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Grid Modernization

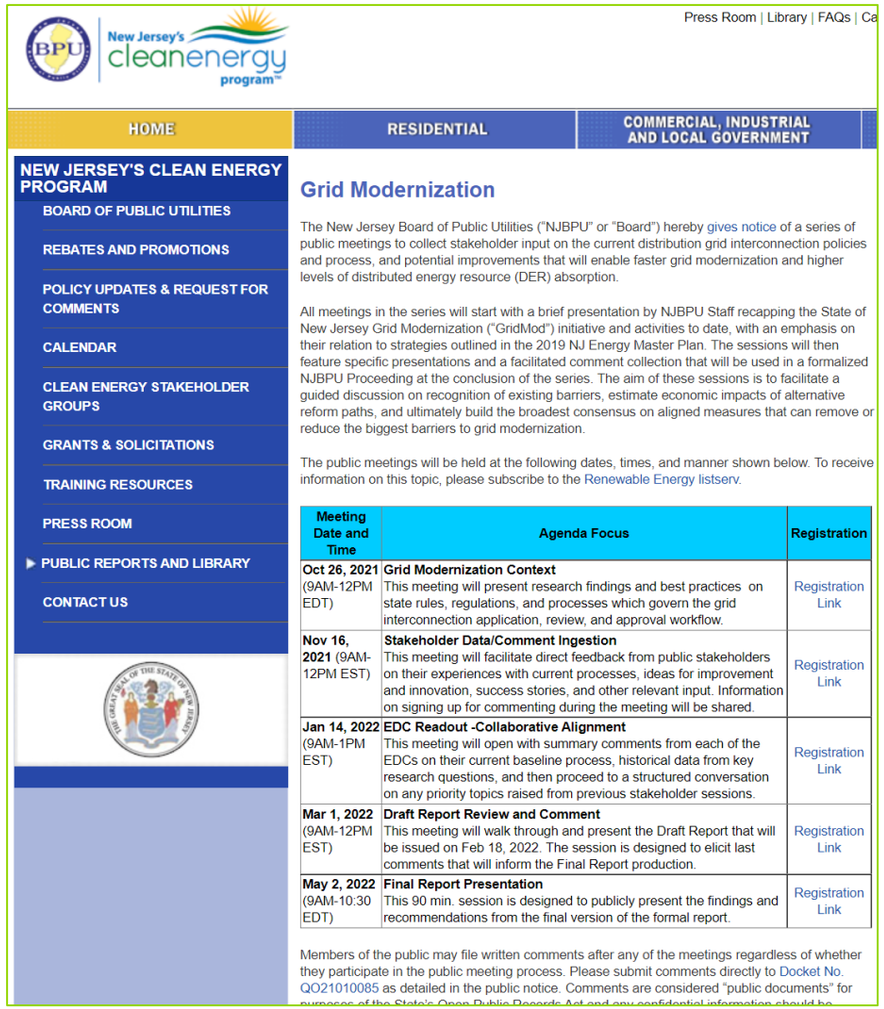
Stakeholder Meeting #1

October 26, 2021

NJ BPU Clean Energy Grid Modernization

pursuant to Public Docket: Docket No. QO21010085

https://njcleanenergy.com/gridmod



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New Jersey's cleanenergy program

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Grid Modernization

The New Jersey Board of Public Utilities ("NJBPU" or "Board") hereby gives notice of a series of public meetings to collect stakeholder input on the current distribution grid interconnection policies and process, and potential improvements that will enable faster grid modernization and higher levels of distributed energy resource (DER) absorption.

All meetings in the series will start with a brief presentation by NJBPU Staff recapping the State of New Jersey Grid Modernization ("GridMod") initiative and activities to date, with an emphasis on their relation to strategies outlined in the 2019 NJ Energy Master Plan. The sessions will then feature specific presentations and a facilitated comment collection that will be used in a formalized NJBPU Proceeding at the conclusion of the series. The aim of these sessions is to facilitate a guided discussion on recognition of existing barriers, estimate economic impacts of alternative reform paths, and ultimately build the broadest consensus on aligned measures that can remove or reduce the biggest barriers to grid modernization.

The public meetings will be held at the following dates, times, and manner shown below. To receive information on this topic, please subscribe to the Renewable Energy listserv.

Meeting Date and Time	Agenda Focus	Registration
Oct 26, 2021 (9AM-12PM EDT)	**Grid Modernization Context** This meeting will present research findings and best practices on state rules, regulations, and processes which govern the grid interconnection application, review, and approval workflow.	Registration Link
Nov 16, 2021 (9AM-12PM EST)	**Stakeholder Data/Comment Ingestion** This meeting will facilitate direct feedback from public stakeholders on their experiences with current processes, ideas for improvement and innovation, success stories, and other relevant input. Information on signing up for commenting during the meeting will be shared.	Registration Link
Jan 14, 2022 (9AM-1PM EST)	**EDC Readout -Collaborative Alignment** This meeting will open with summary comments from each of the EDCs on their current baseline process, historical data from key research questions, and then proceed to a structured conversation on any priority topics raised from previous stakeholder sessions.	Registration Link
Mar 1, 2022 (9AM-12PM EST)	**Draft Report Review and Comment** This meeting will walk through and present the Draft Report that will be issued on Feb 18, 2022. The session is designed to elicit last comments that will inform the Final Report production.	Registration Link
May 2, 2022 (9AM-10:30 EDT)	**Final Report Presentation** This 90 min. session is designed to publicly present the findings and recommendations from the final version of the formal report.	Registration Link

Members of the public may file written comments after any of the meetings regardless of whether they participate in the public meeting process. Please submit comments directly to Docket No. QO21010085 as detailed in the public notice. Comments are considered "public documents" for

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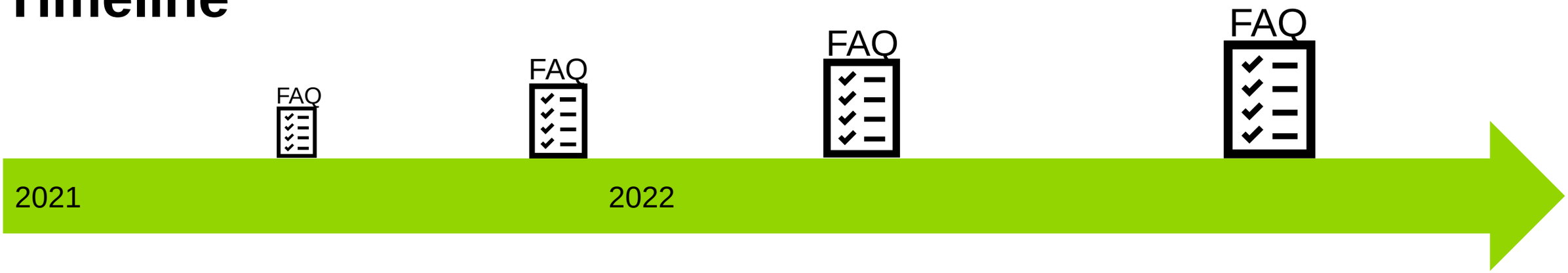
Timeline



October | November | December | January | February | March | April | May

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

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Agenda

Topic	Presenters	Time
Welcome and Opening Remarks	NJ BPU	9:00 – 9:10
Meeting Series Overview and Logistics, Timeline	Guidehouse	9:10 – 9:20
Introductions, Project Overview and Objectives	Guidehouse	9:20 – 9:30
Poll Questions	Guidehouse	9:30 – 9:40
NJ Interconnection Process Observations	Guidehouse	9:40 – 10:10
Break (15 minutes)		
Stakeholder Requests to Speak	All	10:25 – TBD
Next Steps	Guidehouse	End

Introductions
Project Team

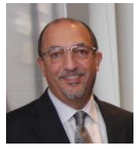
New Jersey Board of Public Utilities

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

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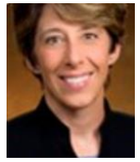

Laura Manz
Director

Matthew Wharton
Associate Director

Emily Cross
Managing Consultant
Project Manager

Fernando Palma
Managing Consultant

Project Overview and Objectives

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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

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Project Overview and Objectives - Background

NJBPU Grid Modernization

- 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

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NJ Interconnection Process Observations

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NJ Interconnection Process Observations

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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.

NJ Interconnection Process Observations

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N.J.A.C. Interconnection Application and Implementation Process

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:

Primary Distribution Line Type	Type of Interconnection to Primary Distribution Line	Result/Criteria
Three-phase, three wire	3-phase or single phase, phase-to-phase	Pass screen
Three-phase, four wire	Effectively-grounded 3 phase or Single-phase, line-to-neutral	Pass screen

  - 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

Fast Track Eligibility for Inverter-Based Systems		
Line Voltage	Fast Track Eligibility Regardless of Location	Fast Track Eligibility on a Mainline[1] and ≤ 2.5 Electrical Circuit Miles from Substation[2]
< 5 kV	≤ 500 kW	≤ 500 kW
≥ 5 kV and < 15 kV	≤ 2 MW	≤ 3 MW
≥ 15 kV and < 30 kV	≤ 3 MW	≤ 4 MW
≥ 30 kV and ≤ 69 kV	≤ 4 MW	≤ 5 MW

Source: FERC SGIP, section 2.1

- 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

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

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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

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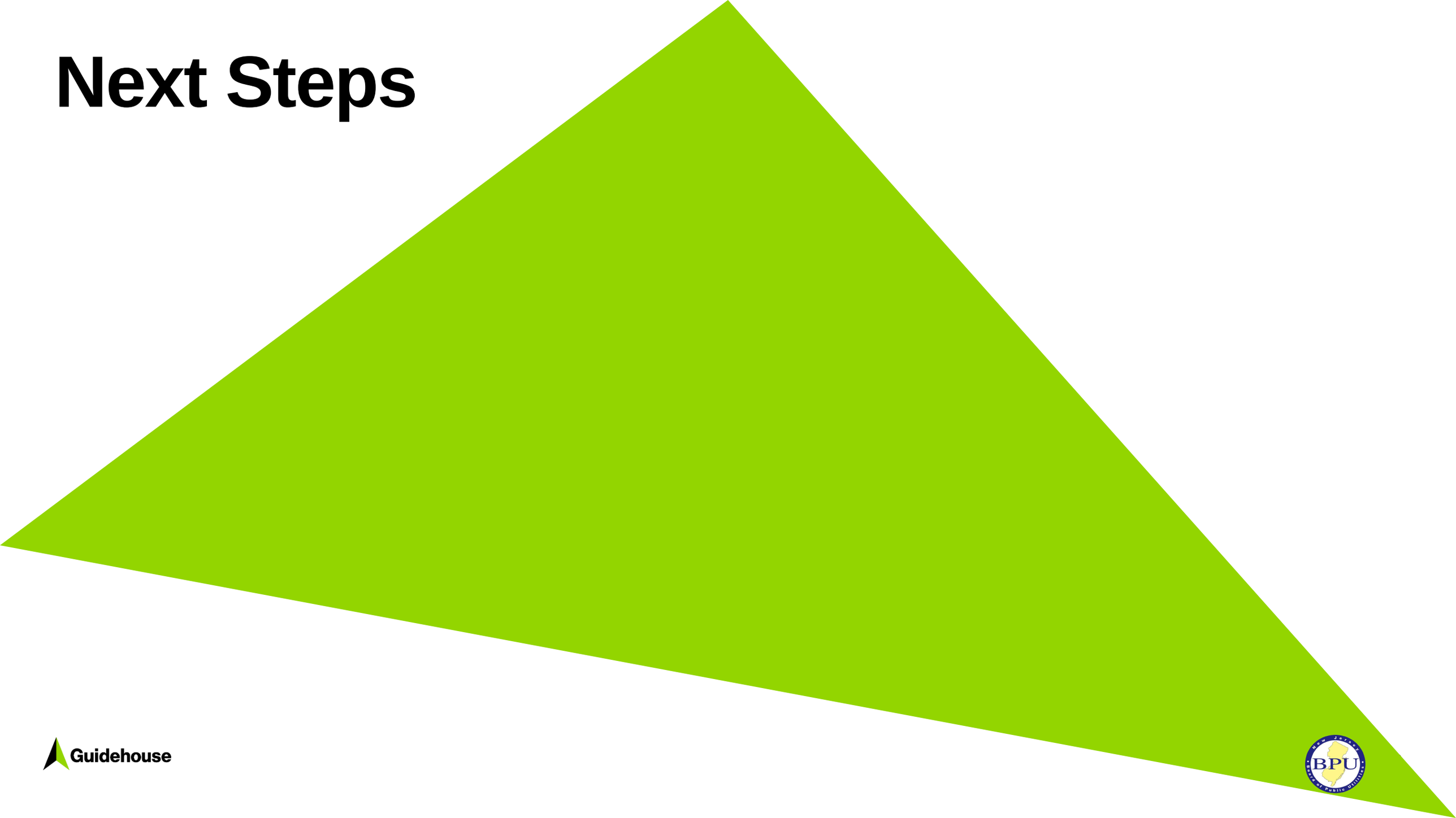
Stakeholder Requests to Speak

Next Steps



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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:

  Aida Camacho-Welch
  Secretary of the Board
  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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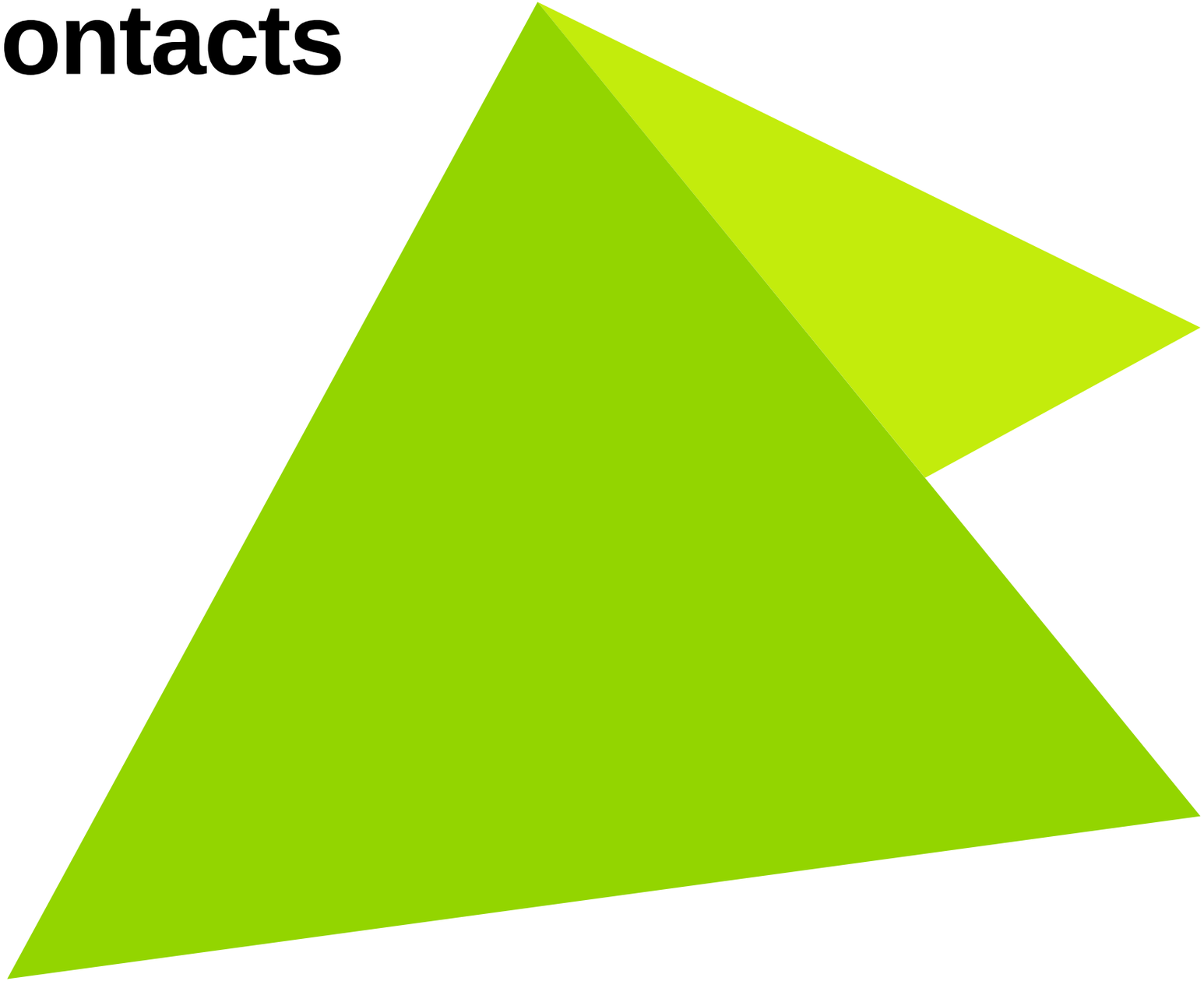

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