NJ BPU Clean Energy Grid Modernization pursuant to Public Docket: **Docket No. QO21010085**

https://njcleanenergy.com/gridmod
Meeting 1
This Meeting
Grid Modernization Context
Oct 26

Meeting 2
Stakeholder Data/Receive Comments
Nov 16

Meeting 3
EDC Presentations / Collaborative Alignment
Jan 14

Draft Report

Meeting 4
Draft Report Review and Comment
Mar 1

Final Report

Meeting 5
Final Report Presentation
May 2

more detail is available at https://njcleanenergy.com/gridmod
# Agenda

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<th>Presenters</th>
<th>Time</th>
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<td>NJ BPU</td>
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<td>Meeting Series Overview and Logistics, Timeline</td>
<td>Guidehouse</td>
<td>9:10 – 9:20</td>
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<td>Introductions, Project Overview and Objectives</td>
<td>Guidehouse</td>
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<td>Poll Questions</td>
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<td>Guidehouse</td>
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<td><strong>Break (15 minutes)</strong></td>
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<td>Stakeholder Requests to Speak</td>
<td>All</td>
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<td>Next Steps</td>
<td>Guidehouse</td>
<td>End</td>
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</table>
Introductions
Project Team

New Jersey Board of Public Utilities

Paul Heitmann
Program Manager
BPU Clean Energy Division

David Brown
Environmental Engineer
BPU Division of Energy

David Schmitt
Office of General Counsel

Abe Silverman
Office of General Counsel

Jim Ferris
Bureau Chief of New Technology
Clean Energy Division

Guidehouse

Laura Manz
Director

Matthew Wharton
Associate Director

Emily Cross
Managing Consultant
Project Manager

Fernando Palma
Managing Consultant

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Project Overview and Objectives
Project Overview and Objectives
Through an open discussion assure the interconnection process is ready to move New Jersey toward its clean energy goals

Efficient
• Streamlined
• Automated
• Consistent
• Understandable

Transparent
• Visibility into points of interconnection
• Clear, right-sized requirements
• Supports NJ’s goals and objectives

Cost Effective
• Minimize costs where practical
• Leverages technology
• Fosters investment
The State’s 2019 Energy Master Plan (EMP) calls for 100% clean energy by 2050; the resource interconnection processes are critical to achieving this goal.

New Jersey’s interconnection rules and processes must accommodate:
- 50% Renewable Portfolio Standard and 2000 MWs of energy storage by 2030
- 32 GW of in-state solar, 11 GW of offshore wind, and 9 GW of storage to meet clean energy by 2050

The EMP identifies several strategies to achieve New Jersey’s clean energy and greenhouse gas emissions reduction goals.
- Chief among them is accelerated procurement of renewable energy and distributed energy resources and electrification of the transportation and building sectors.
Project Overview and Objectives – Detail
NJBPU Grid Modernization

Objectives:

• Recommend updates to the interconnection process based on a review of the New Jersey Administrative Code (N.J.A.C.)

• Assess and modernize the processing of interconnection requests

• Identify challenges with interconnection standards and processes

• Improve interconnection coordination with PJM

• Facilitate changes to meet ambitious clean energy targets
Poll Questions
NJ Interconnection
Process
Observations
NJ Interconnection Process Observations
N.J.A.C. – Current Process, Interconnection Level Definitions

- New Jersey Administrative Code (N.J.A.C) - Title 14, Chapter 8, Subchapter 5
- **Level 1**: An Electric Distribution Company (EDC) shall use this review procedure for all applications to connect inverter-based customer-generator facilities, which have a power rating of 10 kW or less, and which meet the certification requirements
- **Level 2**: An EDC shall use this review procedure for applications to connect customer-generator facilities with a power rating of two MW or less, and which meet the certification requirements
- **Level 3**: An EDC shall use this review procedure for applications to connect customer-generator facilities that do not qualify for either the level 1 or level 2 interconnection review procedures.
1. Customer selects a location for the resource
2. Customer submits an Interconnection Application/Agreement
   – Submit Part 1 of the application
3. EDC identifies / installs network upgrades
4. Customer receives Approval to Install (ATI); installs the facility
5. EDC conducts inspections
   – Customer submit Part 2 of the application (Certificate of Completion)
6. EDC installs new meter for net metering (if applicable)
7. Customer receives Authorization/Approval to Operate (ATO); operate
NJ Interconnection Process Observations
Certification of Customer-Generator Interconnection Equipment
N.J.A.C 14:8-5.3

• Applicable to level 1 and level 2 interconnections

• Institute of Electrical and Electronic Engineers (IEEE) 1547, Standard for Interconnecting Distributed Resources with Electric Power Systems

• Underwriters Laboratory (UL) 1741 Inverters, Converters, and Controllers for Use in Independent Power Systems

• Interconnection equipment shall be considered certified for interconnected operation if it has been submitted by a manufacturer to an OSHA-approved nationally recognized testing laboratory, such as Underwriters Laboratory, and has been tested and listed by the laboratory for continuous interactive operation with an electric distribution system in compliance with the applicable codes and standards
NJ Interconnection Process Observations
Level 1 Interconnection Review
N.J.A.C 14:8-5.4

• Facility is inverter-based
• Capacity of 10 kW or less
• Screenings:
  – Shall not contribute more than 10 percent of the distribution circuit maximum fault current
  – Point of Common Coupling (PCC) shall not be on a transmission line, a spot network, or an area network
  – Shall not exceed 10 percent (15 for solar) of the circuit’s total annual peak load
  – Single-phase shared secondary, the aggregate generation shall not exceed 20 kVA
  – Shall not create an imbalance between the two sides of 240 V service of more than 20 percent of nameplate rating of the service transformer
NJ Interconnection Process Observations
Level 2 Interconnection Review
N.J.A.C 14:8-5.5

• Capacity of 2 MW or less

• Screenings:
  – Shall not exceed 90 percent of the short circuit interrupting capability of equipment
  – If transient stability limits near PCC, the section containing the PCC shall not exceed 10 MW
  – Shall not contribute more than 10 percent of the distribution circuit maximum fault current
  – Shall not exceed 10 percent (15 for solar) of the circuit’s total annual peak load
  – Single-phase Shared secondary, the aggregate generation shall not exceed 20 kVA
  – Shall not create an imbalance between the two sides of 240 V service of more than 20 percent of nameplate rating of the service transformer
  – Point of Common Coupling (PCC) shall not be on a transmission line
NJ Interconnection Process Observations
Level 2 Interconnection Review
N.J.A.C 14:8-5.5

• Screenings:

<table>
<thead>
<tr>
<th>Primary Distribution Line Type</th>
<th>Type of Interconnection to Primary Distribution Line</th>
<th>Result/Criteria</th>
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<tbody>
<tr>
<td>Three-phase, three wire</td>
<td>3-phase or single phase, phase-to-phase</td>
<td>Pass screen</td>
</tr>
<tr>
<td>Three-phase, four wire</td>
<td>Effectively-grounded 3 phase or Single-phase, line-to-neutral</td>
<td>Pass screen</td>
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– Single-phase shared secondary, the aggregate generation shall not exceed 20 kVA
– If connected on a spot or area network
  – Aggregate of generation capacity shall not exceed five percent of the spot network’s maximum load
  – Facilities using protective functions, and in aggregate with other facilities, shall not exceed 10 percent of the minimum annual load on the network, or 500 kW, whichever is less
  – Facilities not using protective functions, and in aggregate with other facilities, shall utilize reverse power relays or other protection devices that ensure no export of power from the customer-generator facility
NJ Interconnection Process Observations

Level 3 Interconnection Review
N.J.A.C 14:8-5.6

• Does not qualify for the level 1 or level 2 interconnection review procedures

• Optional scoping meeting

• Impact study – (as applicable)
  – Load flow study
  – Short-circuit
  – Circuit protection and coordination
  – Impact on the operation of the electric distribution systems
  – Stability study
  – Voltage collapse study

• Facilities Study –
  – Determine Interconnection Facilities and Network Upgrades
NJ Interconnection Process Observations

High Level Observations

– New Jersey Administrative Code (N.J.A.C) generally follows the FERC’s Small Generator Interconnection Procedures (FERC SGIP)
  – N.J.A.C has a Level 1 fast track (Less than 10 kW) for inverter-based resources
  – N.J.A.C has a Level 2 fast track (<2MW) for all resources

Out-of-date references
– Some Codes and Standards are out of date
  – IEEE 1547 has released 2018 version with a 2020A (Amendment) (2003 is currently referenced instead of 2018)

Project Timelines
– No specified timelines within the level 3 study process (i.e., does not state when an impact study needs to be delivered to a customer)
NJ Interconnection Process Observations
Level 1 Interconnection Review <10kW (N.J.A.C. 14:8-5.4)

High Level Observations

• Industry scan: what others are doing:
  – Reducing screening criteria
  – Simplifying language for screening criteria
    – E.g., “The Utility shall verify that the Generating Facility can be interconnected safely and reliably”

  – Screening criteria from other sources are based on combining Level 1 and Level 2, such as:
    – California Public Utility Commission Rule 21
    – Interstate Renewable Energy Council (IREC) / Electric Power Research Institute (EPRI)
NJ Interconnection Process Observations
Level 2 Interconnection Review (14:8-5.5)
High Level Observations

- N.J.A.C. Level 2 currently has a limit of 2 MWs or less that applies to all resources
  - FERC MW limits for Fast Track are based on voltage level
- Screening criteria vary for Level 2 for the following industry sources:
  - FERC
  - California Public Utility Commission Rule 21
  - IREC / EPRI

Source: FERC SGIP, section 2.1
NJ Interconnection Process Observations
Level 3 Interconnection Review (14:8-5.6)
High Level Observations

• Full study process – currently is a serial study
  – Others utilize a cluster process to help spread cost among similar projects
  – Others require initial review / scoping meetings

• No defined timelines for different studies to be completed
  – This might be defined within internal processes but could be different for each company
NJ Interconnection Process Observations
High-level observations, Electric Distribution Companies (EDCs)

Application Process

- Range of application methods is used across EDCs (e.g., software application, PDF/email, online web portal)
- Majority of applications are currently Level 1, with some Level 2
- Queuing approach is primarily first in/first served
- Level 1 application process
  - Primarily an administrative review
- Level 2/3 application process
  - Larger projects require engineering/planning department review and studies
  - Cost allocation approach varies, is primarily “cost-causer” approach
    - Customer can decide to pay for upgrades, or reduce the project capacity
NJ Interconnection Process Observations
High-level observations, Electric Distribution Companies (EDCs)

Cause of Delays (all Levels unless otherwise specified)

• Customer data issues
  – Missing data
  – Apparent system oversizing based on typical usage (EDC must investigate whether an error, or actual reason such as an Electric Vehicle or conversion from natural gas, requires letter from engineer if oversized)

• Slow Part 2 application delays approval to operate (ATO)

• Supply chain delays

• Storm outage restoration services can cause resource bottleneck

• Installer/billing issues (work cannot proceed without a paid invoice)

• Level 2/3
  – Different department routing for Level 2, Level 3
  – Resource saturation (not enough engineers)
NJ Interconnection Process Observations
High-level observations, Electric Distribution Companies (EDCs)

NJ Capacity Maps

• Perceived update frequency ranges from no regularly scheduled update, to quarterly updates

FERC 2222 / PJM

• Need for additional coordination between utility and PJM
• Aggregation projects may be delayed because of not meeting safety/reliability standards (e.g., no UL rating on equipment)
• Misalignment between capacity threshold for required added telemetry (added costs) for EDCs (e.g., 250 kW, 500 kW), FERC (100 kW)
• Market rules are governed by PJM, interconnection rules are not
Break
15 min
Stakeholder Requests to Speak
Next Steps
Next Step and Outcomes

Continued engagement

• Meeting #2 November 16, 2021
  – Participants can pre-register to present on topics of interest and their concerns. Presentations are limited to 5 minutes per participant. Guidehouse will be taking detailed notes and also open the feedback window. Guidehouse will gather and organize feedback by categories. Follow up includes a frequently asked questions (FAQ) document and updated presentations where issues can be clarified.

• Outcomes of the stakeholder process could result in:
  – Gap analysis and proposed roadmap
  – Identified modifications and updates to meet the clean energy plan
  – Directives from the NJ BPU
Submitting Comments

https://njcleanenergy.com/gridmod

• Please submit comments directly to Docket No. QO21010085 as detailed in the public notice. Comments are considered “public documents” for purposes of the State’s Open Public Records Act and any confidential information should be submitted in accordance with the procedures set forth in N.J.A.C. 14:1-12.3. Written comments, including questions regarding the stakeholder process, may also be submitted to:

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44 South Clinton Avenue, 1st Floor
Post Office Box 350
Trenton, NJ 08625-0350
Phone: 609-292-1599
Email: board.secretary@bpu.nj.gov

• All comments must be received on or before 5:00 p.m. EDT on March 22, 2022.
NJ BPU Closing Remarks
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