

FACT SHEET

New Developments in Empire Wind's Onshore Power Delivery System

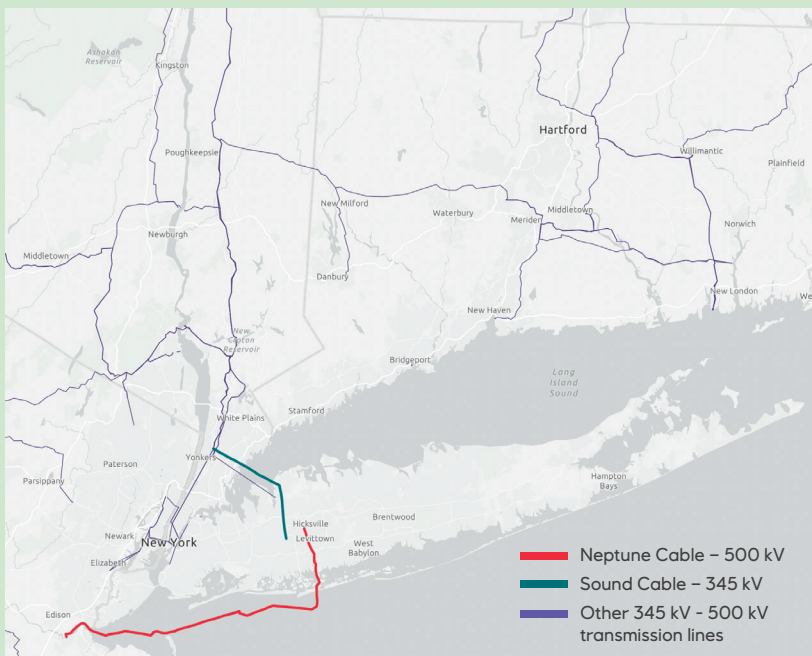
Design updates enhance efficiency, decrease environmental and community impacts

On August 1, 2023, the Empire Wind team submitted a supplement to the Empire Wind 2 project's application to the New York Public Service Commission under Article VII of the New York Public Service Law. This supplement incorporated design changes to the planned underground transmission cables, transitioning, from a 3-circuit 230 kV system to a 2-circuit 345 kV system. These cables will serve as the crucial link between Empire Wind 2 and Long Island's power grid, ensuring the safe, efficient, and reliable transmission of 1,260 MW of clean electricity from offshore wind. The design updates detailed in this fact sheet will reduce the width of the trench for the onshore cable duct bank, thereby decreasing the impact of installation and the time needed to complete construction.

How modern underground power cables work

Underground power cables, like those proposed by Empire Wind 2, are commonly used to bring electricity to densely populated suburban and urban areas (see map). Cables rated to 345 kV are standard components of New York's electrical infrastructure (see map), enabling the efficient transmission of large amounts of electricity over long distances.

345 kV AND 500 kV TRANSMISSION CABLES CURRENTLY IN OPERATION (2021)



Overhead and underground transmission cables are the trusted backbone of New York's power grid, transmitting electricity safely, efficiently, and reliably over long distances.

Neptune Cable – 500 kV

The Neptune Regional Transmission System (Neptune RTS) is a 500-kV undersea and underground power cable that links the New Jersey power grid to New York. The cable was completed in 2007 and runs approximately 65 miles between New Jersey, and North Hempstead on Long Island.

Sound Cable – 345 kV

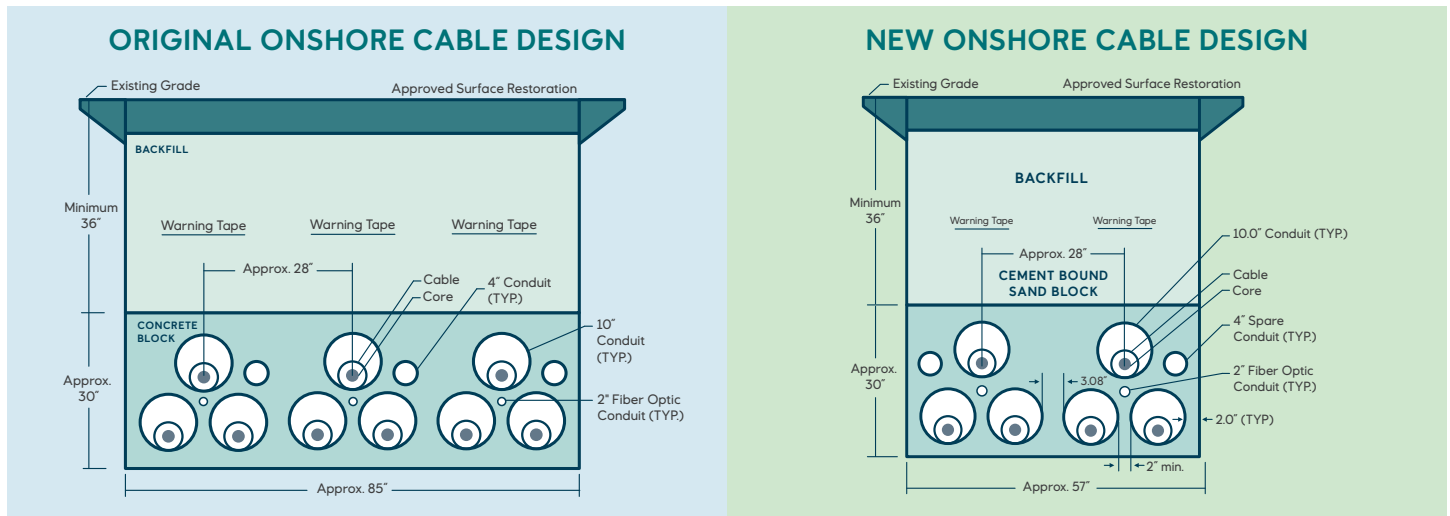
The Long Island Sound Cable, installed in 1991, is a 26-mile, 345 kV power cable crossing under the Long Island Sound between Westchester County and Nassau County.

Source: U.S. Energy Atlas, U.S. Energy Information Administration

The cable connecting Empire Wind 2's power generation to Long Island's electricity grid will be protected by concrete encased duct banks buried beneath streets to reduce the chance of accidental damage and to protect against severe weather conditions such as strong winds, ice storms, and heavy snowfall that are increasing in frequency and severity due to climate change.

Reduction in construction and environmental disturbance

Decreasing the number of underground cables reduces the width of construction space needed for the duct bank. Analysis by Empire Wind 2's project team showed that power generated by the offshore wind turbines can feasibly be met by two cables operating at 345 kV, rather than three operating at 230 kV. This change will result in a reduced construction impact at landfall as well, as only two Horizontal Directional Drilling (HDD) connections will be needed to connect the offshore cables to onshore.



Will the new design effect EMF?

EMF, or electric and magnetic fields, are natural phenomena that occur wherever electricity flows. The scientific community, including scientists convened by the World Health Organization (WHO) and other health and scientific agencies across the globe, has studied scientific evidence from more than 40 years regarding the potential health effects of EMF exposure. None of these agencies has concluded that exposure to low levels of EMF (such as from the Empire Wind 2 transmission cables) is harmful to human health or the environment.

Additionally, New York State has established strict regulatory guidelines for EMF levels, well below the international standards for public health outlined by the WHO, applicable to all new transmission lines greater than 100 kV in New York. New York State established guidelines in 1978 for electric fields generated by new transmission that state that AC electric-field levels from overhead transmission lines should be limited to 1.6 kilovolts per meter (kV/m) at the right-of-way edge.¹ The guidelines for magnetic fields require that all new transmission lines are designed to "ensure that magnetic fields at the edges of future major electric transmission facility rights-of-way will be no stronger than the fields typical of the many existing 345 kV lines operating throughout the State."²

The levels of EMF produced by the proposed buried 345 kV underground cables will be lower than those of most overhead power lines and the guidelines established by New York State. The 345 kV underground cables will result in **no above ground electric fields** because they will be blocked by cable construction and the ground. The **minimal magnetic fields** produced above ground by the new 345-kV cables will be similar to the previously-proposed 230-kV cables because less total current is required to deliver the same power at 345-kV as for 230-kV and the reduced-cable design results in similar current flow per cable for both 345-kV and 230-kV designs.

Have a question about Empire Wind?

Contact empirewind@equinor.com

To sign up for project updates, visit www.empirewind.com

Empire Wind is a 50/50 partnership between Equinor and bp. Equinor will be the operator through the development, construction, and operations phases of the project.

Citation:

¹New York Public Service Commission (NYPSC) Opinion 78-13. Issued and Effective: June 19, 1978.

²New York Public Service Commission (NYPSC). Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities. Cases 26529 and 26559 Proceeding on Motion of the Commission. Issued and Effective: September 11, 1990.