Non-specialist summary

Environmental Impact Assessment Report for the Baltic East Offshore Wind Farm

IMCA Contractor Co Member

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ISO 9001:2015 (Quality management systems)

ISO 14001:2015 (Environmental management systems)

ISO 45001:2018 (Occupational health and safety management systems)

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Abbreviations and definitions

ABBREVIATION	EXPLANATION
AIS	Automatic Identification System
AMC POLAND	Civil and military authority performing pre-tactical and tactical airspace management tasks
APV	Applicant Proposed Variant
HOPN	Hydrographic Office of the Polish Navy
BIAS	Baltic International Acoustic Survey
Bq	Unit of radioactivity in the SI system
CLV	Cable Laying Vessel
CTV	Crew Transfer Vessel
decibel (dB)	Logarithmic unit of sound intensity / sound pressure. Decibel value for the sound pressure is 20 log10 (P / P0), where P = measured pressure value and P0 = reference pressure
DIN	Dissolved inorganic nitrogen
DPD	Detection Positive Days
DPM	Detection Positive Minutes
GIOŚ	Chief Inspectorate of Environmental Protection
HELCOM	Helsinki Commission, Baltic Marine Environment Protection Commission
HLCV	Heavy Lift Crane Vessel
HLJV	Heavy Lift Jack up Vessel
IAC	inter array cables
IM UMG	Maritime Institute of the Gdynia Maritime University
IMGW–PIB	Institute of Meteorology and Water Management – National Research Institute
ISO	International Organization for Standardization
JCWP	Surface water bodies
EC	European Commission
kW	kilowatts
kW of cruises	Number of cruises times engine capacity
LOI	Sample organic matter content determined as Loss on ignition
LOQ	Limit of qualification
LPS	Lightning Protection System
MARPOL	International Convention for the Prevention of Pollution from Ships
OWE	Offshore wind energy
OWF	Offshore wind farm / offshore wind farms
MFW Baltic East	East Baltic Power Offshore Wind Farm
MW	Megawatt, power unit
Baltic East OWF Area	Area covered by Decision No. MFW/46.E.1 of the Minister of Infrastructure of September 29, 2023 (ref. No.: DGM-3.530.20.2022) on the permit for erection and use of artificial islands, structures and devices in the Polish maritime areas, determined by the coordinates indicated in Part II of this permit
OSS	Offshore Substation
PCB	Polychlorinated biphenyls
PLB	Post Lay Burial
SEM	State Environmental Monitoring

ABBREVIATION	EXPLANATION
POM	Polish maritime areas within the meaning of the Act of March 21, 1991 on maritime areas of the Republic of Poland and maritime administration (consolidated text, Journal of Laws of 2024, item 1125)
Source level	Sound pressure at a standard distance of 1 m; unit: dB re 1 µPa at a distance of 1 m
PAI	Permit for erection or use of artificial islands, structures and devices in the Polish maritime areas within the meaning of the Act of March 21, 1991 on maritime areas of the Republic of Poland and maritime administration (consolidated text, Journal of Laws of 2024, item 1125)
Baltic East OWF PAI	Decision No. MFW/46.E.1 of the Minister of Infrastructure of September 29, 2023 (ref. No.: DGM-3.530.20.2022) on the permit for erection and use of artificial islands, structures and devices in the Polish maritime areas
PZPOM	The spatial development plan for internal sea waters, the territorial sea and the exclusive economic zone at a scale of 1:200,000 was adopted with the Regulation of the Council of Ministers of April 14, 2021 (Journal of Laws of 2021, item 935)
Report / EIA Report	Environmental Impact Assessment Report within the meaning of the Act of October 3, 2008 on access to information on the environment and its protection, public participation in environmental protection and on environmental impact assessments (consolidated text, Journal of Laws of 2024, item 1112)
SAMBAH	Static Acoustic Monitoring of the Baltic Sea Harbour Porpoise
SLB	Simultaneous Lay and Burial
SOV	Service Operations Vessel
SPL	Sound pressure level
SPRAS	Acoustic cruises conducted by the Maritime Fisheries Institute in the Baltic Proper area SPRat Acoustic Survey – SPRAS.
NRS	Noise Reduction System
TBT	Tributyltin
POP	Persistent organic pollutants
UNFCCC	United Nations Framework Convention on Climate Change
EEZ	Exclusive Economic Zone
PAH	Polycyclic aromatic hydrocarbons

1 INTRODUCTION

1.1 Introduction

This chapter is a summary of the Environmental Impact Assessment Report for the Baltic East Offshore Wind Farm, which is planned to be constructed by the Applicant - Orlen Neptun VIII sp. z o.o.

The project is the Baltic East OWF with a maximum installed capacity of 966 MW within an area of approx. 111.7 km^2, located in Polish maritime areas in the Exclusive Economic Zone. The project will consist of a maximum of 64 wind turbines, a maximum of 150 km of inter array cable routes and 2 offshore substations. The document is applicable to the implementation, operation and decommissioning of the Project.

ORLEN Neptun VIII sp. z o.o. received the decision No. MFW/46.E.1 of the Minister of Infrastructure of September 29, 2023 on the permit for erection and use of artificial islands, structures and devices in the Polish maritime areas for the project named “Baltic East Offshore Wind Farm in the area 46.E.1 with necessary infrastructure” (hereinafter referred to as: PAI BE OWF).

1.2 Objective of the Project implementation

The purpose of the Project is to generate electricity using a renewable energy source – wind.

1.3 Project classification

Pursuant to the Regulation of the Council of Ministers of September 10, 2019 on projects that may have a significant impact on the environment, the Project is classified as a project that may always have a significant impact on the environment as a plant using wind energy for electricity generation located in maritime areas of the Republic of Poland.

1.4 Purpose, scope and basis for preparation of the EIA Report

The purpose of the EIA Report is to present environmental, social, economic and cultural conditions and to assess the impact of the Project on the environment and human life and health conditions. The Report specifies:

- characteristics and scale of the planned Project;

- environmental conditions such as: state of the environment (on the basis of conducted surveys and wildlife surveys), cultural and landscape values, existing and planned use and development of sea regions;
- characteristics, extent and significance of expected environmental, spatial and social impacts;
- the possibility of avoiding, preventing, limiting and possibly compensating the identified adverse effects of the Project or hazards, taking into account potential emergency situations;
- a proposed environmental monitoring program.

Furthermore, the conditions imposed in the decision on BE OWF PAI, such as taking into account the impact:

- on resources and recruitment of fish species important for fishing;
- generation of physical fields (electromagnetic field), possible cumulative negative impacts with neighboring offshore wind farms and risk of failures related to collisions, also in emergency situations.

The scope of the EIA Report complies with the legal regulations, specifically the Act of October 3, 2008 on providing information on the environment and its protection, social participation in protecting the environment and environmental impact assessment (hereinafter referred to as the EIA Act).

The EIA Report is an Appendix to the application for issuing a decision on environmental conditions by the Regional Director for Environmental Protection in Gdańsk in accordance with the EIA Act.

The report was prepared by MEWO S.A. in cooperation with the subcontractors: GEOMOR Sp. z o.o., ODJT - Kancelaria Radców Prawnych i Adwokatów Otawski Dziura Jarzyński Troszyński Hernik Sp.p., ODJ Enviro sp. z o.o., CDM Smith Sp. z o.o., Maritime Fisheries Institute – National Research Institute, MAREA, DHI, Maritime Institute of the Gdynia Maritime University.

The basis for preparation of the EIA Report was both technical documents provided by the Applicant and applicable provisions of law, strategic, program and planning documents, as well as literature data and environmental impact assessment reports or other documentation for projects completed, being implemented or planned, located in the vicinity of the planned Project.

The EIA Report is based on the concept of an envelope description of the Project, i.e. performing an impact assessment for the largest values describing a given project. The project is described in

a manner enabling future application of solutions resulting from technological progress and not worse than those currently in place.

1.5 Documents important for the Project

The arrangements of strategic documents or legal acts at international, European and national level may be important or set the framework for the implementation of the Project. The main objectives set out in these documents are environmental protection, energy transition, climate change mitigation and adaptation, sustainable development, reduction of emissions and protection against pollution of the Baltic Sea, its management and use. The project is consistent with the assumptions and will not hinder and in many cases will contribute to the achievement of environmental objectives resulting from the applicable strategic and planning documents.

1.6 Methods for preparation of the EIA report

The purpose of the EIA Report is to assess the environmental impact of the Project and to identify methods of avoiding or reducing its negative impacts. The assessment is a study and analytical work performed by a team of specialists.

Works on the document were performed in accordance with the methodology for preparation of the EIA Report adapted to the purpose of the document.

The results of comprehensive environmental surveys and wildlife surveys performed in 2022-2024, guidelines, manuals and other materials related to this document, as well as the authors' experience and good practices were used. Descriptive materials and maps were analyzed, the results of surveys and modeling were interpreted and the methodology of determining the impact of the Project on environmental elements was applied. Environmental data relevant from the point of view of the Project included in the documents prepared prior to the adoption of the spatial development plan for Polish maritime areas were taken into account. The EIA report contains the elements specified in the EIA Act and information enabling the analysis of the environmental impact assessment criteria specified therein.

1.7 Methodology of performed works

The methodology used in the EIA Report is intended to ensure a comprehensive approach to the impacts of the Project changing the development and manner of use of the maritime area. The impact of the Project on the environmental elements referred to in the report as receptors, such as e.g. plant and animal species, habitats, geology, landscape and people, was determined. Actions that may cause impact resulting from the phases of implementation (lasting approx. 2

years), operation (lasting approx. 55 years) and decommissioning (lasting approx. 2 years) were specified. Links among sources of potential impacts and individual receptors were identified. An analysis was also performed for the Project in combination with other projects in order to determine cumulative impacts and possible transboundary impacts.

The expected impacts, including significant ones, of the Project on the environment, covering direct, indirect, secondary, cumulative, short -, medium - and long-term, permanent and temporary as well as positive and negative impacts are described.

A unified presentation of the obtained results consisting of 5 steps was used.

Step 1: **Identification of key** activities related to the implementation of the Applicant Proposed Variant (APV) and the reasonable alternative variant (RAV), as well as information on the effects of failure to implement the Project.

Step 2: **Identification of key impacts**.

Step 3: Characteristics and scale of an impact.

Step 4: **Sensitivity of the environment** as a diversified ability of the environment to respond to pressure.

Step 5: Impact significance, i.e. importance of the impact (negligible, insignificant, moderate, significant, important).

The relation between the scale of the impact and the sensitivity of the receptor indicates the impact significance (both positive and negative). For the Natura 2000 sites, a significant negative impact was assumed in accordance with the EIA Act as an impact on the protection objectives of the Natura 2000 site, including in particular activities that may: deteriorate the condition of natural habitats or habitats of plant and animal species for the protection of which the Natura 2000 site has been designated, or adversely affect the species for the protection of which the Natura 2000 site has been designated, or deteriorate the integrity of the Natura 2000 site or its connections with other areas.

Standardization of the environmental impact assessment of different types of activities, emissions resulting from the Project on different types of receptors allows for comparison of its impacts and assessment of the Project as a whole.

The EIA Report presents measures consisting of avoiding and mitigating impacts as adopted by the Applicant as part of the Project and mitigation measures resulting from the prepared EIA Report.

Cumulative impacts with other completed, implemented or planned projects concerning the same receptors are presented separately.

A separate chapter of the EIA Report refers to transboundary impacts.

The impacts of the alternatives (APV and RAV) were compared and the option most beneficial for the environment was determined.

The EIA Report also refers to other elements required under the EIA Act.

2 DESCRIPTION OF THE PLANNED PROJECT

2.1 General characteristics of the planned project

2.1.1 Subject and scope of the project

The project is the Baltic East Offshore Wind Farm designed for generating electricity using a renewable energy source – wind. The project will consist of the following elements:

- wind turbines (nacelle with rotor, tower, transition pieces) and single-support (monopile) or multi-support (jacket) foundations;
- offshore substations (OSS);
- internal power and communication lines with accessories.

The parameters characterizing the Baltic East OWF are as follows:

- maximum installed capacity of 966 MW;
- a maximum of 64 wind turbines;
- power output of a wind turbine: nominal – 15 MW, maximum – 25 MW;
- maximum rotor diameter of 310 m;
- minimum clearance above sea surface – 22.5 m;
- maximum altitude of a wind turbine of 347.5 m a.s.l.;
- a maximum of 2 offshore substations (medium/high voltage);
- maximum length of internal cable lines of 150 km;
- maximum 5% of the disturbed seabed surface;
- general rotor sweep area – minimum 2.79 million m^2 – maximum 2.87 million m^2.

2.1.2 Location of the project, area of the occupied water region and conditions of use of the water region

As indicated in the spatial development plan for maritime areas, the Baltic East OWF area is located within the Polish maritime area in the Exclusive Economic Zone in the water region POM.46.E, where the primary function is renewable energy generation.

The Baltic East OWF Project will be implemented entirely within the boundaries of the area indicated in the permit for erection and use of artificial islands, structures and devices at the surface area of 111.7 km^2.

Due to the need to take into account the limitations resulting from the decision on environmental conditions issued for neighboring OWFs, the development area of the Baltic East OWF will be divided into two types:

- Development area A and C – where OWF elements, i.e. wind turbines, offshore substations, etc., and linear infrastructure will be installed,
- Development area B – between area A and C – where only linear infrastructure (cables) will be installed on the seabed.

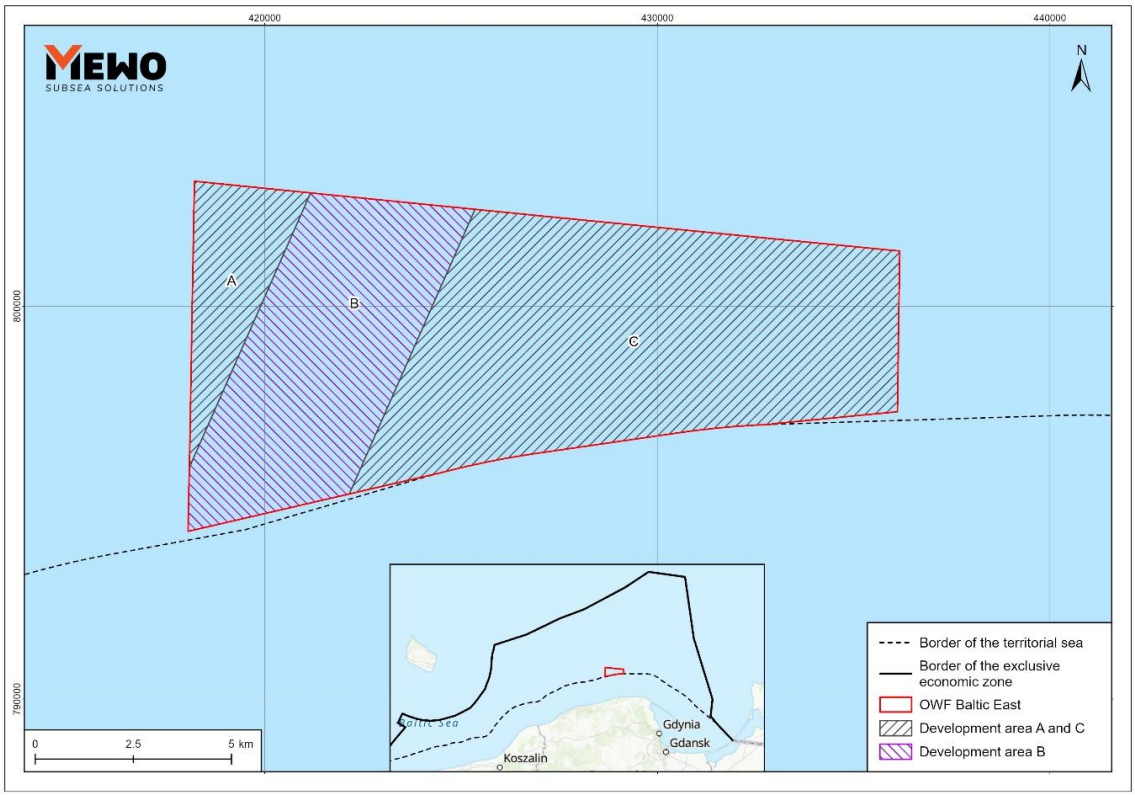

Figure 1 Planned types of the Baltic East OWF development areas [source: own study]

2.1.3 Staging of the Project implementation

The Applicant takes into account the project implementation both continuously and in stages.

2.1.4 Project execution schedule

The construction time is assumed to be 2 years, some stages will overlap and there may be interruptions in the works.

The implementation phase will include:

- preliminary and preparatory works such as seabed preparation;

- construction/installation works for elements such as foundations, supporting structures and wind turbines and substations alone, as well as laying of inter array cables.

The Baltic East OWF operation phase will last up to 55 years.

The final decommissioning phase will last approx. 2 years, and this does not include any possible interruptions as in the implementation phase.

2.2 Considered project alternatives

Considered project alternatives are as follows:

- option proposed for implementation – that is the option proposed by the Applicant (APV), which, as part of the environmental impact assessment, also turned out to be the reasonable option most beneficial for the environment,
- the reasonable alternative(RA).

2.2.1 Approach to determine the Project alternatives

Parameters of wind turbines planned to be placed on the market were assumed in the Option proposed by the Applicant, whereas parameters of wind turbines installed at present were adopted in the reasonable alternative. Such an assumption allows for analyses taking into account the highest expected level of project environmental impact.

2.2.1.1 Option proposed by the Applicant (APV)

The option proposed by the Applicant assumes the use of optimal technological solutions available at the preparation stage of the building permit design. This option includes the use of wind turbines with different power output ranging from 15 MW to 25 MW. It is planned to use monopiles and/or jacket foundations. With a total maximum power output of up to 966 MW, it is assumed that up to 64 wind turbines will be installed.

The APV takes into account the development of OWF technologies as observed on the market towards increasing the size of rotors and structural components and to enhance the efficiency of technical and technological solutions.

2.2.1.2 Reasonable alternative (RA)

The RA assumes the use of existing technological solutions available on an industrial scale. It was assumed to install wind turbines with a power output of 14 MW. With the power output of the entire Baltic East OWF of 966 MW, the total number of wind turbines is 69.

The RA assumes the use of a single type of wind turbines on monopile and/or jacket foundations.

2.2.1.3 List of technical parameters of the considered Project alternatives

The parameters of both aforementioned alternatives are tabulated.

2.3 Description of the technology

The technological solutions for the electricity generation process planned for the Baltic East OWF, available at the time of preparation of the EIA Report, are described below.

2.3.1 Description of the production process

An offshore wind farm is a plant constituting a separate set of equipment used for energy generation, consisting of one or more offshore wind turbines, a medium or high voltage network with offshore substations, excluding equipment on the high voltage side of the transformer or transformers located in that substation.

2.3.2 Description of the technology of individual elements of the Project

The offshore wind farm consists of: wind turbines with supporting structures, inter array cables (IAC), offshore substations (offshore substation).

2.4 Description of individual phases of the Project and conditions of use of the water region during the implementation and operation phases

2.4.1 General information concerning all phases of the project

Works will be performed in the mode of maritime operations using various types of vessels: construction and installation vessels, transport vessels, transport barges (platforms), push boats and tugboats, service operations vessels and helicopters.

The installation, transhipment and supporting ports taken into account for the Baltic East OWF are the ports in Świnoujście, Gdańsk, Gdynia, Władysławowo, Łeba and Rønne, Aalborg (on the island of Bornholm). During the operation phase it will be possible to use the port in Władysławowo or Łeba.

The competent Director of the Maritime Office will be able to establish safety zones around the OWF structures or complexes thereof together with determination of traffic conditions, including restrictions on navigation, fishing, water sports and underwater works.

2.4.2 Implementation phase

The OWF implementation phase requires the involvement of vessels, equipment and human resources functioning as a coordinated supply chain of goods and specialized services in a number of areas: generation, transport, construction, erection and installation.

2.4.2.1 Preliminary and preparatory works

As part of preliminary and preparatory works, the Investor will use port areas as site back-up facilities and storage yards, from where elements will be transported to the Baltic East OWF area. Preparatory works of the seabed for installation of foundations and inner array cables will be done first . It is assumed that boulders and disturbed sediment will remainentirely within the Baltic Power OWF area.

2.4.2.2 Construction/installation works

As part of the construction, it is planned to transport and install foundations, wind turbines, substations, lay internal cable connections, protect foundations and places of cable crossing with external infrastructure against scour, as well as clean the seabed.

2.4.2.2.1 Laying of cables

Different cable laying technologies and equipment will be used. The expected methods of cable laying are as follows:

- SLB (*Simultaneous Lay and Burial*), i.e. simultaneous execution of an excavation, laying and burial of a cable;
- PLB (*Post Lay Burial*), i.e. burying the cable after it has been laid on the seabed.

The selection of the cable laying method depends on environmental and logistic conditions as well as the technology recommended by the manufacturer or the Contractor of works.

2.4.2.2.2 Piling

Monopiles in the Baltic East OWF will be driven into the seabed using surface pile drivers from specialized vessels, which may have several jack-up legs with spudcans, which requires seabed preparation.

2.4.2.2.2.1 Noise reduction system

Significant underwater noise is generated when installing pile foundations, therefore a noise reduction system (NRS) will be used, which may include:

- visual and acoustic observations, including deterrence systems and pile driver soft-start system;
- passive noise reduction systems, e.g. air curtains or other similar;
- organization of works taking into account the schedules of works in other projects.

The NRS is intended to minimize the impact of underwater noise on marine mammals and fish. Noise measurements will be performed.

2.4.2.2.3 Transport routes (sea and land)

Transport will include handling works and vessel traffic from a port to the OWF and back or between ports. The number of specialized offshore operations is proportional to the number of facilities and cables in the OWF area. It is estimated that during 2 years of construction an average of 2.5 vessels will be stationed at the OWF and approx. 360 cruises of approx. 40 vessels will be performed.

2.4.3 Operation phase

The operation phase is characterized by its specific issues related to maritime transport, electromagnetic field emission and emission of heat generated by cables.

2.4.3.1 Sea transport

The OWF requires regular maintenance of underwater and above-water elements consisting in inspections and preventive maintenance, as well as interventions when a malfunction or fault is identified.

The largest share of maritime traffic will have small- and medium-sized vessels and, depending on the needs, larger vessels with cranes. Operations will be performed, among others, by specialized vessels, service operations vessels, working boats and unmanned undersea vehicles.

The number of cruises of OWF handling vessels may reach 700 per year – between the port in Łeba / Władysławowo (or other) and the Baltic East OWF area. There may be approx. 100 cruises per year from the Gdańsk Bay to the Baltic East OWF and back to the Gdańsk Bay.

The service season has two periods: high (April to October with an intensive service campaign – approx. 2 cruises per day) and low (with a minimum number of maintenance works – approx. 1 cruise per day).

2.4.3.2 Electromagnetic field (EMF)

The source of the electromagnetic field are inter array cables transferring electricity from each wind turbine to the offshore substation. Cables for the voltage of 66 kV or 132 kV will be used. Electric field emission will be residual due to the optimized placement of cables on the seabed; the magnetic component of the electromagnetic field of cables is minimized by routing single conductors as close as possible.

2.4.4 Decommissioning phase

The decommissioning phase is a reversal of the OWF construction phase. Individual OWF components will be removed and transported onshore by vessels. It is expected that the structure will be removed to seabed level, and parts of the foundations driven into the seabed will remain as they do not cause environmental impacts and their removal may cause environmental impacts, e.g. when using explosives. The part of piles above the seabed will be cut or burnt. Underwater elements of the Baltic East OWF may constitute a habitat for marine organisms.

The possibility of repowering, i.e. the removal of wind turbines and their replacement with next generation turbines, is not excluded.

2.5 Information on the use of resources

2.5.1 Demand for raw materials and materials

Preparation of the seabed before installation of the foundation and laying of the inner array cables consists in movement of bottom sediments and/or displacement of stones and boulders. They will be managed within the Baltic East OWF area.

The cubic volume of sediments transferred is:

- replacement of soil for gravel pads – approx. 240 thousand m^3;
- drillings/borings from monopiles – approx. 160 thousand m^3.

The seabed occupancy related to backfilling the seabed with gravel material at the foundation locations (as scour protection) is estimated at:

- **gravel pads/fills** – surface area of approx. 300 thousand m^2 for a material with a cubic volume of up to 1.2 million m^3;
- **scour protection** – surface area of approx. 120 thousand m^2 for material up to approx. 240 thousand m^3.

The estimated seabed occupancy for cable fills will amount to approx. 280 thousand m^3 to 380 thousand m^2.

Information on the deep structure of the seabed will be known when geotechnical surveys are completed. The arrangement of individual elements will be specified in the execution design. In cooperation with the maritime administration authorities, the Investor will be able to develop a detailed method of handling seabed material, and if it is necessary to extract it to the sea surface, a sediment contamination survey program will be prepared, which will be submitted for review by the Regional Director for Environmental Protection in Gdańsk.

2.5.2 Water demand (domestic needs, technological processes, fire protection)

Water demand is related to domestic use by the onshore and offshore crews.

2.5.3 Fuel demand

The estimation of fuel demand for the OWF depends on the specificity of the project. Specialized vessels perform complex maritime operations resulting from a specified number of working hours. At this stage, the suppliers of individual components and the routes of travel of involved vessels are not known.

The capacity of vessels' fuel tanks ranges from 60 m^3 + optionally up to 0.5 t of H2, through 500 m^3 up to 5 000 m^3).

2.5.4 Power demand and consumption (electricity, thermal energy)

Due to the specificity of the Project, i.e. generation of electricity from renewable energy sources, in the final balance it will have a significant positive impact on the climate by reducing emissions from emission-intensive sources generating electricity from fossil fuels.

2.6 Expected types and quantities of emissions, including waste, resulting from the implementation and operation phase of the Project

2.6.1 Noise emission

In each phase of the Baltic East OWF, noise emissions related to sea transport will occur. In the implementation phase there will also be noise emission related to piling, therefore, a noise reduction system (NRS) will be applied.

2.6.2 Emission of air pollutions

Emissions of air pollutions will occur at each stage of the project. In all phases, pollutions will be generated by transport, whereas in the operation phase also by systems or equipment on the OWF.

2.6.3 Emission of electromagnetic radiation

The source of the electromagnetic field are inter array cables transferring electricity from each wind turbine to the offshore substation. Electric field emission will be residual due to the optimized placement of cables on the seabed; the magnetic component of the electromagnetic field of cables is minimized by routing single conductors as close as possible.

2.6.4 Heat emission

Heat emission will occur during the operation phase when the temperature of a power cable reaches a value above the temperature of the surrounding environment. Exact quantification of the heat released is difficult because it depends on many factors. The heating of sediment may lead to a change of the benthos living on and in the seabed in direct proximity of the cables. Inter array cables will be laid to a depth of up to 3 m.

2.6.5 Light emission

Light emission will occur on vessels, mainly during the construction and decommissioning phases. During the operation phase, light emission will come from aviation obstruction lights of wind turbines (red light), and the flicker effect is an additional aspect. Light emission will be limited to the necessary level resulting from applicable occupational safety regulations and standards.

2.6.6 Wastewater emission – type, quantity and management

The emission of wastewater is related to the implementation phase (process wastewater, wastewater from ships and vessels) and to the consumption of water for domestic purposes by the onshore and offshore crews. The amount of wastewater during the execution phase is estimated at approx. 11,000 m^3.

During operation, wastewater will be generated by persons on board ships and during servicing. The estimated amount of wastewater during the operation phase will amount to approx. 385 m^3/year.

During the decommissioning phase, wastewater emission is estimated at the level of the implementation phase.

Applicable legal requirements and good practices for wastewater management will be applied.

2.6.7 Waste – type, quantity and management

The expected types and amounts of waste in subsequent phases of the Project are determined on an annual basis using information on the assumed technology. Ballast water will be handled in accordance with the International Convention for the Control and Management of Ships' Ballast Water and Sediments adopted on February 13, 2004.

Implementation phase

It is expected that waste will be generated due to the operation of vessels and when joining structural components (e.g. welding or grouting), in the piling process, i.e. driving or drilling piles (e.g. drill cuttings), as well as during the installation of corrosion protection elements and possible abrasion of protective coatings (e.g. during piling). The anodic and cathodic method will be used for corrosion protection of structural components of the OWF in accordance with the adopted standards.

Operation phase

In the operation phase, waste will be generated during repairs, servicing and use of vessels.

Decommissioning phase

Individual elements of the OWF will be removed and transported for further processing in accordance with the regulations in force at that time.

2.7 Risk of serious failures or natural and construction disasters

2.7.1 Types of failures resulting in contamination of the environment

The project involving the construction, operation and decommissioning of the Baltic East OWF is associated with a period of several dozen years of complex onshore and offshore operations.
The implementation and operation of the Project will not involve the presence of hazardous substances in the plant in quantities determining the classification of the Baltic East OWF as plants with increased or high risk of occurrence of a major industrial accident.
Production technologies and processes related to the manufacturing of elements for the Baltic East OWF do not pose a risk of occurrence of emergency situations of significant importance.

The main hazards include spills of oil derivative substances, mainly fuel oil, hydraulic, transformer and lubricating oils, and incidental hazards related to the use of materials containing hazardous substances.

Oil spills may pose a problem with long-term effects on the fauna, flora, fisheries and beaches affected by pollution, therefore appropriate procedures and measures protecting against spills of hazardous substances will be applied.

2.7.2 Failure pattern with the assessment of potential consequences

2.7.2.1 Leakage of oil derivative substances during normal operation of vessels

During normal operation of vessels, leakages of various types of oil derivative substances (lubricating and diesel oils, petrol) may occur. It should be assumed that these will be small spills. The place where the spill occurred is of key importance and the range can be determined only during the event. The number of potential leakages is proportional to the number of vessels used during implementation, operation or decommissioning.

Protected natural areas, including those designated as Natura 2000 sites are particularly vulnerable to potential pollution. The most sensitive places in case of possible spills are the Natura 2000 site Przybrzeżne Wody Bałtyku and the coastal strip from Ustka to Władysławowo.

Leakage of oil derivative substances (in an emergency situation) may result in contamination of water and bottom sediments. In the worst case scenario, in the implementation or decommissioning phase, there will be class II spills (medium-sized spills). The probability of major accidents is calculated to be very low.

Assuming the worst case scenario and release of 200 m^3 of fuel oil into the marine environment, it is expected that the pollution range will not exceed 5 to 20 km from the Baltic East OWF.

Detailed rules for preventing and combating hazards and pollution will be agreed with the maritime administration prior to submission of the application for the building permit for the Baltic East OWF.

The release of chemicals and waste can happen accidentally and is proportional to the activity related to the use of chemicals.

2.7.3 Other types of releases

Other types of releases related to the Baltic East OWF are as follows:

- waste and sewage,

- pollution of the water column and seabed sediments with anti-fouling agents used previously on vessel hulls, the emission will be insignificant,
- release of pollutants from facilities of anthropogenic origin located on the seabed; such facilities were identified during geophysical surveys (2022-2024); The applicant will prepare a plan for handling hazardous facilities.

2.7.4 Environmental hazards

Potential events threatening the environment were identified, which may become a source of negative environmental impacts during the implementation, operation and decommissioning phases of the project. The events are listed above – furthermore, in the implementation phase, the hazard may be related to the failure of the noise reduction system. The applicant will implement a procedure in case of environmental hazards, including safety procedures.

2.7.5 Prevention of failures

The prevention of failures is a set of activities related to the protection of human health and life, the environment and property, as well as reputation of all participants of the processes related to the implementation, operation and decommissioning of the OWF.

2.7.6 Design, process and organizational protections planned to be used by the Applicant

Design, process and organizational protections mainly consist in performing navigation risk assessments and developing plans to prevent the hazards. As required under the Act on maritime safety, prior to submission of the application for the building permit for the offshore wind farm, the applicant is obliged to prepare and approve the following with competent administration authorities:

- navigation expert opinion regarding the assessment of the impact of an offshore wind farm and a set of equipment on the safety and efficiency of the navigation of vessels in Polish maritime areas;
- technical expert opinion regarding the assessment of impact of an offshore wind farm and a set of equipment on the Polish AI and A2 offshore areas of the Global Maritime Distress and Safety System (GMDSS) and the Operational Communication System of the Maritime Search and Rescue Service;
- technical expert opinion regarding the assessment of impact of an offshore wind farm and a set of equipment on the National Maritime Safety System;

- rescue plan specifying the types of hazards to the health and life of personnel involved in the construction, operation and decommissioning of the offshore wind farm and the set of equipment, the methods and procedures to be followed in the event of the occurrence of those hazards and the forces and measures provided by the generating entity to implement this rescue plan;
- plan for combating hazards and pollution for the offshore wind farm and the set of equipment to be approved by the Director of Maritime Office competent for the location of the offshore wind farm;
- technical expert opinion regarding the assessment of the impact of the offshore wind farm and the set of power output equipment on the state defense systems, including the radar imaging system, technical observation, maritime radio communication and control system of air traffic services of the Armed Forces of the Republic of Poland;
- technical expert opinion regarding the assessment of the impact of the offshore wind farm and the set of power output equipment on the radar imaging system, technical observation and maritime radio communication of the Border Guard.

2.7.7 Potential causes of the failure taking into account extreme situations and the risk of occurrence of natural and construction disasters

Due to their intended use, OWF structures are designed and constructed to withstand extremely heavy weather and sea conditions during long-term operation.

All items of the equipment are continuously monitored and any deviation signal results in appropriate operational actions. The rotor is stopped automatically at wind speed exceeding values for safe operation of the wind turbine. The service plan shall ensure failure-free operation.

The occurrence of negative effects of climate changes in the form of too strong wind or too high waves may only result in the extension of the implementation cycle and increased energy demand – fuel consumption.

2.7.8 The risk of occurrence of major accidents or natural and construction disasters, taking into account the substances and technologies used, including the risk of climate change.

The risk of a serious failure resulting in the emission of hazardous substances is minimal. The probability of vessel collisions is classified as very rare events with the probability of occurrence of once every 100 years, and such as contact of a vessel with the OWF structure as very rare events with probability of occurrence once every 200 years. Taking into account the effects of

emission of 200 m^3 of fuel oil, the level of risk is within the acceptable range as it will cause insignificant environmental damage and will disperse within 12 hours.

2.8 Relations between the project parameters and impacts

Table [Table 1] presents a matrix of interconnections between the parameters of the planned project and impacts in the phases of implementation, operation and decommissioning of the Baltic East OWF.

Table 1 Matrix of interconnections between the parameters of the project and the impacts [source: own study]

PROJECT PARAMETER	IMPACT (TYPE OF EMISSION OR DISTURBANCES/CHANGES)																		
	SUBSTRUCTURES	TOPSIDE STRUCTURES	UNDERWATER NOISE	ABOVE-WATER NOISE	SPATIAL BARRIER EFFECT	CULTURAL VALUES	LANDSCAPE	PEOPLE	DISPLACEMENT OF ANIMALS	SEABED DISTURBANCES	SUSPENDED MATTER AND	EMF	HEAT	LIGHT	WASTE	WATER POLLUTION	AIR POLLUTION	INCREASE IN VESSEL TRAFFIC	HAZARDS / FAILURES	FORMATION OF ARTIFICIAL
Width of scour protection	X					X			X	X	X				X	X		X		X
Monopile diameter	X		X			X			X	X					X			X		X
Piling parameters	X		X	X				X	X						X	X	X	X	X	
Total height of wind turbines		X		X	X		X	X	X					X			X	X	X	
Rotor diameter		X		X	X		X		X					X	X	X	X	X	X	
Length and type of cables	X								X	X		X	X		X	X		X	X	
Depth and method of cable laying / burying	X					X			X	X	X	X	X		X	X		X	X	X
Number and size of substations	X	X		X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
Process organization (number of vessels, time)		X		X	X		X	X	X	X	X			X	X	X	X	X	X	

3 ENVIRONMENTAL CONDITIONS

3.1 Location, topography of the sea basin bottom

The Baltic East OWF area is located 22.5 km north of the seashore at the level of Sasino and Białogóra. The seabed of the surveyed area is located at the depth from 25.8 to 45.9 m below sea level, and the depth of the surveyed area increases northwards. The shallowest parts of the seabed are located in the southern part of the area. The seabed surface varies.

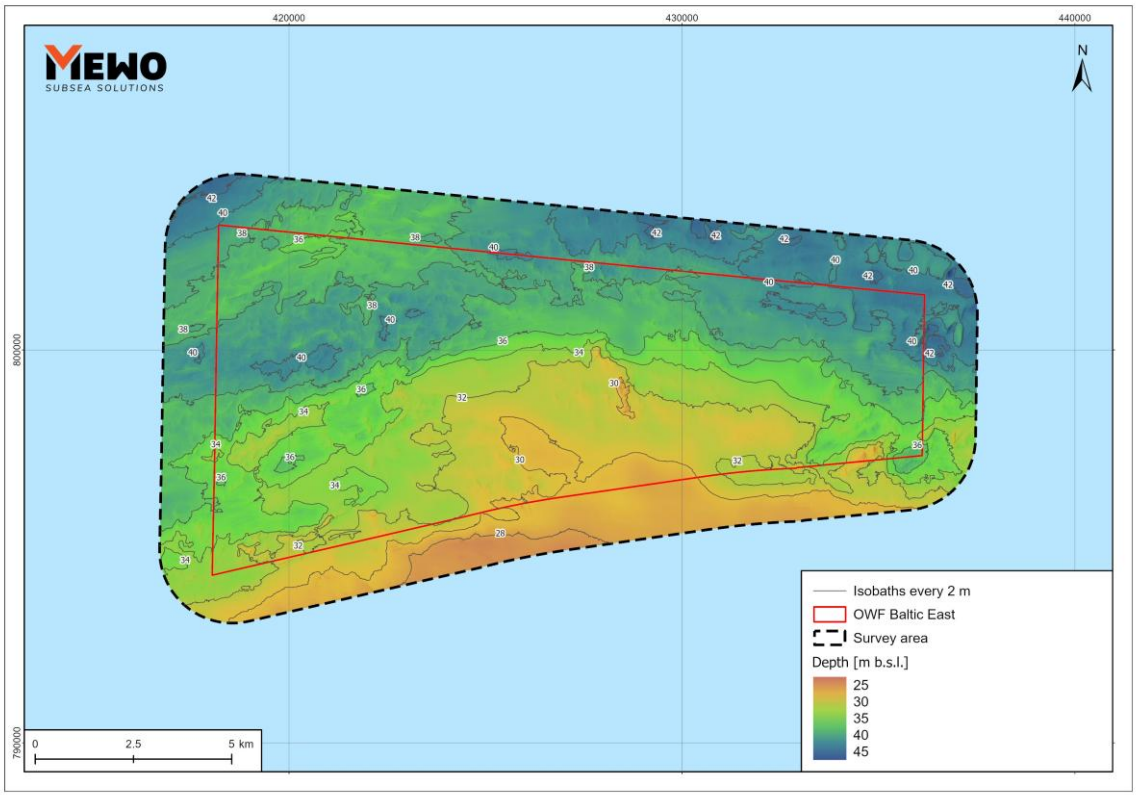

Figure 2 *Bathymetric map of the Baltic East OWF [source: own study]*

The characteristics of changes in the depth and relief of the surveyed area seabed were developed in the form of a map of seabed surface types, which was prepared using the following maps: bathymetric, slopes, sonar mosaics and surface sediments and seabed sediment structure data obtained by interpretation of seismoacoustic data.

Within the analyzed area, two types of seabed surface were distinguished, including an accumulation platform and an abrasion and accumulation platform.

3.2 Geological structure, bottom sediments, raw materials and deposits

3.2.1 Geological structure, geotechnical conditions

According to literature data, within the boundaries of the surveyed area, crystalline substrate is located at the depth from 2,500 to 2,900 m below sea level. The northern part of the Baltic East OWF surveyed area is located within the Łeba Block and the southern part within the Żarnowiec Block. The Sambia fault intersects the analyzed area. A series of Cambrian, Ordovician, Silurian and Permian sediments are deposited above the crystalline substrate. These formations are covered with Triassic sediments (excluding the north-western part of the area), and in the southern part of the area – also with Cretaceous sediments. Paleogene and Neogene sediments were identified above the Permian and Mesozoic sediments. Quaternary sediments the thickness of which for the analyzed area is estimated at 5 to 30 m are deposited on Paleogene and Neogene sediments.

3.2.2 Bottom sediments and their quality

Based on the conducted analyses, it was found that the majority of the seabed surface of the surveyed area is made of cohesive sediments with a thin discontinuous sandy cover and with erosive pavement and individual boulders on the surface. The remaining part of the surveyed area is made of fine and medium-grained sands.

The content of biogenic substances (nitrogen and phosphorus compounds) in the surveyed area did not exceed the values typical of sediments of the southern Baltic Sea.

Concentrations of persistent organic pollutants (PAHs, PCBs) and harmful substances, such as metals or mineral oils, were low in the surveyed area and did not exceed the values typical for sandy sediments of the southern Baltic Sea. The surveyed sediments were also characterized by low values of cadmium concentration and low activity of radioactive caesium isotope, typical of sandy sediments.

3.2.3 Raw materials and deposits

Within the boundaries of the Baltic East OWF surveyed area and in its immediate vicinity, no mineral deposit and mining area were found.

According to the geoenvironmental map of the Polish maritime areas, the eastern and north-eastern part of the Baltic East OWF surveyed area is indicated as prospective for the occurrence of aggregate raw materials – sands, sands and gravels, however, the surveys performed within the Baltic East OWF area did not confirm the presence of sands suitable for coastal silting.

3.3 Sea waters and their quality

The results of tests of individual chemical parameters of water in the Baltic East OWF surveyed area, such as reaction, oxygenation, five-day biochemical oxygen demand (BOD_5), total organic carbon (TOC), biogenic substances, PCBs, PAHs, mineral oil, cyanides, metals, phenols, cesium, strontium, did not differ significantly from typical values for waters of the southern Baltic Sea.

These waters are characterized by alkaline reaction and relatively good oxygenation, with seasonal variations characteristic of southern Baltic waters. The assessment of the water quality indicator in the Baltic East OWF surveyed area based on the oxygen content in the demersal layer in the summer period indicates a good condition. During the entire measurement period, the average biochemical oxygen demand (BOD_5) in water samples taken from the Baltic East OWF surveyed area in individual measurement periods was below 2.00 $mg \cdot dm^{-3}$ (only in March 2023 it amounted to 3.25 $mg \cdot dm^{-3}$ in the surface layer and 2.92 $mg \cdot dm^{-3}$ in the demersal layer).

The suspended matter content in the individual measurement periods was typical of the southern Baltic waters. The content of biogenic substances was normal and characterized by seasonal variations characteristic of the southern Baltic waters.

The waters of the surveyed water region were characterized by low concentrations of particularly harmful substances. The surveyed waters were also characterized by low values of activity of ^{137}Cs and ^{90}Sr typical of the southern Baltic waters. In the Baltic East OWF surveyed area, slightly higher concentrations of PAHs than given in the literature were observed, which may result from differences at the stage of preparation of samples for analysis.

The identified spatial diversity of the analyzed physical and chemical properties of sea waters does not create any limitations for the location of facilities, i.e.: foundations and supporting structures as well as internal power system.

3.3.1 Condition of sea waters and seabed sediments

Physical and chemical elements of water, such as concentration value: of dissolved oxygen at the seabed in summer, TOC, nitrate nitrogen, mineral nitrogen and total nitrogen, analyzed in the surveyed Baltic East OWF area, are in the 1st water quality class. However, the obtained results of water tests as regards the concentration of total phosphorus and phosphate phosphorus, and pH classify the waters tested as the 2nd quality class.

The assessment of water quality in the Baltic East OWF area, performed for the presence of substances particularly harmful to the aquatic environment and priority substances in the field of water policy, showed that the limit values of parameters in taken water samples were not

exceeded in most cases. The identified exceedance for two indicators was incidental, falling within the measurement uncertainty of the applied test methods.

The obtained results of concentration of total chromium, phenols and cyanides in waters from the Baltic East OWF area in relation to the limit values of water quality indicators for surface water bodies did not exceed the admissible values.

Moreover, in all analyzed water samples from the surveyed Baltic East OWF area, the concentration values of the sum of 7 PCBs were below the possibility of identification of the applied analytical methods. The results obtained for the average concentration of Cs confirmed a gradual decrease in radionuclide activity since the beginning of the continuous monitoring in 2010/2011.

Based on the conducted surveys and analyses, it was found that the environmental state of sea waters of the Baltic East OWF area in terms of eutrophication is poor, which resulted from increased concentrations of phosphates in winter and total phosphorus (expressed as an annual average concentration). However, the limits of mineral nitrogen concentrations in winter and total nitrogen were not exceeded.

The determined concentrations of metals (cadmium and mercury) in bottom sediments did not result in exceeding the limit values. In contrast, the value of lead concentration in seabed sediments exceeded the limit value, which classifies them as inadequate. Furthermore, the environmental status in terms of radioactive contamination with Cs isotope in water was considered inadequate. In addition, the concentrations of persistent organic pollutants did not exceed the limits.

The obtained results, in accordance with the available literature, do not differ from the data from the monitoring of sea waters of the Baltic Sea.

3.4 Climate and air quality conditions

3.4.1 Climate and risk of climate change

Based on the available observational data and analyses of climate models, the most important conclusions concerning the forecasts of changes of individual atmosphere and water elements in the Baltic Sea area in the coming decades can be presented:

- the air temperature rise is faster than the average global rise, and this trend will continue;
- the water surface temperature rise is greater than in deeper layers of the water column, which may result in greater thermal stratification and stabilization of the thermocline during the year;

- forecast changes in salinity are not clearly defined and will depend, on one hand, on changes in air circulation conditions and the volume of water exchange with the North Sea, and, on the other hand, on the volume of fluvial water inflow; in general a decrease in salinity is forecast;
- precipitation is forecast to increase throughout the Baltic Sea basin during the winter season, while only in the northern part during the summer; the frequency of extreme precipitation will increase;
- in terms of forecast of sea level changes, the effects of global growth will not be significantly felt.
- forecasts of wind climate changes are subject to significant uncertainty, however, it is assumed that with an increase in the average surface water temperature, the average wind speed over sea areas will increase and the conditions of stability of the near-water layer of the atmosphere will decrease;
- wave climate changes are mainly related to changes in wind conditions, which will result in an increase in the frequency and intensity of storms;
- model calculations indicate that there will be an increase in the surface area of areas with low oxygen content in water and anaerobic areas at the seabed.

Due to the increase in the average water temperature and the increased inflow of biogenic pollutants (nitrogen compounds and phosphorus) to the sea, the negative phenomenon will be the progressive eutrophication, especially on the water surface (algal blooms).

3.4.2 Meteorological conditions

Meteorological conditions of the sea water region covering the Baltic East OWF area were determined on the basis of measurements of parameters of the near-water atmosphere layer carried out at the height of approx. 4 m a.s.l., in the period from June 13, 2022 to October 12, 2023.

The obtained results characterizing meteorological conditions for the Baltic East OWF include: wind speed and direction from 0.01 to 20.25 m/s – mainly in W, WSW and SW directions, temperature from -2.96 to 25.20°C, pressure from 983.38 to 1,042.62 hPa and air humidity from 39.96 to 100.00%.

3.4.3 Air quality

The assessment of air quality of the near-water layer was referred to the information obtained as part of the measurements carried out for the nearest onshore substation (Łeba). Due to the lack of significant sources of pollution emission above the sea area, the air purity parameters should

not be worse than those measured on the shore. The area of the coastal zone in the Łeba area has air purity class A.

3.5 Background noise, including noise related to vessel traffic

3.5.1 Characteristics of the acoustic landscape of the Baltic Sea

The background noise of the sea is a set of underwater sounds consisting of sounds of natural and anthropogenic origin over time. The most important natural sound-generating factor is wind speed influencing the formation of waves that increase acoustic levels under water. The Baltic Sea is characterized by unique noise propagation conditions as compared to other seas, which affects the sound landscape of the water region. This is mainly caused by the relatively small depth, which makes the Baltic Sea more susceptible to temperature changes caused by seasonal fluctuations in atmospheric temperature, which also affects the conditions of sound power propagation.

Therefore, the Baltic Sea has a very diverse acoustic landscape, with a strong impact of maritime navigation, as well as natural factors, additionally emphasized by a small depth.

3.5.2 Background noise at the Baltic East OWF site

The results of the background noise monitoring conducted in the Baltic East OWF area are consistent with the results of other measurement campaigns from the southern Baltic Sea area and indicate a significant anthropogenic impact of maritime navigation in shaping sound pressure levels (SPL). Noise levels in the surveyed location are also characterized by high seasonal variability, to which both natural and anthropogenic factors contribute. The background noise levels in the area of the planned Baltic East OWF are in line with the diverse acoustic landscape of the Baltic Sea.

3.6 Electromagnetic field

There are no artificial sources of electromagnetic field in the Baltic East OWF area. The existing DC transmission system between Poland and Sweden (SwePol Link) is located at a distance of several dozen kilometers west of the planned location of the Baltic East OWF. The planned projects related to the generation of electromagnetic fields include: direct current transmission system between Poland and Lithuania, located at a distance of more than 16 km to the east and related to offshore wind energy: substations, cables between wind turbines within the OWF, grid connection infrastructure and communication systems, as well as the currently implemented nuclear power plant in Lubiatowo-Kopalino (including in the sea area).

Changes in natural electric fields have no direct impact on living organisms. Natural magnetic fields vary according to geographical location. They have a significant impact on some living organisms. Electromagnetic fields generated as a result of electric current flow may change natural migratory behavior of sea mammals and fishes and may also be a source of thermal energy introduced into the marine environment.

3.7 Cultural values, monuments and archaeological sites and objects

There are no elements of underwater cultural heritage in the Baltic East OWF area.

In the surveyed area around the Baltic East OWF, during geophysical surveys conducted between March 2022 and May 2024, a total of 3 wrecks were found, including 1 (marked as ID: WK-0055) named “Sailing vessel”, which was previously identified based on SIPAM data and 2 wrecks (marked as ID: SSS-033 and SSS-049) not yet identified.

3.8 Use and management of the water area and tangible property

The Baltic East OWF area is located within the water region POM.46.E, designated by the regulation of the Council of Ministers of April 14, 2021 *on the adoption of the spatial development plan for internal sea waters, the territorial sea and the exclusive economic zone to a scale of 1:200,000 (Journal of Laws, item 935, as amended).* For this water region, renewable energy generation was indicated as the basic function, at the same time allowing for the performance of other activities in the future, such as: aquaculture, scientific research, cultural heritage, technical infrastructure, prospecting and exploration of mineral deposits and extraction of minerals from deposits, fishing, artificial islands and structures, transport and tourism, sport and recreation. All allowed functions in the water region may be performed provided that the basic function is considered as primary function.

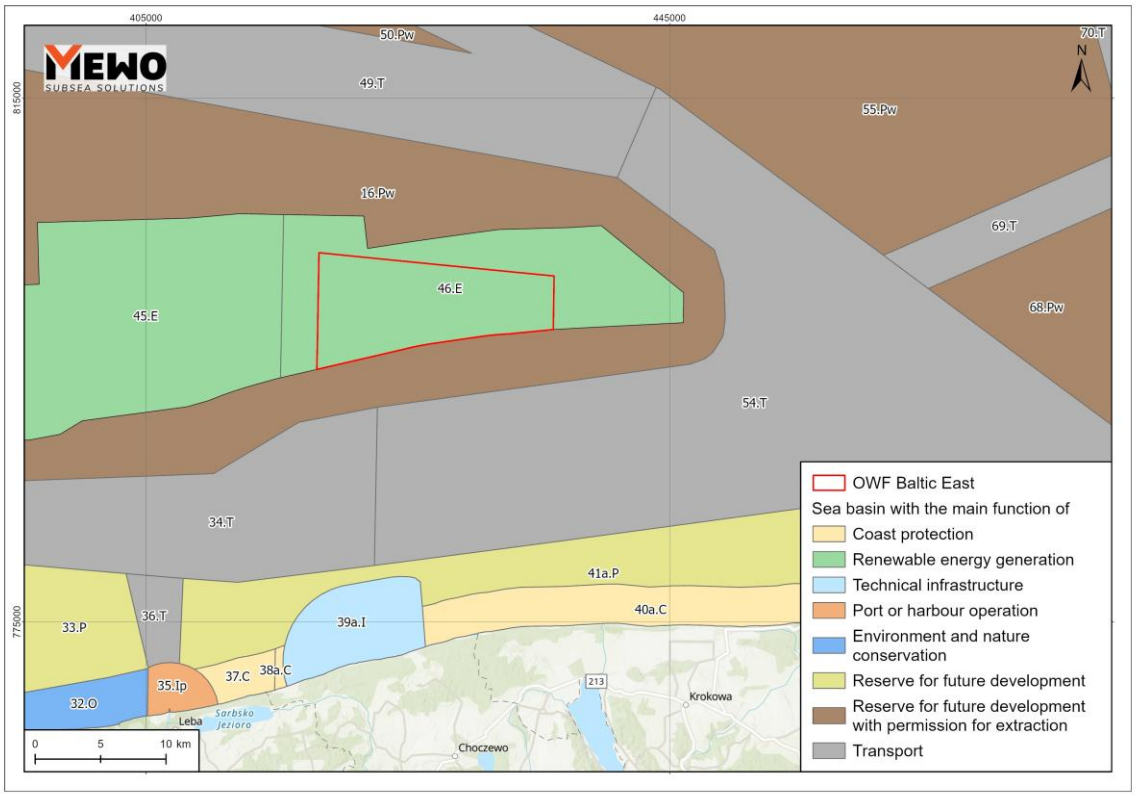

Figure 3 Baltic East OWF area against SIPAM POM [Source: own study]

3.8.1 Maritime transport (navigation)

The Baltic East OWF area is generally characterized by a low degree of human use, limited to relatively rare catches and occasional navigation.

In general, it can be demonstrated that CARGO vessel traffic in the area and immediate vicinity of the Baltic East OWF is insignificant. Passenger vessel traffic in the surveyed area occurs in the north-eastern part and is mainly related to ferry navigation between Gdynia and Karlskrona. Tanker traffic in the surveyed area has recently shown a significant increase in intensity, which is related to diversification of crude oil supplies, oil products and increase in LNG transport. Tanker traffic takes place mainly south of the Baltic East OWF area and partially through the Project area in its northern part. The traffic of very large vessels takes place mainly south of the Baltic East OWF area and partially through the Project area in its northern part.

During the analyses, two separate categories of vessels were also assessed – fishing vessels and pleasure ships. The comparison of vessel traffic in 2019 and 2023 shows a significant decrease in the intensity of fishing vessel traffic. The significant vessel traffic in the southern part of the corridor for the grid connection infrastructure and in the Baltic East OWF area in 2023 results from the fact that, although fishing vessels were present there, they did not perform activities related to travel to fishing grounds or fishing. The traffic of pleasure ships takes place mainly in

the coastal zone and the implementation of any project in this zone will have an impact on pleasure boating.

3.8.2 Fisheries (volume and value of fish catches, volume of fishing effort)

Fishing activities are carried out by Polish fishing vessels in the Baltic East OWF area. The analysis of this activity was performed based on data from fishing vessel catch reports, taking into account the place of fishing or geographical position, fish species, month of fishing, fishing gear and vessel size.

The main fish species caught in this area were herring and sprat – this together accounted for as much as 99% of the total volume and value of fish caught. The volume and value of fish catches in the Baltic East OWF area varied in individual years (2019-2023) – in general, the volume of catches changed, with a decreasing trend. The observed decrease in catches of both species over the years – by 53% for herring and 95% for sprat – could be a consequence, of the reduction in catch quotas for Baltic herring during this period or of the decrease in prices. On the other hadn, the recorded volume of catches in the analyzed area is so low that the observed fluctuations in catches could also be the result of random changes in activity of a small number of fishing vessels.

3.8.3 Aviation

The Baltic East OWF area is located within the Polish airspace above the Baltic Sea, within which flight information and alarm services are provided. The use of the zone requires prior agreement and/or reservation with the relevant services.

3.8.4 State Defense

The Baltic East OWF area is not located in zones permanently or periodically closed for navigation and fishing, established by the Minister of National Defense.

The OWF area is located beyond the range of areas performing defense functions (military training grounds and routes of the Polish Navy).

3.8.5 Other management and use as well as tangible property

There are no structures permanently fixed to the seabed in the Baltic East OWF area.

There are also no licenses issued for prospecting, exploration and production of hydrocarbons from undersea reservoirs (the validity of licenses issued in previous years for the sites within this area has already expired). No mineral deposit or mining area was recorded in the Baltic East OWF area.

The Baltic East OWF Area is located within the POM.46.E water region, for which renewable energy generation was indicated as the basic function, at the same time allowing for the performance of other activities in the future, such as: aquaculture, scientific research, cultural heritage, technical infrastructure, prospecting and exploration of mineral deposits and extraction of minerals from deposits, fishing, artificial islands and structures, transport and tourism, sport and recreation. All allowed functions in the water region may be performed provided that the basic function is considered as primary function. The Baltic East OWF area is characterized by a low degree of human use, limited to relatively rare catches and occasional navigation.

3.9 Landscape, including cultural landscape

The Baltic East OWF area is located at a distance of 22,5 km from the seashore. The landscape of the area is an open sea without existing topside structures. From the Baltic East OWF area, the land is visible rarely and rarely occupied by people.

Navigation routes (at a distance of several to several dozen kilometers) of various vessels run through the Baltic East OWF area and in its vicinity: freight and rail and passenger ferries, passenger and cargo vessels, freight carriers, tankers, container ships and others. In this area, there are also two fishing squares where fishing vessel traffic takes place.

The potential zone of the Baltic East OWF impact on the landscape includes a land area from Ustka in the west to Jastrzębia Góra in the east. Due to the shape of the coastal zone, the Baltic East OWF can be visible from beaches at this section. Under meteorological conditions with good air transparency, the Baltic East OWF may potentially be visible from higher lookout points, such as: Czołpino lighthouse, dunes in Słowiński National Park, Stilo lighthouse and towns/cities: Ustka, Rowy, Łeba and Jastrzębie Góra.

The maritime cultural landscape includes the anthropogenic development and the use of both the sea and the seabed, which is only accessible to divers and underwater vehicle operators. In the Baltic East OWF area and in its vicinity there are no permanent development elements.

3.10 Population and living conditions of people

The population in coastal municipalities and cities from Ustka to Hel based on 2022 GUS data is: Ustka: 13,950 people, Ustka Municipality: 8,006 people, Smołdzino Municipality: 3,073 people, Wicko: 5,561 people, Łeba: 3,100 people, Choczewo: 5,010 people, Krokowa: 10,545 people, Władysławowo: 14,463 people, Jastarnia: 3,782 people, Hel: 2,835 people.

The largest population is in the municipalities of Ustka and Władysławowo. In recent years, the population has declined in all analyzed municipalities. Due to the coastal location and landscape

and cultural values, these are municipalities with high tourist and recreational values. They are the basis for the existence of a significant number of inhabitants. This includes fishing, maritime tourism, marine navigation, marine sports and other human activities related to the immediate vicinity of the sea.

3.11 Description of natural elements and protected areas

Summing up the monitoring and environmental analyses performed for the needs of the Baltic East OWF, details of which are included in chapters of the EIA Report, it should be stated that biodiversity in the area of the planned wind farm does not differ from biodiversity typical of waters of the southern Baltic Sea.

The surveys conducted in the Baltic East OWF area showed the absence of underwater vegetation (**phytobenthos**) within the surveyed area.

Macrozoobenthos (benthic macrofauna) is a group of invertebrate organisms inhabiting the surface layer of bottom sediments (epifauna), also of the hard substrate (boulders, stones) or living inside the sediment (infauna). Macrobenthos includes: clams, crustaceans, polychaetes, oligochaetes and gastropods. Most of these are sedentary species with a life cycle of at least one year. Macrozoobenthos plays an important role in the trophic chain of marine ecosystems. Benthic invertebrates are food for many species of fish and seabirds, shape living conditions of other organisms (habitat-forming role) and affect the environmental status (e.g. sediment oxygenation, biofiltration of suspended matter from the water column).

For the purposes of the EIA Report, macrozoobenthos surveys were performed in the Baltic East OWF area on the soft seabed (sandy, gravel, gravel and sandy sediments, gravel and stone sediments, sand and gravel sediments) and on the hard Baltic East OWF seabed (stones, boulders). The survey results showed that the area is inhabited with rather diversified benthic macrofauna.

On the soft seabed, 22 macrozoobenthos taxons were found – dominated by species typical of shallow and medium deep seabed of open waters of the southern Baltic Sea. In terms of abundance on the gravel and sandy seabed, the largest share had the sand polychaette – *Pygospio elegans*, whereas in terms of biomass, the species of bivalvia – *Macoma balthica.*

On the seabed covered with a layer of boulders and large stones, the epiphytic and accompanying fauna community formed 20 macrozoobenthos taxons. *Mytilus trossulus* mussels dominated in abundance and biomass (which are an important component of the diet of benthivorous birds). In

the southern part of the surveyed area, macrozoobenthos abundance was much lower than in the northern part.

In the Baltic East OWF area, as compared to the results of surveys conducted for neighboring wind farm locations, the average macrozoobenthos biomass was higher on boulders and stones, and its composition included all four typical taxons characteristic of this community, i.e. *Mytilus trossulus*, *Einhornia crustulenta*, *Amphibalanus improvisus* and *Gammarus* genus sprouts.

The conducted **ichthyological** analysis shows that the Baltic East OWF area, in terms of species diversity – with a clear predominance of cod and European flounder in benthic fishing, and herring and sprat in pelagic fishing – is consistent with the characteristics typical of the waters of the southern Baltic Sea.

Based on the survey results of ichthyoplankton and literature data, it can be assumed that late spring and summer sprat spawning takes place in July in the surveyed area. Due to the relatively high depth and lack of suitable substrate, the surveyed area does not constitute a significant spawning ground for herring. The results of the surveys on the abundance of codfish and European flounder conducted in individual survey seasons indicate numerous occurrences of these fish in the annual cycle in the surveyed area. Therefore, the above survey results may indicate that the proposed project area is – regardless of the season – an important place of living of fish of these species, but it is not a place of their reproduction.

Given the presence of protected species of Community interest, the importance of the survey area for ichthyofauna was determined as medium. Three of the identified taxons – gobies, common seasnail and straightnose pipefish – are the species under partial protection (however, the presence of adult stages of these species was not found in the surveyed area).

To sum up **seabird** surveys conducted in the Baltic East OWF area, it can be concluded that the species composition of seabirds in this area is typical as for most water regions located in the Baltic Sea away from the coast. The surveys conducted covering all four phenological periods indicate that this water region is not a place of very high avifauna concentrations. This is mainly caused by large depths present there – too large for birds from the diving bentophages group, which feed on the seabed. In the area subject to monitoring, there was no clear relation between the depth of the water region and the abundance of birds – this may indicate small resources of clams, which are the main component of their food.

As part of the observations, a total of 23 species of birds staying on water were recorded in all phenological periods, including 12 species related to the marine environment and 11 species of aquatic birds rarely encountered at sea away from the coast. Of these 23 bird species, 17 species

are under strict species protection in Poland (long-tailed duck, razorbill, common guillemot, black guillemot, velvet scoter, great black-backed gull, lesser black-backed gull, little gull, common gull, common scoter, red-throated diver, black-throated diver, greater scaup, common goldeneye, leaf warbler, black-headed gull, common merganser) and 2 species are under partial protection (great cormorant and European herring gull). In addition, 4 species covered by hunting management were found (mallard, tusk, common teal and graylag goose).

The abundance of seabird groups in the Baltic East OWF area during the entire survey period was very variable. The highest abundance was found in winter (1x) and during spring migration period (2x). Higher concentrations of birds appear irregularly in this water region, which is probably the result of bird movements related to migrations and local movements in winter. In both cases, bird flocks stop and stay there for a short period of time.

The most numerous species found from autumn to spring in the Baltic East OWF area was the long-tailed duck. It is a species with an increased protection status, dominating in numbers throughout the Baltic Sea in the post-breeding period. However, its abundance and average density were low as compared to other areas in the Polish zone of the Baltic Sea and part of the water regions intended for construction of offshore wind farms. The abundance of other species was significantly lower. In the surveyed area, razorbill appeared in great numbers as for this species – it is an ichthyophage and feeds mainly on pelagic fish. Significant fluctuations in its abundance and related common guillemot result from movements of fish stocks due to the fact that these birds concentrate in places of their numerous occurrences. In the surveyed area, there were more common guillemots in summer, which together with young individuals after the end of breeding concentrate in places of abundant fish presence, where young individuals learn to obtain food independently.

Bird flights over the Baltic East OWF area in the daytime were not very numerous and the vast majority of them took place low above water. In most cases, migration through the Baltic Sea takes place on a broad front, and its intensity depends to a large extent on regional and local weather conditions (e.g. wind strength and direction, precipitation, cloud cover, visibility), which means that there are no open waters of the Baltic Sea with constant, repeatable annual flight intensity that could be indicated as the most valuable for migratory avifauna.

The planned Baltic East OWF area is located in the central part of the Polish maritime area, in the southern area of the Baltic Proper, where four species of **marine mammals** were found (harbor porpoise, gray seal, harbor seal and ringed seal).

The occurrence of porpoises in the surveyed area was identified as a result of the monitoring of the Baltic East OWF area. The analysis showed visible changes in porpoise activity during the

monitoring period – no occurrence of these animals in the surveyed area was found in summer and autumn 2022, single individuals were recorded in winter 2022/2023, whereas the number of detections began to increase in spring 2023, reaching the highest values in summer and autumn.

In order to analyze the activity of seals in the Baltic East OWF area and adjacent waters, visual monitoring from the aircraft was conducted in all seasons in 2023. The results showed that seals appear in the surveyed area – taking into account the monitoring results and literature data, it can be concluded that the area of the planned Baltic East OWF is used by gray seals and – occasionally – by harbor seals. Animals appear at different times of the year and their activity varied over time.

To sum up, porpoises, gray seals and harbor seals are found (occasionally) in the area of the planned Baltic East OWF. The activity of recorded species is generally low, changes over time, both seasonally and at the turn of years.

During field surveys conducted for the needs of the Baltic East OWF, flights were recorded, and three **bat** species were identified: the common noctule, Nathusius' pipistrelle and soprano pipistrelle – under strict legal protection. These species are common and frequent in our country and have the risk category LC (*Least Concern*) according to the IUCN. No rare species with the highest protection status were found. Both the common noctule and pipistrelles are classified as species highly exposed to collisions with wind turbines.

The Baltic East OWF Area is located outside the boundaries of **protected areas**, including the areas of the European ecological network **Natura 2000.**

The marine protected area Natura 2000 Przybrzeżne Wody Bałtyku (PLB990002) is the closest to the Baltic East OWF area at a distance of approx. 11 km south. The second closest Natura 2000 protected area is the Ławica Słupska (PLC990001) located west of the OWF area. Both the Ławica Słupska and the Przybrzeżne Wody Bałtyku are critical habitats for seabirds (especially during migration and wintering). The rich marine biodiversity and relatively undisturbed nature of these areas provide feeding grounds, helping to maintain populations of birds migrating to the Baltic Sea in winter.

The maritime area of the Ławica Słupska (PLC990001) and offshore and onshore area of the Ostoja Słowińska (PLH220023), as well as 7 onshore areas (on the coast at the section from Ustka to Hel) are also present at a distance of more than 20 km from the Baltic East OWF area. In the area of Ostoja Słowińska (PLH220023), there is the main complex of the Słowiński National Park, including its section located in the maritime areas.

Furthermore, the following protected areas are located within the land on the southern shore of the Baltic Sea: Coastal protected landscape area, Mierzeja Sarbska, Babnica and Białogóra nature reserves, Coastal Landscape Park, Natura 2000 sites: Mierzeja Sarbska (PLH220018), Białogóra (PLH220003). The majority of national protected areas, such as national parks, landscape parks, nature reserves and others, overlap with the areas of the European ecological network Natura 2000.

At the distance of more than 61 km from the Baltic East OWF Area, there is the Hoburgs bank och Midsjöbankarna SE0330308 Swedish Natura 2000 site. It is a habitat area where banks and reefs are the subject of protection. The bird species present there – referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EC – long-tailed duck and eider are diving benthophages and black guillemot is an ichthyophagus.

Due to the analyses carried out in this EIA Report, with reference to the European ecological network Natura 2000, standard data forms of the above mentioned Natura 2000 sites were analyzed which showed that there are links between them and the following protected areas: Słowiński National Park, Coastal Landscape Park, Sarbska Mierzeja Nature Reserve, "Koszaliński Coastal Strip" Protected Landscape Area, "Coastal Strip to the East of Ustka" Protected Landscape Area.

It cannot be excluded that birds observed during the monitoring of migratory birds in the Baltic East OWF area used the Natura 2000 sites Hoburgs bank och Midsjöbankarna (SE0330308) and Zatoka Pomorska (PLB990003). All 11 bird species listed in the documentation of the said Natura 2000 sites were observed during surveys of migratory birds in the Baltic East OWF area.

Ecological corridors are interconnected and interpenetrating areas that ensure free migration of plant, animal or fungal species in order to maintain their spatial extent and spread of their populations. Marine ecological corridors – airspace above sea surface – include bird migration areas from breeding grounds to wintering sites in autumn and vice versa in spring. For other animals, including marine mammals found in the southern Baltic Sea, no areas can be identified that can meet the criteria for ecological corridors. Both seals and porpoises go after food, without preferring specific routes.

Flight routes are the shortest possible sections between terrain features. According to the general classification of the migration system of wetland birds in Eurasia, Poland with its maritime areas is located within two large migration corridors: East Atlantic and Mediterranean – Black Sea corridor. The detailed migration strategy and migration corridors of seabirds in the Baltic Sea area are very poorly understood. As evidenced by the surveys of bird flights carried out for offshore

wind farms in the Baltic Sea, migrations generally take place from the north-east to the south-west in the autumn migration period and vice versa in the spring migration period.

4 DESCRIPTION OF THE EXPECTED EFFECTS ON THE ENVIRONMENT IN CASE OF A DECISION NOT TO IMPLEMENT THE PROJECT, TAKING INTO ACCOUNT THE AVAILABLE ENVIRONMENTAL INFORMATION AND SCIENTIFIC KNOWLEDGE

Abandoning the Project consisting in the construction and operation of the Baltic East OWF would require compensation of the intended amount of energy obtained with energy from, for example, conventional sources, which would involve emission of gaseous and dust pollutants from combustion of fossil fuels and generation of waste from combustion. It would also indirectly transform the environment in locations of energy generation and fuel extraction.

Failure to implement the offshore wind energy (OWE) would involve not using the energy potential of the Polish maritime areas and would have a negative impact on the regional economic development potential related to the construction and operation of offshore wind farms.

The benefits of abandoning the Project are related to the management of maritime areas. The abandonment of the project is equivalent to the absence of impacts related to any of the project phases. There will be no restrictions on the availability of the planned Baltic East OWF area for users, i.e. navigation, fishing, tourism.

5 ENVIRONMENTAL IMPACT ASSESSMENT OF THE PROJECT

The analysis of impacts was carried out separately for the construction, operation and decommissioning phases of the Baltic East Offshore Wind Farm. Subsequent sub-chapters contain results of the assessment of the expected environmental impact of the Project together with a description of the expected significant impacts.

5.1 Determination of the expected project environmental impact and description of the expected significant environmental impacts of the Applicant Proposed Variant (APV)

5.1.1 Implementation phase

5.1.1.1 Impact on geological structure, seabed topography and availability of raw materials and deposits

Activities related to the construction of the project may cause impacts on the seabed (geological structure, seabed topography and availability of raw materials and deposits):

- changes in the seabed structure in the case of soil replacement or strengthening;
- disturbance of the geological structure and shape of the seabed by execution of foundations or supporting structures, as well as laying or possible burial of cables;
- seabed level changes due to the settlement of rock material (including suspended matter) raised and moved during preparatory and construction works.

The overall impact of the Project at the implementation stage on the geological structure, seabed topography and surface sediments was assessed as negligible – changes will be small, on a small seabed surface area.

5.1.1.2 Impact on the quality of sea waters and bottom sediments

It was found that activities undertaken during the implementation phase of the Baltic East OWF may cause a series of impacts on the discussed receptors (water and bottom sediment); they include:

- release of pollutants and biogenic compounds from sediment into water;
- pollution of water and bottom sediments with oil derivative substances;
- pollution of water and bottom sediments with anti-fouling agents;
- pollution of water and bottom sediments by accidental release of waste or sewage;
- pollution of water and bottom sediments with accidentally released chemicals.

Release of pollutants and biogenic substances from bottom sediments during the implementation phase may cause direct negative, short-term impact of a regional range. The significance of this impact during the implementation phase in the APV was determined as insignificant for sea waters and as negligible for bottom sediments.

Pollution of sea waters or bottom sediments with oil derivative substances released during normal operation of vessels is a direct negative impact of local range, momentary or short-term. The significance of this impact during the implementation phase in the APV was determined as negligible for sea waters and bottom sediments. Pollution of water or bottom sediments with oil derivative substances released in an emergency situation is a direct negative impact of a regional range. The significance of this impact during the implementation phase in the APV due to the random and sporadic nature of failures and collisions was assessed to have low significance for sea waters and bottom sediments.

Pollution of water or bottom sediments with anti-fouling substances during the implementation phase in the APV was determined as a direct negative impact of local or regional range, short-term. The significance of this impact during the implementation phase in the APV was assessed as negligible for sea waters and bottom sediments.

During the implementation phase in the APV, pollution of water or bottom sediments with waste or sewage was determined as a direct negative impact of local range, temporary. The significance of this impact during the implementation phase in the APV was assessed as negligible for sea waters and bottom sediments.

Pollution of water or seabed sediments related to the implementation of the Baltic East OWF is a direct, negative impact of local range, being short-term or momentary, irreversible, repeatable during the construction period, and of low intensity. The significance of the impact resulting from accidental release of chemicals during the implementation phase in the APV was assessed as negligible for the quality of sea waters and as of low importance for bottom sediments.

Taking into account the results of the assessment of the impact of Baltic East OWF, the limited space where it is located and the possible technologies of its implementation, it is not indicated to be necessary to apply measures minimizing the negative impact of the Baltic East OWF on the quality of sea waters and bottom sediments.

5.1.1.3 Impact on ambient air quality, including on the climate and greenhouse gas emissions

During the implementation phase of the Baltic East OWF, an increased traffic of vessels involved in the implementation of the Project should be mainly expected. Therefore, an increase in the

load of pollutants introduced into the air is expected, mainly from flue gas emissions from vessels and systems or from combustion equipment used at the stage of preparation and construction of Baltic East OWF. It can be assumed that during the implementation phase, the impact significance of the proposed Project resulting from greenhouse gas emissions will be negligible, as no significant presence of factors that could affect their increased generation is expected.

During the implementation phase of the Baltic East OWF, the impact on air quality will be direct, negative, local and will disappear quickly after the works cease. This assessment results from the fact that the Project will be implemented in an open maritime area without terrain obstacles, where the predicted pollutant concentration will quickly decrease (dilution). Therefore, the impact significance will be negligible.

5.1.1.4 Impact on systems using EMF

Impacts during the implementation phase of the Baltic East OWF on EMF systems may consist in the occurrence of obstacles or barriers to the transmission of communication signals. These may be direct and cumulative impacts with other obstructions occurring in the water region. The impact range may be regional, as the communication equipment is located outside the Baltic East OWF area, these may be short-term or long-term impacts, both temporary and continuous. The type of impact will be negative. During the implementation phase, the impact of the project on systems using electromagnetic field was determined to be of low importance, provided that mitigation or compensatory measures are applied, if they result from the prepared expert opinions or arrangements with competent administrative authorities.

5.1.1.5 Impact on cultural values, monuments and archaeological sites and objects

Both preparatory and construction works carried out during the implementation phase of the Baltic East OWF may have an impact on cultural heritage facilities that have not been identified so far. These impacts may be both positive and negative. Positive impacts include discoveries of new archaeological objects, previously unidentified archaeological sites, objects or artifacts. The discovery of cultural heritage objects may also be negative, as they may be damaged due to their uncovering. Taking into account the above, the impact of the implementation of the Baltic East OWF on cultural values, monuments and archaeological sites and objects is local, short-term, direct, and the significance of these impacts was determined to be negligible.

5.1.1.6 Impact on the use and management of the water region and tangible property

Based on the conducted analyses, it was indicated that the implementation of the Baltic East OWF will cause impacts on the use and management of the water region (maritime transport and navigation, fishing, aviation, defense and other management) and on tangible property. Increased traffic of construction vessels of the OWF may cause disruptions in the vessel traffic on the route located south of the OWF. The spatial extent of impacts was assessed to be local and the duration of the impact at the preparation stage will be short-term, and medium-term at the construction stage. The impact will be temporary and continuous. The type of impact will be negative.

However, the impact significance of the Baltic East OWF on fishing will be of low importance. This is due to the fact that the previous use of the Baltic East OWF area in fishing activity has been low and that this is not a leading function of the water region, and fishing may be carried out in other water regions.

As a result of the conducted analysis, the impact significance of the Project on the use and management of the water region and tangible property at the implementation phase was determined as insignificant.

For maritime transport and aviation, the implementation of the Project will require preparation of expert opinions and obtaining approvals of competent administration authorities in accordance with the permit for erection and use of artificial islands, structures and devices.

5.1.1.7 Impact on landscape, including the cultural landscape

The impact of the Baltic East OWF on the landscape will be subjective, depending on the individual features of the viewer – changes may be perceived as either negative, positive or neutral. The impact of the OWF on the landscape during the implementation phase depends on:

- intensity of vessel traffic related to the construction and size of the structures transported;
- the size of the structure, diameter of the rotor and its position in relation to the viewer;
- number and location of the OWF and substations;
- meteorological conditions and the sea state;
- the location where the landscape observer is located and individual visual perception characteristics of the observer;
- perception of landscape changes by the observer (aesthetic preferences).

At the onshore section in question, under special meteorological conditions (very good visibility), the Baltic East OWF will be potentially visible from the lookout points located higher: the Czołpino

lighthouse, dunes in the Słowiński National Park, Stilo lighthouse and towns: Ustka, Rowy, Łeba and Jastrzębia Góra. The visibility of vessels related to the implementation and construction from the beach will be very limited due to a great distance of the Baltic East OWF area from the shore. For onshore observers, the scale of impact will be much smaller than for offshore observers moving in the immediate vicinity of the OWF.

It was determined as a result of the conducted analysis that the impact of the Project implementation phase on the landscape, including the cultural landscape, will be moderate or insignificant, of a positive or negative type. The impact on the landscape at the project implementation stage will be direct, regional, and long-term.

5.1.1.8 Impact on population, health and living conditions of people

It was assessed that due to an increase in employment for production of components and elements of the Baltic East OWF in onshore plants and ports, as well as people working at sea during the implementation of the Project, including transport, the impact during the implementation phase of Baltic East OWF will be positive, regional, medium-term, direct and indirect. There will also be negative, direct or indirect impacts of local and regional scale, medium-term, related to changes in navigation and fishing, as well as possible emergency and hazardous situations both during the implementation of the Baltic East OWF and during transport. It was determined as result of the conducted analysis that the impact of the Project on the population, health and living conditions of people during the implementation phase will be moderate.

5.1.1.9 Impact on biotic components in the offshore area

In accordance with the results of the survey carried out, **phytobenthos** does not occur in the Baltic East OWF area.

During the implementation phase of the Baltic East OWF, works carried out on the seabed will cause the following impacts affecting the condition of **macrozoobenthos** inhabiting this area by: disturbing the structure of seabed sediments, increasing in the concentration of suspended matter in water, sedimentation of suspended matter on the seabed, and redistribution of pollutants from sediments to water. The impact assessment carried out for both macrozoobenthos communities during the implementation phase of the Baltic East OWF indicates that both physical disturbance of the seabed by disturbing the seabed sediment structure and disturbance of sediments causing an increase in suspended matter concentration in the water column will be of low importance for the hard seabed macrozoobenthos community and

negligible for the soft seabed macrozoobenthos community. All other types of impacts will be negligible.

The impact significance of the Baltic East OWF on **ichthyofauna** for the implementation phase was assessed in accordance with the adopted technical conditions of the project, i.e. using the noise reduction system (NRS). Importantly, the assessment was based on the results of underwater noise propagation modeling. The main impacts on **ichthyofauna** during the implementation phase of the Baltic East OWF will include:

- noise and vibration emission – where the result of the conducted noise and vibration impact assessment for adult fish showed that it would be negative, direct, short-term and regional. The impact significance was assessed as insignificant or negligible for individual fish species;
- increase in suspended matter concentration – the impact on fish related to the increase in suspended matter content will be negative, direct, local, short-term. The significance of the impact is assessed to be negligible for all investigated fish species;
- release of pollutants and biogenic substances from the sediment into water – taking into account low concentrations of most harmful substances in sediments found during the surveys carried out in the Baltic East OWF area in 2022-2023, it can be assumed that they will not pose a significant threat to ichthyofauna. The impact on fish related to releasing pollutants and biogenic substances from the sediments to the water will be negative, direct, temporary and local. The significance of the impact is assessed to be negligible for all investigated fish species;
- change of the habitat – in the case of fish feeding in the pelagic zone (herring, sprat), even complete periodical leaving the Project area will not limit the food base due to its availability in the neighboring areas. The impact on fish related to the change of habitat will be negative, direct, temporary and local. The significance of the impact was assessed as negligible for all investigated fish species;
- creation of a barrier – adverse environmental conditions caused by works performed (high concentration of suspended matter in the water column, noise caused by performed installation and dredging works) and increased vessel traffic in relation to the vessel traffic at the implementation stage may cause fish to avoid the Project area. This may result in disturbance of fish migration routes running through the area in question. The impact related to creation of a barrier will be negative, direct, local and short-term impact on all fish species. The significance of the impact is assessed as negligible for all the surveyed fish species.

In accordance with the above, the conducted assessment showed that the significance of all impacts for ichthyofauna at the implementation stage, except for noise and vibration emission, will be negligible. The impact of noise and vibration on fish will be of low importance for codfish both in terms of mortality as well as spawning and foraging processes. In the case of sprat, European flounder and protected species, negligible significance was found for the level of mortality and insignificant for spawning and foraging.

Marine mammals at the implementation phase of the Baltic East OWF may be subject to impacts resulting from: underwater noise caused by installation of foundations, noise generated by the vessel traffic, increased content of suspended matter in water, habitat changes, spillage of oil derivative substances into the environment as a result of vessel failures. As a result of the conducted analysis, the impact of the project on marine mammals during the implementation phase was determined as negligible to insignificant, assuming the implementation of measures mitigating activities that may cause impacts. Additionally, the modeling results showed that if mitigation measures are applied, in none of the analyzed scenarios the permissible noise levels are expected to be exceeded in the nearby Natura 2000 sites, where harbour porpoise is the subject of protection.

The most important impact on marine mammals during the implementation phase will be the emission of underwater noise generated as a result of foundation works. The use of NRS significantly reduces this impact. Moreover, harbour porpoises and seals appear at low frequency in the Baltic East OWF area. The significance of this impact was assessed as moderate at most.

At the implementation phase of the Baltic East OWF, the following impacts on **seabirds** were identified: vessel traffic, noise and vibration emission, lighting of the Project area, creation of a barrier for birds, collisions with vessels, benthic habitats destruction, increase in suspended matter concentration in water and sedimentation of disturbed sediment. As a result of the conducted analysis, the impact of the Project on seabirds at the implementation phase was determined as negative of low to significant importance. Impacts of moderate and significant importance are related to birds, the so-called benthophagas and ichthyophagas (birds diving in water in searching for food), and low significance of the impact is related to gulls.

At the implementation phase of the Baltic East OWF, there will be a gradual and most intensive disturbance of airspace above the maritime area amongst all phases of the Project in connection with the erection and construction works. Both the vessels participating in these works and the erected OWF structures create obstacles for **migratory birds**. The impact on migratory birds will therefore result from the barrier effect and collision with the structures of the Baltic East OWF. The analyses carried out using the modeling results showed that the significance of impacts on

migratory birds at the Baltic East OWF implementation phase is negligible for an impact in the form of a barrier effect, and insignificant for collisions with construction vessels.

At the implementation phase of the Baltic East OWF, there can be impacts on **bats** resulting from the presence of vessels and gradual spatial development. There may be a risk of collision of bats with vessels and structural components in the implementation area. The presence of vessels will result in an increase in the noise level and disturbances related to lighting, which also affects bats. The impact on bats at the Baltic East OWF implementation phase will be direct, local, short-term, temporary, and the impact significance was determined as insignificant.

5.1.1.10 Impact on protected areas and objects under the Act of April 16, 2004 on nature conservation

All areas protected under the Act indicated in the title are located at a significant distance from the planned Baltic East OWF – the smallest distance is 11.8 km for the marine Natura 2000 site Przybrzeżne Wody Bałtyku. The identification and assessment of impact on areas protected under the European ecological network Natura 2000 are presented in one of subsequent sub-chapters.

Given the location of the Baltic East OWF at a significant distance from the protected area of the Słowiński National Park, there will be no significant impact on this area, including any element for which it was established, i.e. biodiversity, resources, objects and elements of inanimate nature and the landscape of the Park. Impact significance of the Baltic East OWF on protected areas was assessed as insignificant.

5.1.1.11 Impact on ecological corridors

Taking into account the poor identification and lack of information on the occurrence, functioning and importance of ecological corridors within the Baltic Sea and the spatial scale of the Baltic East OWF Area in relation to the size of the Baltic Sea maritime area, including the increasing effect of spatial development, it was assessed that the impact of the Baltic East OWF at the implementation phase on potential migration routes of migratory species will be negligible.

5.1.1.12 Impact on biodiversity

Taking into account the type of impacts at the implementation phase of the Baltic East OWF and animal species present in the area, including the role played by this area for them, it can be assumed that at this stage of the project there may be a short-term change in the number of species present. Impacts occurring at the implementation phase may reduce biodiversity by

deterring fish and mammals, as well as seabirds caused by noise. The impact of the Baltic East OWF on biodiversity assessed for the implementation phase was considered insignificant.

5.1.2 Operation phase

5.1.2.1 Impact on geological structure, seabed topography and availability of raw materials and deposits

During the operation of the Baltic East OWF, access to potentially identified deposits of raw materials on its surface will be impossible or significantly limited, which is compliant with the applicable document of the Spatial Development Plan For The Polish Maritime Areas (PZPPOM).

As regards geology and sediments forming the seabed surface of the OWF Area, no significant changes in the nature of sediments during the operation phase are expected. The impact of the project on seabed sediments at the operation phase in terms of their geological nature was assessed as negligible. The overall impact of the project in the operation phase can be assessed as negligible.

5.1.2.2 Impact on the dynamics of sea waters

The presence of structural components of the Baltic East OWF may result in a change in the velocity, directions of flow and pressure of water in the immediate vicinity of each structure. This may manifest itself with an increase in water velocity due to the choking of flow and formation of swirls around the structure. The impact of the Baltic East OWF on the wave field and sea current field will be local, direct, long-term and will not have a key impact on these elements. The impact significance of the Baltic East OWF on the dynamics of sea waters was assessed as negligible.

5.1.2.3 Impact on the quality of sea waters and bottom sediments

During the operation of the Baltic East OWF, the impacts will be similar as for the implementation phase, however, their scale, due to the size of resources used in both phases of the project, will be many times smaller than in the construction phase. The impact at the operation stage results from the vessel traffic handling and servicing OWF and the presence of a large number of substructures and topside structures. These will mainly be service works and interventions in case of an emergency situation.

As compared to the implementation phase, new impacts for the operation phase will result from: contamination of water and sediments with compounds from anti-corrosion agents and change of sediments and water through the reception of heat from transmission cables.

The significance of the Project impact at the operation stage on the quality of sea waters and bottom sediments is insignificant or negligible, except for pollution of seabed sediments and sea waters with oil derivative substances as a result of oil spills during collisions or emergency situations, which were assessed as moderate.

5.1.2.4 Impact on ambient air quality, including on the climate and greenhouse gas emissions

The operation of wind turbines will locally reduce wind energy and disturb atmospheric pressure directly in the area of the rotor operation. Due to the presence of wind turbine towers, velocities and directions of surface water flows may be locally disturbed and energy of sea waves may be reduced, and thus their height may decrease.

During the operation phase, the Baltic East OWF will have both negative and positive impacts on the climate. Negative impacts are related to greenhouse gas emissions caused by fuel combustion – short-term at the substations and regular by service vessels. The impact in terms of emissions of greenhouse gases from substations and vessels to the atmosphere will be negligible. The positive impact on the climate will be the generation of electricity from a renewable source by the Baltic East OWF. However, the impact of operation of the Baltic East OWF on the conditions of the climate itself (precipitation, air temperature, wind) occurring in this area and adjacent water regions will be negligible.

5.1.2.5 Impact on systems using EMF

It follows from the operation of offshore wind farms so far that some types of tower structures and operation of wind turbines may adversely affect vessel and onshore navigation support equipment or other applications. This applies primarily to radars, radar transponders. The key activities during the operation phase of the project that may have an impact on systems using electromagnetic field include: tower structures, operation of wind turbines.

Based on the analysis conducted, the impact of the project on systems using electromagnetic field during the implementation phase was determined to be of low importance, provided that mitigation or compensatory measures are applied, if they result from the prepared expert opinions or arrangements with competent administrative authorities.

5.1.2.6 Impact on cultural values, monuments and archaeological sites and objects

During the operation of the Baltic East OWF, the requirements specified for monuments and archaeological objects obtained by the Applicant in the arrangements of the Pomorskie Voivodship Heritage Conservation Officer will be met. Taking into account the above, based on

the conducted analysis, it was found that during the operation phase the impact significance of the Baltic East OWF on potential monuments and/or archaeological objects will be negligible.

5.1.2.7 Impact on the use and management of the water region and tangible property

For safety reasons, the Baltic East OWF Area will be excluded from regular navigation and maritime transport for purposes other than servicing and operating the OWF may be approved under separate decisions. Decisions on the approval of vessels other than those operating the Baltic East OWF will be made by competent maritime administration authorities.

During the operation phase, the significance of the impact on aviation and maritime transport was assessed as significant, and the range of this impact will be regional. The exclusion of the Baltic East OWF Area from use by fishing vessels will result in the elongation of routes to and from fishing grounds. The impact range for fishing will be regional and the impact significance was assessed as moderate.

5.1.2.8 Impact on landscape, including the cultural landscape

During the operation phase of the Baltic East OWF, potential impacts of the project on the landscape, including the cultural landscape, resulting from the presence of marine structures and vessels were identified. Objectively the landscape within the OWF will be industrial, but its impact will be subjective and will depend on individual characteristics of the receiver and may be perceived negatively and positively. As a result, the impact of the project operation on the landscape, including the cultural landscape, will be moderate, and occasional traffic of service operations vessels in the landscape will be negligible.

5.1.2.9 Impact on population, health and living conditions of people

The operation of the Baltic East OWF will require regular maintenance services. These works will be subject to the provisions of the occupational health and safety regulations. The analysis performed showed that the impact of the project on the population, health and living conditions of people during the operation phase will primarily have a significant positive impact on maintaining employment and developing the local economy, generating numerous jobs for many professions in the perspective of the planned 55 years of OWF operation. The impact on tourism in the region will be moderate and disturbances for fishing distance were assessed as insignificant.

5.1.2.10 Impact on biotic components in the offshore area

The Project area is located outside the depth range of **phytobenthos** occurrence and no aquatic plants were identified during the surveys. Nevertheless, the introduction of wind turbines and substations to the water column during the operation phase will enable their surface to be inhabited by macroalgae up to the reach of the sunlight zone. The growth of macroalgae on the surface of substructures will result in a local increase in species diversity, as well as qualitative and quantitative changes in local biocenoses (local impact). The impact will be positive, direct, local and long-term and will be negligible.

The operation phase of the Baltic East OWF for the APV will cause the following two impacts on **macrozoobenthos** inhabiting this area. New structures on the seabed will result in the loss of a part of the natural macrozoobenthos habitat. There will be the so-called artificial reef effect, i.e. colonization of OWF support structures by animal and plant epiphytic communities, as well as mobile epifauna. This is a positive phenomenon, as local biodiversity will increase: species and habitat diversity, increase in biological production and change in natural values of this micro-habitat. The local impact range was also examined, the sensitivity of macrozoobenthos to electromagnetic field was assessed as low, thus the impact significance will be negligible for macrozoobenthos. Heat emission from cables causing an increase in sediment temperature during the operation phase will be negligible in terms of long-term impact.

The impact on **ichthyofauna** as regards noise and vibration emission generated during OWF operation may have a direct and negative impact. The above impacts will be of negative, direct, local, long-term and permanent nature. The impact related to the emission of electromagnetic field will be negative, direct, local, long-term and permanent for fish. The significance of both impacts is assessed to be negligible for all investigated fish species.

Moreover, for fish, the presence of structural components of wind turbines and substations involves the creation of additional hard substrates forming a new habitat. Taking into account the presence of numerous boulders and relatively large seabed surfaces with abrasive pavement found during geological surveys of the Baltic East OWF Area, it can be assumed that the appearance of additional hard substrates being OWF elements will not change the living conditions of ichthyofauna in the Baltic East OWF Area to a great extent. Changing the habitat will have little impact on reproductive processes. However, additional overgrown areas can provide shelter and good growth conditions for juvenile codfish stages, indirectly positively influencing their recruitment. An increase in biomass of organisms growing newly-formed substrates and of crustaceans living on overgrown surfaces may increase the food base for codfish, gobies, common seasnail and European flounder. The impact related to the change of habitat will be positive,

direct, local, permanent and long-term. The significance of the impact is assessed to be negligible for all investigated fish species.

The construction of underwater structures may constitute a migration barrier for economically important fish whose routes run in this place. The impact related to the creation of a barrier will be negative, direct, local, long-term and permanent. The significance of the impact is assessed to be negligible for all investigated fish species.

Potential impacts on **mammals** related to the operation phase of the Baltic East OWF include an increase in the level of underwater noise and changes in the habitat and food base. Given the low frequency of seals and harbour porpoises in the analyzed area, no significant impact of noise generated during the Baltic East OWF phase on marine mammals is expected. The significance of this impact will be negligible. Due to the impact related to the change of the habitat and food base during the operation phase of the Baltic East OWF, the scale is moderate and the significance will be low.

The impact on **seabirds** during the operation phase include: vessel traffic, scaring away and displacement from the habitat, creation of a barrier, collisions with wind turbines, creation of an artificial reef and creation of a closed water region.

The significance of the above-mentioned impacts for the European herring gull was assessed as insignificant, important for ichthyophages, and moderate for benthophages.

The presence of the Baltic East OWF results in the creation of a barrier effect affecting the behavior (movement) of **migratory birds**. The forced change of the route to bypass the Baltic East OWF is extended by 17 km on average. This impact is direct and long-term. Additionally, for passerine birds flying the migration route mainly at night and at high altitudes (above the rotor range), the barrier effect will not occur because the birds will fly over the Baltic East OWF. Therefore, the significance of the barrier effect impact for all bird groups and species considered in the analysis was considered of low importance and negligible. The risk of collision, i.e. bird mortality resulting from collision with OWF elements, was investigated for all considered species in the analysis. The impact significance resulting from the collision was assessed as insignificant for most species and groups of species. The impact in the form of collision risk was assessed as moderate for crane.

The potential impact of the Baltic East OWF on **bats** results mainly from the possibility of direct collision as well as from barotrauma. The impact significance of the Baltic East OWF during the operation phase was considered insignificant due to the identified low activity of bats in the Baltic East OWF Area.

5.1.2.11 Impact on protected areas and objects under the Act of April 16, 2004 on nature conservation

Given its location, the Baltic East OWF will not constitute a hazard for the Słowiński National Park, no significant impacts on this area will occur during the operation phase, including any element for which it was established, i.e. biodiversity, resources, objects and components of inanimate nature and landscape values of the Park.

The identification and assessment of impacts on areas protected under the European ecological network Natura 2000 are presented in one of subsequent sub-chapters.

5.1.2.12 Impact on ecological corridors

Due to the same pre-conditions in terms of knowledge about wildlife corridors in maritime areas and the spatial scale of the Baltic East OWF Area in relation to the size of the Baltic Sea, including the permanent effect of space development, it was assessed that the impact of the Baltic East OWF in the operation phase considered separately, similarly as in the implementation phase, on migration routes of migratory species will be negligible.

5.1.2.13 Impact on biodiversity

During the operation phase of the Baltic East OWF, structures permanently submerged in water will be founded in the environment, creating favorable conditions for the development of animal and plant epiphytic organisms. On a local scale, within the range of structural members, there will be an increase in species diversity, although the character of natural value of this habitat may be ambiguous. This results from the fact that, on the one hand, periphyton communities will be a new biocenosis component of this area, additionally increasing the food base for fish, birds and, incidentally, for marine mammals. On the other hand, this location may favor the spread of foreign species, which lowers the ecological quality of this micro-habitat.

The operation phase of the Baltic East OWF should not have a negative impact on the biodiversity of marine mammals in the OWF area and adjacent waters. It is also worth noting that the artificial reef effect may occur and contribute to an increase in the number of fish living in the surveyed area and, consequently, to an increase in the number of marine mammals.

The analysis of possible impacts resulting from the operation of the Baltic East OWF indicates that their effects in terms of changes in biological diversity of seabirds will be local. The impact of the Baltic East OWF on biodiversity in terms of seabirds largely coincides with the effect of the loss of their habitats. With respect to migratory birds, the creation of a barrier by the Baltic East OWF

may hinder the movement of these populations between the closest, similar overwintering areas, such as the Ławica Słupska, Ławica Środkowa and the Hoburgs Bank. Currently, there are no scientific data on the significance of the links between these areas, but they cannot be excluded based on the precautionary principle.

5.1.3 Decommissioning phase

When assessing the impact of the planned activities during the decommissioning phase of the Baltic East OWF, no higher significance of these impacts on individual assessed elements of the environment than during the implementation or operation phase was found. The list and nature of the impacts related to decommissioning of the Baltic East OWF should be similar to those occurring during the operation phase.

As a result of the decommissioning process of the Baltic East OWF, the condition of biocenotic balance created during the several decades of operation will be disturbed. The removal of structural components from water will lead to removal of the substrate for the growth of epiphytic fauna and flora, and the living epiphytic communities will be destroyed. This applies in particular to plant organisms which, without the OWF structure, did not occur in the Baltic East OWF Area. As a result, a new biocenotic balance will be created, more similar to the present one, before the implementation and operation phases. Furthermore, the release of the sea space (sub-structure and topside structure) from the structural components of the Baltic East OWF will enable its re-use by the existing users, in particular in navigation. The possibility of using this area in terms of fishing will depend on the degree of removal of structural components in water.

5.2 Determination of the expected environmental impact of the Project and description of the expected significant environmental impacts of the Reasonable Alternative Variant (RAV)

The Applicant Proposed Variant (APV) and the Reasonable Alternative Variant (RAV) differ in the number of planned wind turbines and their power output. These differences may result in discrepancies in the environmental impact of each option.

The impacts on individual elements of the environment were compared in all phases of the project implementation and it was found that their range and assessment of their significance are mostly similar in both options. Several differences were noted.

In the case of implementation of the RAV, more wind turbines would be constructed, and consequently the risk of bat mortality due to collisions or barotrauma would be higher.

In the RA, the occupied area of habitats will increase (by 8%) and the risk of collision of migrating birds with wind turbines will increase. However, it should be assumed that the negative impact of the RA on seabirds will be slightly higher compared to the APV.

A slight difference in impact may also be related to the duration of noise impact.

5.3 Impact on Natura 2000 sites

5.3.1 Description of the impact assessment method used

The assessment of the impact of the Baltic East OWF on Natura 2000 sites was performed in accordance with the guidelines of the European Commission.

5.3.2 Criteria for impact assessment

The primary objective of protection of Natura 2000 ecological network sites is to maintain or restore the proper conservation status of species and natural habitats which are being protected and for the protection of which these areas have been designated.

The Baltic East OWF project is not directly related to or necessary for the management of Natura 2000 sites. It follows from these premises that it is necessary to carry out an assessment of the impact on these areas.

5.3.2.1 Impact assessment with comparison of options

An essential element of the preliminary assessment of the Baltic East OWF impact on the Natura 2000 sites is to determine whether a given Natura 2000 site is within the range of potential impacts of the Baltic East OWF.

The main grounds for assuming whether the Project may have impacts on the Natura 2000 site are the distance between this site and the project implementation area, as well as the range of impacts; the location of the Project area in relation to the Natura 2000 sites is also important due to their functional links.

5.3.3 Determination of the project impact ranges

The Baltic East OWF Area is located outside the European ecological network Natura 2000 sites. Therefore, when determining the impact of the project on Natura 2000 sites, impacts and emissions that go beyond the Baltic East OWF Area were assumed, i.e.: increased concentration of suspended matter in water and its sedimentation, underwater noise, and space disturbance.

The increased concentration of suspended matter in water and its sedimentation, when using a precautionary approach, it was assumed that the limit of significant impact for fish roe and

juvenile forms is the increase in suspended matter content to 5 mg dm^{-1}; for benthos, the value of 1.5 mm of deposited sediment was conservatively assumed. Taking into account the distance of the nearest structures of the Baltic East OWF from the boundaries of habitats and the maximum range of suspended matter sedimentation, the boundaries of the habitat will not change, there will be no fragmentation of habitats, and the structure and functions will not change.

The noise reduction system, which is an integral part of the Baltic East OWF at the implementation phase, is intended to restrict **underwater noise generated during piling works** to such an extent that it is insignificant for marine organisms, i.e. it does not exceed the TTS values within Natura 2000 sites where these organisms are subject to protection.

Based on modelling, the ranges of cumulative TTS were examined, taking into account Natura 2000 sites where species of marine mammals are protected. For harbour porpoises, two areas were taken into account: the Ostoja Słowińska (PLH220032) and Hoburgs bank och Midsjöbankarna (SE0330308), whereas for seals, the Ostoja Słowińska was taken into account, where the subject of protection is the gray seal.

The results of model analyses showed that in the case of piling in a single location, the noise limit for harbour porpoises will not be exceeded at the boundary of both Natura 2000 sites in the summer season, but during the winter season, they may be exceeded, therefore the noise reduction system will be applied.

In the case of piling in several locations without mitigation measures, the threshold values at the boundary of both Natura 2000 sites in question will not be exceeded in the summer season, but in the winter season the threshold values may be exceeded, therefore the noise reduction system will be applied.

The analyses performed for seals showed that if the noise reduction system is used, the impact in the form of cumulative TTS was not recorded in Natura 2000 sites.

For fish without and with swim bladders, the cumulative TTS range (in scenarios with the NRS) did not cross the boundary of any of the two previously mentioned Natura 2000 sites.

Large-size structures of the Baltic East OWF will be constructed on the currently undeveloped sea and air space above the offshore area and they may **disturb** the sea space within the Baltic East OWF area.

The development of area under the water surface does not significantly disturb its use by fish, mammals and birds sitting on water.

The airspace above the maritime area is used by migratory birds or seabirds both in seasonal migrations and in local flights. Disturbances of these flights may affect the populations of birds subject to protection in the Natura 2000 sites – Przybrzeżne Wody Bałtyku (PLB990002) and Ławica Słupska (PLC990001), thereby disturbing the Natura 2000 network.

As a result of the preliminary assessment of the impact of the Project on Natura 2000 sites, given the ranges and type of impacts, both the Baltic East OWF and, in the case of the cumulative impact with impacts of other projects, it was indicated that none of the Natura 2000 sites is within the range of significant impacts. The absence of impacts applies in particular to the subjects of protection (species and habitats) within the areas for which protection was established.

Accordingly, the proper assessment of the impact of the Baltic East OWF on Natura 2000 sites covered the aspect related to the probable impact caused by the disturbance of the airspace over the Baltic East OWF development area in the context of integrity and coherence of the Natura 2000 network.

5.3.4 Proper assessment for the APV

The operation phase of the Baltic East OWF was included in the proper assessment due to the impact type. During this phase, the airspace above the maritime area will be occupied as much as possible by the structures of both wind turbines and substations, so the impact will be the greatest in relation to the remaining phases of the project.

As regards the protection of seabird populations within the Natura 2000 network, the important features of the Ławica Słupska (PLC990001) and Przybrzeżne Wody Bałtyku (PLB990002) areas are the location of these areas along the bird migration route, the availability of these areas for wintering and resting bird populations during migration, appropriate habitat conditions making these areas attractive to birds.

In the context of maintaining the coherence as part of the Natura 2000 network, it is important above all to maintain the possibility of dislocation of bird populations between the areas without the risk of significant depletion of the population or significant energy inputs that could affect the ecology and biology of those populations.

Although the availability of the Baltic East OWF Area for the populations of birds wintering and resting during migration and subject to protection in the adjacent Natura 2000 sites will be limited, this impact was assessed to be of low importance for the long-tailed duck, velvet scoter, auks and common scoter, whereas there will be no impact for the European herring gull and black guillemot. Moreover, the existence of corridors (an undeveloped area) in the middle west part of

the Baltic East OWF, between the Baltic Power OWF and the BC-Wind OWF, as well as between Baltica 2 OWF and the Baltica 3 OWF will significantly increase the possibility of migrating birds flying within offshore wind farms in this area.

To sum up, it should be concluded that given a low population of seabirds in the Project area, no significant negative impacts of the Baltic East OWF consisting in the displacement of projected bird species from habitats within the area of the Ławica Słupska (PLC990001) and the Przybrzeżne Wody Bałtyku (PLB990002) is expected.

Due to the location of the Baltic East OWF, the issue of the impact of the Project on the integrity of the Natura 2000 site can be considered in the context of the nearest network site, i.e. the Przybrzeżne Wody Bałtyku area (PLB990002).

Due to the distance, birds will not be scared away from their habitats located in the Przybrzeżne Wody Bałtyku (PLB990002). Moreover, due to large distances between them and the presence of other suitable habitats at a similar distance, it should not be expected that a large number of birds displaced from the Baltic East OWF area will move to the Przybrzeżne Wody Bałtyku area (PLB990002). Therefore, it is unlikely that in the Przybrzeżne Wody Bałtyku area (PLB990002) there will be negative impacts of the OWF associated with the increase in bird density, especially as the population of avifauna in the Baltic East OWF Area is low. As a result, negative impacts on the Przybrzeżne Wody Bałtyku area (PLB990002) due to the long-tailed duck scaring and displacement from habitats may be excluded.

To sum up, it should be concluded that the Baltic East OWF is not expected to cause significant negative impacts consisting in the displacement of bird species subject to protection from the habitats within the Przybrzeżne Wody Bałtyku (PLB990002).

As a result of the proper assessment of the impact of the Baltic East OWF on the bird species subject to protection in the Ławica Słupska (PLC990001) and Przybrzeżne Wody Bałtyku (PLB990002) areas, on the integrity of the Przybrzeżne Wody Bałtyku area (PLB990002) and coherence of the Natura 2000 network, it can be concluded that the Project in the APV will not cause any significant impacts on the analyzed Natura 2000 sites.

5.3.5 Preliminary assessment for the RA

The Baltic East OWF project in the RA is not directly related to or necessary for the management of Natura 2000 sites. The necessity to conduct the impact assessment follows from these considerations. The considerations for assuming whether the project may have impacts on the Natura 2000 site are the distance between this area and the project implementation area, and

the extent of impacts, and due to functional relations, the location of the Project in relation to Natura 2000 sites is also important.

The Baltic East OWF Area in the RA is located outside the areas of the European ecological network Natura 2000, therefore, when determining the impacts, the ones that go beyond the Baltic East OWF Area were adopted, such as: increase in suspended matter content in water and its sedimentation, underwater noise and space disturbance.

Taking into account the sources of suspended matter generation, the distance to the boundaries of protected habitats is many times larger than the maximum range of suspended matter sedimentation, there will be no impacts on these habitats, both in the context of changing their boundaries, or on their structure and function.

The noise reduction system, which is an integral part of the Baltic East OWF in the construction phase in the RAV, is designed for limiting underwater noise generated during piling works to such an extent that it does not exceed the TTS values within Natura 2000 sites. It is assumed that this will also be the case for other OWFs.

As a result of the preliminary assessment of the impact of the planned project on Natura 2000 sites, given the ranges and type of impacts, both the Baltic East OWF in the RAV and, in the case of the cumulative impact with impacts from other projects, it was indicated that none of the Natura 2000 sites is within the range of such impacts as increased concentration of suspended matter in water and its sedimentation, and underwater noise. The absence of these impacts applies in particular to the subjects of protection (species and habitats) within the areas for which protection was established.

The proper assessment of the impact of the Baltic East OWF in the RAV on Natura 2000 sites covered the aspect related to the probable impact caused by the disturbance of the airspace over the Baltic East OWF development area in the context of integrity of the Przybrzeżne Wody Bałtyku area (PLB990002) and coherence of the Natura 2000 network.

5.3.6 Proper assessment for the RA

The proper assessment in terms of the impact type accounted for the operation phase of the Baltic East OWF in the RA, as the impact will be the greatest in relation to the other project phases.

In the context of the protection of seabird populations within the Natura 2000 network, the following are important features of the Ławica Słupska (PLC990001) and Przybrzeżne Wody Bałtyku (PLB990002) areas: the location of these areas along the migration route of birds, habitat

conditions, and the availability of these areas for the populations of wintering birds and birds resting during migration.

In the context of maintaining the coherence as part of the Natura 2000 network, it is important above all to maintain the possibility of dislocation of bird populations between the areas without the risk of significant depletion of the population or significant energy inputs that could affect the ecology and biology of these populations.

Although the availability of the Baltic East OWF Area in the RA for the populations of birds wintering and resting during migration and subject to protection in the neighboring Natura 2000 sites will be limited, but this impact was assessed to be of low importance for the long-tailed duck, velvet scoter and razorbill, whereas there will be no impact for the European herring gull, black guillemot and the common scoter. Moreover, the existence of corridors (an undeveloped area) in the middle part of the Baltic East OWF, as well as the corridors between the Baltic Power OWF and the BC-Wind OWF, as well as between Baltica 2 OWF and the Baltica 3 OWF will significantly increase the possibility of migrating birds flying within offshore wind farms in this area.

Due to the location of the Baltic East OWF, the issue of the impact of the Project on the integrity of the Natura 2000 site can be considered in the context of the nearest network site, i.e. the Przybrzeżne Wody Bałtyku area (PLB990002). The Baltic East OWF in the RA is not expected to cause significant negative impacts consisting in the displacement of bird species subject to protection from the habitats within the Przybrzeżne Wody Bałtyku area (PLB990002).

As a result of the proper assessment of the impact of the Baltic East OWF on the bird species subject to protection in the Ławica Słupska (PLC990001) and Przybrzeżne Wody Bałtyku (PLB990002) areas, the integrity of the Przybrzeżne Wody Bałtyku area (PLB990002) and coherence of the Natura 2000 network, it can be concluded that the planned project in the RA will not cause any significant impacts on the analyzed Natura 2000 sites.

Considering that the Natura 2000 sites may be classified as receptors of very high sensitivity, and at the same time taking into account the scale of impact of the Baltic East OWF on them as low, the significance of this impact is moderate.

6 CUMULATIVE IMPACTS OF THE PLANNED PROJECT (TAKING INTO ACCOUNT THE EXISTING, IMPLEMENTED AND PLANNED PROJECTS AND ACTIVITIES)

6.1 Introduction

The assessment of the cumulative impact resulting from the implementation of the Baltic East OWF in conjunction with other projects accounted for the projects being implemented, completed or planned for which the decision on environmental conditions has been issued. In the case of projects at the planning stage, the ones for which decisions on environmental conditions were issued were taken into account.

At present, no other projects that may cause impacts, including cumulative impacts, are being implemented and will not be implemented within the Baltic East OWF area. Implementation of the Baltic East OWF in all its phases, due to the correct and safe functioning of this Project, prevents carrying out other activities in the same area. Therefore, the impacts that possibly may accumulate with the impacts of the Baltic East OWF will have their source outside its area.

6.2 Existing, implemented and planned projects not functionally related to the planned Project, having the decision on environmental conditions

Projects related to the extraction of hydrocarbons from underneath the seabed and hydrogen production are being implemented, completed or planned within the Polish maritime areas. Their distance from the Baltic East OWF and the different specificity of these projects cause that no cumulative impacts will occur during their implementation.

At the moment, nine projects related to the construction of the OWF and grid connection infrastructure in the Polish maritime areas have received decisions on environmental conditions, which indicates that the construction phase may commence within several years. These projects are at different stages of progress, therefore, among others, the dates of construction works commencement and their detailed schedules are unknown.

The construction of the first Polish Nuclear Plant (NPP), for which a decision on environmental conditions is issued, has been commenced in Choczewo commune. Accompanying projects will also be implemented in connection with the construction of the NPP.

The possibility of cumulative impact occurrence at the construction phase, due to the temporary limitation of the impacts themselves, may take place only in the case of carrying simultaneous or short time interval works of the same nature.

After completion of the implementation phases, the operation phases of individual OWF will commence, and it is also expected that this phase will be postponed as compared to the neighboring wind farms, but due to the significant duration of operation phases of such projects, they will overlap to a large extent.

For the OWF decommissioning phases, both the time and scale of their performance are currently unknown, except for the operation periods indicated in the decisions on environmental conditions. The environmental impacts associated with this phase will be of a different nature and will be not be greater than for the implementation and operation phases. As a result of commencing the removal of the topside structures, the space will be gradually released until the original condition without offshore wind turbines is restored.

6.3 Types of impacts that may cause cumulative impacts

Cumulative impacts of the Baltic East OWF with other projects implemented in the Polish maritime areas may occur, if the activities generating similar impacts are performed simultaneously. In the case of impacts that have been classified as temporary, simultaneous performance of the same activities by different Investors should be considered as rare. Also the impacts that have been identified as local will not cause cumulative impacts, as in most cases their range will not exceed the Baltic East OWF area.

Therefore, the impacts of the Baltic East OWF that may cause cumulative impacts with other projects include those resulting from:

- space disturbance;
- difficulties / limitations in fishing;
- underwater noise;
- increase in the concentration and sedimentation of suspended matter.

Two of the indicated types of impacts (concerning underwater noise and increase in concentration and sedimentation of suspended matter) will occur during the implementation phase, while the remaining ones will occur at the end of the implementation phase and during the operation phase.

6.4 Assessment of cumulative impacts

6.4.1 Space disturbances

6.4.1.1 Exclusion of feeding grounds

The implementation of the planned Project will cause temporary loss of feeding grounds for benthophages and ichthyophages. Space disturbances resulting from preparatory and construction works, such as noise emission and reduced water transparency, will cause scaring of birds and reduction of food availability for diving birds. The greatest effect of feeding grounds occupation will occur in the worst situation – when the operation phase of the last of the OWF begins.

The cumulative loss of habitats of lesser importance will involve the movement of seabirds to more accessible, richer feeding grounds located in nearby Natura 2000 sites. The significance of the above-mentioned cumulative impact in the form of exclusion of feeding grounds was assessed as insignificant at most.

6.4.1.2 Creation of a physical barrier

Within the Baltic East OWF and in other OWFs, there will be a partial, long-term reduction in the use of airspace. The creation of a physical barrier will result in the necessity to bypass it, both during flights to overwintering areas and spring and autumn migrations. With the progress of construction works and formation of subsequent offshore wind turbines, the barrier effect will gradually increase, reaching its maximum at the operation stage.

Within all OWF development areas and around individual OWF areas, undisturbed space will remain. Non-continuous type of development, with significant distances between individual OWF structures will make the space disturbance non-continuous and uneven. The greatest space disturbance will occur within the operating range of the rotor, i.e. above 20 m or more above the water surface.

The Baltic East OWF project takes into account the necessity to leave such a free area undeveloped with wind turbines. The creation of this area, in conjunction with other above-mentioned undeveloped areas, will create a free space system in this area, enabling the movement of birds in a manner minimizing potential disturbances in their migration.

6.4.1.3 Cumulative risk of avifauna collisions

The maximum cumulative number of collisions may occur during migration. Impact significance for most migratory birds remains insignificant and neglible. Increasing the visibility of the OWF

during daytime and nighttime will be conducive to reduce the number of bird collisions with the OWF.

6.4.1.4 Disruption of the landscape

Initially, during the implementation phase, together with the construction of topside structures, cumulative impacts will occur consisting in the disruption of landscape from the Baltic East OWF against the background of other OWF completed or being implemented. Next, during the operation phase, these impacts will be the greatest and will last the longest for the assumed decades. Along with the decommissioning of the Baltic East OWF, including the removal of the structures, the disturbance of the natural landscape will decrease until it completely ceases when the structures are removed to the seabed level.

Landscape disturbances in the case of cumulative impacts related to simultaneous operation of the OWFs depend, to the greatest extent, on the weather conditions – visibility and the Earth curvature.

The cumulative impact of the Project on the landscape in the implementation, operation and decommissioning phases was determined to be of moderate importance.

6.4.1.5 Disturbances in the operation of systems that use EMF

The construction of a single wind farm as well as a larger number of wind farms may cause disturbances in the proper functioning of systems using electromagnetic field. The magnitude of disturbances will depend on the number of structures constructed in maritime areas and may cover a larger maritime area, and will be related to the sequence of project implementation.

The range of environmental impact of the electromagnetic field radiation will be local, but it may be regional in terms of ensuring proper functioning and safety, as the communication equipment is located outside the Baltic East OWF area. These may be cumulative long-term impacts, both temporary and permanent. The type of impact will be negative.

The sensitivity of communication systems to potential impacts in the phases of implementation, operation and decommissioning of the project can be assessed as very high. The scale of the impact, due to the need to ensure uninterrupted communication of the functioning systems of different operators, should be considered very high.

6.4.1.6 Impact on fishing

The Baltic East OWF together with other planned OWFs will have an impact on offshore fishing activities. The presence of topside structures will cause two possible types of impacts resulting from space limitations, i.e.: lack of possibility to fish within the OWF and the necessity to avoid the OWF on the way to and from the fishing grounds located north of the OWF. In the case of transmission infrastructure in its immediate vicinity, fishing, in particular with bottom trawl nets, will not be possible either.

The necessity for fishing vessels using bottom-set gears to move may cause conflicts with existing users of fishing grounds where the number of used gears would increase. Excessive concentration of gillnets should not be expected after shifting the effort from the area occupied by the OWF. Considering this, the negative effect of effort concentration caused by the need to relocate the fleet should be considered negligible.

As a result of locating many wind farms in directly adjacent areas, a barrier extending over many kilometers will be created, hindering navigation of vessels. Locating other wind farms, adjacent to the Baltic East OWF from the east and west, without establishing a navigation corridor for vessels, may extend the route of fish cutters to efficient fishing grounds located below the South Middle Bank. This may cause additional losses, mainly for vessels stationed in the ports of Ustka and Łeba, resulting from higher fuel costs and time of arrival at the fishing ground. Considering the above, the significance of the cumulative negative impact related to the necessity to extend the route of fishing vessels to fishing grounds should be considered as high.

In order to restrict the cumulative negative impact on fishing in this respect, a navigation corridor or corridors with the width necessary to maintain the safety of navigation should be provided between wind farms. In this case, the significance of the cumulative impact of the Project on fishing may be considered as moderate.

6.4.2 Underwater noise and its impact on marine mammals

Noise emitted during the piling of wind turbine support structures in the implementation phase may spread in the water column over significant distances and have a negative impact on organisms.

In the case of underwater noise, the results of various possible scenarios regarding simultaneous piling indicated the range of impact, including possible accumulation of impacts.

The calculation results indicate that in the scenario of using double mitigation, the effect of hearing damage to marine mammals is not expected, but changes in behavior may occur in a very large area, in particular for harbour porpoises. Due to the probability of cumulative impacts,

construction works related to pile driving should not take place at the same time as on the planned Baltic Power OWF and BC Wind OWF.

During the operation and decommissioning phase of the Baltic East OWF, the levels of underwater noise related to the operation of wind turbines, vessel traffic, cutting and drilling of large-diameter piles will be much lower than during the implementation phase, and their cumulative impact can be assessed as negligible.

6.4.3 Increase in the concentration and sedimentation of suspended matter

It was found based on the model calculations performed that the cumulative effect of the increase in suspended matter content is possible as a result of various anthropogenic activities during the implementation phase. The increase in suspended matter concentration and its sedimentation will be local and the increase in suspended matter concentration will be short-term.

Due to the temporal and spatial separation between the activities performed within the OWF and in the area of the external connection infrastructure, there will be no cumulative impacts as a result of the increase in the suspended matter content and its sedimentation.

7 DETERMINATION OF THE EXPECTED ENVIRONMENTAL IMPACT IN CASE OF A MAJOR ACCIDENT, NATURAL AND COLLAPSE DISASTER

The chapter contains a summary of the significance of the environmental impacts identified in the phases of implementation, operation and decommissioning of the Baltic East OWF. The presented information refers to both options of the Project, as the impact significance for the APV and RAV will be similar. The identified range of impacts in the case of a major accident include:

- emissions to the environment, possible emergency situations in service ports;
- spills of oil derivative substances when servicing during normal operation of vessels (small spills);
- spills of oil derivative substances during servicing of the OWF in emergency situations or as a result of collisions of vessels or with OWF components (medium-sized or catastrophic spill);
- emissions to the environment, e.g. accidental release of sewage or waste in the Baltic East OWF area,
- emissions of hazardous substances to the environment, e.g. incidental penetration of materials, equipment, OWF components, chemicals into the environment, in the Baltic East OWF area;
- technical issues, damage or destruction of OWF components as a result of a natural and/or collapse disaster in the Baltic East OWF area;
- contamination of water and bottom sediments with anti-fouling agents;
- indirect hazards as a results of emergency events on living organisms that inhabit or otherwise use the seabed, water column and sea surface.

In the event of a major accident, natural and collapse disaster in each phase of the project using measures mitigating or compensating, the impact significance of the Baltic East OWF will be from negligible to significant. These will be negative, direct or indirect, local, short-term, momentary impacts. The impact of emergency events during the construction, operation and decommissioning of the Baltic East OWF on living organisms inhabiting or otherwise using the seabed, water column and sea surface should be considered significant.

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8 DETERMINATION OF A POSSIBLE TRANSBOUNDARY ENVIRONMENTAL IMPACT

The conducted EIA for the Baltic East OWF project excluded the possibility of occurrence of significant transboundary impacts.

Due to the type and manner of designing the Project, the impacts that will occur will mostly be local. In the case of impacts that may have a regional range (quality of sea waters and bottom sediments, systems using electromagnetic field, land use and development, landscape, ichthyofauna, marine mammals and seabirds), additional analyses were carried out to assess whether there is a risk that these impacts will cross the border of the Polish Exclusive Economic Zone. During the analysis, the possibility of cumulative impacts of the Baltic East OWF with other proposed offshore wind farms was also taken into account.

The chapter on cumulative impacts indicates that collisions of migratory birds flying over the Baltic Sea (including seabirds) will be cumulated within all offshore wind farms. Therefore, the assessment of cumulative impacts as regards collisions of birds flying through the OWF areas in the Baltic Sea considered all known (including proposed) OWF projects. The impact of collisions for migratory birds was also assessed in such an extended case as the impact of negligible and insignificant importance, only moderate for the common crane. Therefore, it should be concluded that there will be no significant transboundary impacts in this respect.

The primary factor influencing the lack of risk of transboundary impacts is a significant distance of the project area from the nearest border of the Exclusive Economic Zone – approx. 60 kilometers in a straight line. Additionally, potential impacts will be limited by suitable actions designed by the Investor, for example, limiting noise propagation.

9 ANALYSIS AND SELECTION OF THE ENVIRONMENTALLY MOST FAVORABLE OPTION

Taking into account the issued decision on permit for erection and use of artificial islands, structures and devices, it would be unjustified to take into account another Baltic East OWF location option. Therefore, both the APV and the RAV were considered within the same area. The main parameters differentiating the two options under consideration are the number of wind turbines and the rotor diameter. The construction and operation of a smaller number of wind turbines as part of the APV in relation to the RAV means less interference with the environment as a result of: shorter duration of the construction and decommissioning phase, fewer risky lifting and offshore operations, lower consumption of construction materials and consumables, smaller area swept by rotors, and smaller seabed area occupied or covered by underwater works, fewer maintenance and operational activities.

In the RA, 14 MW turbines were assumed for the analyses, therefore in relation to the maximum installed capacity of the Baltic East OWF, 69 wind turbines would have to be constructed in this option. With the turbine power output of 15-25 MW assumed in the APV, a comparable installed capacity will already be achieved after the construction of 38 wind turbines (for 25 MW) or 64 wind turbines (for 15 MW). A smaller number of wind turbines as part of the APVmeans a shorter time of the implementation phase and a shorter time for decommissioning – the impacts in these phases will therefore have less environmental impact as part of the APV than in the RAV and are more advantageous in terms of economic, technical and social factors. Moreover, as part of the RAV, with a greater number of wind turbines, there will be a higher seabed occupancy for foundations, and marine mammals and fish will be exposed to noise impact for a longer period than in the APV.

The operation phase will also be more favorable for the APV, which results mainly from a smaller swept area.

In accordance with the above, the most favorable option for the environment as regards the implementation of the Baltic East OWF is the Applicant Proposed Variant (APV).

10 DESCRIPTION OF PLANNED ACTIVITIES AIMED AT AVOIDING, PREVENTING AND LIMITING NEGATIVE ENVIRONMENTAL IMPACTS

The conducted environmental impact assessment for the Baltic Power OWF indicates that no significant negative impacts will occur as a result of this Project. However, the occurrence of impacts of minor importance is unavoidable. Therefore, reasonable measures aimed at avoiding, preventing and limiting negative environmental impacts as a result of the Baltic East OWF Project are indicated below, divided into individual phases.

The Project will include solutions aimed at avoiding, preventing and limiting negative environmental impacts. These will be:

SYSTEMS:

- Noise Reduction System (NRS) – minimization of the impact on marine mammals;
- systems monitoring and protecting the operation of wind turbines, mainly: overspeed protection system and lightning protection system;
- a system detecting cranes flying at a collision height and temporary shutdown of selected wind turbines that could endanger migratory birds;

PROCEDURES – STANDARDS:

- construction and transport works will be performed in accordance with the labor law and OH&S standards;
- transport and logistics will be planned taking into account the minimization of impacts and disturbances in maritime traffic;
- within the Baltic East OWF, a 4 km wide corridor without topside structures has been designated, where only power cables will be laid on the seabed;
- marine structures will be painted and marked, and illuminated at night in accordance with applicable requirements and standards in order to ensure maritime and aviation safety, as well as work safety for contractors of execution, maintenance and decommissioning works;
- prior to obtaining the building permit, a proper archaeological survey will be carried out;
- prior to obtaining the building permit, expert opinions required by the regulations on the impact of the Baltic East OWF on systems using electromagnetic field, defense, aviation, maritime safety and combating hazards will be prepared and agreed with competent

administration authorities; on this basis, the needs and scope of application of measures aimed at avoiding, preventing, mitigating or compensating possible negative impacts on systems using electromagnetic field, defense, aviation (during the implementation, operation and decommissioning phases) will be determined and met.

The Environmental Impact Assessment Report has been prepared taking into account the implementation of the aforementioned systems, obligations and procedures.

The project will be implemented, operated and decommissioned in accordance with the applicable regulations and requirements.

The proposed mitigation measures during the implementation phase include:

- commencement of piling works in accordance with the procedure allowing seabirds to leave and move away from the area of performed works;
- ornithological monitoring will be conducted during piling works; if the ornithological monitoring does not indicate the presence of common guillemots, razorbills, long-tailed ducks and velvet scoters in an area with a radius of 1.5 km from the piling site; works may be commenced;
- commencement of the piling process after prior confirmation of the absence of harbour porpoises and seals in the immediate area of works;
- limitation of sources of strong light at night, directed upwards and, if possible, sideways. This applies mainly to bird migration periods. The emission of light should be limited to the necessary level resulting from applicable occupational safety regulations and standards.

The proposed mitigation measures during the operation phase include:

- limitation of sources of strong light at night, directed upwards and, if possible, sideways. This applies mainly to bird migration periods. The emission of light will be limited to the necessary level resulting from applicable occupational safety regulations and standards.
- if jacket foundations are used, the topside components should be painted with a bright color to minimize the risk of collision with birds.

The proposed mitigation measures during the decommissioning phase include:

- removal from the seabed of any possible residues and pollutants when the removal of wind turbines and substations is completed, unless otherwise agreed with administration authorities.

11 PROPOSAL FOR MONITORING OF THE IMPACT OF THE PROPOSED PROJECT AND INFORMATION ON THE AVAILABLE RESULTS OF ANOTHER MONITORING, WHICH MAY BE IMPORTANT FOR DETERMINING THE OBLIGATIONS IN THIS REGARD

11.1 Proposal for monitoring the impact of the proposed project

Due to the duration of the construction process, the schedules of individual monitoring were described continuously, indicating three phases of the project, i.e.:

- Implementation phase;
- Operation phase;
- Decommissioning phase.

Detailed methodologies of monitoring surveys will be presented to the Regional Director for Environmental Protection in Gdańsk for approval prior to the commencement of surveys.

During the implementation of the Baltic East OWF, the following monitoring will be carried out:

- monitoring of underwater noise;
- monitoring of benthic organisms (including surveys of epiphytic flora and fauna);
- monitoring of ichthyofauna;
- monitoring of water and bottom sediments quality;
- monitoring of migratory birds;
- monitoring of seabirds;
- monitoring of sea mammals;
- monitoring of bats.

The monitoring of underwater noise will be carried out at the project implementation phase. The exceeding of the specified thresholds of emitted sounds should be immediately communicated to the locally competent Regional Director for Environmental Protection. The results will be reported to this authority after the monitoring is completed.

The monitoring of benthic organisms is intended to determine the scale and spatial range of changes in the seabed biocenoses. For the first time, the surveys should be carried out 3 months

after the completion of construction works related to interference with the seabed. Subsequent surveys should be performed 2 and 4 years after the first surveys.

The monitoring of ichthyofauna will be carried out at the implementation and operation phases of the Project. For the first time, the surveys should be performed immediately after one and five years from the completion of the construction and after one year from the completion of the decommissioning. The surveys will allow determining the species structure, abundance and condition of local fish populations. As part of this monitoring, it is also assumed to assess the impact of the artificial reef created as a result of the Baltic East OWF on local fish populations. As part of artificial reef monitoring, potential inhabitation by invasive species will be analyzed, which is crucial for the protection of local sea ecosystems.

Monitoring during the implementation phase may be required as a result of force majeure events, such as accidents, vessel collisions, in order to assess changes in water quality in the environment as a result of an event. The scope and manner of monitoring for force majeure events will be determined in the plan for combating hazards and pollution for an offshore wind farm and a set of equipment, agreed in accordance with the Act on maritime safety by the Director of Maritime Office. During the operation phase of Baltic East OWF, the monitoring of seawater and bottom sediments will be carried out in parallel with the monitoring of benthic organisms.

The monitoring of migratory birds will be carried out during the operation of the OWF in order to determine the number of bird collisions and the barrier effect. It will be carried out in 4 monitoring blocks: in the period of spring and autumn migration in the first and fourth year after the completion of all stages of implementation works.

The monitoring of seabirds includes pre-investment monitoring, which will be carried out on a monthly basis one year prior to the commencement of any works as part of the OWF implementation phase. Seabirds will also be monitored during the operation of the Baltic East OWF.

The monitoring of marine mammals will be carried out as part of passive acoustic monitoring. These activities include pre-investment monitoring, monitoring during implementation and at the project operation stage.

The monitoring of bats in order to determine the activity of these mammals in wind turbines is planned for the operation phase. The monitoring will be conducted for 3 years.

Detailed methodologies of monitoring surveys will be presented to the Regional Director for Environmental Protection in Gdańsk for approval prior to the commencement of surveys.

11.2 Information on the available results of another monitoring which may be important for determining the obligations in this regard

As part of the State Environmental Monitoring, a number of environmental monitoring activities are carried out in the Polish maritime areas. These monitoring activities include surveys of physical-chemical parameters in water and sediments as well as biological parameters. Additionally, a number of bird monitoring surveys is carried out as part of the State Environmental Monitoring. The results of these monitoring activities are collected and made available to the Chief Inspectorate of Environmental Protection.

Since 2015, the Monitoring of Marine Species and Habitats (MMSH) has been carried out, covering the distinguished species of fish, lampreys, mammals and natural habitats related to maritime areas. The MMSH results are collected and made available at the Chief Inspectorate of Environmental Protection in Warsaw.

The ministry competent for maritime economy collects data on the volume of fishing catches carried out in the Polish maritime areas. An analysis of these data will enable the assessment of the impact of the proposed project on fishing in the future.

The results of the presented monitoring surveys of the Polish maritime areas from offshore measuring stations located in the vicinity of the Baltic East OWF area may be used to determine the environmental conditions of sea regions related to the farm as reference data as well as a valuable supplement to the measurement data obtained from direct monitoring carried out in the Baltic East OWF area in the pre-investment, implementation, operation and decommissioning phases.

In the perspective of several dozen years for which the Baltic East OWF is planned to be implemented, the obtained results of surveys as part of monitoring and information on other activities performed in maritime areas may be used to monitor the environmental impact of the project. This is due to the fact that the scope of these monitoring activities and information covers those elements of the marine environment which may be directly and indirectly affected by the proposed project. Long time series of data will allow short-term changes in the environment, i.e. those resulting from the specificity of the complex marine ecosystem and not being a consequence of the impact of the proposed project, to be eliminated from the assessment.

12 INDICATION WHETHER IT IS NECESSARY TO ESTABLISH A LIMITED USAGE AREA FOR THE PROPOSED PROJECT

Based on the analyses and their results performed for the Baltic East OWF Area for the purposes of this EIA Report, it should be concluded that at the current stage of project preparation, there are no grounds to determine the possibility of exceeding the environmental quality standards either in relation to air, noise, wastewater and the intensity of the electromagnetic field, which will not exceed the permissible values outside the area to which the Applicant holds a legal title.

13 COMPARISON OF THE PROPOSED TECHNOLOGY WITH THE TECHNOLOGY MEETING THE REQUIREMENTS REFERRED TO IN ARTICLE 143 OF THE ENVIRONMENTAL PROTECTION LAW

Pursuant to Article 143 of the Environmental Protection Law, the technologies used in newly commissioned plants which are the source of environmental hazards should meet a number of requirements.

Due to the process specificity of the implementation, operation and decommissioning phases and special conditions of operation in the marine environment, offshore wind farms require verification of these requirements at an early stage of project planning.

The structural components of the Baltic East OWF will be made of materials neutral to seawater and seabed. The components must also be resistant to erosion, corrosion and activity of chemical compounds that may be present in water.

The efficiency of energy generation is one of the main criteria for the location of OWFs, as well as the method of transmission of generated energy to the National Power System with minimization of transmission losses. The overriding criterion of energy efficiency for offshore wind farms is the generation of energy in a fully renewable manner, without consuming energy resources, with obvious limitations related to environmental conditions – wind conditions in the water region.

In the case of the renewable energy sector of this type, the actual efficiency of energy use involves non-returnable energy consumption for the production of OWF components and their installation at sea.

The consumption of water, materials, raw materials and fuels will take place during the implementation process and during the decommissioning of Baltic East OWF components when they are deteriorated. During the operation period, the wind turbines will require the use of consumables and fuels for maintenance activities.

Emissions and their range will mainly relate to acoustic impacts accompanying the operation of wind turbines. They will not have a significant impact on marine organisms or cause noticeable electromagnetic impacts.

The experience in the use of wind turbines with the Baltic Sea area allows for the installation of the most efficient and proven solutions meeting the requirements for the most advanced technologies.

14 ANALYSIS OF POSSIBLE SOCIAL CONFLICTS RELATED TO THE PROPOSED PROJECT, INCLUDING THE ANALYSIS OF IMPACTS ON THE LOCAL COMMUNITY

When considering the probability of social conflicts related to the implementation of the Baltic East OWF, it was taken into account that the process of informing the public about its implementation started many years ago during the preparation and consultation of strategic documents related directly or indirectly to the development of wind energy in the Baltic Sea.

Prior to the adoption of strategic and planning documents concerning the Project, a strategic environmental assessment was carried out, during which the draft documents together with the environmental impact forecasts were subject to public consultations.

The proposed Project will be subject to public consultations as part of the Environmental Impact Assessment procedure, both as part of the national procedure and, if necessary, also in a transboundary context.

Press releases, entries in social media and entries in local media that appeared in connection with the process of preparing offshore wind farms for implementation were analyzed. No signals leading to negative perceptions of the public regarding such projects were identified.

The real factors that will occur and may give rise to conflicts are:

- occurrence of nuisances related to the wind farm preparation and construction process – operation of machines and equipment, construction of offshore structures and increased vessel traffic and transport of large-size offshore structures;
- impact on the natural environment of the Baltic Sea, issues of broadly understood nature protection, including birds;
- limitation of fishing areas;
- landscape impact and visibility of the Baltic East OWF;
- impact on tourism in coastal municipalities;
- impact on the economy in coastal municipalities.

The potential conflict concerning the proposed Baltic East OWF is underpinned by the following issues:

- possible difficulties for fishing in the water region occupied by the wind farm, resulting in limiting access to it and, at the same time, hindering free fishing and transit through the wind farm area;
- incompatibility of the objectives and interests of the parties – the objective indicated by the fishermen community is fishing and transit through the OWF area to further fishing grounds, as well as ensuring the presence of fish in the Baltic Sea;
- disturbance in the environment that the OWF may cause.

The potential target groups are:

- administration and state institutions;
- self-government units and institutions;
- trade organizations, including fishing organizations;
- national, regional and local social associations and organizations, including environmental organizations;
- potential suppliers, partners, other investors at sea;
- scientific, research and engineering units;
- residents of the region.

Discussing the sources of potential conflicts related to the construction and operation of the Baltic East OWF, it is necessary to emphasize at the same time the positive aspects of such projects for local communities, such as e.g. jobs for the residents of coastal municipalities in the implementation phase and long-term operation of the OWF, a stimulus for the development of business activities related to the maintenance of the OWF, or the impact on tourism and perception of the OWF as a tourist attraction.

The appropriately used potential of the benefits will allow for partial elimination of possible inconveniences.

15 IDENTIFICATION OF DIFFICULTIES RESULTING FROM SHORTAGES IN ENGINEERING OR GAPS IN CONTEMPORARY KNOWLEDGE, WHICH HAVE BEEN ENCOUNTERED DURING THE PREPARATION OF THE REPORT

The surveys carried out for the benefit of the EIA Report allowed more detailed information to be obtained on the environment in the area of the proposed Project. This allowed a comprehensive wildlife survey to be developed, both in terms of abiotic and biotic elements. It was concluded as part of the works that there is an uneven level of information and data on individual elements of the environment. Some aspects are better recognized than others, e.g. well-recognized presence of zoobenthos, and residual knowledge about the presence of bats over maritime areas.

There is no information on potential impacts of the Offshore wind farm in the Polish maritime areas. This scarcity relates mainly to the operation phase, e.g. in the scope of the phenomenon of overgrowing of underwater structures, environmental effects of an artificial reef or behavior of birds encountering topside structures during flights. The reason for this is the fact that wind turbines have not been constructed in the Polish maritime areas so far, hence there is no experience and detailed knowledge based on the results of surveys regarding the impact of such projects.