



Federal Energy Regulatory Commission Order 2023: Improvements to Generator Interconnection Procedures and Agreements

What is Order 2023?

Order 2023 is a final rule issued by the Federal Energy Regulatory Commission (FERC) on July 27, 2023, that requires all transmission providers — including Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs) — to revise their *pro forma* Large and Small Generator Interconnection Procedures and Agreements. The purpose of the rule is to improve the process by which developers of renewable and storage resources interconnect to the grid.

RTOs, ISOs, and other transmission providers will be required to submit compliance filings 90 days after the Order is published in the Federal Register that revise their interconnection agreements and procedures to implement the requirements of the rule.

Why is it Needed?

Reforms to the interconnection process are sorely needed to address the growing backlog of renewable and storage resources waiting in the queues. These resources are facing increasingly lengthy wait times, growing interconnection costs, study delays, and a rising number of withdrawals. Key data points on the full scope of this problem are:

- As of the end of 2022, there were at least 10,000 projects representing 1,350 gigawatts (GW) of generation and 680 GW of storage actively seeking interconnection, of which 94% is renewable and storage capacity.¹
- The average amount of time from the interconnection request to commercial operations was 5 years in 2022, compared to 3 years in 2015.²
- Interconnection costs have also grown over time and have doubled in recent years compared to earlier time periods in ISO-New England, New York ISO, Midcontinent ISO and PJM Interconnection,³ with renewable resources facing greater costs than natural gas facilities.⁴
- Withdrawals in the later parts of the interconnection process have been increasing, which leads to re-studies of other projects in the queue and increases delays.⁵
- Two-thirds of the interconnection studies completed in 2022 were delayed.⁶

While RTOs and ISOs have implemented a number of the reforms contained in the rule, no transmission provider has implemented all of them and Order 2023 ensures that the full set of reforms are implemented.

¹ Lawrence Berkeley National Laboratory (LBNL), [Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection as of the end of 2022](#).

² *Id.*

³ LBNL, [Interconnection Cost Analysis in ISO-New England](#), [Interconnection Cost Analysis in the NYISO Territory](#), [Interconnection Cost Analysis in the PJM Territory](#), [Generator Interconnection Cost Analysis in the Midcontinent Independent System Operator \(MISO\) territory](#), finding that interconnection costs for projects that completed their studies in ISO-NE have nearly doubled for projects studied since 2018 relative to costs for projects studied from 2010 through 2017; in NYISO have doubled for projects studied since 2017 relative to costs for projects studied from 2006 to 2016; in PJM have doubled on average for projects in recent years relative to costs from 2000-2019; in MISO have nearly doubled for more recent completed projects relative to costs from 2000-2018.

⁴ *Ibid.*, and LBNL, [Generator Interconnection Costs to the Transmission System](#).

⁵ LBNL, [Queued Up](#).

⁶ Order 2023 at P 1012, based upon a Commission analysis of data provided by transmission providers.

What are the Primary Requirements of the Order?

Order 2023 is a 1,500-page rule that requires a wide array of revisions to increase the efficiency of the interconnection process, streamline the projects entering the queues, reduce withdrawal rates, and reduce the delays in the completion of interconnection studies. The rule places obligations on both transmission providers and the project developers seeking to interconnect (interconnection customers), including the following primary provisions:

- A shift from a serial first-come, first-served study process to a first-ready, first-served cluster study process where transmission providers perform interconnection studies for a large number of projects, rather than separate studies for each individual interconnection request. Multiple RTOs/ISOs have or are in the process of shifting to such a cluster process.
- Greater transparency and public information on available interconnection capacity by location (such as a heatmap) to reduce the uncertainty faced by interconnection customers.
- Interconnection customer payment of commercial readiness deposits that increase as the interconnection process proceeds, and are based on network upgrade costs in later stages.
- Penalties for withdrawal from the queue that increase in amount as projects proceed through the queue process.
- Elimination of the “reasonable efforts standard” for the completion of studies with transmission providers subject to penalties when studies are not completed on time, ranging from \$1,000 to \$2,500 per day depending upon the type of study.
- Standardization of the affected system study agreement to minimize disputes and delays in such studies, which examine the impact of proposed interconnection requests on neighboring transmission systems and are often the cause of interconnection delays.
- Allowing more than one generating facility to co-locate on a shared site and provide access to the use of surplus interconnection.
- At the request of the interconnection customer, require transmission providers to use operating assumptions in the studies that reflect the proposed charging behavior of electric storage resources (such as whether it will charge during times of peak load).
- Require transmission providers to evaluate a specified list of alternative transmission technologies in the interconnection studies, including advanced conductor, and to explain the results of this evaluation. Such technologies can significantly reduce interconnection costs and increase the interconnection of renewable resources into the grid.⁷

Are further reforms needed?

Yes. While the multiple provisions of Order 2023 represent an important first step, much more is needed to resolve the massive interconnection backlog, including:

- Improvements to the interconnection study process that include at a minimum:
 - Establish uniform, transparent, and reasonable interconnection study assumptions and criteria that allow for reproducible and verifiable study results.
 - Ensure that studies of needed network upgrades include both the full range of alternative transmission technologies and the use of market tools, such as generator redispatch.
 - Expand the use of automation in the study process to increase both the speed and accuracy of these studies.
- Reforms to the current Participant Funding model to establish metrics for the allocation of the costs of

⁷ The Brattle Group, [Unlocking the Queue with Grid-Enhancing Technologies](#); Grid Strategies LLC, [Opportunities to Use Advanced Conductors to Accelerate Grid Decarbonization](#).

network upgrades. This will create greater cost certainty for interconnection customers and allow those costs to be shared more equitably.⁸ Cost uncertainty is a primary reason that interconnection queues become clogged and project schedules are delayed.

- An expanded transmission system through the conduct of regional and interregional long-term, comprehensive, scenario-based planning that incorporates the interconnection needs rather than the current piecemeal approach. A critical first step to achieve this goal is for the Commission to issue a stronger final rule on regional transmission planning and cost allocation.⁹
- Establishment of a minimum transfer capability standard and required interregional transmission planning.

Additional Resources:

- [ACORE Initial](#) and [Reply](#) Comments on the Proposed Rule on Improvements to Generator Interconnection Procedures and Agreements
- [Coalition Letter](#) on Interconnection Reforms
- [Power Up PJM](#): Quantifying the economic benefits of renewable energy projects waiting to connect to the Mid-Atlantic power grid.

⁸ For a more detailed discussion, see Clean Energy Coalition [Comments](#) to the Joint Task Force at 17.

⁹ See ACORE [Comments](#) on FERC's Transmission Planning NOPR.