

New Hampshire Department of Energy



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Investigative Proceeding Relative to Customer-Generator Interconnection

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Submitted to:

SCIENCE, TECHNOLOGY AND ENERGY COMMITTEE
NEW HAMPSHIRE HOUSE OF REPRESENTATIVES

SENATE ENERGY AND NATURAL RESOURCES COMMITTEE

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ACRONYMS & ABBREVIATIONS

AC	Alternating Current
CIAC	Contribution in Aid of Construction
DER	Distributed Energy Resource
EDC	Electric Distribution Company
FTG	Freeing the Grid
FERC	Federal Energy Regulatory Commission
IREC	Interstate Renewable Energy Council
kW	Kilowatt
kVA	Kilovolt-amp
ISO-NE	ISO New England Inc., the independent system operator of the New England power grid
MW	Megawatt
NH	New Hampshire
NHDOE	New Hampshire Department of Energy
NHEC	New Hampshire Electric Cooperative, Inc.
RSA	New Hampshire Revised Statutes Annotated
SB	Senate Bill
SGIP	Small Generator Interconnection Procedures
W	Watt

PREFACE

Efficient, clean, and diversified electricity sources are vital to New Hampshire’s economy and environment. New Hampshire RSA Chapter 362-A, “Limited Electrical Energy Producers Act”, states in 362-A:1 Declaration of Purpose:

*It is found to be in the public interest to provide for small scale and diversified sources of supplemental electrical power to lessen the state's dependence upon other sources which may, from time to time, be uncertain. It is also found to be in the public interest to encourage and support diversified electrical production that uses indigenous and renewable fuels and has beneficial impacts on the environment and public health. It is also found that these goals should be pursued in a competitive environment pursuant to the restructuring policy principles set forth in RSA 374-F:3. It is further found that net energy metering for eligible customer-generators may be one way to provide a reasonable opportunity for small customers to choose **interconnected self-generation**, encourage private investment in renewable energy resources, stimulate in-state commercialization of innovative and beneficial new technology, enhance the future diversification of the state's energy resource mix, and reduce interconnection and administrative costs. [Emphasis added]*

The New Hampshire General Court in Senate Bill 262 (SB 262)¹, signed into law on July 8, 2022, states in part, “the department of energy shall initiate a proceeding to investigate modification of the rules of the public utilities commission in PUC 903.01(e) to ensure cost-effective, predictable, and timely interconnection procedures for customer generators to the state’s electric distribution system.” See 2022 N.H. Laws Ch. 328:4, I. The bill further states, “[t]he report shall identify ways any recommended statutory changes can reduce barriers to cost-effective, predictable, and timely interconnection of distributed energy resources to the state’s electric distribution system.” See 2022 N.H. Laws Ch. 328:4, III.

This document provides the results of the investigation conducted by the New Hampshire Department of Energy (NHDOE or Department). The Department formally initiated this investigation on December 5, 2022, titled, “IP 2022-01 – Investigative Proceeding Relative to Customer-Generator Interconnection.”²

¹ https://gencourt.state.nh.us/bill_status/legacy/bs2016/billText.aspx?id=2063&txtFormat=html&sy=2022

² [Investigative Proceedings | NH Department of Energy](#)

Executive Summary

Overview of Investigation

As directed in SB 262 (2022), the New Hampshire Department of Energy (NHDOE or Department) conducted a proceeding to investigate modification of the rules of the Public Utilities Commission in PUC 903.01(e) to ensure cost-effective, predictable, and timely interconnection procedures for customer generation to the state's electric distribution system.

This report provides a description of the investigation, highlights of the stakeholder comments and feedback, and recommendations. As discussed throughout this report, and as evidenced in the stakeholder comments and technical sessions, most of the issues are complex and require thoughtful, detailed discussions, debate, and analyses. Therefore, the Department believes it prudent to await the results of the working groups before making recommendations for any statutory changes.

The Department published an Order of Notice on December 5, 2022,³ and sent the notice directly to potential stakeholders, including the three (3) investor-owned electric distribution utilities in New Hampshire - Public Service Company of New Hampshire d/b/a Eversource Energy (Eversource), Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty (Liberty), Unitil Energy Systems, Inc. (Unitil); the New Hampshire Electric Cooperative (NHEC); and others.

The investigation included two technical sessions and four comment solicitations. Further, all stakeholders were invited by Clean Energy New Hampshire to a presentation on September 28, 2023, by the Interstate Renewable Energy Council (IREC)⁴ to discuss the newly released (August 2023) IREC 2023 Model Interconnection Procedures, as well as a report titled, *Freeing the Grid*.⁵ *Freeing the Grid* is a joint initiative of IREC and Vote Solar that grades states on specific policies that help to increase clean energy adoption and access to the electric grid.

Stakeholders generally agree on the need for clear, predictable, and timely interconnection rules, procedures, and standards, with maximum consistency among the utilities wherever warranted and reasonable. While there are areas without consensus, all Stakeholders agree on the need to address these issues as soon as possible through various processes, including stakeholder working groups, utility process modifications, and rule modification/rulemaking initiatives.

Areas of Consensus

- All Stakeholders expressed the need and desire for clarity and as much consistency of the interconnection rules, processes, and standards as possible.

³ See [order-of-notice-investigative-proceeding-relative-to-customer-generator-interconnection.pdf \(nh.gov\)](#)

⁴ <https://irecusa.org/>

⁵ <https://freeingthegrid.org/>

- The current utility hosting capacity maps provide useful information. SB 262 (2022) amended RSA 362-A:9 by inserting language requiring utilities to publish a hosting capacity map on their website. See RSA 362-A:9, XXII.⁶
- Interconnection application fees can help increase the efficiency of processing applications and more equitably allocate costs. Interconnection application fees are currently being discussed as part of PUC Docket DE 22-060,⁷ “Consideration of Changes to the Current Net Metering Tariff Structure, Including Compensation of Customer-Generators.”
- Utilization of third-party portals and program management software such as PowerClerk^{®8} are expected to significantly improve interconnection processes. Eversource is utilizing PowerClerk in its other service territories and recently began utilizing it in New Hampshire. Unitil is also implementing PowerClerk in New Hampshire and expects it to be on-line in early- to mid-2024.
- This investigative effort has significant potential benefits and has shown a strong willingness of Stakeholders to work together and a need for stakeholder working groups. Two working groups are recommended: one for Technical/Engineering, and one for Administrative/Process.
- Stakeholders prefer a NHDOE-led/facilitated process and NHDOE-led working groups.
- Stakeholders prefer facilitators/ombudsmen for interconnection requests and processing.
- Stakeholders recognize the utilities need an efficient and flexible means to address variability of interconnection applications and requests. All utilities indicate applications have increased tremendously, especially within the last two years.
- All stakeholders recognize the benefits of utilities having regularly updated interconnection queues, but do not agree on format or specific content.
- Stakeholders want to ensure energy storage devices and systems are addressed as part of customer-generator interconnection processes and requirements.

Non-Consensus and Key Issues to Address

- Which interconnection model(s) should be used as the basis or as reference(s) for NH (e.g., Connecticut [CT], Illinois [IL], IREC, Massachusetts [MA], New Mexico [NM], New York [NY], or other States).
 - Non-utility Stakeholders generally favor adopting the IREC interconnection procedures. (A new 2023 version was released in August). The utilities are open to using IREC as a reference and modifying for application in NH. Two of the three utilities recommend using MA procedures as the base reference.
 - Whether or not all NH utilities use an identical process, especially for larger systems (i.e., greater than 100 kVA).
- Which cost allocation methodologies for interconnection related costs are most appropriate.
 - Utilities prefer traditional principles that generally align with cost causation but are open to further discussion on potential cost-sharing alternatives.
 - Developers prefer more socialization of costs.

⁶ [Section 362-A:9 Net Energy Metering. \(state.nh.us\)](https://www.nh.gov/section-362-a-9-net-energy-metering)

⁷ [New Hampshire Public Utilities Commission \(nh.gov\)](https://www.nh.gov/new-hampshire-public-utilities-commission)

⁸ <https://www.cleanpower.com/powerclerk/>

- Hosting capacity map information enhancements and whether planned capital projects should be identified.
- Interconnection queue: How information is presented and methods of communication.
- Time limits for various interconnection processes and how to enforce/hold parties accountable.
- How to organize and ensure sufficient resources are available for working groups and facilitators/ombudsmen, and whether the facilitators/ombudsmen are a utility function or should be done by a third party.
- Application of N-1⁹ planning criteria.
- The near-term need for statutory changes. Some stakeholders prefer changes prior to working group recommendations, particularly with the Puc 900 rules.
- How to ensure Group Net Metering (GNM) interconnection applications are properly addressed in any potential rule, standards, and process changes.
- The schedule for recommending and implementing statutory changes. The non-utility stakeholders would like to see statutory changes implemented as soon as possible rather than wait on the formation and recommendations of working groups. Some non-utility stakeholders advocate the immediate opening of a rulemaking proceeding.

Recommendations

Statutory

- There are considerable technical, operating, processing, and procedural challenges of integrating large numbers of customer-generator and energy storage systems into New Hampshire's electric distribution systems. To ensure greater clarity and appropriateness of any potential statutory changes, the Department suggests waiting for results from the working groups before recommending statutory changes.
 - The Department cautions putting rates or cost ceilings in statutory recommendations and believes these are better suited as part of the utility tariffs and evaluated in rate cases.

Working Groups

- Immediate creation of two NHDOE-led Working Groups.
 - **Technical/Engineering Working Group.** On-going effort to regularly address applicable engineering standards, codes, and best practices.
 - **Administrative/Process Working Group.** On-going effort to address the following:
 - Update NH interconnection rules, processes, fees; dispute resolution process and schedules; and other administrative issues.

⁹ N-1 in the simplest terms means that a process will continue to operate with the failure of an item of equipment and it will not have an effect on the process continuity.

- Develop/adopt NH interconnection rules that may incorporate provisions of IREC 2023/CT/IL/MA/NM/NY and other relevant interconnection models.
 - Make recommendations regarding Puc 900 rule changes and additions for DER, including energy storage.
 - Develop interconnection queue requirements.
 - Develop a list of best practices to facilitate greater flexibility and timely changes, where appropriate.
- Working groups to make recommendations to Puc 900 rule changes and additions, as well as for additional rules and potential statutory changes to address non-net-metering DER, including energy storage devices/systems, and DER greater than 1,000 kW.
 - Evaluate and make recommendations regarding the potential benefits and roles of customer-generator interconnection facilitators/ombudsmen.
 - Working groups shall strive to submit recommendations to the Department for changes as each issue, or sets of issues, achieve consensus.
 - The working group recommendations may result in the Department making statutory recommendations, NHDOE rule changes, recommendations for PUC rule changes, or other actions.

Near-Term

- Encourage stakeholders to develop informal minimum interconnection queue criteria.
- Encourage utilities to post/report consistent basic interconnection queue information.
- Encourage the creation of technical and procedural working groups.
- Encourage utility collaboration on timelines, fee structure, and fast-track/preliminary review criteria. It should be noted there is currently substantial consistency among the utilities for customer-generator interconnection rules and requirements for net-metering systems < 100 kVA, and particularly with systems < 10 kVA.
- Encourage utilities to develop consistent interconnection processes and requirements for systems > 100 kVA. It is noted these larger systems require greater flexibility on the part of the utilities.
- The Department will continue to work with stakeholders to develop customer-generator interconnection application fee structures to more equitably allocate application costs, and the Department will also work with stakeholders to reduce processing times and possibly develop more timelines and deadlines.

Background and Summary of Issues

Interconnection and the Drive for Interconnection Standards

Interconnection is the process by which electric generation and energy storage resources receive permission to connect to the local utility distribution system or the transmission system. This process often includes changes/modifications to the electric system(s) and operating criteria to ensure the generation and storage systems operate safely, reliably, efficiently, and do not negatively affect the electric delivery systems.

While there are substantial benefits to increased levels of distributed energy resources (DERs), there are considerable challenges to the organizations/utilities that operate the electric and transmission systems, and DER developers, owners, and operators. The challenges intensify with increased penetration of DERs. Moreover, each physical interconnection location often has unique characteristics that must be fully understood and addressed by the DER developer/owner/operator, and critically, by the electric distribution companies and transmission system operator(s).

For many reasons, electric utilities, states, and municipalities across the country have different criteria, requirements, cost allocation methodologies, and processes for these generation and storage systems to be able to connect to the utility grid. With the rapid increase in DERs many utilities, states, and localities are working to make the interconnection process more efficient, consistent, transparent, and fair to all parties.

Due to the tremendous variability in the electric distribution and transmission systems, the types and sizes of the DERs, the location of the DER within the system, and many other conditions, a “one-size-fits-all” approach is impractical. Regardless, many states and organizations are working to develop or adopt Interconnection Standards.

Interconnection applications in New Hampshire, and across the country, have been rapidly increasing in both their numbers (quantity), and size (capacity), and at times overwhelming the utility’s ability to process and evaluate the applications in reasonable time periods. As previously mentioned, virtually every state and region of the country is trying to address customer generator interconnection issues and develop standards. Many common issues and challenges among these entities exist, some of which are briefly discussed in this report.

Interconnection Standards

For many years, regulators, utilities, customers, and DER developers have had a desire for more consistent, efficient, and fair interconnection rules and standards. Several states have developed their own standards or have adopted all or parts of other states or organizations, such as: the Interstate Renewable Energy Council's (IREC) Model Interconnection Procedures and the Federal Energy Regulatory Commission's (FERC) Small Generator Interconnection Procedures¹⁰.

IREC Model Interconnection Procedures

IREC has been developing their Model Interconnection Procedures for over 18 years and recently released the latest version, IREC Model Interconnection Procedures – 2023.¹¹ From the IREC literature, they state, “[t]he Interstate Renewable Energy Council's (IREC) Model Interconnection Procedures, 2023 Edition (2023 Model Procedures) synthesize and reflect the evolving best practices for safe and reliable interconnections of distributed energy resources (DERs). For over 18 years, this publicly available, complimentary resource has helped guide and inform state utility regulators, energy industry professionals, utilities, policymakers, and other DER stakeholders as they develop and refine the rules for grid access. The goal of these Model Procedures is to streamline the process for safe and reliable interconnection for all DER customers, while also helping states and utilities save time and resources as they address interconnection issues.”

Several states utilize or reference the IREC Model Interconnection Procedures.

FERC Standard Generator Interconnection Procedures

FERC developed, and regularly updates, their pro forma Small Generator Interconnection Agreement (SGIA) and Small Generator Interconnection Agreement Procedures (SGIP) with FERC rules that apply to the interconnection of small generators no larger than 20 MW. Several states and organizations utilize or reference the SGIA/SGIP in their interconnection procedures.

Other State Interconnection Models

Many other state interconnection models can be considered. NH stakeholders suggested that the primary state models to be considered by the recommended working groups are Connecticut, Illinois, Maine, Massachusetts, New Mexico, and New York. However, other states may also be evaluated.

¹⁰ <https://www.ferc.gov/sites/default/files/2020-04/sm-gen-procedures.pdf>

¹¹ <https://irecusa.org/resources/irec-model-interconnection-procedures-2023>

Freeing the Grid (FTG)

Freeing the Grid is a joint venture of IREC and Vote Solar that grades states on critical policies (including interconnection standards/procedures) that help to increase clean energy adoption and access to the grid. To date FTG has graded 37 states plus Washington, D.C., and Puerto Rico. The scoring is based on 56 evaluation criteria with a maximum of 63 points. The grading points are as follows:

- A: >45 – 63
- B: >30 – 45
- C: >15 – 30
- D: 1 – 15
- F: 0

New Hampshire received a “D” grade for 2023. However, a representative from IREC indicated that New Hampshire’s grade will likely increase to a “C” or better with some additional information and clarification. Additional information on the FTG report and stakeholder perspective is discussed in the Interconnection Investigation Section.

The Electric Distribution Company Utility Perspective

The primary objectives and issues for Electric Distribution Companies (EDCs) regarding the DER interconnection requests include the following:

- Ensuring the electric distribution system is safe, stable, and reliable: This is of paramount importance to the EDCs and their customers. As the number and size of the DERs increase, so do the potential system impacts and the need for more comprehensive engineering analyses.
- Cybersecurity: As the number of DER related control and monitoring devices increase on the distribution network so do the cybersecurity risks and concerns.
- Managing variability of interconnection applications and evaluations: New Hampshire EDCs have reported DER applications increasing by approximately 250% to 400% in the last few years.
- Cost allocation: How to ensure fair and equitable cost allocation for necessary distribution cost upgrades.
- Compliance: Ensure compliance with engineering standards and code requirements given the rapidly changing technology and increases in DER deployment.
- DER support: Ensure sufficient resources are available to process applications, prepare engineering studies, inspect and approve DER facilities, maintain and test system protection, update hosting capacity maps, update interconnection queues, etc.

The Developer and Owner Perspective

The primary objectives and issues for DER developers and owners include the following:

- Need for clarity and consistency of process, rules, fees, engineering study assumptions, and timelines.
- Transparency for utility engineering evaluations/studies and system upgrade costs.
- A readily available, accurate, and up-to-date interconnection queue.
- Delays in application processing and engineering evaluation increases costs and can result in missed opportunities.
- The desire for up-to-date utility distribution system status and planned upgrades.
- Fair, reasonable, and transparent cost allocation for system upgrades and enhancements the EDC deems necessary for the interconnection.
- Enforcement by regulators of interconnection rules, timelines, and responsibilities.

Puc 900 Rules

The Puc 900¹² rules were developed for net-metering customer-owned renewable generation resources of 1,000 kW or less. The Department became responsible for administration of the Puc 900 rules in 2021 and plans to adopt its own rules to replace the Puc 900 rules in the near future. The Puc 900 rules identify “Large customer-generators” as facilities with a total maximum generating capacity greater than 100 kW alternating current (AC) up to and including 1,000 kW (1 MW). “Small customer-generators” are those facilities of not more than 100 kW (AC).

The current Puc 900 rules only address “eligible customer-generators” up to 1,000 kW. Further, energy storage is not currently addressed in these rules. Among other issues, the working groups should revisit the definition of “eligible,” the 1,000 kW threshold, and interconnected energy storage systems.

¹² <https://www.puc.nh.gov/Regulatory/Rules/PUC900.pdf>

Interconnection Investigation

SB 262 (2022) Directives

Senate Bill 262 (SB 262)¹³ was signed into law on July 8, 2022. See 2022 N.H. Laws Ch. 328. This bill addresses several aspects of net metering and includes the following requirements:

- I. Within 90 days of the effective date of this section, the department of energy shall initiate a proceeding to investigate modification of the rules of the public utilities commission in PUC 903.01(e) to ensure cost-effective, predictable, and timely interconnection procedures for customer generators to the state's electric distribution system. In so doing, the department shall consult with electric distribution utilities, distributed generation project developers, and any person or entity the department deems relevant to its study.
- II. The department's investigative proceeding shall examine and make specific recommendations concerning the following:
 - a. How to create transparent, consistent, and reasonable engineering standards for interconnection, with special consideration given to established best practices used by other states as set forth in the Interstate Renewable Energy Council's (IREC) 2019 Model Interconnection Procedures.
 - b. How to ensure timely, consistent, and reasonably-priced interconnection studies.
 - c. How to ensure just and reasonable pricing of grid modernization upgrades mandated by the distribution utility for interconnection of distributed energy resources, including transparency and consistency in pricing guidelines and appropriate cost-sharing among parties benefitting from such upgrades.
 - d. How to ensure distribution system upgrades paid for by customer-generators are not claimed as part of the utility rate-base.
 - e. Whether it is appropriate to establish an "Interconnection Working Group" convened at the department of energy to regularly assess if interconnection standards need modification.
 - f. Any other topic the department reasonably believes it should consider in order to diligently conduct the proceeding.
- III. The department shall report its findings and recommendations to the standing committees of the house of representatives and senate with jurisdiction over energy and utility matters no later than one year after initiating the proceeding. The report shall identify ways any recommended statutory changes can reduce barriers to cost-effective, predictable, and timely interconnection of distributed energy resources to the state's electric distribution system.

¹³ https://gencourt.state.nh.us/bill_status/legacy/bs2016/billText.aspx?id=2063&txtFormat=html&sy=2022

The Department formally initiated this investigation on December 5, 2022, titled “IP 2022-01 – Investigative Proceeding Relative to Customer-Generator Interconnection.”¹⁴ The Order of Notice was sent to several participants (stakeholders) including the three investor-owned electric distribution utilities in NH, the New Hampshire Electric Cooperative (NHEC), DER developers, and other interested parties.

The investigation included two technical sessions and four comment solicitations. Further, all stakeholders were invited to a presentation on September 28, 2023, by the Interstate Renewable Energy Council (IREC)¹⁵ to discuss the newly released (August 2023) IREC 2023 Model Interconnection Procedures, as well as a report titled, “Freeing the Grid.”¹⁶ The Freeing the Grid (FTG) presentation was attended by many of the stakeholders.

Detailed Stakeholder comments are available on the Department’s Investigative Proceedings website [Investigative Proceedings | NH Department of Energy](#). The following provides a high-level summary of the technical sessions and comments received regarding the SB 262 directive from Chapter 328:4, Section II.

SB 262- Chapter 328:4, II

a. How to create transparent, consistent, and reasonable engineering standards for interconnection, with special consideration given to established best practices used by other states as set forth in the Interstate Renewable Energy Council’s (IREC) 2019 Model Interconnection Procedures.

Throughout the investigation, there has been enthusiasm and consensus regarding the need for transparent, consistent, and reasonable engineering and process standards and best practices for interconnection. However, considerable discussion took place as to which standard(s) should be either adopted or used a reference to create a New Hampshire interconnection standard.

Some DER developers and clean energy advocates prefer the adoption of the IREC 2019 Model Interconnection Procedures, or as a minimum to use as the main reference for a New Hampshire model. The utility stakeholders cited concerns regarding the IREC 2019 model and prefer to use it as one reference among several that can be used to develop the New Hampshire model. It is important to note the IREC 2023 model was released at the end of August 2023 and not available until September 2023 which did not allow sufficient time to be considered in this investigation. However, it should be evaluated as part of the recommended working group process.

Stakeholders suggested several other interconnection models for consideration, including the Connecticut, Illinois, Massachusetts, and New York models, as well as FERC’s SGIP. Two of New Hampshire’s electric utilities serve customers in Massachusetts and are very familiar with Massachusetts’ more developed interconnection processes. Both of these utilities suggested using Massachusetts as a reference for developing New Hampshire’s standard. At least one of the non-utility stakeholders suggested Illinois as the basis for a primary reference.

¹⁴ [Investigative Proceedings | NH Department of Energy](#)

¹⁵ <https://irecusa.org/>

¹⁶ <https://freeingthegrid.org/>

Given the recent release of the IREC 2023 model, as well as the variety of thoughts regarding other models, the Department believes this issue is best addressed by the recommended working groups.

b. How to ensure timely, consistent, and reasonably-priced interconnection studies.

This issue generated considerable thoughts, concerns, frustration, and opinions from non-utility stakeholders regarding the utility's performance, costs, and processes. These included:

- Long delays occurring in various stages of the process.
- Perceived lack of focus and commitment on smaller DER.
- Availability of hosting maps (now available but updating frequency and information available in need of review).
- Minimal to no automation on the application processes (currently being addressed with PowerClerk for Eversource and Unitil).
- Lack of transparency.
- Lack of enforceable timelines.
- Insufficient detail in interconnection studies.
- Tremendous variability in costs for both studies and interconnection requirements.
- Limited to no ability to control costs in the utility's studies/evaluations and upgrade costs.

The utility stakeholders provided the following perspective:

- The number of DER applications have increased by three to four times in the last few years.
- The more DERs on the system, the more complicated the studies become.
- Recent FERC Orders require analysis of all DERs and additional requirements.

It is important to note virtually every point of interconnection on an electric system is unique in terms of evaluating the impact of DERs. Moreover, as the number of DERs increase, the potential electric system impact and complexity of the engineering and cost evaluations often increase disproportionately. These issues result in increased costs and time to complete the analyses for the electric utilities and DER developers.

These are extremely critical and sensitive issues. The stakeholders and the Department believe this topic is best addressed by the recommended working groups.

c. How to ensure just and reasonable pricing of grid modernization upgrades mandated by the distribution utility for interconnection of distributed energy resources, including transparency and consistency in pricing guidelines and appropriate cost-sharing among parties benefitting from such upgrades.

Based on the considerable feedback from stakeholders, as well as additional research by the Department, this topic will likely require the greatest amount of effort to achieve consensus, particularly in regard to cost-sharing. Listed below is a partial list of the perspectives and issues:

Non-utility stakeholders:

- Uncertainty and variability of costs, engineering standards, technical requirements, best practices, and assumptions used by the utilities. Price uncertainty is particularly problematic as they can render a project no longer economically viable after considerable effort and costs were already expended.
- Insufficient access to information/resources the utilities use in their engineering analyses and cost estimates.
- Variability of the duration of the engineering effort and associated cost estimates by the utilities.
- Lack of cost and time/duration guidelines in Puc 900 rules.
- A regularly updated interconnection queue should be provided by the utilities to aid DER developers in proposing projects by providing them the information to potentially leverage their interconnection investments for various locations.
- Fair allocation of the utility electric distribution system upgrade costs. Nearly all non-utility stakeholders believe upgrade costs that provide benefit to the utility's system and/or other customers should not have to be paid solely by the DER projects. Nearly all non-utility stakeholders prefer a "beneficiaries pay/contribute" approach.
- All non-utility stakeholders are open to discussing various cost-sharing methodologies, including recoupment of costs over time.

Utility stakeholders:

- Generally, the utilities stated they were unaware of significant issues of transparency regarding interconnection costs.
- Each interconnection engineering evaluation and cost estimate is unique, and the level of effort varies substantially.
- The engineering analyses and cost estimates are specific to the DER projects. Therefore, the utilities generally prefer the cost causation methodology.
- All utility stakeholders are open to discussing various cost-sharing methodologies if the upgrades will benefit others.

The stakeholders and the Department believe this topic is best addressed by the working groups.

d. How to ensure distribution system upgrades paid for by customer-generators are not claimed as part of the utility rate base.

The feedback from non-utility stakeholders on this topic was relatively light. One utility stakeholder provided a lengthy response.

Non-utility stakeholders:

- All expressed the need to ensure upgrade costs paid for by DER developers are not included in the utility rate base.
- One stakeholder suggested using Vermont as a template on this issue.
- If it is determined that all customers in a utility's system benefit from a particular investment, that may be justification for inclusion in the utility's rate base.

Utility stakeholders:

- Customer/DER developer contributions in aid of construction (CIAC) are applied to the projects thereby reducing the cost of the assets placed in service. Utilities indicate this practice is the same for all customer contributions related to construction, not just DER interconnections.

The Department will investigate this topic further before beginning discussions with the working groups. However, as is the case with nearly all topics in this investigation, the consensus of the working groups should be available prior to the Department making recommendations.

e. Whether it is appropriate to establish an “Interconnection Working Group” convened at the department of energy to regularly assess if interconnection standards need modification.

Working groups were discussed throughout the investigation. All stakeholders agree on the appropriateness and need for the establishment of interconnection working groups. The recommendation is initially for two working groups, one to address technical and engineering issues, and one to address administration and process. The consensus is for the working groups to be led by the Department.

f. Any other topic the department reasonably believes it should consider in order to diligently conduct the proceeding.

Application Fees

Interconnection application fees are being implemented in various locations across the country and in New England. They can help increase the efficiency of processing applications and more equitably allocate costs. Application fees were discussed during technical session 1 on May 5, 2023. The Department requested Set 2 comments on a variety of subjects, including application fees. Virtually all stakeholders are generally supportive of some type of standardized application fees.

Additionally, interconnection application fees are currently being discussed as part of PUC Docket DE 22-060,¹⁷ “Consideration of Changes to the Current Net Metering Tariff Structure, Including Compensation of Customer-Generators.” The utilities provided an initial draft proposal during a DE 22-060 technical session on November 11, 2023.

¹⁷ [New Hampshire Public Utilities Commission \(nh.gov\)](https://www.nh.gov)

Stakeholders believe that application fees may be a better approach for addressing interconnection application costs. The Department and stakeholders are awaiting additional information from the utilities in PUC Docket DE 22-060. The application fee issue may get fully or partially addressed/resolved in that docket. Regardless, the Department believes application fees should regularly be addressed by the interconnection working groups.

Export Capacity

The stakeholders discussed using the export capacity of a DER facility versus the nameplate rating as a better value for determining the level for utility screening and review for interconnection requests. This concept is being increasingly accepted across the country and should be considered by the working groups.

Freeing The Grid

Freeing the Grid (FTG) is a joint initiative of the IREC and Vote Solar that grades states on specific policies that help to increase clean energy adoption and access to the grid.¹⁸

The state grades are intended to assist policymakers and other stakeholders with identifying policy best practices for enabling the rapid growth of DERs, such as solar and energy storage, and benchmarking states' existing policies against those adopted in other jurisdictions.

As briefly discussed above, New Hampshire received a "D" grade for 2023. One of the stakeholders arranged a virtual meeting and presentation of the FTG report scoring, and highlights of the IREC 2023 Model Interconnection Procedures. All stakeholders were invited to a meeting/presentation held on September 28, 2023.¹⁹ Two IREC representatives presented the material and answered questions regarding the New Hampshire scoring and highlights of changes in the 2023 Model Interconnection Procedures.

The IREC representatives indicated that with some additional information, clarification, and minor changes to the Puc 900 rules, it is likely New Hampshire's grade will increase to a "C" or better. They also compared New Hampshire's score to Connecticut and Massachusetts, both of which have a score of "C."

Interconnection Queue

Interconnection queues are utilized by electric system operators and provide detailed information on the status of requests for new interconnections or upgrading (increased capacity) of generating facilities and transmission projects. For example, please see ISO-NE's interconnection queue: <https://www.iso-ne.com/system-planning/interconnection-service/interconnection-request-queue>.

¹⁸ Reference <https://freeingthegrid.org/>

¹⁹ <https://www.youtube.com/watch?v=FAAnI6vvZGVg>

Interconnection queue reports are provided by many EDCs. These reports are often in a document or Excel type format. The type of information and frequency vary tremendously, and the accuracy is sometimes questionable.

Several stakeholders expressed a desire for regularly updated, comprehensive interconnection queues for each of New Hampshire's electric utilities. These stakeholders indicate these queues will increase transparency and greatly aid them in tracking existing and new projects, planning where to locate projects, and identifying potential opportunities for synergy with other projects.

Stakeholders disagreed about what information is essential as well as the format and where/how the queues should be provided. Some stakeholders suggested the utilities post the queues on their websites and potentially associate with their hosting capacity maps. Generally, stakeholders agreed monthly updates, in an Excel format, would be sufficient. It should be noted that an interconnection queue is one of the best practices recommended by IREC.

Ombudsman/Facilitator

Virtually all stakeholders support ombudsmen or facilitators to assist with the interconnection processes, disputes, complaints, and other issues. Use of an ombudsman or facilitators would require the working groups to define their role, responsibility, authority, and other functions.

Conclusions and Summary

As part of this investigative proceeding regarding customer-generator interconnection, the Department facilitated technical sessions and solicited comments to help ensure all stakeholders' views were considered and discussed. Considerable pertinent and important information regarding the various stakeholder perspectives was presented. This report summarizes the investigation and strives to provide as complete a perspective as possible, identifying areas of consensus, non-consensus, and areas to address both near and long term.

Significant progress regarding interconnection standards is occurring across the country, including the Northeast and New Hampshire. The three regulated New Hampshire utilities have relatively standardized interconnection requirements for net-metering interconnections less than 1,000 kW in their tariffs and/or interconnection related documents based on the Puc 900 rules. However, there is room for significant improvement in consistency and clarity. The three NH regulated utilities and the New Hampshire Electric Cooperative (NHEC) have active hosting capacity maps.

This investigation identified a strong interest and desire to work together among the utilities and non-utility stakeholders to ensure cost-effective, predictable, and timely interconnection procedures for customer generators. There is a consensus among the stakeholders that formal, on-going working groups will provide the best possible outcomes for the issues already identified and those that will arise in the future.

Recommendations

Statutory

- As discussed, there are considerable technical, operating, processing, and procedural challenges of integrating large numbers of customer-generator and energy storage systems into New Hampshire's electric distribution systems. The Department strongly believes the working groups will help ensure greater clarity and appropriateness of the potential recommended statutory changes and suggests waiting for their recommendations.
- The Department cautions putting rates or cost ceilings in statutory recommendations and believes these are better suited as part of the utility tariffs and evaluated in rate cases.

Working Groups

- Creation of two NHD OE-led Working Groups:
 - **Technical/Engineering Working Group.** On-going effort to regularly address applicable engineering standards, codes, and best practices.
 - **Administrative/Process Working Group.** On-going effort to regularly address and update New Hampshire interconnection rules.
- Working group roles:

- Make recommendations for additional rules and other changes to Puc 900 rules (net-metering).
- Make recommendations for changes to address non-net-metering DER, including energy storage devices/systems, and DER greater than 1,000 kW.
- Evaluate and make recommendations regarding the potential benefits and roles of customer-generator interconnection facilitators/ombudsmen.
- The working group recommendations could result in the Department making statutory recommendations.
- Working groups shall strive to make recommendations for regulatory changes as each issue, or sets of issues, achieve consensus.

Near-term

Encourage utility collaboration on issues that do not require regulatory changes.

Conclusion

Through this investigation, stakeholders have provided valuable input on issues to discuss and resolve regarding interconnection for distributed electric generation and energy storage systems. Per the statute, stakeholders believe that working groups will be helpful and enable a more efficient and fair process. Based on this investigation, the Department plans to initiate the recommended stakeholder working group process and will propose any potential recommended statutory changes to the legislature if needed and will propose any rule or tariff changes.