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New Jersey Board of Public Utilities
Prebuild Infrastructure

Public Engagement Meeting

October 1, 2024

Welcome

Thank you for coming to tonight's public stakeholder meeting

To keep up to date on information for the Project, please sign up by visiting the Board's list



Purpose for Tonight's Meeting

Provide information regarding the Prebuild Infrastructure project and potential impacts on the community.

- ▶ Foster transparency
- ▶ Understand community concerns
- ▶ Information Sharing

Agenda

1 New Jersey's Transmission Needs

New Jersey's Electric System Needs

2 Project Information

Project Background • Prebuild Infrastructure

3 Project Timelines and Regulatory Reviews

Project Status • State and Federal Planning Timeline • Project Timeline • Key Milestones and Public Involvement

4 Infrastructure Overview

Duct Banks • Cable Vaults • Landfall

5 Similar Projects

Existing Underground Power Cables • Neptune Cable • Similar Projects

6 Community and Environmental Standards

Responsible Infrastructure • Responsible Project Design • Transmission and Economic Development Grant

7 Background on DC Magnetic Fields: Special Presentation

8 Next Steps

9 Public Comment

New Jersey's Transmission Needs

▶ New Jersey's Electric System Needs

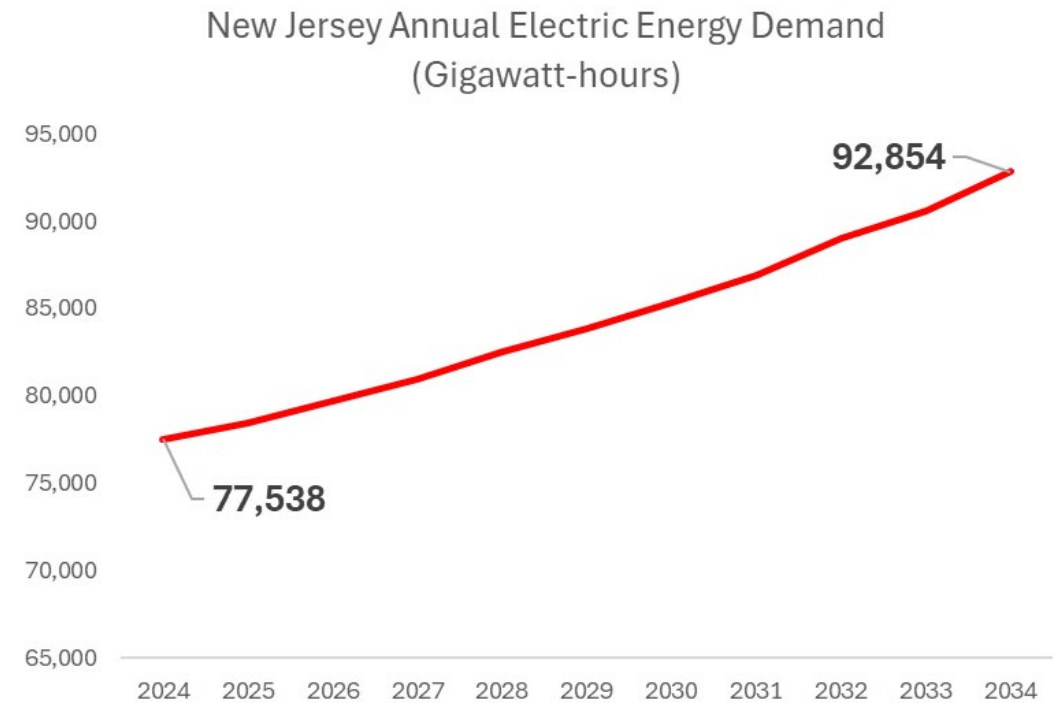


New Jersey's Electric System Needs

New Jersey's electricity consumption is growing rapidly—data centers, port electrification, electric vehicles, larger homes, population growth, etc.

New Jersey is forecast to consume over 92 billion kilowatt-hours of electricity in 2034. The average home in New Jersey consumes about 681 kilowatt-hours a month.

New Jersey is part of a larger regional electricity market called PJM - which oversees the coordination and operation of the grid in 13 states serving over 65 million people.



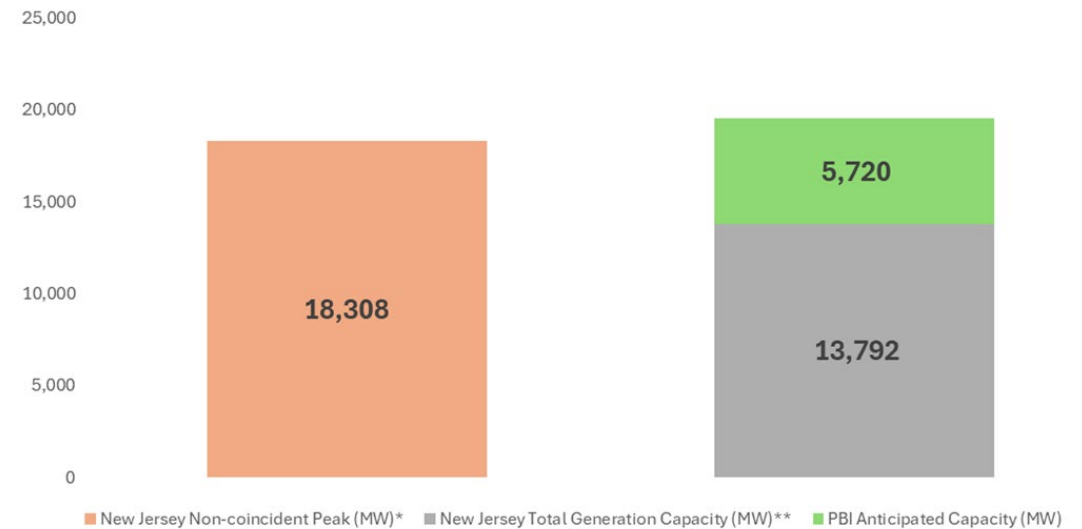
Source: *PJM January 2024 Load Forecast Report Table E-1*

New Jersey's Electric System Needs

Projects like the Prebuild Infrastructure provides the transmission needed to support reliable electric service in New Jersey.

- ▶ New Jersey relies on 6,000 megawatts of electric power from generators out of state—transmitted into the state over high voltage power lines
- ▶ Offshore wind is needed to serve increasing demand while importing less coal power from other states
- ▶ Much of the power imported to New Jersey during critical winter periods is produced by coal plants. Many of those plants are already shutting down due to age, high costs, and negative health & environmental impact.

New Jersey 2023 Electric Demand & Generation Capacity (Megawatts)



*Source: PJM January 2024 Load Forecast Report Table B-1

**Source: PJM 2023 New Jersey State Infrastructure Report

Project Information

- ▶ Key Terms
- ▶ Project Background
- ▶ Prebuild Infrastructure



Key Terms

Circuit: A closed electrical path that carries electric power, may consist of multiple cables

Cable: An insulated wire or set of wires that makes up a circuit

Duct Bank: a set of pipes set in concrete that hold cables

Cable Vault: A concrete box underground where cable segments are connected

Voltage: The “pressure” that pushes electric power. Higher voltage allows more power transfer with less current (and smaller wires).

Current: the movement of electrons through a cable. Higher current requires bigger wires.

Power: This is what we want! Voltage times current powers our electronics. Higher voltages allow us to transfer more power with less current, so we can use smaller wires.

Energy: How much power you use over time. Your utility bill is based on energy, measured in kilowatt-hours, which is produced by electric generators.

Key Terms (Cont.)

AC: Alternating current is electric current and power that changes direction over time. Most high voltage electric power, as well as the power in your home, in the U.S. is AC and changes direction 60 times every second (60 Hertz).

DC: Direct current is power that flows in only one direction.

HVDC: High Voltage Direct Current is simply direct current power at a high voltage! The purpose of high voltage is to transmit more power with smaller wires. Prebuild Infrastructure will host HVDC cables.

POI: Point of interconnection is the specific location on the electrical grid where a power generator (Solar, Gas plant, Offshore Wind, Hydropower) connects.

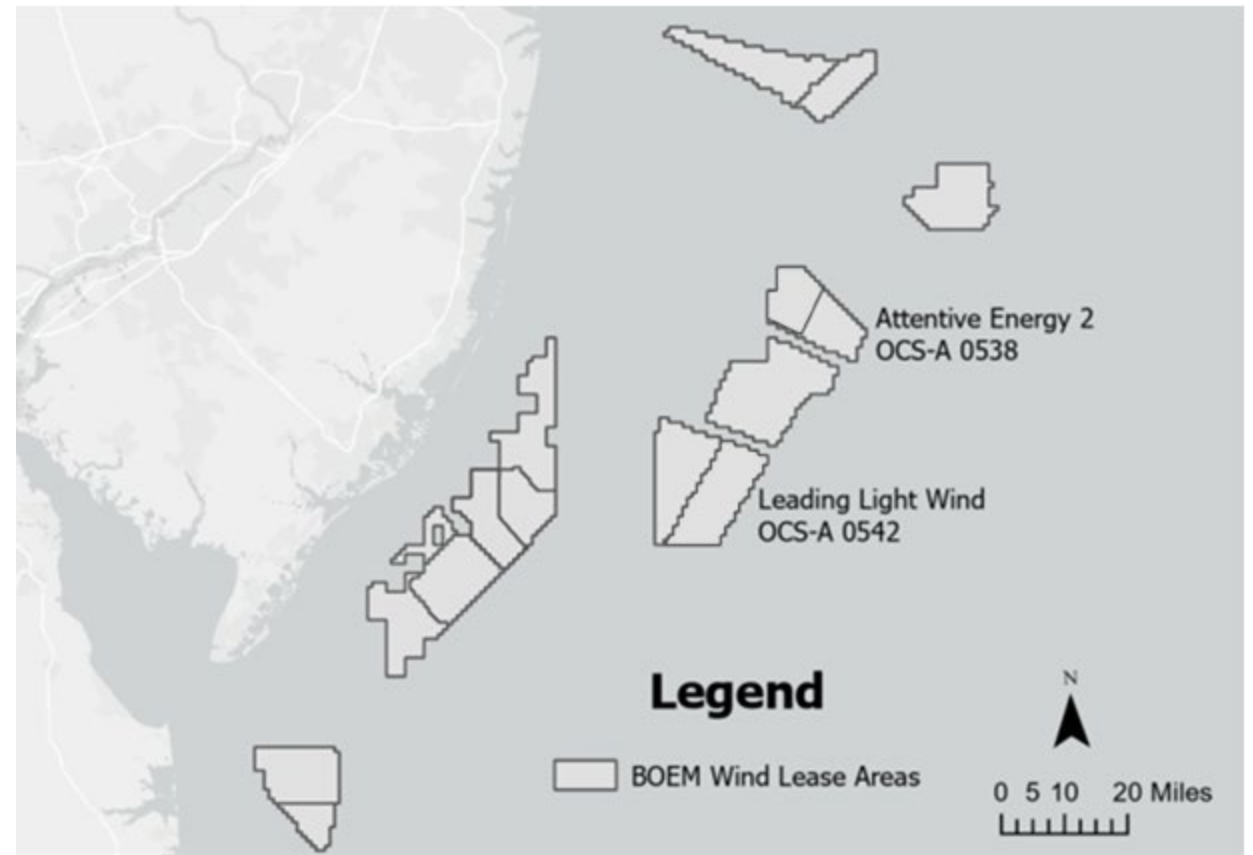
SAA: State Agreement Approach is a regulatory pathway where the state of New Jersey works with the regional planning organization called PJM to incorporate the State's offshore wind goals into the regional transmission planning process. The result of the SAA was to build a large collector station to be a point of interconnection for multiple offshore wind projects.

Project Background

The Prebuild Infrastructure is envisioned to develop coordinated transmission infrastructure to provide cost efficiencies and reduce environmental and community impacts.

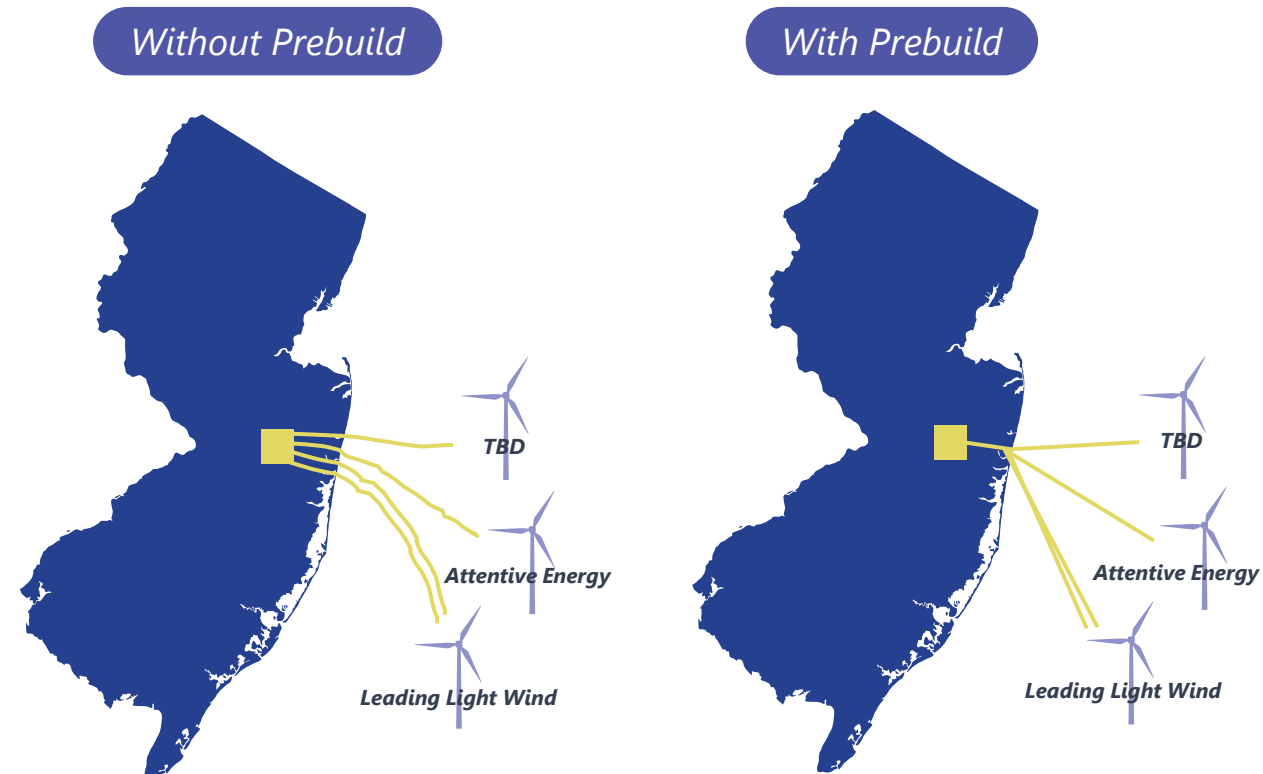
The Prebuild Infrastructure will provide transmission corridors for up to four offshore wind projects. It will allow offshore wind projects to “plug-in” at a big “power strip” called the Larrabee Collector Station.

Offshore Wind Lease Areas



Prebuild Infrastructure

- ▶ The Prebuild Infrastructure is a path for approved qualified offshore wind projects to follow from the Sea Girt National Guard Training Center to the Larrabee Collector Station.
- ▶ The Larrabee Collector Station is a common point for multiple offshore wind projects to connect to the grid.
- ▶ Power cables will be installed by the offshore wind developers.
- ▶ The infrastructure could make use of one or two corridors.
- ▶ Prebuild Infrastructure includes necessary duct banks and cable vaults for up to four approved offshore wind projects.



*Figure is illustrative and not drawn to scale, landing is intended to be Sea Girt National Guard Training Center

Corridor between Sea Girt National Guard Training Center and Larrabee Collector Station



Larrabee Collector Station

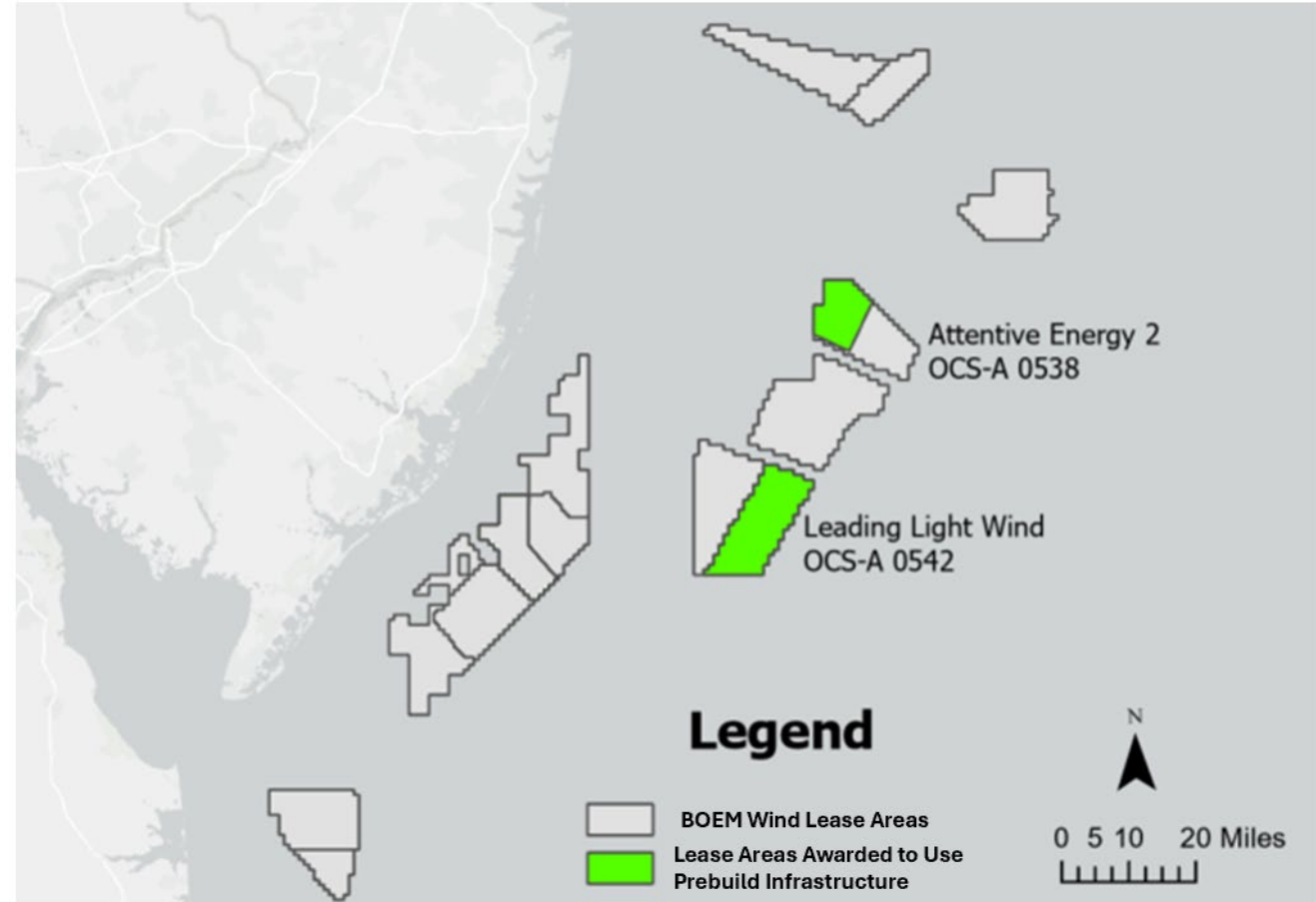


Sea Girt National Guard Training Center

Project Background

The Infrastructure for three of the four circuits were awarded in New Jersey's Offshore Wind Solicitation 3.

- ▶ 1 awarded to Attentive Energy 2 for their 1,342-megawatt project
- ▶ 2 awarded to Leading Light Wind for their 2,400-megawatt project (2 x 1,200 megawatt)
- ▶ 1 remains available for a future New Jersey Offshore Wind solicitation (anticipated range of 1,148 to 1,500-megawatt)



The current awarded projects utilizing the Prebuild Infrastructure provide 3,742 megawatts of power delivered to New Jersey's grid.

Project Timelines & Regulatory Review

- ▶ Project Status
- ▶ State and Federal Planning Timeline
- ▶ Project Timeline
- ▶ Key Milestones & Public Involvement

Project Status

The developer selected to build this infrastructure will work in close coordination with federal and state agencies, as well as other stakeholders, to minimize impacts on natural resources and ensure compatibility with surrounding land use and communities.

The Board is reviewing the viability, feasibility, and cost of each project which includes ensuring that the successful project developer takes **the least disruptive construction and operation plan to the community.**

The Board will consider making an award for a selected Prebuild Infrastructure developer in fall 2024. Construction of the Prebuild Infrastructure is expected to start in 2027 and finish in 2029.

The installation of cables by offshore wind projects will begin as early as 2029.

State and Federal Planning Timeline

★ We are Here

Phase 1

Solicitation

Transmission developers confidentially bid into the solicitation built by the Board and Cooperating state/federal agencies

Public guidance document for Prebuild Infrastructure released

Phase 2

Selection

The Board considers making an award for a responsibly designed project to efficiently build energy transmission infrastructure.

Attend Public Stakeholder Meeting
10/01/2024 (this meeting)

Submit comments live in this webinar or to the [Docket No. QO23100719](#)

Comment period:
9/17/24-10/15/2024

Phase 3

Project Design

Developer works with community groups, stakeholders, state agencies, and utilities to design this project. Multiple opportunities to make comments/have your voice heard.

Developer meetings

Community/stakeholder meetings

TBD: The Developer will announce where and when

Phase 4

Project Siting and Permitting

Concurrent with project design, the developer must acquire environmental permits from state and federal agencies, in addition to completing the NEPA process. This phase has several opportunities to comment at both state and federal levels.

Phase 5

Project Construction

Begins following receipt of all state and federal permits
Developer will continue coordination with local leaders to minimize temporary construction impacts

Key Milestones and Public Involvement

Timeline of the Project's development and key milestones

**Spring and Winter
2022**

Early planning and
public comment

November 17, 2023

Solicitation Issued

April 3, 2024

Application Submission
Deadline

**September 17–
October 15, 2024**

Prebuild Infrastructure
Public Comment Period

Fall 2024

Board Decision



Award

2025

Project Permitting /
Comment Period

2027

Construction to begin

2029

Project Completion

Infrastructure Overview

- ▶ Duct Banks
- ▶ Cable Vaults
- ▶ Landfall & Trenchless Drill

Infrastructure Overview

Ducts Banks

All Prebuild Infrastructure will be underground with fully restored road surfaces—the only visible elements will be manhole covers for cable vault access.

- ▶ Stacks of PVC pipes covered in concrete and buried under soil and road surfaces—protect power cables from physical stress and water.
- ▶ The concrete and backfill used is designed to dissipate heat to ensure cables and surroundings don't get hot.



Example duct bank in roadway prior to concrete being poured

Source: [Eversource Middletown-Norwalk Transmission Line - BOND Civil & Utility \(bond-civilutility.com\)](https://www.bond-civilutility.com/)

Infrastructure Overview

Ducts Banks

- ▶ Duct banks will likely be 3 to 5 feet deep. Some sections may go as deep as 15 feet to avoid conflicts with existing pipes.
- ▶ Insulated cables will be pulled into the PVC conduits and carry energy to a substation for distribution to customers



Source: [Eversource Middletown-Norwalk Transmission Line - BOND Civil & Utility \(bond-civilutility.com\)](http://Eversource Middletown-Norwalk Transmission Line - BOND Civil & Utility (bond-civilutility.com))

Infrastructure Overview

Cable Vaults

All Prebuild Infrastructure will be underground with fully restored road surfaces—the only visible elements will be manhole covers for cable vault access.

- ▶ Large concrete boxes buried at regular intervals for joining cable sections and performing maintenance.
- ▶ Cable vaults will measure about 10 feet by 20 feet by 5 feet deep.
- ▶ Access is via a manhole and is flush with the road surface making it minimally invasive along transmission lines and roadways.



Example cable vault installation in a residential neighborhood in NYC

Source: Powermag.com "Useful Specifications and Guides for Underground Cable and Vaults"

Indicative Construction Locations

Prebuild Infrastructure Landfall

Landfall Process Overview

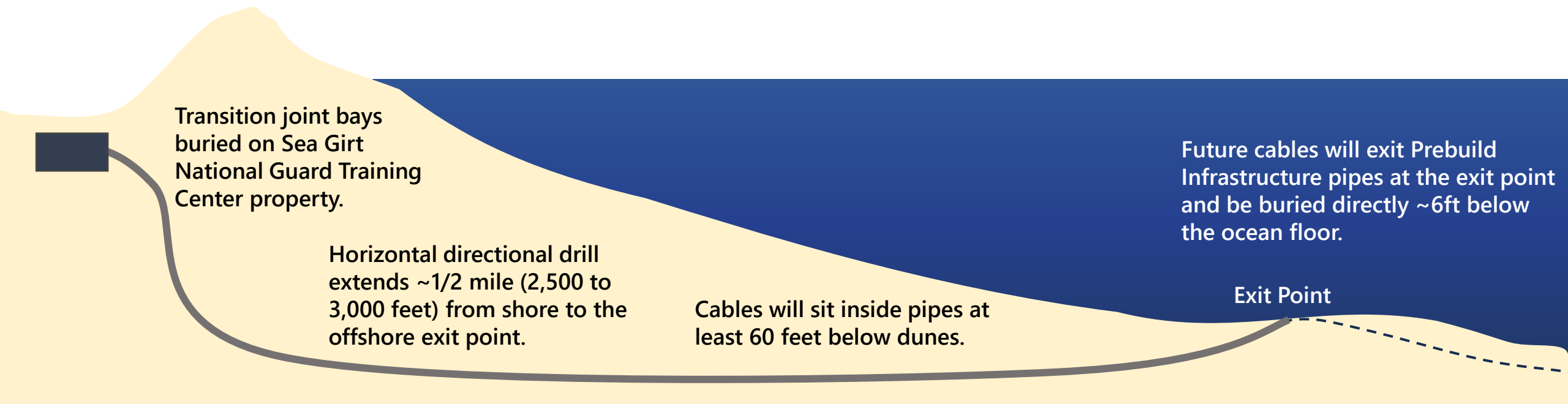
- ▶ Holes will be drilled and filled with pipes between the Sea Girt National Guard Training Center property and the Exit Points on the ocean floor. **No trenches or excavation at the beach!**
- ▶ The pipes will be at least 60 feet at the deepest point below the dunes—final depths determined during detailed engineering.
- ▶ After holes are drilled and pipes installed—future power cables will be pulled into the pipes. The underground joint bays are where submarine power cables will transition to land cables.



Illustrative Landfall for Prebuild Infrastructure

Underground Side View

Beach and dunes not impacted—holes are drilled from the exit point and pipes are pulled in to fill the drilled holes.



Similar Projects

- ▶ Existing Underground Power Cables
- ▶ Similar Projects: Neptune Cable, New York
- ▶ Similar High Voltage Direct Current Projects

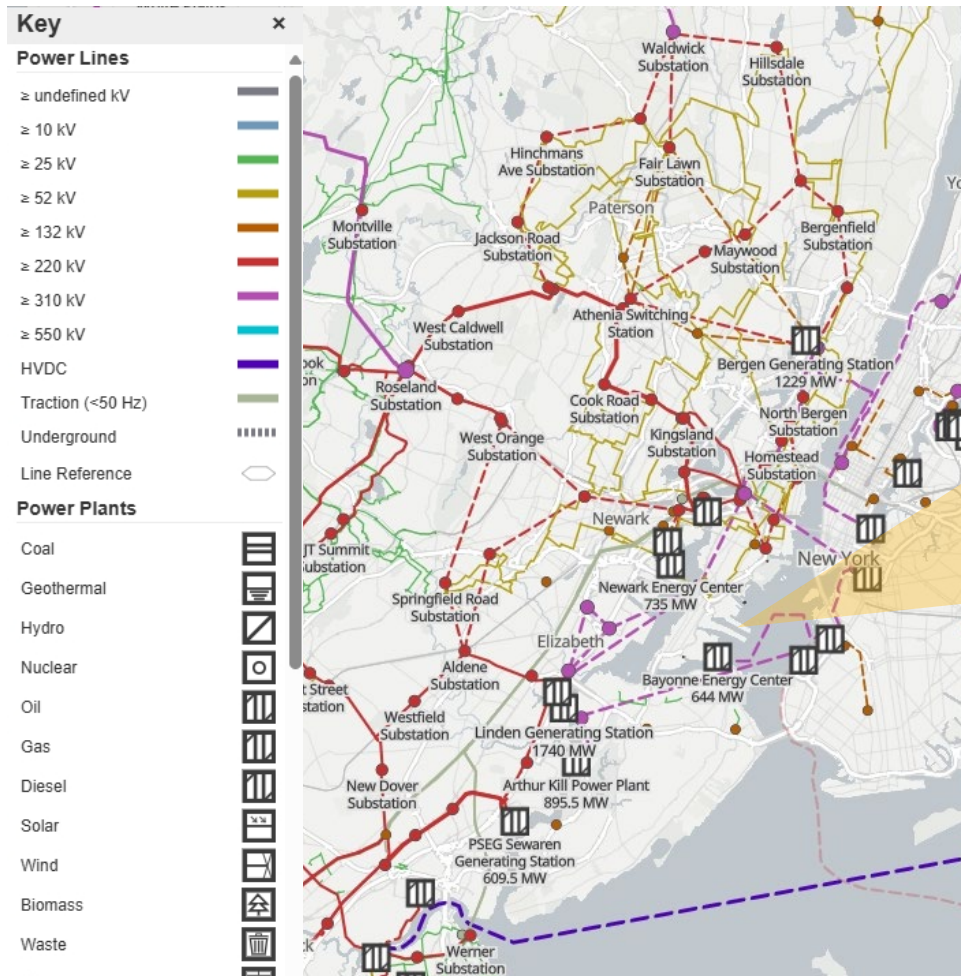
Existing Underground Power Cables

A significant portion of the high voltage electric transmission infrastructure in New Jersey (and New York) is underground, in duct banks, particularly in densely populated regions where overhead lines are not practical.

There are many existing multi-circuit transmission duct banks in populated regions of New Jersey, New York, and the U.S. with comparable power ratings to the full Prebuild Infrastructure buildout (see PJM System Map, NYISO System Map, Open Infrastructure Map).

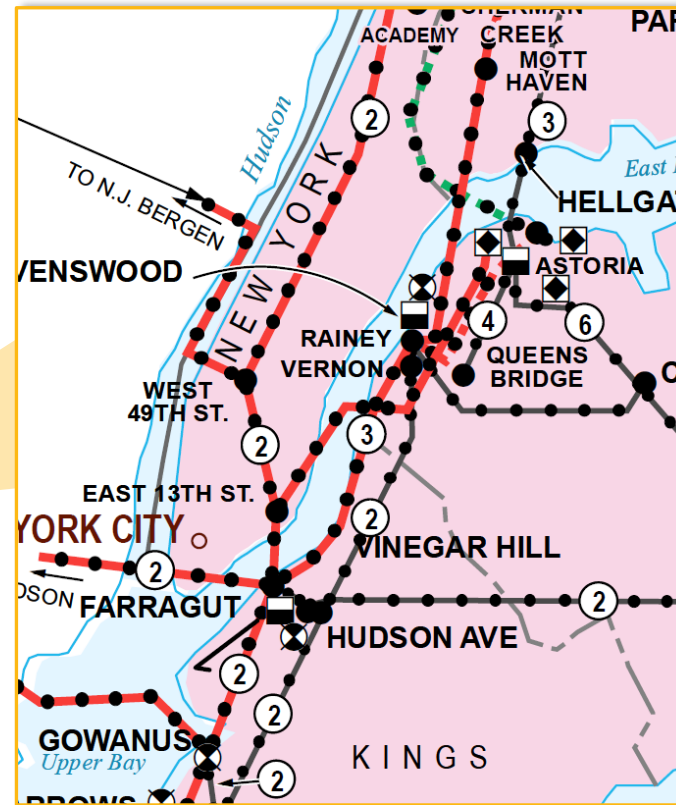
There have been multi-gigawatt high voltage direct current lines in operation in the U.S. since the 1970s, with more currently under construction.

Examples of Existing Underground Power Cables



Source: Open Infrastructure Map (openinframap.org)

Close up of New York City duct banks with up to 6 high voltage circuits



Source: NYC detailed map source: NYISO.com

Similar Projects: Neptune Cable

The Neptune Regional Transmission System is a 500-kilovolt high voltage direct current underground and underwater cable from Sayreville, New Jersey to Jones Beach, Long Island.

Developed in response to growing power demands after the 2003 blackout—Neptune went into service in 2007. It has been fully operational since installation and increased electric reliability in the region with no adverse impacts.

Installation of conduit trench along the Wantagh Parkway



Splicing of cables along the Wantagh Parkway



Project route from New Jersey through Jones Beach



Existing Underground Power Cables

Cross Channel High Voltage Direct Current (France to England)

- ▶ 2,000-megawatts in service since 1986. Lower voltage than Prebuild Infrastructure = more current for the same power.
- ▶ Shore landing in populated coastal residential area
- ▶ Meets up with 1,000-megawatts ElecLink further inland in residential areas



Source: Open Infrastructure Map, (<https://openinframap.org>) & Bing

Similar Projects

U.S. Multi-Gigawatt High Voltage Direct Current

- ▶ Widespread use of underground high voltage alternating current cables in New Jersey, New York, the country, and the world.
- ▶ Existing underground high voltage direct current in New Jersey with the Neptune cable.
- ▶ Multi-gigawatt high voltage direct current projects in operation and under construction in the U.S. that traverse highly populated areas since the 1970s:
 - **Hydro Quebec Phase II:** 2,250-megawatts (450 kilovolts). Operating since early 1990s to serve demand in Boston with hydropower from Canada.
 - **Direct Current Pacific Intertie:** 3,100-megawatts (500 kilovolts). Installed 1970, upgraded to current rating 2004.
 - **Champlain-Hudson Express:** 1,250-megawatts (320 kilovolts). Under construction, anticipated in service early 2026.

Each Prebuild Infrastructure duct bank will be rated for approximately 1,360 megawatts—well within the common range of existing high voltage direct current projects in the U.S.

Community & Environmental Standards

- ▶ Responsible Infrastructure
- ▶ Responsible Project Design
- ▶ Transmission and Economic Development Grant

Responsible Infrastructure

The Prebuild Infrastructure solicitation is seeking projects that will align with the principles of responsible infrastructure design.

- ▶ The developer will work with the State and municipalities to design a project and construction plan to minimally impact properties, rights-of-way, and traffic.
- ▶ Construction will occur in previously disturbed public rights-of-way, including roadways, with construction occurring after Labor Day and before Memorial Day to avoid seasonal tourism.
- ▶ All aspects of this project will be underground and not cause visual disruption to the current viewshed in the proposed project area along roadways and beaches.
- ▶ This project will have minimal impacts to property and property values.

Responsible Project Design

Projects must obtain all necessary federal, state, and local permits and approvals. Per those approvals, any disturbances and/or impacts must follow the standard the hierarchy for avoiding, minimizing, or mitigating impacts.

Areas where duct banks and cable vaults are installed are expected to return to pre-construction state.

The Prebuild Infrastructure project must meet National Electric Safety Code, Institute of Electrical and Electronics Engineers, International Electrotechnical Commission, New Jersey Department of Transportation, and relevant municipal code design and safety standards.

Transmission and Economic Development Grant

U.S. Department of Energy awarded New Jersey \$50M grant to support economic development in New Jersey communities where new renewable energy transmission infrastructure is sited.

The Transmission Siting and Economic Development Grant Program is an investment through the Inflation Reduction Act designed to advance critical transmission projects by accelerating siting and permitting while supporting economic development efforts in communities impacted by transmission construction and operation.

The project prioritizes local capital improvements and equitable employment projects for New Jersey communities where new offshore wind transmission infrastructure will be constructed and operated.

Transmission and Economic Development Grant

The project will design and implement key initiatives that will empower these communities as leaders in unlocking our clean energy future through these three avenues:

1 Invest in Community Improvement Projects Through Citizen Governance

Create a \$40 million fund to support prioritized capital projects in communities with new transmission infrastructure through participatory budgeting, a democratic decision-making process. We are targeting at least 40% of these funds to be invested in disadvantaged communities.

2 Develop the Next Generation of Skilled Transmission Workers

- ▶ Launch a new Transmission Trailblazers Training through Atlantic City Electric that provides high-demand skills for entry-level roles in transmission to 200 individuals. The program's goal is for 70% of enrollments to be from disadvantaged communities.
- ▶ Provide High Voltage Direct Current cable installation and maintenance upskilling to 30 IBEW Local 400 electrician apprentices and journeypersons with goal of 40% of enrollments from disadvantaged/ underrepresented communities and/or workers lacking steady employment.
- ▶ Offer a new Pre-Apprenticeship Training for Electrical Careers that supports entry of aspiring electricians into IBEW Local 400 and electrical trade jobs.

3 Transform Transmission Corridors into Public Use Amenities

Develop an approximately 7-mile Transmission Corridor Bike Path that will link existing state, county, and municipal parks and trails into a much larger interconnected trail system that brings economic and quality of life benefits to offshore wind transmission communities.

Background on Magnetic Fields from Direct Current Cables

- ▶ Special Presentation from Dr. Benjamin Cotts at Exponent

Project Next Steps

- ▶ Public Comment Period
- ▶ Next Steps

Next Steps

The meeting is being recorded and a recording will be made available on the Board's website on the Public Notices page, located at:

<https://www.nj.gov/bpu/newsroom/public/>

All comments will be recorded for the official record and will be considered by the Board in their deliberations prior to rendering a decision in the Prebuild Infrastructure solicitation.

Written comments can be submitted to the [Docket No. QO23100719](#). All comments must be received by 5pm on **October 15, 2024**.



- ▶ Comments to the docket will be public unless filed confidentially in accordance with N.J.A.C. 14:1-12.3.

Public Comments

To ensure all speakers have a chance to provide input, please expect the following format:

1. Elected officials and community leaders will be called to speak first. Speakers will then be called to comment in the order they signed up prior to tonight's meeting.
2. Every speaker has three (3) minutes to provide remarks.
3. A timekeeper will provide a three-minute clock to keep the session running smoothly and allow for all speakers who wish to comment the opportunity to do so.
4. Speakers will only have one opportunity to comment to allow maximum time to hear from as many community members as possible.

Thank you for attending this meeting!
Following a short break, the floor will open for public comment.

Rules of Engagement

To ensure a respectful, equitable, and productive dialogue. Everyone, regardless of viewpoint, will be treated equally. Please honor the following considerations during your comment.

Respect for All Speakers

no interruptions, courteous language, no personal attacks or inflammatory remarks

Time Limits

adhere to the permitted time so everyone has a chance to speak

Stay on Topic

focus comments relevant to the topic of the meeting

Repetitive Comments

avoid repeating points to ensure new perspectives are heard

No Disruptions

refrain from clapping, booing, or making noise while others are speaking

Address the Issues

comments should be directed toward the issue or policy, not individuals

Thank You for Coming to
Tonight's Meeting