New Jersey Board of Public Utilities
Prebuild Infrastructure Frequently Asked Questions

Q Can you describe the activity the Board is proposing?

Prebuild Infrastructure Project Overview.

To help bring responsibly developed offshore wind power to New Jersey homes and businesses, we're inviting companies to build essential onshore electric transmission infrastructure. This includes cable vaults and duct banks (Prebuild Infrastructure) that will eventually enable multiple offshore wind projects, using direct current electric transmission cables, to be connected to our power grid. The planned path for this Prebuild Infrastructure starts at Sea Girt National Guard Training Center and ends at the Larrabee Collector Station, a new point of interconnection with the high voltage transmission system, in Howell, New Jersey. Just like other local electric projects, we are encouraging the use of existing utility pathways and previously disturbed areas to minimize disruption. Three out of the four planned duct banks and cable vaults will be used by existing offshore wind projects (two of the duct banks will be used by the 2,400-megawatt Leading Light Wind Project and one duct bank will be used by the 1,342-megawatt Attentive Energy 2 Project, both chosen in the Board's most recent offshore wind project selection process). The fourth duct bank is still available for a future wind project. The Prebuild Infrastructure will be designed to accommodate approximately 5,720-megawatts.

Duct banks are concrete structures designed to provide physical protection for underground cables. After installation of the duct bank, the direct current power cables will be pulled through PVC pipes in the duct bank. At intervals, sections of the cables are spliced together in cable vaults with maintenance access via manholes with steel covers.

Developers will be required to work closely with municipal, state, and federal agencies, as well as members of the community and other stakeholders, to minimize impacts on communities and natural resources, and ensure compatibility with surrounding land uses.

The Board will consider all potential solutions for the Prebuild Infrastructure and may select a project in the fall of 2024. If awarded, the winning developer will then need to apply for and receive all necessary permits and approvals through the normal permitting process with construction expected to start in 2027 and finish in 2029.

Why is the Board and New Jersey proposing to consolidate the landings for offshore wind cables and connection to the electric grid?

The Prebuild Infrastructure seeks to consolidate the necessary onshore infrastructure needed to interconnect multiple offshore wind projects to the grid into a reduced number of onshore cable corridors. Consolidating the infrastructure of this Prebuild Infrastructure into fewer routes will reduce the potential disruption of installation that might come with four separate routes if the infrastructure were installed separately. Practically, this means there will be a smaller overall project footprint and thus fewer roads and areas affected during construction. Additionally, because the Prebuild Infrastructure would be constructed by a single developer, construction efforts would occur in one continuous construction effort with a reduced overall duration as opposed to having multiple back-to-back construction efforts that could come with constructing four separate routes.

How will the Board and New Jersey communicate about upcoming hearings and events?

Stay Updated and Get Involved

We encourage everyone to join the Board's email list to receive updates about public meetings and events. To do so, please visit: https://nj.gov/bpu/about/contact/subscribe.html

Board public notices are available on our website at: https://www.nj.gov/bpu/newsroom/public/

If you have any questions or concerns regarding Board hearings, feel free to contact our Ombudsman's Office at Ombudsman@bpu.nj.gov.

Q Will my municipality receive any tax breaks? What funding through the state or the federal government is available to us?

Exciting Grant for Community Development

The New Jersey Economic Development Authority has received a $50 Million Transmission Siting and Economic Development Grant from the U.S. Department of Energy. This grant aims to provide funding for local communities that will host onshore offshore wind transmission assets through various avenues including local capital improvements, apprenticeships and job training and, workforce development opportunities. Funding will also build new bike trails connected to existing paths and parks. New Jersey Economic Development Authority will fund projects identified and chosen by local residents through participatory budgeting, during which residents propose, vote on, and lead spending decisions for projects in localities where new renewable transmission infrastructure is sited. More details on this process will be shared over the coming year. At this time there is no additional state funding or tax breaks for towns hosting the Prebuild Infrastructure project. The chosen developer will cover road repair costs after construction.

Q Has the Board or New Jersey considered the hardships and monetary loss my municipality and local businesses will face during construction?

Review Process for New Projects in Alignment with the Board's Mission.

Board staff is currently evaluating Prebuild Infrastructure applications to ensure they are practical, have the least impact on communities and are aligned with the Board's Mission. The Board's mission is to ensure that safe, adequate, and proper utility services are provided at reasonable, non-discriminatory rates to all members of the public who desire such services. Further, to develop and regulate a competitive, economically cost-effective energy policy that promotes responsible growth and clean renewable energy sources while maintaining a high quality of life in New Jersey.

Q What mechanisms are in place to ensure these projects are finished on time?

Ensuring Project Completion

The Board will impose financial penalties related to project completion milestones to ensure accountability and timely project completion.

Q Will communities have input in the route?

Community Involvement and Communication

Municipalities will have the opportunity to discuss routing options with developers when they present their Prebuild Infrastructure plans. The chosen developer must then communicate and work with municipalities and community groups throughout project design and permitting, from planning to completion.

Q Does the municipality have a say in which developer is picked, and will the amount/degree of town disturbance be considered when awarding these bids?

Minimizing Community Impact

Although towns are not directly involved in the Board's solicitation review process, the Board is actively soliciting feedback from communities to best understand community concerns and to help identify the best solution. Developers must choose routes that minimize disruptions to local communities and the environment while also minimizing cost to ratepayers and still being technically feasible. The Board reviews each project's potential impact on the community as part of the evaluation process. The Board does not anticipate authorizing a specific route upon selection of a project; instead, if selected, the project developer will be responsible for finalizing its routing and design following comprehensive geotechnical, utility, and environmental surveys and engagement with the municipalities which will be conducted after an award from the Board. This will allow communities and municipalities a formal process through which to interact with the developer on routing considerations and priorities.

Q How has the public been consulted about the Prebuild Infrastructure?

Consultations with the Community

For offshore wind solicitations (including the Board's third offshore wind solicitation in which the Prebuild Infrastructure was first discussed), the Board offered the general public an opportunity to comment on the proposed project. The Board carefully considers all comments it receives. For example, community input was solicited during a public stakeholder meeting on December 13, 2022, with public comments accepted until December 29, 2022. Public comments were received through the Public Document Search tool. Then on November 17, 2023, following review of the bids received as part of the Third Solicitation, the Board separated the Prebuild Infrastructure (the transmission portion of the

solicitation) from the generation portion of the solicitation. The Board then opened a separate transmission solicitation for the Prebuild Infrastructure under Docket No. QO23100719. Dockets can be downloaded here: BOARD OF PUBLIC UTILITIES (state.nj.us).

To continue community coordination for the Prebuild Infrastructure, on October 1, 2024, Board Staff is hosting a hybrid public stakeholder meeting, such that attendees may attend either in-person or virtually. A corresponding four-week public comment period opened between September 17, 2024, and October 15, 2024. Board Staff asks for community comments on the Prebuild Infrastructure solicitation for the purpose of understanding community concerns and will consider all comments received during evaluation of the Prebuild Infrastructure bids.

Q Were other state and federal agencies involved in developing the Prebuild Infrastructure solicitation?

Consultations with Agencies

For the Prebuild Infrastructure, the Board Staff consulted with the New Jersey Division of Military and Veterans Affairs, the US Army Corps of Engineers, the New Jersey Department of Environmental Protection, and the New Jersey Division of Rate Counsel to ensure that important agency viewpoints also from a variety of perspectives are considered.

Q How can municipalities and interested stakeholders communicate concerns/ideas to implement in Prebuild Infrastructure selection to minimize impacts to residents without adversely impacting performance of the offshore wind projects?

Share Your Thoughts

While project applications are confidential, you can share any concerns or ideas with the Board Ombudsman at Ombudsman@bpu.nj.gov. Comments received during an open public comment period will be considered during the Board's evaluation process. For the Prebuild Infrastructure process, the public comment period is open between September 17, 2024, and October 15, 2024. Comments must be submitted through the public docket at: Docket No. QO23100719.

Q How did the Board select the National Guard Training Center at Sea Girt for landfall?

Coordinated Solution to Save Costs and Minimize Impact

The Board worked with the regional electric grid operator, PJM Interconnection, to find a transmission solution that reduces costs for residents and minimizes the impact on communities and the environment. PJM is a nonprofit organization that coordinates, controls, and monitors the electric grid serving 65 million people across 13 states, including New Jersey. As a member, New Jersey shares the benefits of coordinated electric grid planning, power pooling, and competitive electricity markets. New Jersey works closely with PJM to identify and respond to various power industry matters.

After a competitive process and thorough consultation with PJM, Larrabee Collector Station was chosen as the connection point and the Sea Girt National Guard Training Center was selected for the landfall to reduce permitting delays and community disruption.

Q Are there cable landfalls and underground duct banks/electric infrastructure that are similar to this project and are already operational in other communities?

Common and Proven Infrastructure

Underground electric infrastructure is common throughout New Jersey and the U. S. New Jersey has significant underground electric cable duct banks, especially in urban areas. Alternating current duct banks are used throughout the U.S. and abroad with more than 5,000 miles of existing underground transmission lines in the U.S. alone. While the specific locations and ratings of many high voltage electric cables are kept confidential for security reasons, public maps from the New York Independent System Operator and PJM Interconnection show that there are many existing multi-cable high voltage underground duct banks in heavily populated neighborhoods throughout New York and New Jersey. Direct current transmission lines are currently less common than alternating current transmission lines but have been operating in the U.S. since 1970. Examples of submarine or underground direct current transmission lines in the Northeast U.S. alone include the Cross-Sound Cable (2003, New York), Neptune Regional Transmission System (2007, New York), and Champlain Hudson Power Express Transmission Project (under construction, New York). Globally, there are many examples of high-power underground high voltage direct current cables making landfall in populated coastal communities, such as the Cross-Channel (1986) and ElecLink (2022) cables, both making landfall in Folkstone, England with a combined power rating of 3,000 MW.

Q What is the length/duration of Prebuild Infrastructure construction along individual segments/overall?

Phased Construction to Minimize Disruption Along the Project Route

Construction will be done in discrete phases to limit local disruptions. A Traffic Management Plan will be developed with local authorities before work begins on the Prebuild Infrastructure. Onshore construction of the Prebuild Infrastructure between the Sea Girt National Guard Training Center and Howell will take approximately 18 months. Efforts will be made to avoid working in summer tourism-heavy shore towns between Memorial Day and Labor Day

Q What effect will the underground shore crossing have on the habitat for protected birds and plant life?

Underground and Environmentally Friendly Design

The infrastructure includes underground duct banks and cable vaults that will eventually hold transmission cables. The shoreline and associated sensitive areas will be crossed via a trenchless technology called horizontal directional drilling which avoids impacting sensitive habitats for protected birds and plants by drilling very deep (10's of feet) below the ground and any sensitive habitat. Trenchless crossing technology is especially handy for crossing under sensitive areas like creeks, rivers, train tracks, or highways.

The drilling pathway that connects the Atlantic Ocean to the landing area at the Sea Girt National Guard Training Center can be very deep (~60 feet at its deepest point beneath the dunes) and quite long, ranging from 2,500 to 4,000 feet. For sensitive onshore areas, the drilling pathways are shorter, around 1,100 feet long, to minimize environmental and community disruptions. The project will undergo environmental surveys and permit reviews by state and federal agencies to ensure environmental impacts are avoided, minimized, and/or mitigated as required by federal and state regulations.

Q Please provide a description of the underground infrastructure, particularly the size/length of duct banks.

Understanding Underground Cable Installations

Underground duct banks and vaults help ensure safe, reliable, and cost-efficient transmission. Power cables cannot be manufactured in one big piece, but instead are made up of segments that are a few thousand feet long each. The different sections of cables are connected at cable vaults, which are underground boxes made of concrete. For this project, each vault would be approximately 10 feet wide by 20 feet long by 5 feet deep. The top of each vault will be flush with the surface of the road and accessible via manholes for splicing cable sections together and maintaining the cables. Duct banks are collections of pipes encased in concrete that will protect the cables. The duct banks containing the power cables provide a protected pathway ranging from approximately 3.5 to 5 feet deep in most cases but going as deep as 15 feet in some locations to avoid constraints with other existing utilities. A cable circuit runs through the duct bank, which is a specific pathway for the cables. The cables themselves have an outer diameter that is roughly 5 inches—about the same size around as a regular two-liter soda bottle. The infrastructure is being designed to accommodate direct current electric transmission cables.

All project infrastructure is carefully planned to avoid impacting the environment and community, ensuring that the installation of the duct banks and cable vaults is both efficient and minimally disruptive. Following construction, the project developer is responsible for restoring all disturbed roads to the previously existing or better condition.

Q How will soil contamination be handled including the White Swan Laundry Federal Superfund site?

Strict Standards for Contaminated Sites

The White Swan Laundry Superfund site is a known previously contaminated site that is in remediation and monitored by the U.S. Environmental Protection Agency. Should the site become a part of the future Prebuild Infrastructure route, all federally-mandated site remediation measures will be followed. Any project potentially impacting known historic contamination locations must meet strict state and federal standards for working around contaminated sites. Developers are required to identify and follow regulations to avoid the risk of impacting existing contamination or in-place mitigation measures.

What are electric and magnetic fields (EMF) and where do we encounter EMF in our daily lives?

The term EMF is frequently used to refer to **alternating current (AC) electric and magnetic fields**. Because most of our electric system transports and uses alternating current electricity, AC EMF is found nearly everywhere in modern society. Anything that generates, transmits, or uses electricity in a home, business or elsewhere is a source of AC EMF. The most common sources of AC EMF we encounter are the overhead and underground distribution lines bringing power to our homes as well as the appliances, equipment, and wiring in our homes and workplaces.

The electric field generated by an underground cable is blocked by the cable insulation and shielding around the cable. Underground duct banks or cable vaults of the Prebuild Infrastructure are not a source of exposure to electric fields above ground. Therefore, we only discuss here the magnetic fields from underground cables that are not appreciably blocked by most materials.

Direct current (DC) electricity is a source of static (i.e., 0-Hz) magnetic fields. Other sources of direct current magnetic fields include natural sources like earth's geomagnetic field (used by compasses), as well as batteries and magnets in many consumer products. Where AC electricity is converted to DC electricity or vise-versa, trace levels of AC may be present.

Direct current transmission lines proposed by Prebuild Infrastructure are not the same as alternating current transmission lines. What are some of the significant differences?

Direct current (DC) transmission lines use only two cables per transmission line and the electricity flowing in a direct current transmission line does not change direction (i.e., 0-Hertz), similar to that supplied from a battery. The magnetic fields from direct current transmission lines are known as static fields or direct current magnetic fields. The transmission lines proposed for the Prebuild Infrastructure will DC transmission lines with shielded cables, which block electric fields from escaping outside of the cable.

In contrast, alternating current (AC) transmission lines use three cables per transmission line. In North America, the electric current carried along a transmission line changes in direction of flow in a continuous cycle that repeats 60 times per second (i.e., 60-Hertz). The fields from alternating current transmission lines are known as (AC) fields. These alternating current fields are often referred to as AC EMF. While alternating current transmission lines are used for the majority of electricity transmission in North America, direct current transmission lines have been operating in the U.S. since the 1970s.

Direct current lines are becoming increasingly common because they can more efficiently and cost-effectively transmit power over large distances. Direct current cables are particularly useful for underground installations

because they minimize power losses over long distances for which underground or submarine alternating current transmission line have prohibitively high losses.

Q Are there other differences between EMF from alternating current sources and DC magnetic field sources?

Yes. Alternating current electricity (and the alternating current EMF that they produce) changes strength and direction 60 times per second (60-Hertz), while direct current electricity (and direct current magnetic fields they produce) carries an electric current that flows in the same direction, so that there is no alteration in frequency i.e., (0-Hz). The constant changing direction of the alternating current magnetic fields can induce small currents and voltages in nearby objects (including people). Because the direction of the 0-Hz magnetic fields do not change each second, direct current electricity does not induce such voltages or currents. Direct current transmission lines, such as those proposed as part of the PBI are a source of static magnetic fields, like that created by the earth, accompanied only by trace levels of AC magnetic fields.

Q Are there limits on direct current magnetic fields in the U.S. or New Jersey?

No. Neither the federal government nor the state of New Jersey have any limits on direct current magnetic fields. New Jersey has a limit for **alternating current** electric fields that applies at the edges of overhead alternating current transmission line rights-of-way. However, the direct current transmission lines installed in the buried duct banks and cable vaults of the Prebuild Infrastructure will not be a source of either alternating current or direct current electric fields above ground.

Q Are there health-based limits on direct current magnetic fields?

Health-based limits on direct current magnetic fields have been developed by organizations such as the International Commission on Non-Ionizing Radiation Protection. The limit for the general public is 4,000,000 milligauss (the unit used to describe the strength of magnetic fields). This limit is far higher than what would be produced by any transmission lines installed within the Prebuild Infrastructure. Directly above the PBI (in the street, away from nearby residences) the upper range of the direct current magnetic field is expected to be less than ½ of one percent of the International Commission on Non-Ionizing Radiation Protection's 2009 recommended limit for exposure of the general public to static magnetic fields. Magnetic field levels decrease rapidly with distance and at nearby residences would be still lower. Furthermore, the World Health Organization's International Agency for Research on Cancer review of research on direct current magnetic fields did not identify exposures as possibly carcinogenic to humans.

What are the health and safety concerns and have studies been done on alternating current EMF and direct current magnetic fields?

Scientific and Health Research

There is now nearly a half-century of scientific and health research on the topic of electric and magnetic fields, including more than 25,000 studies from around the world. The vast majority of research has focused on alternating current (e.g., 60-Hertz) EMF. This is likely due to two reasons. First, alternating current sources are far more common than direct current. Second, early research from the late 1970's reported as statistical association between estimated alternating current magnetic-field levels and a particular form of leukemia. More recent studies report a weaker or no association with leulemia.

In contrast, there has been no identification of adverse effects from direct current magnetic fields. In particular, for direct current transmission lines, the direct current magnetic field produced will be the same as earth's natural geomagnetic field (which is used for compass navigation). While direct current magnetic fields directly over the Prebuild Infrastructure may be higher than earth's magnetic field, the strength of magnetic fields decreases very quickly with distance. Furthermore, the World Health Organization's International Agency for Research on Cancer review of research on direct current magnetic fields did not identify such exposures as possibly carcinogenic to humans

Magnetic Fields from Underground/Submarine Direct Current Cables.

Direct current underground and submarine cables, like those used for offshore wind farms, produce very low levels of direct current magnetic fields. These magnetic fields are far weaker than the levels known to cause any health effects. The scientific research on direct current magnetic fields has been assessed by organizations and agencies around the globe. These agencies include the International Agency for Research on Cancer, Scientific Committees of the European Union, the Oak Ridge National Laboratory, and the U.S. Food and Drug Administration. None of these agencies have concluded that direct current magnetic fields at levels below the limits established by the International Commission on Non-Ionizing Radiation Protection contribute to cancer or other diseases in adults or children.

Comprehensive studies and literature reviews confirm that the direct current magnetic fields generated by these cables do not pose health or environmental hazards. Literature on direct current magnetic fields and human health can be found from scientific organizations such as the World Health Organization and International Commission on Non-Ionizing Radiation Protection at these websites:

https://www.who.int/publications/i/item/9241572329

https://www.icnirp.org/en/frequencies/static-magnetic-fields-0-hz/index.html

What are cable operating temperatures, and will this impact drinking water / other below ground infrastructure or resources?

Electric Current and Transmission Cables

In a typical transmission cable, the electric current flowing through it generates heat. The higher the current, the more heat is produced. Each cable is designed to handle a certain maximum temperature to ensure reliability. Since these cables are insulated and surrounded by special material, the heat dissipates quickly and soil nearby remains cooler. Additionally, this project will adhere to design standards for utility separation. This means underground infrastructure, including drinking water systems, are not negatively affected.

What are the potential impacts on property values from having underground infrastructure adjacent to homes?

Property Values

Property values are dynamic and influenced by many factors. Well-planned developments that improve infrastructure and amenities without significantly disrupting the community tend to have the most positive impact on property values. The presence of underground cables and associated infrastructure beneath roadways should not pose a disruption to the community and is not expected to affect property values. Once everything is in place, there will be no visible aboveground structures resulting from the Prebuild Infrastructure project

How will cables/landfall avoid residences at north end of the National Guard Training Facility at Sea Girt?

Route Planning

The Prebuild Infrastructure project would keep transmission routes within the Sea Girt National Guard Training Center area for as long as possible. Once exiting into community areas, the Prebuild Infrastructure project would use existing roads and rights of way whenever feasible.

Q Can the Prebuild Infrastructure avoid construction and traffic obstructions near a library or school?

Community Impact

Project planners have taken schools and libraries into consideration in early route design, avoiding them as much as possible. They will collaborate with local officials to manage road closures and traffic, keeping community impact in mind while complying with all applicable zoning, permitting and state/municipal approvals.

Q What kind, how often, and who is maintaining these transmission lines and how often is maintenance required? What does that look like?

Infrastructure Maintenance

After the Prebuild Infrastructure project is complete, developers will be responsible for maintaining the underground cables and equipment. Routine maintenance will be conducted through manholes and subsurface vaults, similar to other existing underground infrastructure.

Q Describe rate impacts from the Prebuild Infrastructure.

Electricity Bill Impact

The cost impact on the average New Jersey residential customer's bill due to the Prebuild Infrastructure project is expected to be less than $0.50 per month. The exact rate impact will be known once the Prebuild Infrastructure project is finalized.

Q What are the rate impacts from an offshore wind project? Will there be a surcharge?

Rate Impacts of Offshore Wind Projects

The cost on the average monthly residential electrical customer bill for the selected offshore wind projects that have been awarded Prebuild Infrastructure capacity (i.e., the Leading Light Wind and Attentive Energy 2 Projects) is estimated to be $6.85. These two projects will provide enough energy for 1.8 million New Jersey homes. This cost will not appear as a separate surcharge/line item on customer electricity bills but will be included in the standard electricity rate. Rate increases will not occur until the projects are complete and producing electricity.

What are the rate impacts once the offshore wind renewable energy credits expire?

Duration of Rate Impacts

The charges related to each offshore wind project will last for 20 years that begins once the individual project is completed and generating electricity. After this period, the projects will continue to supply power at market rates without additional costs to ratepayers.