



## Baltic East Project - INTRODUCTION

as part of the procurement procedure entitled:

**“Transport and Installation services of Offshore Wind Turbine  
Generator (WTG) components  
for the Offshore Wind Farm Project.”**

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0.0	2025-06-13	Tomasz Wojcik	Rafał Żendarski	Łukasz Sikorski	To be sent to the market

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## **1. ORLEN S.A. and ORLEN Neptun as the investor**

ORLEN is an integrated, multi-utility corporation primarily active in Central Europe. We supply energy and fuel to over 100 million Europeans, and our advanced products are sold in over 100 countries across six continents.

We are involved in the upstream and downstream sectors of the oil and gas industry, as well as in power generation and distribution. Central to ORLEN's mission is the commitment to lead the regional energy transition. The company is dedicated to adopting innovative, clean, and sustainable technologies, focusing particularly on low- and zero-emission power generation. This forward-thinking approach is part of ORLEN's strategic goal to achieve emission neutrality by the year 2050.

We plan to invest over USD 80 billion in strategic projects by the end of 2030, with approximately 40% dedicated to green investments. These include offshore and onshore wind energy, photovoltaics, biogas and biomethane, biofuels, electromobility, CCUS, green hydrogen, and synthetic fuels.

We aim to create new solutions in the fields of power generation and mobility, based on advanced and sustainable technologies. They are the key to the achievement of our long-term goal – reaching emission neutrality by 2050.

### **Responsible transformation**

ORLEN Group's transition path is determined by renewable energy and modern petrochemicals. The key pillars of our strategic development are complemented by the new approach to retail sales, which will enable us to meet a variety of customer needs comprehensively. The search for innovative solutions in the areas of new mobility, hydrogen energy and recycling is our response to the long-term trends.

### **The future starts now**

We are fully aware that the future starts now. For this reason the maximization of profits and reconstruction of current activity drive the development of new business areas. We consider it crucial to increase efficiency and develop sustainability of our core business segments, including more environmentally-friendly biofuels and biocomponents.

We believe that gas energy is a valuable bridge to the energy transition in our region. For this reason, we are currently reconstructing our upstream assets portfolio and keep investing in power generation infrastructure. In addition, we are dynamically developing our retail network across Central Europe.

### **New energy**

The global shift in approach to the use of natural resources redefines the challenges which our business faces. We believe that strong, integrated, multi-utility companies will be able to respond to them. They are the ones to create new, efficient and sustainable technologies, and the ones to become partners in a process of a profound socio-economic transition.

We've completed an acquisition of two leading Polish energy companies, LOTOS Group and PGNiG. The finalization of these acquisitions allowed us to become a regional leader shaping an entirely new appearance of the Central European economy.

ORLEN Neptun VIII Sp. z o.o. – member of ORLEN capital group – shall be considered as SPV, founded by ORLEN (via 100% owned subsidiary ORLEN Neptun) to develop, construct, operate and maintain offshore wind farm Baltic East.

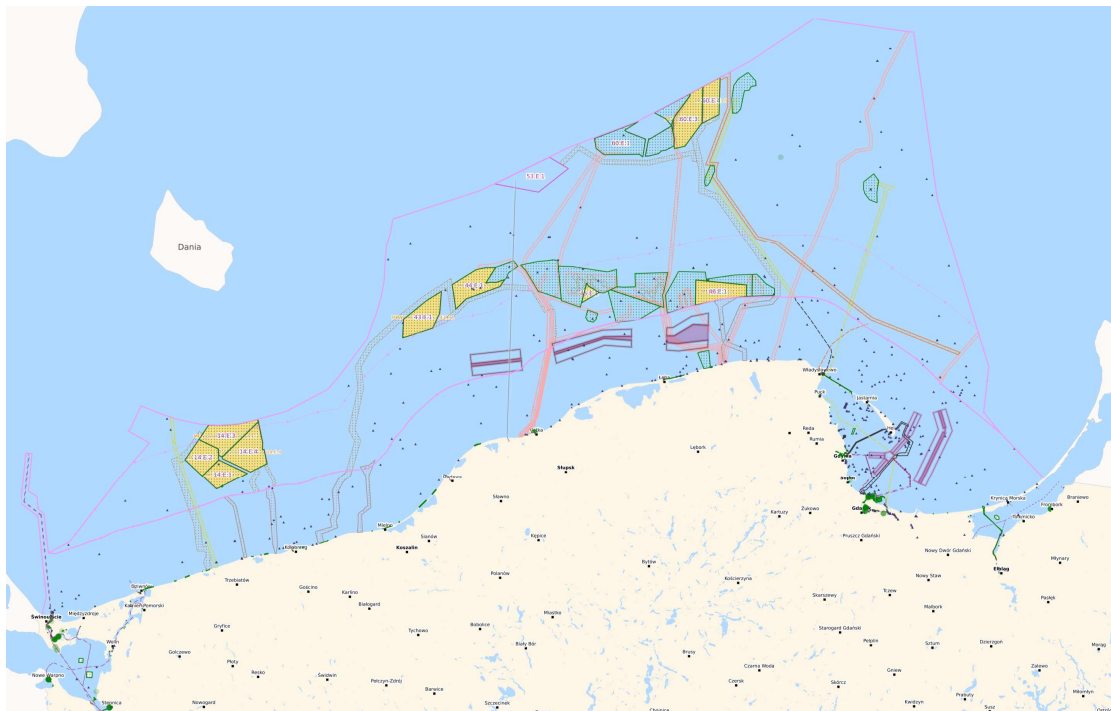
More information about ORLEN and Baltic East Project is available on the following websites:  
<https://www.orlen.pl/en> and <https://neptun.orlen.pl/pl/o-spolce/inwestycje/Baltic-East>.

## 2. Project business environment

It is estimated that the combined size of areas with favourable conditions for offshore wind energy projects development in the Polish maritime areas is approximately 3500 km<sup>2</sup>.

Potential of offshore wind energy development in Poland has been officially confirmed by two major milestones achieved on national level in Poland in the year 2021: official approval of Maritime Spatial Plan of the Polish Sea Areas (“MSP”) (more info here: [link](#) and [here](#)) and official approval of „Energy Policy of Poland until 2040” (“PEP 2040”) (more info here: [link](#)).

MSP define zones where construction of offshore wind farms will be permissible and will have priority over other ways of utilization of that part of the Baltic Sea. Aforementioned zones have favourable conditions for offshore wind farms development (estimated water depth: 25-50 m, estimated average annual wind speed at hub height: 9-10 m/s, negligible tides, low salinity) and combined size of around 2300 km<sup>2</sup>, which is around 10% of Polish Exclusive Economic Zone of the Baltic Sea. Additionally MSP defined areas, where export cables will be permissible.



**Figure 1. Maritime Spatial Plan of Polish Sea Areas**

According to approved PEP 2040, offshore wind energy will be one of the three pillars of Polish energy mix by year 2040. It is expected that there will be almost 5,9 GWe of generation capacity installed on Polish waters in offshore wind farms until 2030 and more than 10 GWe until 2040. Aforementioned declaration is based on the size of areas, dedicated to offshore wind energy development and average offshore wind farm's power density and it's already being confirmed by projects being under development and construction. Expected area reductions caused by legal or environmental constraints were taken into account as well.

### 3. Project support system

Given the potential of offshore wind energy in Poland, thanks to the industry coordinated works and efforts, a legal framework for further development of offshore wind projects in Poland has been developed and new “offshore wind act” has been approved by Polish government and polish authorities. Full text of this act is available here: <https://isap.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20210000234>.

The above-mentioned act created a support system for offshore wind farm projects and divided it into 2 stages:

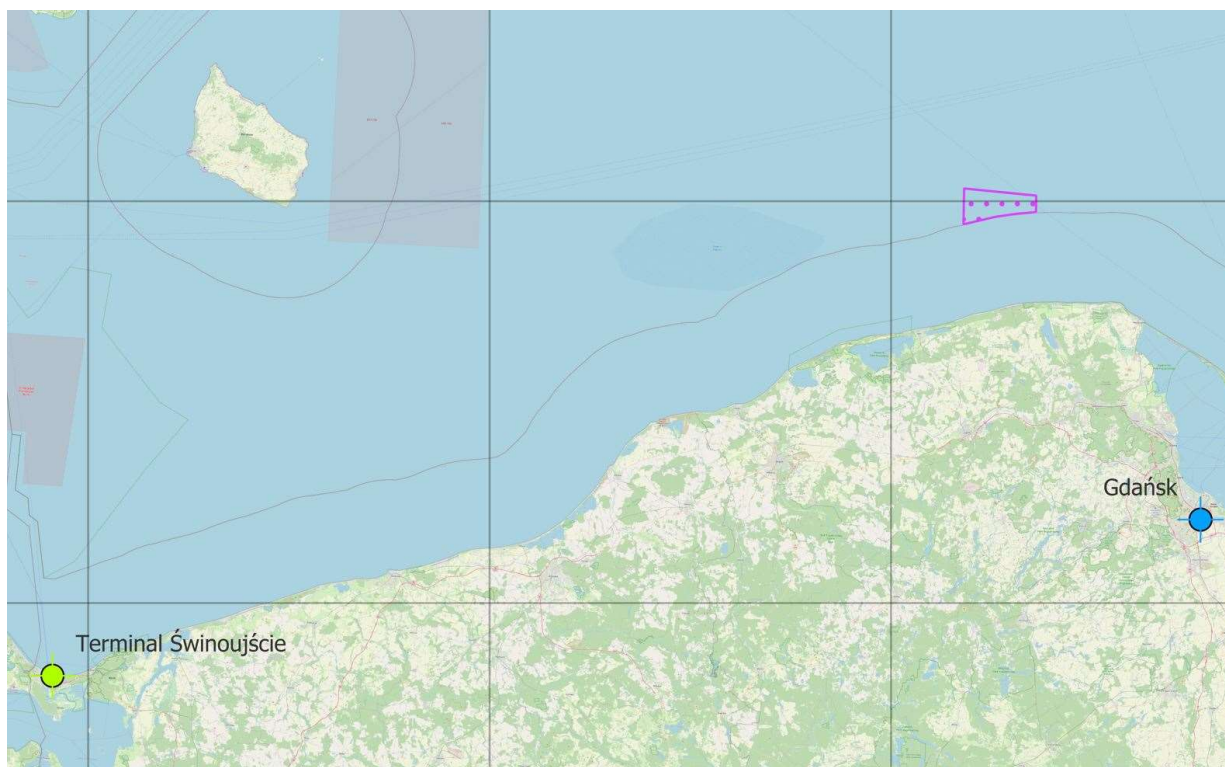
- stage 1 – support is allocated to limited and defined projects in the form of “direct” CfD (Contract for Difference);
- stage 2 – projects compete for state support by declaring maximum electricity price in the auctions organized every other year, first of them due to being organized in December 2025.

Stage 1 of polish offshore wind farm projects consist of nine projects. All of them have valid location permits and already are in construction or in advance development stages.

Stage 2 of polish offshore wind farm projects has been organized in the form of competition, where investors and developers from all over the world were allowed to submit their applications for ‘location permits’ for areas of future offshore wind farms, defined in the MSP. Dozens of applications were submitted and evaluated. As a result of this process, 10 new ‘location permits’ were granted – 5 permits for ORLEN capital group (including Baltic East Project considered herein).

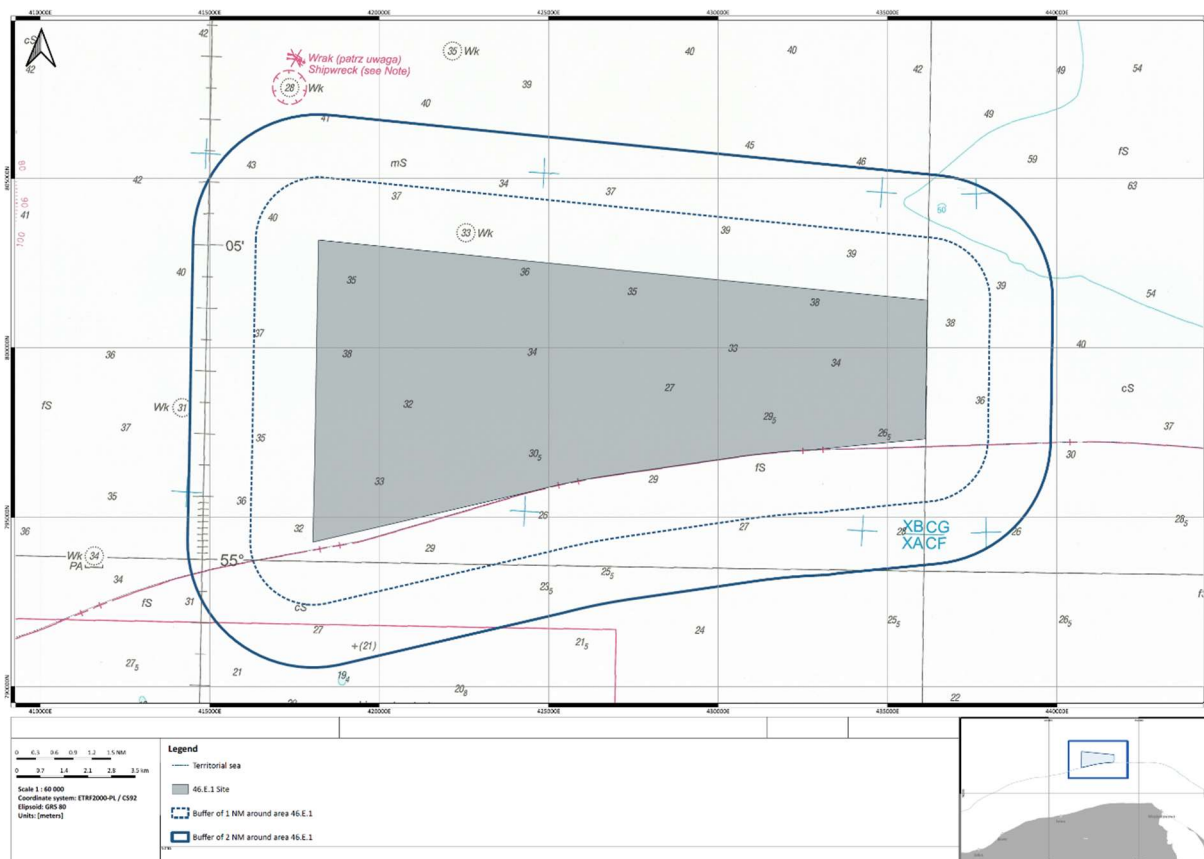
### 4. Location of Baltic East project

Please see all future offshore wind farms in ORLEN capital group’s portfolio presented below. The Baltic East project, being subject of this RFI.



**Figure 2. Development of offshore wind projects in ORLEN Group: 2nd phase**

The Baltic East offshore wind farm is a future development in the Baltic Sea, located in the Polish Exclusive Economic Zone (Figure 1.2). The ‘location permit’ covers a total area of approximately 110 km<sup>2</sup>, located around 23 km north from the coastline of Poland. The project is located next to another offshore wind farm project in ORLEN capital group – Baltic Power, being under construction at the moment.





Status of the Project development comprises the following:

- development:
  - 2025 December - Contract for Difference Auction
- procurement:
  - 2025-2028 – procurement processes for main components supply and installation are planned;
- construction phase:
  - 2029 – Final Investment Decision is expected;
  - 2030 – Foundation installation;
  - 2030/2031 – turbine installation is expected (it is expected to install turbines with grid available);
  - 2032 – commencement of commercial operation.

## **6. Project technical assumptions**

The Baltic East offshore wind farm has been granted a maximum capacity of up to 966 MW (grid connection capacity – 960 MW). The final offshore wind farm capacity (not higher than the above) is still to be determined, but at this stage one may expect that the value will be maximised unless there will be justified commercial or technical factors to reduce it. The type of the turbine is still to be determined and depends – among others – on business case for the Project with different offerings. The Project target is to utilise the latest turbine technology available, so one may expect that any potential transport and installation scope may consist of 65+ WTGs in case of ordering turbines already commonly known or a few less depends on turbines power output. The WTG substructure types are also under evaluation with the most probable substructure types being Monopiles(with Transition Pieces or TP-less) or pre-piled jackets. The Inter-Array Cables (IAC) network will connect each WTG in strings or loops to the project's Offshore Substations (OSSs). It is expected that the IAC voltage level will be 66 kV. The number of OSSs and the High Voltage (HV) level of the electricity export system has not been determined, however, there are generally expected 2 OSS offshore and 220kV AC power export system, connected to onshore 220/400 kV substation.

## **7. Project wind, current, tidal, environmental and soil conditions**

At the moment the met-ocean and geological conditions for Baltic East offshore wind farm are only partially known with studies, analysis and surveys being done in the near future in order to gain significantly more knowledge about the site specific conditions.

## **8. Wind Speed Rose**

The prevailing wind directions in the offshore Baltic East site is expected to be West and South West with 15-20% of time being covered by wind from this direction. Other wind directions are expected to be quite evenly distributed in time.

The average wind speed in the offshore Baltic East site is expected to be between 9 m/s and 11 m/s. The maximum wind speed should not exceed 50 m/s.

Above-mentioned values are expected to be confirmed / verified by measurement campaign commenced in 2025.

## **9. Waves**

It is expected that majority of waves on site will have westerly direction.

Waves directions are expected to be confirmed / verified by measurement campaign commenced in 2025.

## **10. Tides**

The Baltic Sea is a non-tidal sea, meaning tidal ranges are very limited, typically only a few centimetres. Tides have an insignificant impact on water levels, current dynamics, or logistics for the Baltic East project.

## 11. Currents

At the Baltic East wind farm location on the Słupsk Bank, ocean currents are primarily driven by wind and atmospheric pressure gradients. Surface currents typically range from 0.2 to 0.5 m/s, but can intensify during strong wind events.

In the deeper layers, gravity-driven bottom currents occur due to inflows of saline water from the North Sea, known as Major Baltic Inflows. These denser saline waters sink and travel along the seafloor through the Słupsk Furrow, potentially influencing sediment movement and foundation stability.

Short-term oscillatory currents also occur, with periods ranging from 11 to 31 hours, causing periodic shifts in current direction and velocity throughout the water column. While not extreme, these oscillations can affect installation operations.

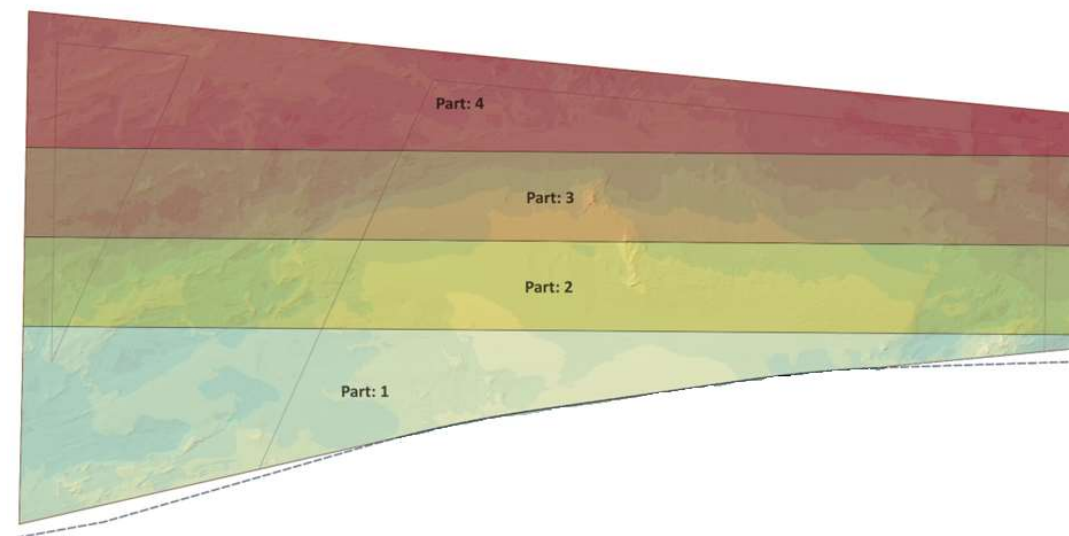
Overall, current behaviour in the Baltic East area is relatively stable and predictable, but bottom-layer hydrodynamics during MBIs require careful monitoring and engineering consideration.

## 12. Soils Initial Information

In the region of Baltic Sea, where the Project is located, the seabed is expected to consist of sand and clay so use of monopiles are preferred option, however use of jackets is also possible as foundations for turbines. However, in this region of the Baltic Sea, high local variability in ground conditions is also expected, therefore the Project will conduct a variety of surveys (among others: geophysical survey, seismic survey, initial and main geotechnical survey including CPTs and boreholes sampling, UXO surveys, boulder survey etc.) in order to better understand ground conditions and jacking restrictions at specific turbines' locations.

## 13. Depth

Mean Depth at Baltic East Project area, provided by preliminary soundings is 35,17 m. Project area exhibits moderately variable bathymetry, water depths typically ranging between 26 m and 43 m, with seabed gently sloping northerly. Depth classes have been mapped across the site and presented on quantile distribution. Project will conduct a variety of surveys in order to better understand ground conditions at specific turbine locations.



**Figure 4. Baltic East Mean depth quantile distribution**



Site No.	Percentage of area	Area km2	Depth mean (m)	Depth max (m)	Depth min (m)
Baltic East (46.E.1) 1	25%	27,95	-32,43	-37,93	-26,10
Baltic East (46.E.1) 2	25%	27,95	-33,23	-40,35	-26,81
Baltic East (46.E.1) 3	25%	27,95	-36,80	-42,92	-26,95
Baltic East (46.E.1) 4	25%	27,95	-38,23	-42,97	-33,59

**Table Błąd! W dokumencie nie ma tekstu o podanym stylu.1. Baltic East Mean depth quantile distribution**

## 14. Foundations preliminary data

Project technical assumptions considers following options: monopiles FOU with TPs(preferred option) or TP-less Monopiles supply. As the engineering in in progress, Jackets with TPs are still considered as an option for minor number of assets.

Preliminary informative data given as bellow:

Component	Value
Monopile Length	~70 - 90
Monopile Outer Diameter	Up to 10 m
Nominal weight	1400 – 1800 tonnes
Transition Piece Length	~35
Transition Piece Outer Diameter	Up to 9 m
Nominal weight	Up to 1000 tonnes

**Table 2. Preliminary data of Monopile + Transition Piece**

Component	Value
Monopile Length	~105-115m
Monopile Outer Diameter	Up to 10 m
Nominal weight	2000-2200 ton tonnes

**Table 3. Preliminary data of TP-less Monopile**

## 15. Suitability for Installation Activities.

Based on the current analysis following can be assumed:

- Water depths fall within operational thresholds for standard installation jack-up vessels.
- The seabed appears to provide stable positioning zones, but preliminary risk of leg punch-through or leg instability will be verified via CPT or borehole investigations.
- The seabed in the area appears suitable for installation activities involving jack-up vessels, anchoring. Further site-specific geotechnical assessments are carried out. The current depth

analysis is a robust initial input for vessel selection, positioning strategy, and marine construction planning.