



The Growth of Distributed Generation: ISO New England's Role in the Interconnection Review Process

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Introduction

The New England states are promoting the development of distributed generation (DG) through a variety of policy initiatives, including feed-in tariffs, net energy metering, Renewable Portfolio Standard (RPS) requirements, and other renewable energy credit (REC) programs. DG is electricity provided by relatively small installations that are directly connected to retail distribution or customer facilities—not the high-voltage transmission system. An example would be a photovoltaic (PV) system (i.e., solar panels) installed on-site by a homeowner or business. These installations are not directly visible to or controllable by ISO New England system operators.

The majority of DG interconnections are for distributed PV that does not participate in the region's wholesale electricity markets, but does reduce the overall system load observed by the ISO. Each year, the ISO develops a long-term PV forecast based on state policies and historical data to anticipate the growth of DG and inform ISO operations and planning. According to the ISO's Final 2019 PV Forecast, nearly 2,900 MW of nameplate PV capacity had been installed across the region through 2018, and the ISO forecasts roughly 6,700 MW of nameplate PV capacity installed by 2028.¹ In January 2010, only 40 MW of nameplate PV capacity had been installed in New England.

This document summarizes tariff requirements applicable to the interconnection review of new DG resources; please refer to the appropriate *ISO New England Inc. Transmission, Markets, and Services Tariff* (ISO Tariff) section for details on governing rules and requirements.²

ISO Tariff Processes Applicable to DG Interconnections

Two primary ISO Tariff processes are potentially applicable to the interconnection review of new DG resources:

1. ISO New England's interconnection process, pursuant to Schedules 22 and 23 of the ISO New England Open Access Transmission Tariff (OATT),³ and
2. ISO New England's Proposed Plan Application (PPA) process, pursuant to Section I.3.9 of the ISO Tariff.⁴

¹ <https://www.iso-ne.com/static-assets/documents/2019/04/final-2019-pv-forecast.pdf>

² <https://www.iso-ne.com/participate/rules-procedures/tariff>

³ https://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_2/oatt/sect_ii.pdf

⁴ https://www.iso-ne.com/static-assets/documents/regulatory/tariff/sect_1/sect_i.pdf

Jurisdiction for Interconnection

DG projects fall under one of two jurisdictions for interconnection: state or federal. A developer proposing to interconnect a DG resource to a state-jurisdictional distribution facility must follow the associated state interconnection process. A developer proposing to interconnect a DG resource to a Federal Energy Regulatory Commission (FERC)-jurisdictional distribution facility must follow the ISO New England interconnection process under Schedule 22 or 23 of the OATT (unless it falls under one of the exemptions identified in Schedule 23).⁵

Most of the DG being installed in New England is interconnecting to the lower-voltage distribution system through state interconnection processes, which are administered by the states' electric distribution companies. In these cases, the DG developer is an interconnection customer of the electric distribution company, not the ISO. A DG developer should contact the owner of the distribution facilities to determine whether the facilities involved in the interconnection are state- or FERC-jurisdictional. The distribution facility owner will coordinate with the ISO on the determination of jurisdiction, as necessary.

Overview of Section I.3.9 Proposed Plan Application (PPA) Process

Regardless of the jurisdiction for interconnection, a DG resource may require review by the ISO pursuant to Section I.3.9 of the ISO Tariff to ensure the proposed system change does not have a significant adverse impact on the regional power system. This is true even in cases where the project is interconnecting under the state process.

The Section I.3.9 PPA process has been part of the region's planning processes for decades. ISO New England, as the Regional Transmission Organization (RTO) for New England, is responsible for reviewing and approving proposed system changes because these changes may impact the stability, reliability, or operating characteristics of the New England power system.

The ISO's Section I.3.9 process applies to the interconnection of the following DG resources:

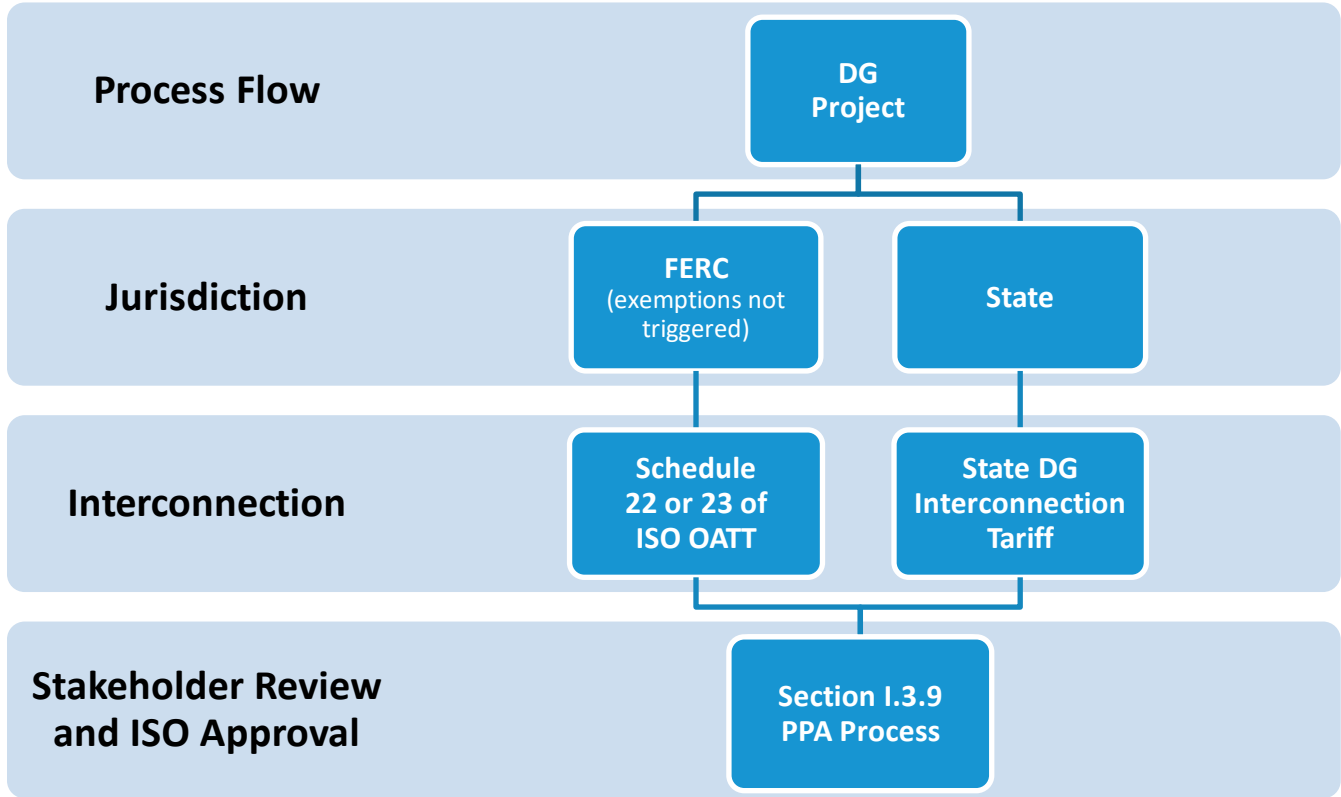
- New or increased generation ≥ 5 MW
 - These projects must include PPA forms in their Section I.3.9 submittals to the ISO
- New or increased generation > 1 MW and < 5 MW, where the ISO has determined such interconnection(s) will have a *cumulative impact* on facilities used for the provision of regional transmission service
 - Generator Notification Forms (GNF) are submitted to the ISO for projects of this size, unless the ISO identifies that a PPA is required

⁵ Exemptions: The state interconnection process will apply if a DG resource is interconnecting to a FERC-jurisdictional distribution facility and the project will:

1. Produce energy to be consumed only on the retail customer's site,
2. Not sell its energy into the ISO markets, or
3. Sell 100% of its output as a Qualifying Facility (QF) to the interconnecting utility under a Public Utility Regulatory Policies Act (PURPA) contract.

Figure 1 provides an illustration of the general process flow for DG projects that require review by the ISO pursuant to Section I.3.9 of the ISO Tariff.

Figure 1: General Process Flow for DG Projects Subject to ISO’s Section I.3.9 Review Process



If the generator owner is not a Market Participant, the Transmission Owner (or Governance Participant) must make the PPA submittal to the ISO on the generator’s behalf. The ISO has 60 days to issue a determination (or 90 days if additional time is needed, with written notification to the Market Participant or Transmission Owner). The submittal must be supported by a transmission study that meets the requirements of ISO New England Planning Procedures to ensure no significant adverse effect upon the reliability or operating characteristics of the utility’s transmission facilities, the transmission facilities of another utility, or the system of a Market Participant.⁶

The Transmission Owner is responsible for scoping and conducting the study, in coordination with the ISO. The electric distribution company is responsible for communicating with the developer of the DG resource on the status of its study. The DG developer is a customer of the distribution company, not the ISO.

Once the study is complete, the Transmission Owner (or Governance Participant) must present the study results and identification of any needed upgrades to the New England Power Pool (NEPOOL) Reliability Committee (RC) for an advisory vote. After an advisory vote by the RC, the ISO will issue a determination approving or denying the PPA.

⁶ <https://www.iso-ne.com/participate/rules-procedures/planning-procedures/>

The RC is a standing technical committee of NEPOOL, which is made up of Market Participants from across the region and serves as the ISO's principal advisory body. The RC provides advisory input to ISO New England on the design and oversight of reliability standards for the New England power system. RC meetings are held on a monthly basis and consider matters such as Proposed Plan Applications for generation and transmission projects.

Triggering the Need for a Transmission Study

ISO New England's Section I.3.9 PPA and accompanying transmission study process automatically applies to DG projects greater than or equal to 5 MW. This process must be completed by the Transmission Owner to ensure the proposed project has no significant adverse impact on the regional power system.

More recently, due to large accumulations of DG on certain parts of the distribution system, smaller projects in the > 1 MW and < 5 MW range (for which a Generator Notification Form previously sufficed) are triggering the need for transmission studies because the interconnections will have a cumulative impact on the regional power system. Given the recent, dramatic growth in DG across New England, the ISO expects a growing number of projects in the > 1 MW and < 5 MW range to require additional study by the Transmission Owner to ensure no significant adverse impact on the regional power system in accordance with Section I.3.9 of the ISO Tariff.

The Transmission Owner, or its distribution company affiliate, is responsible for notifying the ISO of situations where the interconnection of multiple DG resources may have cumulative impacts on the facilities used for the provision of regional transmission service. This requirement can be found in Section 3.03(b) of the Transmission Operating Agreement, entered into by ISO New England and the region's Participating Transmission Owners (PTO) when the ISO became the RTO for New England in 2005. Through this agreement, the ISO will determine whether the interconnection of multiple DG resources will have a cumulative impact on the transmission system and will identify the appropriate level of study by the Transmission Owner to ensure the interconnections have no significant adverse impact on the regional power system.⁷

The ISO's Section I.3.9 and accompanying transmission study process does not apply to projects less than or equal to 1 MW.

ISO Notification and Additional Study for Projects > 1 MW and < 5 MW

For projects greater than 1 MW and less than 5 MW, the Transmission Owner should coordinate with the ISO early in the process to determine whether additional study is required due to the potential for cumulative impacts on the regional transmission system. If there are no cumulative impacts on the regional transmission system, the ISO can approve the project(s) with no need for further study. If there are cumulative impacts on the regional transmission system due to large accumulations of DG resources in a specific location, a study by the Transmission Owner is required through the established I.3.9 process.

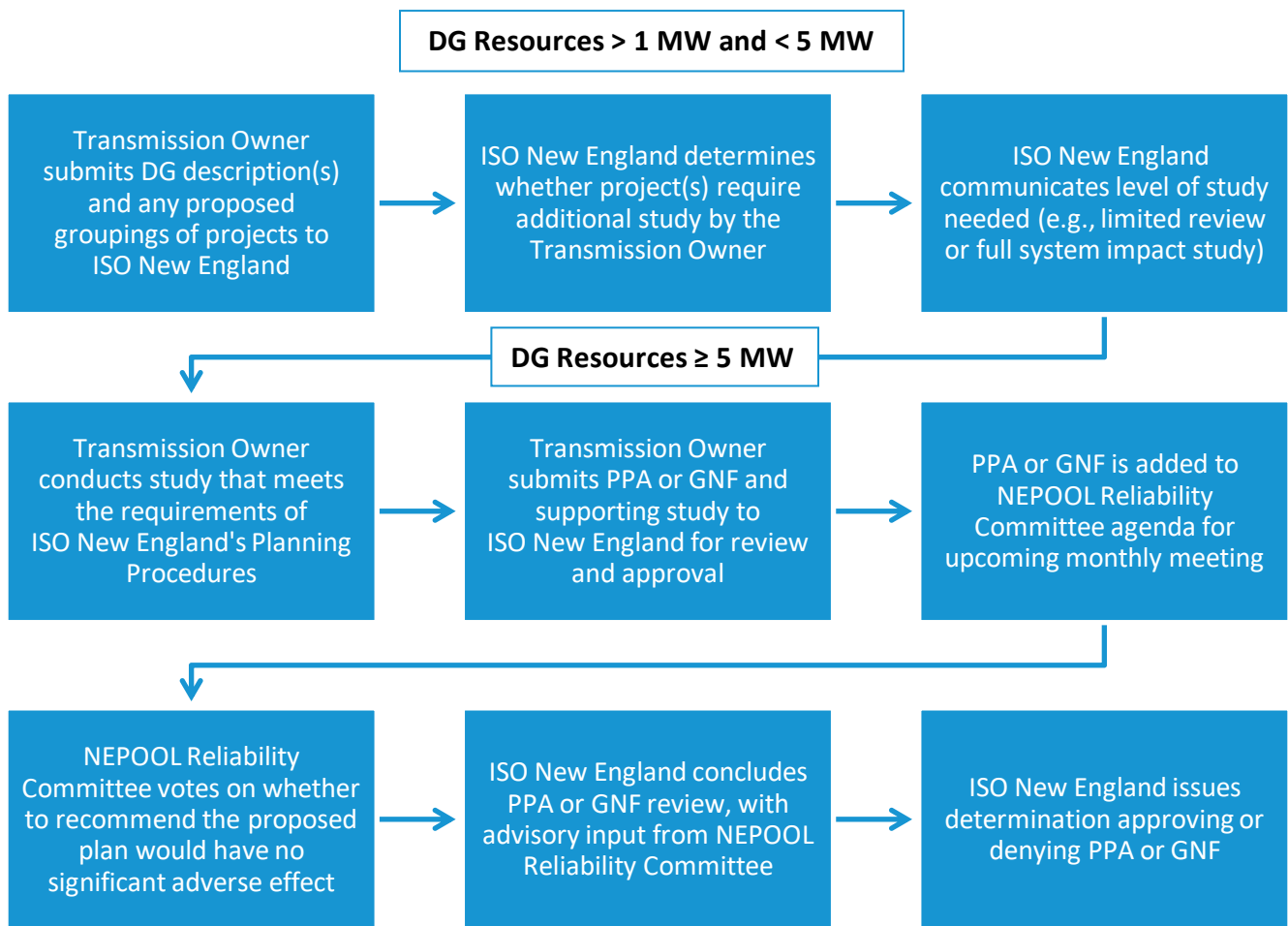
⁷ Transmission Operating Agreement, Section 3.03(b): The PTO or its distribution company Affiliate, as applicable, shall notify the ISO of situations where the interconnection of multiple generators to distribution facilities that are not OATT Interconnection Distribution Facilities may have cumulative impacts affecting the facilities used for the provision of regional transmission service and shall, in such situations, consult with the ISO in its performance of such studies. The ISO will determine whether such interconnections will have a cumulative impact on facilities used for the provision of regional transmission service.

The ISO communicates the level of study needed by the Transmission Owner (e.g., no analysis required, limited review to confirm no adverse impact, or full system impact analysis) in order to support the project’s PPA or GNF. This communication by the ISO to the Transmission Owner is typically made within a week or two of the submission to the ISO. In these cases, the ISO strongly recommends early engagement by the Transmission Owner with the ISO to help ensure timely and successful completion of the I.3.9 process.

ISO New England Interconnection Review Process Diagram for DG Resource Proposals

Figure 2 provides a high-level summary of the ISO New England interconnection review process that applies to DG resources that are 5 MW or greater and DG resources that are greater than 1 MW but less than 5 MW (with a cumulative impact on the regional power system).

Figure 2: ISO New England Interconnection Review Process for DG Resource Proposals



Frequently Asked Questions

- 1. Who is responsible for conducting the study required under the Section 1.3.9 Proposed Plan Application (PPA) process for new DG resources seeking interconnection to the distribution system?**

The Transmission Owner is responsible for conducting the study required under the 1.3.9 PPA process to demonstrate no significant adverse impact on the regional transmission system.

- 2. What are the requirements for conducting Proposed Plan Application (PPA) analyses?**

The requirements for conducting PPA analyses can be found in ISO New England Planning Procedure 5-3: Guidelines for Conducting and Evaluating Proposed Plan Application Analyses and ISO New England Planning Procedure 5-6: Interconnection Planning Procedure for Generation and Elective Transmission Upgrades. For more information, see <https://www.iso-ne.com/participate/rules-procedures/planning-procedures/>.

- 3. What level of accumulation on the distribution system leads to a cumulative impact on the regional transmission system, necessitating a transmission study by the Transmission Owner?**

Generally, an accumulation of 20 MW of new and existing DG on feeders that collect up to a given transmission substation will lead to a cumulative impact on the regional transmission system, necessitating a transmission study by the Transmission Owner under the 1.3.9 PPA process. The ISO will coordinate with the Transmission Owner on the level of study needed to support the PPA/GNF (e.g., limited transfer analysis or a full transmission system impact study).

- 4. What is a cluster study? Who makes the decision to group projects into a cluster study?**

A cluster study is a study of a group of proposed DG interconnections to an area of the distribution system. The Transmission Owner and/or its distribution company affiliate will decide whether to group multiple DG interconnection requests into a cluster study, rather than study them sequentially. The ISO does not decide how DG projects are clustered or prioritized for study. For updates on the cluster study being conducted by National Grid for DG projects seeking interconnection in central and western Massachusetts, see <https://ngus.force.com/s/article/Affected-Substations>.