effort that MISO and SPP are pioneering in the affected systems context. That effort, known as the Joint Targeted Interconnection Queue (JTIQ), examines a larger portfolio of projects to identify solutions that more efficiently solve their collective

Recommendations (May 17, 2023), <https://www.spp.org/spp-documents-filings/?id=297513> (when accessing “CPPTF Meeting Materials 20230621”). SPP proposes to calculate an “entry fee,” which would involve per-MW costs of any “regional” or “sub-regional” interconnection network infrastructure, along with a “local” component derived from a narrower reliability assessment examining any necessary facilities at the point of interconnection. See Southwest Power Pool, *CPP Entry Fee Rate Structure*, at 20 (July 14, 2023), <https://www.spp.org/spp-documents-filings/?id=297513> (when accessing “CPPTF Meeting Materials 20230714”) (setting forth entry fee components). The key to SPP’s proposal, as I understand it, is that the regional and sub-regional components of the entry fee would be identified by “forward-casting,” a “longer-term assessment” derived from estimated costs of interconnecting resources in a fashion that is integrated with SPP’s long-term regional plan. *Id.* By assessing costs across a broader range of projects than any individual cluster, and by calculating it based on SPP’s proactive planning vision rather than calculating costs for a hypothetical cluster of initial applicants that will not all reach commercial operation, SPP may be able to offer far greater cost certainty for project developers and thereby greatly streamline and accelerate the interconnection process. *Id.* at 11, 19 (illustrating a greatly simplified flow chart for the consolidated planning approach as compared to SPP’s status quo).

²⁸ CAISO, *2023 Interconnection Process Enhancements Track 2 Working Group* at 9 (July 11, 2023), <http://www.caiso.com/InitiativeDocuments/Presentation-Interconnection-Process-Enhancements-2023-Track-2-Working-Group-Jul112023.pdf>.

²⁹ *Id.*

needs.³⁰ By assessing larger, long-term system needs across study clusters, this approach identifies efficiencies that could not be captured on a more project-specific basis.³¹

17. As these regions' proposals are still in flux and have yet to be filed with the Commission, I do not prejudge them. But, at a high level, it appears that these types of approaches may hold the potential to provide developers more certainty; avoid a dynamic whereby large upgrades are assigned to individual projects that then drop from the queue, causing a cascading need for restudy; and deliver benefits to consumers by identifying more efficient infrastructure solutions than would be delivered on a piecemeal basis.

18. Questions worth exploring as these types of processes develop include:

- a. How can the process ensure that fees charged to interconnection customers provide the funds needed for the relevant proactively-planned network upgrades, while providing developers with a reasonable degree of cost certainty?;
- b. Would a mechanism such as a competitive auction or open season administered by the transmission provider be an effective tool for allocating scarce interconnection capacity identified by the forward-looking plans, and/or are there other processes that can effectively streamline the study process?;
- c. How can such processes be designed in a manner that is not unduly discriminatory and is consistent with open access principles?; and
- d. What process is appropriate for interconnection applications that do not align with the transmission provider's forward-looking regional transmission plan?

³⁰ See generally SPP & MISO, *SPP-MISO Joint Targeted Interconnection Queue Cost Allocation and Affected System Study Process Changes White Paper* (Dec. 20, 2022), <https://www.spp.org/documents/68518/spp-miso%20jtiq%20study%20updated%20white%20paper%2020221220.pdf>. Because this approach looks at projects that have reached the affected systems study stage, it does not provide a template for narrowing the initial pool of projects to facilitate meaningful study results. But the forward-looking nature of the initiative may nevertheless provide valuable insights to regional interconnection processes more broadly.

³¹ See SPP & MISO, *MISO-SPP Joint Targeted Interconnection Queue Update* at 7 (March 27, 2023), <https://cdn.misoenergy.org/20230337%20MISO%20SPP%20JTIQ%20Update628357.pdf>.

B. Align interconnection processes with competitive resource solicitations

19. In some regions of the country, it may be appropriate to link aspects of the interconnection process to resource solicitation.³² The Colorado Public Utilities Commission (Colorado Commission), for example, characterizes the interconnection queue management processes of transmission providers in its state as “highly functional.”³³ The key, it says, is that its “existing FERC-approved tariffs and bilateral market structure . . . ensures that projects selected in [its] competitive resource planning and acquisition process obtain scarce interconnection in a cost-effective and timely manner.”³⁴

20. The Colorado Commission and Arizona Corporation Commission (Arizona Commission) argue that a mechanism to allocate scarce interconnection capacity is needed.³⁵ The Colorado Commission explains that if there is 400 MW of low-cost headroom on the system, for instance, several commercially viable projects that collectively exceed that amount may compete for that headroom yet be unviable on a collective basis if all proceed.³⁶ It contends that, lacking a mechanism to allocate the headroom, a cluster study process may result in an inefficient cycle of study, re-study and delay, without necessarily ensuring that the 400 MW of headroom is used efficiently.³⁷ It argues that facilitating a process where state-jurisdictional competitive solicitation can be used to allocate scarce interconnection capacity is appropriate given “state priorities involving reliability, customer, and environmental preferences.”³⁸

21. FERC proposed a similar “optional resource solicitation” study in this proceeding. Our proposed process differed in a critical respect: the resource solicitation was not

³² See, e.g., Clean Energy Associations Initial Comments at 38 (urging the acceptance of “regionally specific proposals that would align the interconnection process with competitive procurements associated with resource planning, rather than placing them at odds”). Such alignment may not be appropriate or feasible, of course, in certain multi-state regions in which the bulk of resource development is driven by anticipated market revenues.

³³ Colorado Commission Initial Comments at 2.

³⁴ *Id.*

³⁵ Arizona Commission Initial Comments at 1-2; Colorado Commission Initial Comments at 21-27.

³⁶ Colorado Commission Initial Comments at 21-27.

³⁷ *Id.*

³⁸ *Id.* at 29.

granted a queue position,³⁹ and being selected in the resource solicitation would not serve as a mechanism for allocating scarce interconnection capacity. The possibility of more comprehensively aligning the interconnection process with competitive resource solicitations (beyond the jurisdictions where such an approach is currently used) raises many questions, such as:

- a. How can competitive solicitations and interconnection processes be designed to effectively coordinate with one another, especially where the soliciting entity (e.g., a state) is different from the transmission provider (e.g., an RTO)?
- b. To be effective as a mechanism to allocate scarce interconnection capacity, must a competitive solicitation be paired with a mechanism such as further strengthened commercial readiness requirements to limit the pool of resources in the queue not responding to solicitations, or be designed in a fashion that limits the interactions in the study process between resources responding to the relevant solicitation(s) and those that do not?⁴⁰ Can such requirements be designed in a manner that is not unduly discriminatory, and if so, how?

³⁹ Commenters argue that the Commission should have proposed to grant a queue position to the resource solicitation. *See, e.g.*, Colorado Commission Reply Comments at 6; EEI Initial Comments at 5-6; Xcel Initial Comments at 11-14; Clean Energy Associations Initial Comments at 51. Without a queue position for the resource solicitation, the costs identified in the study may not hold true for the various queue positions of underlying resources.

⁴⁰ The Colorado Commission argues that if projects to be studied as part of a competitive solicitation request are “comingled with a much broader pool of speculative projects,” the process could become “unworkable.” Colorado Commission Reply Comments at 5. It argues that, in the RTO context, commercial readiness requirements will be inadequate for this task, and suggests that the Commission allow transmission providers to prioritize native load, using solicitations as a mechanism to allocate scarce interconnection capacity. *See* Colorado Commission Initial Comments at 21-30. In contrast, the Interwest Energy Alliance argues that while competitive resource solicitations could be a useful tool to organize a portion of the interconnection process, they should not “becom[e] the only pathway through the cluster study process,” because “alternative pathways with reasonable commercial readiness requirements may . . . reveal opportunities for independent transmission companies (potentially associated with independent generation developers) to discover cost-effective ways to add much-needed transmission expansion through additional lines along with additional interconnection capacity.” Interwest Initial Comments at 11-12. Alternatives may be available that allow for other development opportunities alongside resources solicitation clusters. For

- c. Are safeguards necessary to render not unduly discriminatory an interconnection process closely linked to a competitive solicitation process, and if so, what safeguards are necessary or appropriate?⁴¹
- d. Is linking the interconnection process to competitive solicitations a viable option in RTO regions, in which state solicitation processes play a large role in supporting new market entrants but other paths to commercial viability may also exist?

C. Facilitate a “focused” interconnection process

22. Other promising ideas for improving cost certainty and reducing delays were put forward to the Commission in this proceeding. In particular, several commenters endorse a more “focused” interconnection process that streamlines study scope and reduces the need for restudies for projects requesting energy-only service.⁴² As Enel observes, the

example, a resource solicitation might be granted its own cluster (so as to allow the soliciting entity to understand the interconnection costs for its combination of resources), while providing for serial processing of clusters composed of resources not participating in the resource solicitation. *See* Enel Initial Comments at 72 (arguing that if the Commission were to adopt an optional resource solicitation process that designated a queue position, it “should be a separate queue cycle with an intermediate queue priority between the Transmission Provider’s annual study clusters”).

⁴¹ Several entities highlighted the need for guardrails to prevent undue discrimination with regard to the Commission’s proposal of an optional resource solicitation study. *See, e.g.*, R Street Initial Comments at 15-16 (“Guardrails may be helpful to prevent inefficiencies, preference or undue discrimination”); NARUC Initial Comments at 26 (“NARUC strongly supports FERC’s proposal to limit the applicability of the optional resource solicitation study to instances where the resource acquisition is overseen by a state regulatory authority and is competitive and open. Without this requirement, NARUC is concerned about the opportunity for load-serving entities to potentially use the process in a way that would inappropriately favor the interconnection of company-owned resources.”); Pine Gate Initial Comments at 43 (advocating for “appropriate safeguards”). This concern is heightened in the context where the solicitation is granted a queue position, and/or where inclusion in the solicitation serves as a commercial readiness indicator.

⁴² *See, e.g.*, R Street Institute et al. June 8, 2023 Comments in Support of Generator Interconnection Reform, at 2 (urging the Commission to “[c]onsider a focused interconnection study approach”); Public Interest Organizations Initial Comments at 50-52 (highlighting the potential for a narrow study process for ERIS resources to produce significantly faster interconnection timelines); ACORE Initial Comments at 2-3 (identifying potential benefits from an interconnection process “focused on local

dilemma of unwieldy studies and cascading restudy needs, and the delay and cost uncertainty that stems from these challenges, is ultimately caused by “the interdependence amongst Interconnection Customers.”⁴³ Cypress Creek notes that “[i]n one extreme example, a group of non-firm, energy-only resource interconnection service (‘ERIS’) requests triggered the need for upgrades up to 1,000 miles away on three different systems.”⁴⁴ Accordingly, another way to facilitate a more workable interconnection process could be to focus study of new projects on their immediate impact to the system. While the number of studies pursuant to such a process could still be large, their scope would be smaller and the potential for cascading restudies would be greatly reduced.

23. Johannes Pfeifenberger of The Brattle Group notes that, using a “connect and manage” approach, the Electric Reliability Council of Texas (ERCOT) has interconnected more generation more quickly than other regions.⁴⁵ Under its system, which “limits restudy needs,” “[p]rojects can be developed and interconnected within 2-3 years,” while “in other regions, the interconnection study process itself may take longer than that.”⁴⁶ Public Interest Organizations state that “[t]he UK’s ‘Connect and Manage’ approach has reduced lead times by 5 years compared to its previous ‘Invest and Connect’ approach.”⁴⁷

transmission needs only”); R Street Initial Comments at 6-7 (arguing that ERCOT’s “connect and manage” approach is “perhaps the most effective” domestic interconnection process).

⁴³ Enel Initial Comments at 2.

⁴⁴ Cypress Creek Initial Comments at 3-4 (citing Pfeifenberger, *Generation Interconnection and Transmission Planning* (Aug. 9, 2022), <https://www.esig.energy/download/generation-interconnection-and-transmission-planning-johannespfeifenberger/?wpdmdl=9241&refresh=62f38b6a0e44a1660128106>).

⁴⁵ See Pfeifenberger, *Planning for Generation Interconnection 2* (May 31, 2022), <https://www.brattle.com/wp-content/uploads/2022/05/Planning-for-Generation-Interconnection.pdf> (showing that ERCOT has interconnected more than 8 GW of capacity since 2021, significantly more than all other RTOs, even those with considerably greater peak load); see also Cypress Creek Initial Comments at 7.

⁴⁶ Pfeifenberger, *Planning for Generation Interconnection* at 4.

⁴⁷ Public Interest Organizations Initial Comments at 51.

24. While ERCOT's system, which treats all generators as energy-only resources,⁴⁸ may not provide a model for capacity resources, it could provide a template for ERIS interconnection. Enel argues that a "focused" approach to interconnection is appropriate for resources seeking ERIS because "the Transmission Provider is not obligated to maintain the transmission system such that ERIS generators can maintain the same level of available injection throughout the life of the generator," and accordingly, "it would be unreasonable to expect an ERIS generator to mitigate every constraint identified" in a more expansive study that uses a lower transfer distribution factor (TDF) threshold to identify more remote impacts of the project.⁴⁹ Streamlining ERIS interconnection assessment could allow transmission providers to focus their study resources on a smaller number of requests seeking network resource interconnection service (NRIS).⁵⁰

25. Cypress Creek argues that a more focused study approach could be implemented across the many regions that provide an NRIS interconnection option through use of a "two-step ERIS-NRIS" process by which the transmission provider could by default study all resources for ERIS and provide a subsequent process by which an interconnection customer can add firm rights.⁵¹ Such a process might even feasibly provide a faster path to commercial operation while still facilitating deliverable resources in the long run if "NRIS requests [could] be connected more quickly on an ERIS basis while NRIS-related network upgrade study and construction work is still pending."⁵² While the final rule did not adopt the recommendation for a two-step study process because it was outside the scope of this proceeding,⁵³ individual transmission providers could propose to implement such a process on their own initiative or the Commission could take up this suggestion in a subsequent rulemaking.

⁴⁸ See Cypress Creek Initial Comments at 7-8.

⁴⁹ Enel Initial Comments at 23.

⁵⁰ See Public Interest Organizations Initial Comments at 50-52.

⁵¹ Cypress Creek Initial Comments at 8-9.

⁵² Public Interest Organizations Initial Comments at 52. Cypress Creek highlights that SPP currently allows for interim energy-only injection service, providing for a subsequent process by which a generator can add firm rights. Cypress Creek Initial Comments at 8-9. Such a process to add deliverability rights to ERIS resources may hold potential to facilitate immediate contributions to system reliability by these resources, even if such resources are not fully deliverable or compensated in capacity markets or accounted for in applicable resource adequacy analysis.

⁵³ Final Rule at P 183.

26. Key questions that this approach raises include:
- a. What is the appropriate mechanism to narrow the scope of ERIS studies to limit the interdependence of projects in the study process? For example, Enel argues that ERIS resources should be studied using a minimum TDF threshold of 20 percent,⁵⁴ and that transmission providers should replace power flow models that assume extreme grid conditions with more realistic economic dispatch models reflecting security constrained economic dispatch.⁵⁵ How do these approaches interact and are they mutually exclusive? Are there other appropriate mechanisms?
 - b. To the extent that ERIS studies are narrowed, are changes to market dispatch rules or other measures appropriate to account for the possibility that NRIS resources or resources with long-term firm transmission service may be curtailed before them?⁵⁶
 - c. If a two-step study process that considers ERIS analysis first is appropriate, how should it be designed?⁵⁷ Would it be effective to provide for a process that allows ERIS resources to be converted to NRIS after they are constructed?⁵⁸

⁵⁴ Enel Initial Comments at 21-25; *see also* AEE Reply Comments at 10 (supporting a minimum impact threshold); SEIA Initial Comments at 11 (same); Clean Energy Associations Initial Comments at 27 (same); Pine Gate Initial Comments at 19 (supporting a minimum distribution factor impact threshold of 20 percent).

⁵⁵ Enel Initial Comments at 73-74.

⁵⁶ Xcel objects to the treatment of ERIS resources in RTO markets because “[t]hese resources do not bear the costs necessary to ensure that they are deliverable to load as NRIS resources or ERIS resources that have acquired long term firm transmission service do,” and suggests that, as a consequence, it may be appropriate for “ERIS-only service [to] receive a lower dispatch priority.” Xcel Initial Comments at 15-16.

⁵⁷ Some regions currently employ a similar two-step process that considers local project needs prior to considering deliverability analysis non-local upgrades based on project interactions. *See, e.g.*, New York State Department Initial Comments at 5-6 (describing NYISO’s Class Year study process).

⁵⁸ *See* Public Interest Organizations Initial Comments at 52 (arguing that “[i]deally, the interconnecting customer would receive an upfront estimate of typical curtailment levels to be expected under ERIS and would have the option to apply for NRIS at a later date if experienced curtailment levels rise above acceptable levels”).

- d. Could a focused interconnection approach for ERIS resources be combined with approaches above that may align the interconnection process more closely with long-term transmission planning, and/or use competitive selection processes to allocate scarce interconnection capacity?⁵⁹

II. General interconnection process improvements

27. In addition to these deeper reforms, commenters identified several potential incremental improvements to interconnection processes that were not proposed in the Commission’s notice of proposed rulemaking. I discuss some of the most promising ideas below, which in some or most cases may be applicable on a generic basis.⁶⁰

A. Further refine study assumptions

28. Commenters identified a number of ways that study assumptions could be further clarified, which may help to streamline and improve the accuracy of the interconnection process.

1. Clarify ERIS and NRIS assumptions

29. As Enel points out, the Commission has not to date clarified what ERIS studies should entail, and it has “observed vastly different treatments of” resources seeking ERIS by different transmission providers.⁶¹ As discussed above, a narrow approach to ERIS studies may facilitate a more streamlined interconnection process. In addition, some developers contend that grid operators deploy widely varying study assumptions on issues such as whether the models used allow for resource re-dispatch to mitigate any

Might such a process be able to efficiently examine a large number of projects, while still requiring significantly fewer restudies than existing interconnection processes by examining only projects that have already secured ERIS?

⁵⁹ For example, might a transmission provider efficiently assess ERIS upgrades by studying them using a distribution factor of 20 percent, while simultaneously developing an “entry fee” or open season process aligned with its forward-looking transmission plan to fund upgrades to guarantee deliverability of NRIS resources?

⁶⁰ The discussion herein is not intended to comprehensively capture all potential reforms, but rather to highlight some of the ideas that may be appropriate for further stakeholder discussion.

⁶¹ Enel Initial Comments at 26-27.

reliability issues that are identified.⁶² They argue that requiring “a uniform set of minimum interconnection study requirements” would “facilitate effective, efficient interconnection queue processing.”⁶³

30. While the Commission declined to provide direction on how ERIS should be studied because such requests were outside the scope of this final rule,⁶⁴ the Commission could take up this topic as part of a subsequent rulemaking. As an initial step, the Commission could solicit information from transmission providers documenting what assumptions and processes are used for ERIS and NRIS, respectively, to provide a starting point for dialogue around what study assumptions may be appropriate.⁶⁵ Topics that may benefit from further clarification include: (1) the definition and scope of ERIS; (2) the study assumptions that should be implemented in examining ERIS requests; and (3) the proper scope of study results and other information that must be provided by transmission providers to interconnection customers so that they can understand the results.

2. **Provide for more accurate assumptions regarding injection of energy by resources**

31. The final rule clarifies that its requirement to more accurately reflect the proposed charging behavior of electric storage resources extends only to “the operating

⁶² See, e.g., Cypress Creek Initial Comments at 6 n.11 (“Some RTOs conduct power flow analyses that consider redispatch opportunities (e.g., NYISO via a manual process, PJM via a simplified approach) but many do not check if generation redispatch can address an identified criteria violation.”); Pine Gate Initial Comments at 54 (“The primary issues identified relative to current study assumptions are extreme contingency scenarios and overly conservative operational characteristics and strategies (i.e., redispatch protocols).”).

⁶³ Pine Gate Initial Comments at 55; see also Cypress Creek Initial Comments at 6 (“re-dispatch should be a standard approach”); Clean Energy Associations Initial Comments at 28 (“[T]he study approach to re-dispatching the system to account for proposed injections . . . is a crucial assumption that is not well understood or defined, but can trigger significant upgrades and increase complexity of interconnection process, even for energy-only (non-firm) interconnection requests. . . . Economic redispatch should be a standard approach to limit regional upgrades identified in the study process, particularly for energy-only interconnection requests.”).

⁶⁴ Final Rule at P 1291.

⁶⁵ See Enel Initial Comments at 26-27.

assumptions for withdrawals of energy.”⁶⁶ In part due to concerns regarding the administrative burden of extending the proposal to injections or other resource types, the final rule declines to extend the reform in these areas.⁶⁷ But while the Commission determined that this record did not support adopting a structure where such assumptions would be studied at the request of individual generators, further examination of how to render operating assumptions more accurate is warranted.

32. Many commenters argued that the Commission should also require more accurate assumptions regarding injections of storage.⁶⁸ And as the final rule acknowledges, many commenters “support eliminating unrealistic interconnection study assumptions for resource types other than electric storage resources, such as assuming that a solar facility will operate at night, or that a wind resource will produce maximum output during low-wind seasons.”⁶⁹ Further, several commenters highlighted the benefits of using realistic fuel-based dispatch assumptions in studies, as demonstrated by MISO.⁷⁰ The final rule

⁶⁶ Final Rule at PP 1509, 1524.

⁶⁷ Final Rule at P 1529.

⁶⁸ *See, e.g.*, Clean Energy Associations Initial Comments at 53 (“[T]he Clean Energy Associations recommend that the Commission specify that transmission providers should also not study electric storage resources as 100% *injecting* energy during *low* load periods by default.”) (emphasis in original); NextEra Initial Comments at 37 (“Transmission providers should not study electric storage resources as . . . injecting energy during low load and shoulder periods, as [this does] not reasonably reflect typical operations of such units.”); Pine Gate Initial Comments at 51 (arguing that the Commission should prohibit transmission providers from using unrealistic operating assumptions, which includes “assuming that electric storage resources will . . . discharge during light load periods”).

⁶⁹ Final Rule at P 1480 (citing Enel Initial Comments at 74; AES Clean Energy Initial Comments at 24-25; Ameren Initial Comments at 29; CREA and NewSun Initial Comments at 92; Cypress Creek Initial Comments at 9-10; Invenergy Initial Comments at 59-61; Microgrid Resources Initial Comments at 7-8; Pine Gate Initial Comments at 54; Public Interest Organizations Initial Comments at 48-49; R Street Initial Comments at 16; rPlus Initial Comments at 6); *see also id.* (“Ameren, Cypress Creek, Microgrid Resources, NARUC, Pine Gate, and rPlus all request that the Commission extend this reform to allow any resource type, not just electric storage or co-located resources, to request that interconnection studies be based on their particular operating assumptions and characteristics.”).

⁷⁰ *See* Invenergy Initial Comments at 59-61 (highlighting MISO’s practice, as well as “recently approved more realistic fuel-based dispatch” assumptions in SPP); *see also* Enel Initial Comments at 77-78 (arguing that the Commission should require fuel-based

“acknowledge[s] that fuel-based dispatch assumptions may be able to address some of the identified challenges associated with inaccurate modeling assumptions for all resource types and encourage[s] transmission providers to evaluate the merits of adopting it.”⁷¹ Individual transmission providers remain free to advance such assumptions on an individual basis, and further examination of this concept could create a record adequate for the Commission to determine whether to require fuel-based operating assumptions on a generic basis, and if so, how to precisely structure such a requirement.

B. Use automation to facilitate more efficient interconnection

33. Currently, the interconnection study and queue process is heavily labor-intensive, and market participants frequently suffer from shortages of qualified study staff, including transmission planners and engineers, in the face of a high volume of interconnection requests.⁷² Accordingly, numerous commenters noted the great potential of automation to conserve staffing resources and speed up this process.⁷³ The broad term “automation” in this context can refer to a wide variety of time-saving steps to bring the

dispatch of generators in modeling “[i]f Power flow analyses are not replaced with SCED studies”); Interwest Reply Comment at 15 (urging the adoption of “realistic fuel-based dispatch assumptions”).

⁷¹ Final Rule at P 1529.

⁷² See, e.g., *Cal. Indep. Sys. Operator Corp.*, 176 FERC ¶ 61,207, at PP 7, 21 (2021) (noting CAISO’s statement of its difficulty in finding sufficient expert staff and consultants to timely process a large cluster study); MISO, Informational Report, Docket No. ER19-1960, at 12 (filed Nov. 16, 2020) (noting similar delays); see also Akielly Hu, *US Clean Energy Rollout Continues to Be Hamstrung by Grid Challenges*, CANARY MEDIA (June 13, 2023), <https://www.canarymedia.com/articles/transmission/us-clean-energy-rollout-continues-to-be-hamstrung-by-grid-challenges> (noting that “interconnection studies rely on a workforce of engineers at grid operators, and experts say there are not enough to get the job done,” and quoting the author of Lawrence Berkeley National Laboratory’s *Queued Up* study as saying this staffing issue represents a “fundamental constraint” on queue processing); Avangrid Reply Comments at 12 (“Transmission providers are processing unprecedented numbers of interconnection requests at a time when these qualified transmission planners and engineers are scarce.”); APPA-LPPC Initial Comments at 13 (noting that “available industry system simulation tools” can in some cases ameliorate “labor-intensive study obligations”).

⁷³ See, e.g., California Energy Storage Alliance Initial Comments at 5; NextEra Initial Comments at 14, 40; MISO Initial Comments at 26 n.107; ACORE Initial Comments at 5; ACE-NY Initial Comments at 2-3; Pine Gate Reply Comments at 5.

queue process fully into the digital age, such as standardized data entry and collection; a web-based application process and data submission with automated validation; automated study model construction and study processes; and pre-population of manufacturer models for relevant equipment.⁷⁴ Commenters requested steps, including the convening of a technical conference, to study how the interconnection process might become more robustly automated to save resources⁷⁵ and facilitate other benefits, such as the more robust integration of grid enhancing technologies (referred to as “alternative transmission technologies” in the final rule) into the bulk power system.⁷⁶ Of course, continuing to support career path development in this area will remain critical. At the same time, as we have seen in many other industries, automation done right has the potential to save a great deal of unnecessary time, effort, and expense. I support more deeply exploring the range of options available in this domain.

C. **Reduce delay and cost overruns in network upgrade construction**

34. While there appears to be a lack of good data about the timing and cost of construction of network upgrades once an interconnection agreement is executed,⁷⁷ developers have raised concerns that they have little recourse if such upgrades are delayed or subject to cost increases.⁷⁸ As noted above, the Lawrence Berkeley National Laboratory’s *Queued Up* report does not trace the cause of delays between execution of a project’s interconnection agreement and commercial operation, but shows that the average timespan for this period has increased from roughly 17 months for projects built between 2007-2014 to around 22 months for projects built between 2015-2022, with projects in CAISO showing particularly heightened delays.⁷⁹ Enel contends that “upgrades for Interconnection Customers are only overseen by the Commission for

⁷⁴ NextEra Initial Comments at 14, 40.

⁷⁵ See NextEra Initial Comments at 14; Pine Gate Reply Comments at 5.

⁷⁶ See, e.g., WATT Coalition Reply Comments at 2-3.

⁷⁷ See *Queued Up 2023* at 30 (“[L]imited data were available to analyze typical durations from interconnection agreement to commercial operations.”).

⁷⁸ See, e.g., Enel Initial Comments at 50 (“Under the current standard[] of . . . good utility practice, there is a notable lack of incentive, and often a disincentive, for Transmission Owners to perform . . . EPC work in a timely and cost-conscious manner.”); Pine Gate Initial Comments at 64 (expressing concern that limiting the option for interconnection customers to self build will “further exacerbate construction delays and . . . ultimately harm consumers”).

⁷⁹ See *Queued Up 2023* at 30. “The typical solar project built in CAISO since 2018 took over 4 years to reach commercial operations *after securing an interconnection agreement*; those built in 2022 averaged over 6 years.” *Id.* (emphasis in original).

adherence to good utility practice standards,” and “[t]he Commission does not review the timeliness or cost of upgrades unless an Interconnection Customer elects to file an LGIA in unexecuted form and challenge these specific assumptions,” a choice that could result in “costly delays in project timelines that often outweigh any benefit that might be gained from a favorable Commission decision.”⁸⁰

35. Accordingly, it may be appropriate for the Commission to take action to facilitate more timely and cost-conscious construction of such upgrades. One initial step could be for the Commission to gather more data concerning delays that may affect the commercial operation date of a generating facility, and to establish “metrics associated with the delayed construction of facilities.”⁸¹ The Commission could also consider adopting penalties for delays or cost overruns, or an incentive structure for transmission providers that carry out construction on time and on budget.⁸²

36. Finally, it may be appropriate to reconsider the scope of “stand alone network upgrades” to include facilities that may be needed for multiple interconnection customers, and to develop a process that either designates an interconnection customer to build such upgrades, or competitively solicits bids to award construction rights. While this final rule “clarif[ies] that, for a network upgrade to be eligible for treatment as a stand alone network upgrade, the network upgrade must be required for only one interconnection customer,”⁸³ it does so in order to “explicitly maintain[] the status quo.”⁸⁴ The Commission’s Notice of Proposed Rulemaking examined changes to the definition of stand alone network upgrade necessary “to implement a first-ready, first-served cluster

⁸⁰ Enel Initial Comments at 50-51.

⁸¹ Pine Gate Initial Comments at 64.

⁸² This issue has also arisen in the context of the Commission’s docket on transmission planning and cost management. *See, e.g.*, Advanced Energy Economy, Pre-Conference Comments, Docket No. AD22-8, at 2-3 (filed Oct. 4, 2022) (noting that a “major driver[] of transmission cost increases in recent years [has] been . . . incremental network upgrades identified in generator interconnection studies”). In that docket, the Commission has considered, and some commenters have supported, among other measures, new independent entities to monitor transmission planning. *See, e.g.*, Electricity Transmission Competition Coalition, Comments, Docket No. AD22-8, at 6 (filed Oct. 4, 2022); Harvard Electricity Law Initiative, Comment, Docket No. AD22-8, at 18-31 (filed Mar. 23, 2023); R Street Institute, Comments, Docket No. AD22-8, at 6-7 (filed Mar. 23, 2023). To the extent that such entities are established, the Commission could also consider tasking them with monitoring the timely and cost-conscious construction of network upgrades.

⁸³ Final Rule at P 192.

⁸⁴ *Id.* at P 193.

study process,”⁸⁵ and did not contemplate any mechanism to “prevent lengthy conflict and negotiations in instances where multiple interconnection requests trigger the need for a network upgrade” beyond restricting such upgrades to those that are required for only one interconnection customer.⁸⁶

37. Ideas were put forth in this proceeding, however, that may hold potential to efficiently allocate construction rights and obligations. In particular, one idea is that “the Commission should consider establishing a new third-party construction option” pursuant to which stand alone network upgrades could “be bid out and built by third parties, such as non-incumbent utilities, independent transmission developers or contractors.”⁸⁷ To develop such an option, the Commission would need to consider “details such as the posting of minimum design standards that must be met, the criteria for choosing a winning bidder, the incentives to hold the winning bidder to cost and schedule estimates, responsibility for cost overruns, rights to own, operate and maintain the Stand-Alone Network Upgrades, and the profit awarded to the winning bidder.”⁸⁸ Further process is warranted to examine this concept.⁸⁹ I encourage transmission providers to work with

⁸⁵ *Improvements to Generator Interconnection Procedures and Agreements*, Notice of Proposed Rulemaking, 179 FERC ¶ 61,194, at P 65 (2022).

⁸⁶ *Id.*; see Final Rule at P 194 (requests to “expand the definition of stand alone network upgrade . . . are outside the scope of this proceeding, which is not proposing to modify the scope of interconnection customers’ option to build certain stand alone network upgrades but rather is only revising definitions insofar as is necessary to implement reforms adopted elsewhere in this final rule”).

⁸⁷ Enel Initial Comments at 52; see also Pine Gate Initial Comments at 63-64 (proposing that “the Commission should grant the interconnection customer with the largest projected impact on a potential Stand Alone Network Upgrade facility the ability to elect the option to build with priority falling to each interconnection customer based on their interconnection request having the next largest impact on the Stand Alone Network Upgrade”).

⁸⁸ Enel Initial Comments at 52.

⁸⁹ Enel notes that “[t]he Commission could establish workshops or other

interconnection customers and other stakeholders to explore structures such as this that may provide greater certainty surrounding the timing and cost of certain network upgrades.

D. **Address challenges faced by projects serving Tribes and Tribal communities**

38. Beyond these recommendations to further facilitate efficient interconnection of new resources, I encourage transmission providers to examine potential changes to address important considerations of equity and fairness related to interconnection of resources serving or developed by Tribes. In particular, I encourage transmission providers to examine whether any exceptions or waivers to the commercial readiness requirements or withdrawal penalties framework are appropriate for certain projects serving Tribal nations or their communities. While the commercial readiness deposit and withdrawal framework adopted in this final rule hold the potential to make interconnection processes more efficient, they may act as a barrier to projects serving or developed by Tribes in cases where such projects adopt unique ownership and financing structures.⁹⁰ This may also be a concern with regard to projects developed by, or in partnership with, communities that have been historically marginalized or overburdened by pollution, and I encourage further dialogue examining whether that is the case.

39. For example, the Commission recently granted a waiver to the SAGE Development Authority (SAGE), an entity developing a wind generation project on Tribal land, to allow it more time to post financial security as required by SPP.⁹¹ SAGE was created by the Standing Rock Sioux Tribe and is developing the project through “a community-led process designed to, among other things, implement Tribal values and ensure that the financial benefits of the Project will in turn support further community projects intended to address disparities around public health and other issues.”⁹² The Commission granted SAGE’s requested waiver in part because “due to its unique Tribal business structure, it [was] unable to secure credit in advance” of the relevant security

mechanisms to further explore and develop these details.” *Id.*

⁹⁰ See OSPA Initial Comments at 8, 15-16 (arguing that SPP’s current security deposit regime has been “an insuperable barrier to renewable energy development on Tribal lands”).

⁹¹ See *SAGE Development Authority*, 182 FERC ¶ 61,180 (2023).

⁹² *Id.* at P 4.

deposit deadline.⁹³ Waiver “provide[d] SAGE the time necessary to secure additional credit.”⁹⁴

40. To the extent this rule’s deposit requirements subject Tribal projects to greater risk, the need for similar waivers could be heightened. Accordingly, I encourage further inquiry into whether certain projects developed to serve Tribal communities or disadvantaged communities may have other characteristics that uniquely demonstrate commercial readiness as alternatives to the new deposit requirements. The inquiry could also consider other measures that may allow such projects to overcome any unique barriers that they face.⁹⁵

41. While challenges remain, the Commission’s issuance of a final rule today is an important step forward in the effort to address interconnection backlogs around the country. The ideas for continuing reform that I describe in this concurrence represent best practices and innovative thinking by regions and stakeholders considering how to solve the challenges the final rule does not address. I encourage transmission providers, interconnection customers and other stakeholders to consider the rule’s requirements a strong baseline and not a ceiling, and to continue to engage on the topics I have addressed herein.

For these reasons, I respectfully concur.

Allison Clements
Commissioner

⁹³ *Id.* at P 20.

⁹⁴ *Id.*

⁹⁵ *See also* Energy Keepers Initial Comments at 2-3 (arguing that it would not be “unduly discriminatory or preferential for transmission providers to expedite the processing of Native American interconnection requests,” considering “prior environmental justice inequities.”).