

Translation from Polish

[national emblem of Poland]

Regional Director for Environmental Protection in Gdańsk

RDOŚ=Gd=WOO.4211.12.2015.KP.22

Gdańsk, 7 July 2016

DECISION

Pursuant to Article 75(1)(1)(c) in conjunction with Article 71(2)(1), Article 82(1)(2)(b), Article 82(1)(4), Article 82(1)(5), Article 82(2) of the Act dated 3 October 2008 on Provision of Information on Environment and its Protection, Public Participation in Environmental Protection and Environmental Impact Assessments (i.e. Journal of Laws of 2016, item 353), § 2 sec. 1 points 5 and 6 of the Regulation of the Council of Ministers dated 9 November 2010 on Projects Likely to Have Significant Impact on Environment (Journal of Laws of 2016, item 71) in conjunction with Article 104 of the Act dated 14 June 1960 – the Code of Administrative Procedure (i.e. Journal of Laws of 2016, item 353), having reviewed the motion of Polenergia Bałtyk III Sp. z o.o. with its registered office in Warsaw, ul. Krucza 24/26 dated 24 April 2016, together with explanations dated 19 May 2015, 1 June 2015, 1 July 2015, 8 July 2015, 23 July 2015, 30 July 2015, represented by Maciej Stryjecki, Justyna Biegaj and Michał Behnke, attorneys-in-fact, in the case concerning issuance of the decision on environmental constraints for the project entitled:

“Development of the Offshore Wind Farm Bałtyk Środkowy III”

Acting on the basis of:

- 1) Report on the environmental impact of the aforesaid project (contractor: Grupa Doradcza SMDI, Warsaw, April 2015), supplemented on 3 November 2015;
- 2) Decision of the Head of the Maritime Authority in Gdynia, ref. no.: INZ1.1-AM-8103-54-2/15 dated 7 October 2015;
- 3) Opinion of the State Border Sanitary Inspector in Gdynia, ref. no.: SE.ZNS.80.4912.7.15 dated 24 September 2015;
- 4) Applications and comments submitted in the proceedings conducted with public participation,

having conducted an environmental impact assessment,

I adjudicate, as follows:

- I. The following environmental constraints are hereby established for the project entitled **“Development of the Offshore Wind Farm Bałtyk Środkowy III”**:

1. Type and location of development of the project

The subject matter of the project involves the development and operation of the Offshore Wind Farm Bałtyk Środkowy III (“OWF BSIII”) located in the southern part of the Baltic Sea, in the Polish exclusive economic zone, within the nearest distance of 23 km north from the coastline, at the level of Smołdzino Municipality and Łeba Urban Municipality (the Pomorskie Province). The boundaries of the area of OWF BSIII are marked by the geographical coordinates set out in the permit to erect and use artificial islands, structures and equipment in the Polish sea areas (“PSZW”) issued for the project OWF Bałtyk Środkowy III no. OWF/2/2012 dated 30 March 2012 and are presented in the table below.

The geographical coordinates of the OWF BSIII project:

Point	Coordinates	
A	$\Phi = 54^{\circ}56'42,424''$ N	$\lambda = 17^{\circ}16'57,430''$ E
B	$\Phi = 55^{\circ}02'35,801''$ N	$\lambda = 17^{\circ}14'00,653''$ E
C	$\Phi = 55^{\circ}02'52,125''$ N	$\lambda = 17^{\circ}14'45,028''$ E
D	$\Phi = 54^{\circ}59'55,268''$ N	$\lambda = 17^{\circ}31'37,853''$ E
E	$\Phi = 54^{\circ}57'24,641''$ N	$\lambda = 17^{\circ}24'47,597''$ E

F	$\Phi = 54^{\circ}57'09,443''$ N	$\lambda = 17^{\circ}22'42,654''$ E
G	$\Phi = 54^{\circ}57'05,517''$ N	$\lambda = 17^{\circ}21'25,617''$ E

The total surface area of the farm is ca. 117 km² and the footprint, in accordance with the terms and conditions specified in PSZW, is ca. 89km².

The predicted maximum capacity of OWF BSIII is 1200 MW. The Project shall be implemented in stages.

The project consists of:

- 1) not more than 120 wind power plants whose basic components include: foundation, tower, nacelle with a power generator and a rotor;
- 2) not more than 6 offshore power stations,
- 3) up to the total of 200 km of internal sections of offshore power and telecommunication cables.

Particular components of OWF BSIII may be located in the entire area of the project designated for development, hence, maintaining a 500-meter buffer from the internal boundary of the area designated for development of the farm. Location of particular elements of the farm to be established after geotechnical survey of the seabed and wind measurements as well as analysis of the farm productivity, in the building project.

Boundary parameters of particular components of MGW BSIII are specified in the table below:

Parameter	Boundary value
Maximum number of power plants [items]	120
Maximum total height of the power plant above sea level [m]	275
Minimum clearance between the lower location of the wind and the average sea level [m]	20
Maximum rotor diameter [m]	200
Maximum zone of a single rotor [m ²]	31,400
Maximum total area of the rotors [m ²]	3,768,000
Maximum number of foundations in the ancillary infrastructure [items]	6
Maximum area of seabed taken by 1 foundation [m ²]	1,257
Maximum area of seabed taken by all foundations [m ²]	158,382
The biggest density of the power plant	1.35
Maximum length of the internal connection infrastructure cables of the farm [km]	200

Power plants and transformer stations to be erected on foundations on the seabed. Four types of foundation may be used in OWF BSIII, namely: monopile foundation, gravity foundation, lattice jacket foundation and tripod foundation.

Monopile foundation – made of steel, welded cylinders, up to 80 meters long and with a diameter of up to 10 meters. Lattice jacket foundation – made of four steel legs, joined and strengthened with clamps made of cross-mounted pipes, legs with a diameter of up to 1 meter. Maximum leg spacing: 40 meters. The foundation to be affixed to the seabed with 4 piles with maximum diameter of 1.8 m and maximum length of 70 meters. Tripod foundation – to be made of three supporting legs and one central leg which constitutes the basis for the connection and the tower, fitted with sleeves for placing piles, will have a main column with a diameter of up to 7 meters and legs with a diameter of up to 5 meters. Maximum space between the foundation legs: 40 meters. The foundation to be affixed to the seabed with 3 piles with a maximum diameter of 2.5 meters and maximum length of 60 m. The gravity foundation, being a reinforced concrete frame consisting of the main shaft and a basis with a maximum diameter of 40 meters.

A protective layer against leaching, such as: a layer of stones with the width ranging from a few to as many as 20 meters and with a depth of a few meters, placed around the foundation may be

used for all types of foundation (including in particular gravity and monopole foundation, rarely other types) The requirement to deploy the layer as well as its width and depth to be specified in the building design.

Plant towers built of steel, concrete or reinforced concrete rings connected together will to be placed on the foundations. The tower to be placed on the foundation with a steel sleeve, a so called transition element or a connector, on additional elements, such as e. g. anchorage place for "service vessels", ladders, intermediate platform, working platform, as well as elements of power infrastructure (flexible shields for cables, the so called J-tubes and power and telecommunication cables) may be located. The towers to feature wind turbines with a rotor comprising three blades and a hub located at the front of the nacelle. Plastic material (fiberglass) to be the basic construction material of the wings. Helicopter landing sites can be installed on the power plant nacelles.

One or several models, towers and turbines may be installed on the farm. The wind power plants to be connected to the power stations with a 33 kV – 66 kV power cable network. The total cable length inside the farm will not exceed 200km. Their final length will depend on the number and the manner of location of the power plants and will be defined in the construction project. The cables to be buried in the seabed at a depth of up to 3 m. If the technical conditions do not allow them to be buried, they are to be covered with a layer of stones or other specially adapted loads. Electricity generated by the power plants belonging to the OWF BSIII to be prepared on the farm for further transmission. For this purpose, within the boundaries of the farm the internal offshore power stations ("OPS") to be built, in the maximum amount of 6 units.

As part of OWF BSIII the following types of the OPS may be developed:

- 1) transformer stations – receiving the alternate current (AC) from the wind farms, then adjusting the voltage to an appropriate level, allowing its further transmission outside the farm in the alternate current technology;
- 2) back-to-back stations – (AC/DC) – converting the alternate current (AC) into the direct current (DC), allowing its further transmission outside the farm in the direct current technology;
- 3) the ones which combine both functions.

The decision on whether the energy is to be sent onshore in either DC or AC technology to be taken at the construction design stage. The AC offshore transformer station to be constructed on the basis of a platform based on monopoly, jacket, tripod or gravity foundations. The necessary power and social infrastructure to be installed on the working platform. The capacity of a single station is 150 to 350 MW. The parameters of the station of this capacity can be as follows: the area: 30 x 30 m, the height of up to 20 m, the weight of up to 1500 Mg. OPS AC may consist of the following elements: switchroom, power transformers, high voltage and medium voltage distribution substations, reactive power compensation chokes and capacitors, transformers or generator sets for back-up power supply, grounding system, internal installation panel, low voltage distribution devices for auxiliary equipment and protection of control and instrumentation systems, UPS uninterruptible power supply unit, SCADA system equipment, accommodation for service staff, leisure and employee lounge, material warehouse, workshop, marine, helicopter landing site, occupational health and safety and emergency equipment including Diesel generators, emergency lighting, lifeboats.

In case of a decision to use the DC transmission technology, an AC/DC back-to-back station can be built on the offshore wind farm. The AC/DC back-to-back station to be built on the basis of a platform based on monopal, jacket, tripod or gravity foundations. The necessary power infrastructure to be installed on the working platform, in particular equipment for the conversion of alternate current into direct current. The main components of the back-to-back station are transformers, converter transformer, converter thyristors, harmonic filters, capacitor batteries, reactive power compensation chokes, an external pumping station (cooling system). The maximum transmission capacity of the station: 900 MW. The working platform to be up to: 100 m long and 60 m wide and 40 m high. Power substations can also be used as a place for the installation of equipment for measuring and monitoring the environment, e. g. meteorological data or wave information.

The transmission of electricity generated by the OWF BSIII to the National Power System to be made through the offshore transmission infrastructure ("OTI") consisting of export cables and substations, in accordance with the contract for connection of the OWF Bałtyk Środkowy III to the

transmission grid. The OTI is subject to a separate procedure for issuance of an environmental decision.

The OWF BSIII to be implemented in phases. The division into stages results primarily from the connection agreement concluded by the investor, which enables the connection of 600 MW to the National Power System by 2021 and the remaining 600 MW by 2025. Decisions on the details of phasing to be made only after the wind measurement campaign, geotechnical surveys of the seabed and after obtaining the financing of the investment. This Decision concerns the scope of the project covered by all phases of its implementation.

2. Conditions of land use during development, exploitation and decommissioning phase, with particular regard to the need to protect valuable natural values, natural resources and monuments and reduction of nuisance for the neighboring areas:

- 1) Adopt technology of construction works related to installation of particular facilities of the farm, protecting sea water against contamination with solid and liquid waste.
- 2) For the adopted technologies of carrying out the construction works (including transport) prepare and implement the procedures for handling movement of possible contaminants. This applies in particular to protection against contamination with solid and liquid waste. The OWF BSIII must be equipped with measures to combat possible oil spills; collect waste selectively, without endangering the marine environment and transfer it ashore.
- 3) Taking into account the environmental conditions of the area, rule out during implementation of the project the option that some contaminants may enter the aquatic environment. Ensure that the work is carried out in such a way so as to avoid contamination of the marine environment with solid and liquid waste and, immediately and on an ongoing basis, remove from the water surface any pollution arising from the performed work. (pursuant to § 6 sections 1 and 2 of the Regulations of the Council of Ministers of 3 December 2002 on organization and manner of combating threats and pollution at sea (Journal of Laws of 2002, no. 239, item 2026) – combating pollution at Polish maritime areas is performed only by mechanical means. The head of the competent maritime authority may grant approval for the use of means other than mechanical means when combating pollution.
- 4) Organize and operate the facilities for collection of waste and materials in such a manner so as to ensure economical use of the land and minimal conversion of its surface.
- 5) Carry out appropriate waste and wastewater management, including:
 - a. Organize work in such a manner so as to minimize the volume of generated waste;
 - b. Selectively store the generated waste, at designated locations and then manage in accordance with the binding provisions;
 - c. Drain the domestic sewage into leak tight sewage tanks and then hand them over to the authorized recipient.
- 6) If the presence of contaminants is detected during the earthworks, samples of soil to be examined in accordance with the methodology specified in the provisions on soil and soil quality standards, and in the case of exceeding these standards, earth masses treated as waste shall be remediated in accordance with the provisions on waste, outside the location of the project development.
- 7) Organizing construction works with due account taken of the requirements of maritime traffic safety and the necessity of undisturbed navigation.
- 8) Construction works must be carried out with regularly inspected equipment and machinery in good state of repair.
- 9) All contaminants from the units carrying out the construction works to be transferred to the port reception facilities.
- 10) The output that may be produced during installation of individual elements of the farm on the seabed to be left within the boundaries of the farm or placed in a dump site designated by the Director of the Maritime Office in Słupsk.

- 11) After the construction works are completed, remove from the seabed any contamination which could have been a byproduct of the construction process.
- 12) Comply with the OHS procedures established for OWF BSIII in the course of construction works, including the marking of the onshore site and compound and preventing of unauthorized access.
- 13) Supply the onshore site compound, including temporary storage areas for building materials and components of the farm prior to their installation in the offshore area, with the following:
 - a. sorbents or other agents to combat incidental leakage of petroleum-derived substances,
 - b. sanitary facilities and social rooms for employees and ensure regular collection of waste by the authorized operators,
- 14) Construction materials and elements of farm objects should be delivered to the onshore site compound in batches whose size is necessary for carrying out the construction works and if possible avoid the long-term storage of such materials.
- 15) Designate hard surface waste storage areas on the onshore site compound.
- 16) All waste generated in the onshore site compound should be collected selectively in containers or in separate areas which are easily accessible for waste collecting entities. Store hazardous waste in airtight, sealed and labelled containers.
- 17) Provide accommodation for service crews at sea during periods of intensive work.
- 18) Install additional radio/radar stations for efficient operation of all communication and technical observation systems outside the 2 km zone.
- 19) Use ship's radar only under X-band (reduction of false radar echoes).
- 20) Develop rescue plans for the scenarios of accidents and emergencies agreed for OWF BSIII, taking into account environmental protection requirements and this decision.
- 21) Switch off the radio communication and radiolocation equipment while working on antennas and transmitters, due to the transmitting power of this equipment.
- 22) Design the location or locations for the installation of the in-house radio communication and radiolocation equipment so as to ensure that the presence of fields is minimized, so that work can be carried out without the need to shut them down or apply other additional procedures that can reduce operational efficiency.
- 23) Ensure that the equipment is operated by persons trained in the use of the equipment, in general and specific occupational health and safety rules and under the permanent supervision of an occupational doctor.
- 24) During the construction, operation and decommissioning use only ships which meet the national pollution emission standards, or emission standards resulting from international agreements signed by Poland and the consequences of international standards. Vessels operating in the investment area should, to the extent possible, use the established or customary shipping routes.
- 25) Transport of construction components and building materials in the waters administered by the Director of the Maritime Office in Gdynia to be carried out under conditions ensuring safety of the transported elements and materials, in accordance with the applicable regulations on safety of navigation and technical requirements.
- 26) When carrying out the works, consideration should be given to measures ensuring safety of water traffic in order to minimize the risk of collision with other vessels.
- 27) Minimize possible acoustic nuisance during the conducted works through the use of equipment and machines which comply with the Polish Standards, work to be carried out with properly silenced, technically efficient equipment with low emission of pollutants to the air.

- 28) When carrying out the construction works – conversion and use of natural elements to be allowed only to the extent necessary in connection with the realization of the investment.
- 29) Implementation of the project should meet the requirements of environmental protection of marine waters in the context of the requirements arising out of the Water Framework Directive and the Marine Strategy Directive.
- 30) Provide archaeological surveillance during soil stripping in the area of archaeological sites.
- 31) In order to avoid the potential impact of birds colliding with wind turbines, equip the farm with a system allowing for short-term shutdown of wind power plants in particularly difficult weather conditions, causing limited visibility during the period of the most intense migration of birds, i.e. in the period from 15 March to 30 April and from 1 September to 15 October.
- 32) After the exploitation of the farm in question is completed, remove all of its components. Part of the foundation structures may be left if they constitute a habitat for valuable communities of marine organisms. The scope of the elements left behind to be agreed with the authorities competent for environmental protection and maritime economy.
- 33) Upon completion of decommissioning work, carry out inspections of the seabed to ensure that all farm components have been disposed of in accordance with the requirements of the United Nations Convention on the Law of the Sea.

3. Environmental protection requirements necessary to be included in the construction project:

- 1) Design a maximum of 120 power plants with a minimum clearance between the lower rotor wing and the sea surface (medium sea level) of not less than 20 m, a rotor diameter of not more than 200 m, and a total height of not more than 275 m above sea level.
- 2) Design maximum 6 substations and a maximum of 200 km of internal sections of power cables.
- 3) Assume a maximum power plant density 1.35 items /km²
- 4) Assume a maximum zone for a single rotor of not more than 31 400 m² and a total maximum zone for all rotors not more than 3 768 000 m².
- 5) Adopt and justify in the design the selected type of the foundation from among the following types: monopoles, gravitational foundations, jacket or tripod foundations.
- 6) Assume a maximum surface area of the seabed occupied by one foundation (without a possible protective layer against leaching) - not more than 1 257 m² and a total maximum surface area of the seabed occupied by all foundations - not more than 158 382 m².
- 7) The building design should take into account the increasing number of extreme weather events, including the increase in wind speed, sea level rise, the increase in storm days and changes in sea currents. These phenomena (both historical data and forecasts) must be taken into account when, among others, designing the strength of the construction of individual power plant facilities, the clearance between the sea level and the wing tip (in its lower position) and the defrosting systems of power plant wings and lightning protection systems. Materials and technical solutions must be used to reduce the likelihood of construction accidents and catastrophes, thereby reducing the exposure of people and the environment to their consequences.
- 8) The elements of the farm may not be located in a buffer 500 m from the internal border of the area designated for the development of the farm (according to the recommendation of the permit to erect and use artificial islands, constructions and equipment in the Polish maritime areas for the project OWF Bałtyk Środkowy III, decision of the Minister of Transport, Construction and Maritime Economy of 30 March 2012, ref. GT7/62/1170069/Decision/2012). Within the boundaries of such a designated area, all structural elements of the farm must be included, thus it determines the maximum external range of the rotor, which additionally limits the area in which foundations can be laid.

- 9) Establish a protection zone around the wreck recorded in the Underwater Archaeological Sites Register (EPSA [*Polish: Ewidencja Podwodnych Stanowisk Archeologicznych*]) under symbol B96.1, located in a location with geographical coordinates X: 039642.40, Y: 0795912.91, with a radius of 50 m from the wreck boundary or another location dictated by the results of geotechnical surveys of the seabed and exclude location of any elements for the farm, including its foundation and cables, in this particular zone. The zone should be established before commencing geotechnical surveys of the seabed and then during construction, exploitation and decommissioning.
 - 10) Equip offshore power stations with oil trays with a capacity of approx. 110% of the quantity of oil in transformers, which can accommodate a total leakage in the event of leakage.
 - 11) The schedule of construction works and guidelines for the coordination of works should define the order of works, taking into account the need to minimize the time caused by emissions, the number and multiplicity of interference in environmental resources and minimize the risk of environmental damage.
 - 12) The design should provide for a system of short-term wind turbine shutdowns in particularly difficult weather conditions, causing limited visibility during the period of the most intense migration of birds, i. e. 15 March to 30 April and 1 September to 15 October. The system is to ensure the constant observation and recording of the stream of birds migrating through the farm area and immediate shutdown of turbines on the route of the planned flight of registered birds through the farm.
 - 13) The schedule of works to be planned in such a way that the activities which cause the greatest impact on natural environment (i. e. driving into the foundation piles) to be carried out in the period May-September.
- 4. Requirements for counteracting the effects of industrial accidents**
Not specified – the project does not qualify as a plant posing a threat of serious accidents within the meaning of the Act of 27 April 2001 – the Environmental Law (i.e. Journal of Laws of 2016, item 672). Consequently there is no need to specify the requirements for counteracting their effects.
- 5. Cross-border impact requirements for projects for which the cross-border environmental impact procedure has been carried out:**
Not specified – the project will not cause the cross-border environmental impact on environment, provided that the recommended minimization measures, in particular on underwater noise abatement, are taken.

II. The following obligations are hereby imposed on the applicant:

1. Obligations of the applicant with regard to actions minimizing and mitigating negative environmental impact:
 - A) relating to the need to reduce noise from piling:**
 - 1) Design and implement technical solutions in the form of an air curtain or other technology, minimizing the impact of underwater noise on fish and marine mammals, guaranteeing such a reduction of its level that - at the border of the nearest Natura 2000 area, protecting marine mammals, i. e. Ostoja Słowiańska PLH220023 – it is not greater than 171 dB re 1 $\mu\text{Pa}^2\cdot\text{s}$ (SEL, in water). Any incidental overstepping of this level should be reported to the Regional Director for Environmental Protection in Gdańsk within 7 days from the date of its occurrence. The application should indicate the minimizing actions taken by the Applicant and confirm their effectiveness.
 - 2) Ensure that the construction process is properly organized in such a way so as to ensure that breaks in the piling process of not less than four days are

maintained at least once every two months, although these breaks may also result from weather conditions.

- 3) Plan the schedule of works in such a way that the activities causing the greatest impact on the natural environment (i. e. penetration of foundation piles) are carried out in the period May - September.
- 4) Apply the procedure for a gradual commencement of piling (the so-called "soft start").

B) relating to the need to reduce the impact on birds:

- 1) Development of a maximum of 120 power plants with a minimum clearance between the lower rotor wing and the sea surface (medium sea level) of not less than 20 m, a rotor diameter of not more than 200 m, and a total height of not more than 275 m above sea level
- 2) Adopt in the detailed design, the schedule of construction providing for development of new power plants adjacent to each other, starting from one place, so that the area designated for the investment can be gradually filled with structures, expanding the area of the farm to include neighboring power plants.
- 3) Plan the schedule of works in such a way so that the activities causing the greatest impact on the natural environment (i. e. the installation of foundation piles) is done in the period May-September.
- 4) In the periods of migration of birds, i. e. from the beginning of July to mid-November and from the beginning of March to mid-May, limit the use of strong light sources (e. g. headlights) in vessels and farm structures at night time and do not direct light upwards.
- 5) Paint the tips of the blades with bright colors, in accordance with the applicable regulations on marking aircraft obstacles.

C) relating to the need to protect cultural heritage:

If new archaeological sites which have not yet been identified, are discovered during geotechnical surveys or construction works, they must not be damaged as a result of the performed works and the relevant administrative authorities must be notified of the said discovery.

D) relating to the possibility of discovering the remnants of military actions:

Develop and implement procedures aimed at preventing accidents caused by unexploded bombs, in particular those involving chemical warfare agents, at every stage of implementation of the project. The procedures should include the ongoing identification of such facilities during geotechnical surveys and construction works, possible first aid in the event of contamination, the establishment of procedures for communication and notification, and finally the removal of contaminants from the vessel. To a limited extent, develop and implement the same procedures for situations involving the accidental removal of conventional military facilities. Due to the fact that it is not possible to assess the type of the removed weapon, all precautions should be taken as in the case of chemical weapons. The removal of a facility should be reported to the Maritime Office in Stupsk and the relevant naval services.

E) relating to the need to ensure environmental safety in the case of unplanned events:

a. at the stage of development and decommissioning:

- 1) Gradually and temporarily close the water region covered by the construction / decommissioning works for the vessels not related to the construction/ decommissioning of the OWF.
- 2) Implement the alert system for vessels not related to the construction / liquidation of the OWF.

- 3) Identify safety zones by way of navigation warnings of the National Coordinator (KKON), currently: the Navy Hydrographic Office in Gdynia, taking into account the regulation of the Director of the Maritime Office concerning such zones issued pursuant to the Act of 21 March 1991 on Maritime Areas of the Republic of Poland and the Maritime Administration (Journal of Laws of 2013, item 934, as amended).
- 4) Indicate fairways for the vessels related to the construction/liquidation of the OWF in order to minimize potential interactions between the traffic of the vessels operating the farm and the external vessels, as well as to control access (e. g. through designation of an entry to the area) and vessel traffic within the area of the OWF.
- 5) Determine the maximum permitted speed for the vessels within the OWF area and their respective minimum distance from each other (depending on their type and size, meteorological conditions and risk factors).
- 6) Introduce a requirement providing for a minimum of 2 persons to be present on the navigational bridge of a vessel associated with the construction/liquidation of the OWF in order to reduce the risk of navigational error.
- 7) Establish audited time control systems for the service team.
- 8) Regularly update progress in the development of the OWF area (degree of erection and decommissioning of facilities, the course of cable lines, etc.).
- 9) Equip at least one vessel operating in the area of construction/liquidation of the OWF with flexible dams and packaged sorbents - in order to limit the spread of oil spills and to eliminate minor leaks, as well as a device for collecting mechanical pollution from the water surface (e. g. skimmer) together with a container(s) for the collected oil.
- 10) Develop procedures for the movement and storage of substances likely to contaminate the marine environment.
- 11) Establish a system of effective communication in the system: OWF - Contract Engineer -Services responsible for shipping safety and prevention of threats and pollution at sea, in order to react quickly to emergency situations (as defined in the plan and accepted by all participants, i.e. maritime administration, Maritime Search and Rescue Service (Polish: MSPiR), Contract Engineer, investor and other entities).
- 12) Provide regular training and training for employees and subcontractors, covering, among others, the prevention and removal of oil spills.
- 13) Inform the crews of small vessels about the dangers resulting from waves caused by large ships and the associated impacts, which may result in the collision of such vessels with the offshore wind farm.
- 14) Use units whose hulls are not covered with anti-lichen paint containing TBT.
- 15) Update the initial plan developed for the needs of the OWF BSIII to counteract risks and pollution during the construction and decommissioning of the farm. The update should take place before the start of construction or decommissioning of the farm, respectively.

b. at the stage of operation

- 1) Provide a tight turbine casing to prevent oil leaks from the object.
- 2) Equip offshore power stations with an oil tray with a capacity of approx. 110% of the quantity of oil in transformers, which can accommodate total leakage in the event of a leakage.

- 3) Apply a system controlling the operation of the installation and the condition of the facilities, reacting in advance to any possible damage to the installation and allowing for changing the operating parameters or switching off the device before a serious accident occurs, resulting, among others, in oil release.
- 4) Identify safety zones by way of navigation warnings of the National Coordinator (KKON), currently: the Navy Hydrographic Office in Gdynia, taking into account the regulation of the Director of the Maritime Office concerning such zones issued pursuant to the Act of 21 March 1991 on Maritime Areas of the Republic of Poland and the Maritime Administration (Journal of Laws of 2013, item 934, as amended). Determine maximum permitted speed limits for vessels in the area of the offshore wind farm.
- 5) Introduce a requirement providing for a minimum of 2 persons to be present on the navigational bridge of a vessel operating within the area of the offshore wind farm in order to reduce the risk of a navigational error.
- 6) Establish audited time control systems for the service team
- 7) Equip the OWF with flexible dams and packaged sorbents as well as a small/medium size mechanical device(e.g. a skimmer) together with a container(s) for the collected oil - in order to limit the spread of oil spills and to eliminate minor leaks (located in one of the offshore transformer stations).
- 8) Establish 24-hour supervision over the operation of the OWF and monitoring of the OWF by the OWF Operational Centre.
- 9) Develop and implement procedures for the transfer and storage of substances which may contaminate the marine environment.
- 10) Establish a system of effective communication between: OWF – Operational Center of OWF – Services responsible for safety of water transport and prevention of threats and pollution at sea, in order to quickly respond to the emergencies.
- 11) Conduct regular trainings and trainings for employees and subcontractors in, among others, the proper operation of the OWF and prevention and elimination of oil spills.
- 12) Use units whose hulls are not covered with anti-lichen paint containing TBT.
- 13) Update the initial plan developed for the needs of the OWF BSIII to counteract risks and pollution during the construction and decommissioning of the farm. The update should take place before the commissioning of the farm.

A) relating to the need to ensure safe navigation:

- 1) Introduce, maintain and regularly inspect at all stages of the project the correct navigational marking.
- 2) In the developed procedures and conducted actions take into account the following guidelines:
 - a) establish and maintain at the stages of operation and, in particular, decommissioning of appropriately marked safety zones;
 - b) at the stage of construction - gradually, temporarily close for shipping and fishing the investment area in which the works are to be carried out;
 - c) establish an absolute shipping ban after designation of a safe zone around any OWF BSIII structure, min. 50 m.

- d) introduce direct navigation supervision during the phases of construction, decommissioning and monitoring of the OWF BSIII area during the operational phase using closed circuit television (CCTV), Automatic Reporting System (AIS) and radar;
- e) provide navigation support in the form of AIS transponders, RACON radar transponders, navigation lights and fog sirens on key turbines;
- f) develop rescue plans and train crews of the vessels participating in the construction and operation of the OWF BSIII;
- g) regularly update and verify the rescue drills;
- h) provide permanent communication lines between the OWF BSIII and the onshore center for monitoring of operation and provide communication with the Słupsk Traffic Control and Maritime Search Service (MSPIR, SAR);
- i) develop and agree (also publicly) a safe construction, operation and decommissioning plan for OWF BSIII.

B) relating to the need to protect environment:

- 1) Assume in the design that the power plant rotors are painted with a standard paint color RAL7035 used for offshore wind farms or any other color selected in such a way so as to minimize the contrast between the turbines and the background, thereby contributing to the reduction of the impact on the marine landscape, subject to the need to use of air traffic marking system as required by law.

2. Monitoring environmental impact in the following scope:

Applicant's obligation to monitor the environmental impact of the project

- 1) Environmental monitoring (including as regards the impact of the project on the targets, subjects and areas protected under the "Natura 2000" programme and their integrity) at the stage of construction, operation and liquidation of the wind farm in line with the general scope, time schedule and methods set out below.
- 2) Reporting to the Director General for Environmental Protection in Gdańsk the results of the monitoring efforts, and suggesting prevention and/or mitigation measures, if necessary, such reports to be in the form of:
 - a. Periodic reports – to be submitted annually within 3 months of the end of the given year of the research;
 - b. Final reports (prepared to sum up the entire research cycle) – to be submitted within 6 months of the end of research regarding the applicable environmental resource.

If an adverse negative impact on the given environmental resource is indicated in a periodic or the final report or if other material environmental hazards are identified, the monitoring report ought to suggest prevention or mitigation measures, and a method for their implementation and follow-up;

- 3) Final monitoring reports in respect of the given environmental resource ought to be drafted in such a manner as to consist of two parts: one setting out results of the research conducted after the project has been completed, and the other juxtaposing these results with the findings made in the report used as the basis for the present decision and the findings made herein, so that it can be used it as a post-execution analysis.

a. Scope of monitoring at the construction stage:

- **Hydrological research:**

On-going monitoring of hydrological conditions of the project area and day-to-day analysis of these conditions to be made in the course of the construction of each facility on the wind farm.

The scope of research to include: surface water waves, water flows across the entire cross-section of the water column and sea water turbidity.

- **Benthos:**

Maintain on-going monitoring of macrozoobenthos using the HELCOM COMBINE 2014 methodology. The research ought to commence at the stage of the construction phase, no later than one month after the foundation has been laid and continue until the destroyed system has fully recovered and/or the periphyton has been reestablished, i.e. for a minimum of 5 years, which will most likely take place after the wind farm has been commissioned for use. Samples ought to be taken once a year in May.

The scope of research ought to include the taxonomic composition, population and biomass of the macrozoobenthos.

The sites for taking samples from the seabed ought to be spaced along the route of the near-bottom current, at a distance of 20 m, 50m and 100 m away from the foundation (mainline profile) and at the same distances on a perpendicular (reference) profile of the five wind turbines.

- **Sea mammals:**

Porpoises to be monitored using C-POD click detectors in a similar manner to that used before the investment was commenced. As there are no Polish guidelines, acoustic monitoring to be performed in accordance with German environmental guidelines for offshore wind farms – Bundesamt für Seeschifffahrt und Hydrographie, 2013 (BSH). Construction site noise pollution to be measured during noise intensive works (e.g. while piles are being driven into the seabed).

In the construction phase, at least 3 porpoise click detectors (C-POD) to be located in the vicinity of the BSIII OWF, preferably in the same locations as at the stage of the pre-investment monitoring. Additionally, there more C-POD devices to be installed in two different reference locations located at least 20 km away from the source of impact (i.e. within the reach of behavioral reaction to the pile driving activity).

The measurements to be taken by means of calibrated underwater microphones (hydrophones) with a frequency of 10-20kHz. The site must be adequately distant from the site where the pneumatic hammer is used. BSH guidelines suggest a distance of 750 m and 2,000 m away from the foundation and at the nearest area of sea mammal protection (if located at a distance of more than 5,000 m away from the project site). In this case, it will be the Natura 2000 Ostoja Słowińska PLH220023 area. Underwater

noise measurements during the construction phase must be conducted at the time of pile driving activity, in regular intervals.

Additionally, measurements ought to be taken outside the OWF site, at a distance of 1,000 m and 5,000 m away from the OWF.

Porpoise monitoring ought to begin no later than 6 months before the construction begins and continue throughout the project construction phase.

Noise pollution generated by the wind farm must be measured once, for three different wind speeds (sea force scale) – 2, 4 and 6 Bft.

Additionally, visual monitoring of seals must be conducted by observing the beaches and coastline within the boundaries of the Natura 2000 Ostoja Słowińska PLH220023 area, and within the limits of the BSIII OWF area plus a 2km buffer zone around this area. As in the case of porpoises, the monitoring must commence 6 months before the construction phase begins and must be repeated no less frequently than every 2 months.

- **Sea birds and birds flying over the farm (including migrating birds):**

Sea birds to be monitored in the buffer zone around the BSIII OWF and in the area of Natura 2000 Ławica Słupska PLH990001. The research to be conducted by way of transect bird counts. The route of the research boat cruise to be set in such a manner to ensure that a 5 km zone around the borders of the OWF and the eastern part of the aforesaid Natura 2000 area are included in the count. The data collected in this research must be compared with the data collected in the pre-investment monitoring phase and, on this basis, changes in bird concentrations at various distances from the wind farm must be assessed. In the period with highest bird concentrations in the south Baltic sea area (from October to May), a frequency of no less than two inspections per month (with no less than one week's interval) must be observed, whereas in summer (June to September) three research boat cruises shall be sufficient. The research must continue throughout the construction phase.

The scope of monitoring at the stage of project operation ought to include:

- **Sea bottom and seabed sediments**

- 1) Regular technical inspections and audits of foundations and cables must be conducted in the operational phase. A ROV vehicles fitted with an underwater CCTV system ought to be used for at least some of the inspections so as to inspect the erosion of the sea bottom in the project vicinity and detect any potential damage to cables. Detection devices ought to be used to find cable locations.

The inspections ought to be conducted in the 6th and 12th months after the construction phase has been completed (preferably in the spring and autumn seasons due to the increased dynamics of the natural environment, the vertical mixing of water strata, and storm surges) and subsequently, depending on the environment dynamics, once every 2 or 5 years throughout the entire operational life of BSIII OWF.

- 2) Bathymetric tests must be conducted for areas in the direct vicinity of the foundations for each seabed type (P1, P2, P3, P4, P5) to determine the pace and scale of sediments washout depending on seabed type.

The inspections ought to be conducted twice - 6 and 12 months after the construction phase has been completed. As an alternative to ROV vehicle inspections and bathymetric tests, the washout rate may be monitored on an on-going basis by means of devices mounted on the foundations.

- **Hydrological conditions:**

- 1) In the wind farm operation phase, the following hydro-meteorological parameters must be monitored:
 - a) wind speed, direction and gusts;
 - b) height, duration and direction of surface waves;
 - c) water flows across the entire cross-section of the water column;
 - d) increased turbidity – to monitor the seabed washout rate, if any, in the direct vicinity of the wind farm.
- 2) Check the degree of ice build-up on the wind farm structures. Ice build-up inspections must be carried out during long spells of prevailing sub-zero temperatures, especially when the sea is rough (high wave intensity).

- **Benthos:**

Maintain the monitoring of the impact the underwater structures have on the protection of habitats and the preservation of biodiversity in the area of the wind farm by monitoring new growths on the wind farm structures, establishing what plant species they are (including epiphytes and other organisms colonizing the wind farm structures). Special attention to be given to the presence of invasive species. The research to be conducted in the 1st, 3rd and 5th year of operation, with a view to determining tendencies of changes to local biocenoses. The research ought to begin immediately after wind farm foundations have been laid and continue until the destroyed system has fully recovered and/or the periphyton has been reestablished, i.e. for a minimum of 5 years (this time-line is due to the fact that the quantitative structure of bivalve mollusks, which are the longest living sea creatures, takes five years to replenish). The site where samples of macrozoobenthos will be extracted from the seabed ought to be spaced along the route of the near-bottom current, at a distance of 20 m, 50m and 100 m away from the foundation (mainline profile) and at the same distances on a perpendicular (reference) profile of the five wind turbines.

Softer seabed macrozoobenthos ought to be monitored by means of standard HELCOM COMBINE procedures.

- **Fish**

Periodic monitoring research of the ichthyofauna must be conducted in the direct vicinity of the active OWF against the background of neighboring areas.

The monitoring activity must be performed using standard multi-panel research fishing nets used in the pre-investment research phase. In the first year following the

completion of the construction phase, 2,000 meters of fishing nets ought to be put up inside the OWF in the space of one year, in 4 different seasons (spring, summer, autumn and winter), with the proviso that fishing nets need to be put up two times in each season. At the same time, an identical set of research tools must be put up for comparative analysis purposes at a distance of up to 20 km away from the project site, in an area with similar bathymetry. The research must be repeated 3 and 6 years after the structure has been put in place.

Additionally, in the same locations and in the same time intervals samples of ichthyoplankton ought to be taken in accordance with the guidelines of the Food and Agriculture Organization of the United Nations.

- **Sea mammals:**

For 24 months from the wind farm startup date, porpoise monitoring shall be continued using the same methods as during the construction phase.

Noise background ought to be tested when the farm is in operation.

The tests ought to be conducted once for three different wind speeds (sea force scale) – 2, 4 and 6 Bft. The data to be collected on a random basis, from different turbines forming the BSIII OWF.

Noise pollution ought to be measured at a distance of approximately 100 meters away from the noise course and in the central part of the wind farm.

Additionally, noise tests ought to be conducted outside the OWF area, at a distance of 1000 meters and along the borders of the Natura 2000 Ostoja Słowińska PLH220023 area.

Additionally, visual monitoring of seals must be conducted by observing the beaches and coastline within the boundaries of the Natura 2000 Ostoja Słowińska PLH220023 area, and within the limits of the BSIII OWF area plus a 2km buffer zone around this area. The monitoring shall continue for 24 months from the project operational startup date.

The monitoring results must be compared with those obtained at the pre-investment stage.

- **Sea birds and birds flying over the farm (including migrating birds):**

Sea bird flights to be monitored by radar and by way of daylight counting birds in the direct vicinity of BSIII OWF.

In the bird migration season, i.e. early July to mid-November and early March to mid-May, bird research ought to be conducted by means of radar devices and by way of bird counts. Bird counts to be made aboard research vessels by visual observation (including identification of bird species) at daytime and by listening in and identifying noises of night-flying birds. Observation sessions to be carried out from aboard a vessel anchored on a site affording an unobstructed view of the wind farm from the direction on the route chosen by a majority of migrating birds in the migration season. In each migration season, the number of days with 24h monitoring sessions must not

be less than 20, and 2-5 day long observation sessions ought to be spaced evenly in time (to the extent practicable).

In the winter season, i.e. from mid-November to the end of February, bird flight frequency over the wind farm site ought to be monitored using the same method as that in the migration season. In this period too, the number of days with 24h monitoring sessions must not be less than 20, and 2-5 day long observation sessions ought to be spaced evenly in time (to the extent practicable).

Additionally, research to be continued by way of transect bird counts around the perimeter of the wind farm site. The route of the research boat cruise to be set in such a manner to ensure that a 5 km zone around the borders of the OWF is included in the count so that the data collected in this research can be compared with the data collected in the pre-investment monitoring phase and, on this basis, changes in bird concentrations at various distances from the wind farm are assessed. In the period with highest bird concentrations in the south Baltic sea area (from October to May), a frequency of no fewer than two inspections per month (with no less than one week's interval) must be observed, whereas in summer (June to September) three research boat cruises will suffice, one in mid-August and one in mid-September. The research must continue for 5 consecutive years.

Due to the potential formation of a new feeding ground (in the form of mollusk colonies on the farm structures), observations need to factor in the potential utilization of the BSIII OWF site as a feeding ground for birds. If birds are confirmed as using the site as a feeding ground, their species, quantity and duration of stay on the wind farm must be identified.

On-going records of bird flights over the wind farm must be kept. In the migration season (from early July to mid-November and from mid-March to mid-May), turbines located along the path of registered flocks of birds must be shut down.

- **Bats:**

Bat monitoring to be conducted for the first 5 years of the operational life of the wind farm (at least three seasons to be included in the research). Research in the first 2 years is mandatory, whereas the last 3rd seasonal research may be conducted at a later date (however, no later than during the first 5 years of the project operation).

The monitoring ought to focus on two issues: bat mortality rate and bat activity monitoring in the vicinity of the wind turbines. The devices used in the research ought to enable automatic recording and fulfill the equipment requirements applicable to pre-investment research. The monitoring to include spring and autumn bat migrations. The number and location of recording devices to be determined once the layout of wind turbines has been determined; the number of recording devices not to be less than 6. If monitoring results prove a materially adverse impact on bats or other material hazards, adequate mitigation or preventive measures need to be devised and implemented, including temporary shutdown of wind turbines.

b. Monitoring at the stage of liquidation:

Bathymetric survey and side scan sonar readings must be procured to determine which foundation remnants will remain uncovered and which will be buried under the seabed once the near-bottom environment resumes stability (possible navigational perils).

Measurements to be taken 1 and 5 years after the wind farm was liquidated.

Seabed sediments must be tested for metal content (Pb, Cu, Zn, Ni, Cd, Cr, As, Hg, Al), mineral oils, biogenic substances N_{og} and P_{og} as well as TOC, WWA, PCB and TBT.

The research must be performed in the BSIII OWF area and in background reference points located around the investment.

5 reference points and ca. 20 measurement points must be set (assuming a measurement grid of 1 point per ca. 5 km²).

The research must be conducted in the 1st and 2nd year after the wind farm has been liquidated.

Biogenic substance content to be measured in winter, the season with the highest biogene content.

- **Benthos:**

Macrozoobenthos to be tested using the same methodology as in the construction phase. The test ought to be conducted once, in May, after the wind farm has been closed down.

- **Cultural heritage:**

At the stage of geotechnical research performed on paleo-valley edges detected during the land survey of the south and south-west section of the zone at issue, drilled samples to be consulted with a paleo-archeologist to confirm or rule out pre-historical settlement artifacts. Additionally, if substantial translocation of sediments is confirmed during the post-investment research, areas with sediment washouts must be surveyed with a view to revisiting and updating the list of areas barred from anchorage and other forms of use.

III. No need to establish a restricted use area

Wind power plants have not been listed in the catalogue of projects for which it is possible to create a restricted use area.

The project to also include the underground power lines and substations for which the regulations provide for the possibility of creating such an area. However, it is not expected that any standards of environmental quality may not be met by these facilities, and thus there is no need to create a restricted use area for the project.

IV. Recognize the need to carry out a new environmental impact assessment as part of the building permit procedure, with particular emphasis on:

1. defining the width and importance of the designated safety zones around individual power plants for migration of birds and bats;
2. defining the width of the migration corridors between the water regions designated for development of the offshore wind farms of various investors; if the results of the analyses indicate that it is scientifically justified to define migration corridors along the border between the water regions designated for development of the offshore wind farms of various investors, the proposals concerning the said corridor, included in the new environmental impact

assessment report should be based on the guideline that the axis of the indicated corridor coincides with the line which divides the said water regions or if, for scientific reasons the running of the corridor should be different, the axis of the said corridor should be defined in such a manner so as to evoke similar and comparable economic effects for the farms in the said water regions with the possibly lowest costs for the environment;

3. analysis of the adopted methods of laying foundations and assessment of impact of the said procedure on particular components of natural environment;
4. designation of influence of the layout of particular turbines and other surface components of the farm on the availability of the said area for animals, including in particular sea birds and sea mammals, and specification of influence on long-distance and local flight routes of birds;
5. proposal of solutions minimizing the impact of noise and reduction of its impact;
6. determination of the location and number of the bat activity recorders on the surface area of the farm.

V. Post-implementation analysis

An obligation is imposed to perform and submit to RDOŚ in Gdańsk, within 3 months from the date of the end of the second research season, as part of the monitoring for the project operation phase, the post-implementation analysis in accordance with the rules and in the layout of the data specified for the final monitoring reports, ordered under this Decision, in relation to all the elements covered by this monitoring.

VI. Attach the characteristics of the project as an appendix hereto.

Grounds

On April 28, 2015, the Regional Director for Environmental Protection in Gdańsk received an application dated April 24, 2015 from Polenergia Bałtyk III Sp. z o.o. submitted by the President of the Management Board Mr Michał Kozłowski and the Member of the Management Board Mr Michał Michalski concerning the issuance of a decision on environmental conditions for the project consisting in the construction of the Bałtyk Środkowy III (Central Baltic III) offshore wind farm.

The following documents have been appended to the application, pursuant to the requirement of Article 74 section 1 of the Act of October 3, 2008 on providing access to information about the environment, participation of the public in the environmental protection and environmental impact assessments (consolidated text, Journal of Laws of 2016, item 353) - hereinafter "EIA Act": project environmental impact report, graphical appendix presenting the range of the project environmental impact. No cadastral maps or extracts from the local spatial development plan have been appended, as they are not prepared for offshore areas. There is also no adopted land development plan for offshore areas.

The subject matter of the present case is the planned construction and operation of the Bałtyk Środkowy III (Central Baltic III) Offshore Wind Farm ("BSIII OWF"), located in the southern part of the Baltic Sea, in the Polish exclusive economic zone, at the nearest distance of approximately 23 km north of the coastline, at the level of the borough of Smołdzino and the municipality of Łeba (Pomorskie Voivodeship).

In accordance with § 2 section 1 point 5 and 6 of the Regulation of the Council of Ministers of November 9, 2010 on projects that may significantly impact the environment (consolidated text - Journal of Laws of 2016, item 71), this project shall qualify as:

- plants using wind energy for the generation of electric power with a total nominal capacity

- of the farm of not less than 100 MW and located in the maritime areas of the Republic of Poland;
- substations or overhead power lines with a rated voltage of not less than 220 kV and a length of not less than 15 km have the status of a "project which may always have significant impact on the environment", for which it is required to obtain a decision on environmental conditions.

Pursuant to Article 71 section 2 point 1 of the Act on providing access to information about the environment, public participation in the environmental protection and environmental impact assessments, for the planned projects which may always have a significant impact on the environment, it is required to obtain the decision on environmental conditions. The decision on environmental conditions specifies the environmental conditions for the project execution.

The project will be implemented in offshore areas. The above results in the fact that pursuant to Article 75 section 1 point 1, letter c) of the EIA Act, the authority competent to examine the case and issue the decision on environmental conditions is the Regional Director for Environmental Protection in Gdańsk.

Due to the fact that in accordance with Article 6 of the EIA Act, the requirement for approval or providing opinion does not apply if the authority in charge of the procedure is also the authority approving or giving its opinion, in this case the regulations related to approval and issuing an opinion by the Regional Directorate for Environmental Protection do not apply.

The Director of the Maritime Office in Słupsk and the Director of the Maritime Office in Gdynia are responsible for issuing the approval referred to in Article 77 section 1 point 1 of the EIA Act in the subject matter, whereas the State Border Inspector in Gdynia is responsible for issuing the opinion referred to in Article 77 section 1 point 2 on the basis of Article 78 section 1 point 2.

The application and the environmental impact report have been entered into the publicly available list of data kept pursuant to Article 21 section 2 point 9 and point 16 of the aforementioned Act under the numbers, respectively: 454/2015 and 652/2015. The Applicant did not request to cover any of the documents presented with the submission or during the procedure with confidentiality clause.

In the course of proceedings the local authority has set forth and considered as follows:

The planned project is currently at an early stage of preparation. After obtaining a decision on environmental conditions, the project will be able to participate in an auction defining the conditions for its financing, within the framework of the support system for renewable energy sources. Only after winning the auction will it be possible to start further stages of the project preparation, including geotechnical surveys and wind measurements, allowing for the development of the building permit design and starting the supply chain organization. The geotechnical conditions, the results of the productivity analyses carried out on the basis of the wind measurements, as well as the current market conditions will allow to determine the detailed technical solutions of the BSIII OWF, including the precise location of individual elements of the wind farm in the area specified in the PSZW. The construction of the BSIII OWF is planned for 2019-2021. At the same time, the offshore wind energy industry is developing very dynamically, and new models of wind turbines and other equipment appear every year, so the project may use models of turbines that are not currently available on the market. This will also depend on the ordering process and the terms and conditions offered to the Investor by the manufacturers.

For the above reasons, the environmental impact assessment was carried out on the basis of the envelope of technical parameters, which defined the most far-reaching scenarios of environmental impacts of particular technical and technological solutions considered by the Investor at the current stage. On the basis of the impact assessment of the furthest-reaching scenarios, the environmental parameters and conditions limiting the scope and scale of the impacts of the BSIII OWF were determined in the EIA report as guidelines for the building permit design. The final technical

parameters of the individual farm equipment will be specified in the building permit.

The report analyses two options of the project: the option selected for implementation (which is at the same time the most beneficial for the environment from among the considered options) and a rational alternative option. The report shows that both options of the project are technically feasible, meet the parameters specified in the obtained permits and do not pose a threat of significant environmental impacts, including in particular to the integrity, cohesion and subject of protection of the Natura 2000 areas. Therefore, they comply with the requirements of the provisions of the EIA Act.

The option of the project based on the use of technologies currently available on the market, in the quantities maximally allowed in the permits obtained so far, including in particular the permit for the erection and use of artificial islands, structures or equipment in the Polish maritime areas, as well as in the agreement on the connection of the farm to the National Power System, has been identified as a rational alternative option.

The option chosen for implementation was based on technologies that currently undergo tests, but which are likely to be available in the years when the BSIII OWF will be built. It enables a better economic result to be achieved by using fewer, more powerful wind turbines and thus optimizing the use of the energy potential of the area allocated for the construction of the farm and shortening the construction time.

The most significant difference in the option selected for implementation, compared to the rational alternative option, is the reduction of the number of wind turbines by 40%, i.e. to a maximum of 120 units, compared to the 200 units permitted in this area according to the PSZW. This reduction in the number of wind turbines is essential from the point of view of the farm's impact on key environmental elements, as in particular the following decreases together with it:

- the seabed area occupied by the foundations by 39% and the volume of seabed sediments disturbed during construction and moving with sea currents and the destruction of benthic organisms during installation works and the direct and indirect impacts associated with the increase in the amount of suspended matter in water on fish, marine mammals and seabirds,
- the total rotor surface area by 35.3% and the wind turbine density by 40%, thus potentially reducing the estimated bird mortality resulting from collisions with the operating wind turbines,
- the total time of the foundation installation and, consequently, the period during which underwater noise will be emitted which may cause hearing impairment and scaring of fish and marine mammals.

Thus, the option selected for implementation is the most beneficial for the environment.

The remaining boundary parameters of the farm, such as: the maximum height of the structure, the maximum range of the rotor, the maximum cable length, as results from the impact assessment of both options, do not significantly affect the scale of environmental impacts of the project, so there are no premises to limit these parameters.

A comparison of the most important parameters of the option selected for implementation and a rational alternative option, from the point of view of the environmental impact assessment, is presented in the table below.

Parameter	Option selected for implementation / most beneficial for the environment	Rational alternative option
Maximum total height of the wind turbine m.a.s.l. [m]	275 m	212,5 m
Minimum clearance between the lower wing position and the sea	20 m	20 m

surface [m]		
Maximum rotor diameter [m]	200 m	192,5 m
Maximum number of wind turbines [pcs.]	120 pcs.	200 pcs.
Maximum single rotor zone [m ²]	31 400 m ²	29 104 m ²
Maximum total rotor zone [m ²]	3 768 000 m ²	5 820 800 m ²
Maximum number of foundations of accompanying infrastructure [pcs.]	6	8
Maximum sea bed area occupied by 1 foundation [m ²] (gravitational foundation, diameter 40 m)	1 257 m ²	1 257 m ²
Maximum sea bed area occupied by all foundations [m ²](126/208 pcs.)	158 382 m ²	261 456 m ²
Highest density of wind turbines [pcs./km ²] (89 km ² for development)	1,35 szt./km ²	2,25 szt./km ²
Maximum cable length of the farm internal connection infrastructure [km]	200 km	200 km

The location of wind turbines and other facilities within the boundaries of the farm has not been specified at the present stage of the project implementation. The impact assessment has taken into account a uniform distribution of the wind turbines throughout the farm area. Since the environmental impact assessment did not exclude any areas of the farm from the development, it is theoretically possible to locate them in the whole area of the farm, excluding the buffer of 500 m from the borders of the area specified in the PSZW, in accordance with the provisions of this permit. Specific locations will be determined after the seabed geotechnical surveys and wind measurements are carried out before the building permit design is developed.

The wind turbine model will be selected at the stage of preparation of the building permit design and will be based primarily on technical and economic criteria as well as environmental conditions for the implementation of the project, indicated in the environmental decision.

Wind turbines will have rotors consisting of three blades and a hub at the front of the nacelle. The basic structural material of the wings will be plastics. Most of the turbine equipment will be placed inside the nacelle. The rotor will be fixed to the main shaft supported on bearings. The shaft will transfer the rotation energy through the gearbox to the generator, which will convert it into electrical energy. The step-up transformer before electric power transmission to the substation, will most likely be installed inside the nacelle or at the base of the tower. Helicopter landing sites can be installed on the wind turbine nacelles.

The towers of the power plant will be up to 175 m high and have a diameter of 20 m at the base and up to 4 m at the top. They will be constructed of steel, concrete or reinforced concrete rings, joined together. The maximum total height of the wind turbine will not exceed 275 m above sea level and the minimum clearance between the lower wing position and the sea surface (understood as the average sea level) will not be smaller than 20 m. The maximum diameter of the rotor is 200 m. One or more wind turbine models can be installed on the farm. The foundations of the wind turbine will be laid on the seabed. The investor provided for the possibility of using 4 types of foundations: monopiles, gravity foundations, jacket type foundations (truss foundations) and tripod type foundations (tripods). The towers will be connected to the foundation by means of a steel sleeve, a so-called transition element or a connector. There may also be additional elements at the connector, such as the places of anchoring of service vessels, ladders, intermediate platform, working platform, as well as elements of power infrastructure (flexible cable shields, so-called *J-tubes* and power and telecommunication cables).

The types of foundations analyzed in the impact assessment and taken into account by the Investor

are as follows:

- Steel monopile made of steel, welded cylinders. A monopile usually protrudes 5 to 10 m above the sea surface and connects to the tower by means of a transition element/connector. The monopiles that can be used at the BSIII OWF will be up to 80 m long and 10 m in diameter.
- A jacket (truss) type foundation made of four steel legs connected and reinforced with brackets made of cross-mounted pipes. In its upper part, there is a connector (transition piece), which enables the connection of the foundation with the wind turbine tower. In the above-surface part of the jacket type foundation, there are also additional elements such as the place of anchoring of service vessels, ladder, intermediate platform, working platform as well as elements of power infrastructure (*J-tubes*, cables). Jacket type foundations, which can be used at the BSIII OWF, will have legs of up to 1 m in diameter. The maximum distance between the legs is 40 m. The foundation will be fixed to the sea bed with 4 piles with a maximum diameter of 1.8 m and a maximum length of 70 m.
- A tripod type foundation consisting of 3 legs supporting one central leg which forms the basis for the connection and the tower. The tripod legs are equipped with sleeves for pile fixing. In the bottom part of each leg of the foundation, there are also special mats (*mud mats*) to keep the structure in the right position on the sea bed and prevent the structure from settling before it is fixed to the sea bed. There are also additional elements on the foundation, such as *J-tubes*, places of anchoring of boats, transition platform, ladder, etc. The tripod type foundations, which can be used at the BSIII OWF, will have the main column with a diameter of up to 7 m and legs with a diameter of up to 5 m. The distance between the foundation legs is a maximum of 40 m. The foundation will be fixed to the sea bed by means of 3 piles with a maximum diameter of 2.5 m and a maximum length of 60 m.
- The gravitational foundation, which is a reinforced concrete structure, consists of the main base shaft. The base can be conical or flat (in the shape of an octagon, hexagon, circle, etc.), and in the foundation, which can be used in the BSIII OWF, it will have the maximum diameter of 40 m. The gravitational foundation is filled with ballast. During its installation, cement mortar is injected below the base of the foundation in order to ensure constant contact between the foundation and the bearing surface.

A washout protection layer can be applied to all types of foundations. It is usually a layer of stones with a width of a few to even 20 meters and a depth of several meters, laid around the foundation. The need to lay it, the width and depth and the type of material used will be determined during the building permit design phase.

Wind turbines will be connected by means of a grid of 33 kV or 66 kV power cables to the offshore substations. It is planned to lay up to 200 km of cables inside the farm. Their final length will depend on the number and set up of the power plants and will be specified in the building permit design. The cables will be buried in the seabed up to a depth of 3 m. If the technical conditions do not allow for them to be buried, they will be covered with a layer of stones or other specially adapted loads.

Electricity generated by the wind turbines belonging to the BSIII OWF will be prepared on the farm for further transmission. For this purpose, a maximum of 6 internal offshore substations ("OS") will be built within the boundaries of the farm.

The following types of the OS can be built within the framework of the BSIII OWF:

- 1) transformer - receiving *alternate current* (AC) from wind turbines and then converting its voltage (33 or 66 kV) to a correspondingly higher level, enabling its further transmission in the alternating current technology;
- 2) converter (AC/DC) - converting alternating current (AC) into *direct current* (DC), enabling its further transmission in the direct current technology;
- 3) combining both functions.

The decision whether the energy will be transmitted to the shore in the direct-current or alternating-current technology will be made at the stage of the building permit design.

The AC offshore transformer station will be built on a platform based on monopile, jacket, tripod or gravity-base foundations. The necessary power and staff welfare infrastructure will be installed on the working platform. A typical power output of the station is 150 to 350 MW. Typical parameters of the station with the above mentioned power are 30 x 30 m and 15 - 20 m in height, weight of 1,000 - 1,500 Mg. Typical OS AC equipment consists of the following components: an indoor switchgear, power transformers, MV and HV switchgears, reactive power compensation reactors and capacitors, transformers or power generators to provide backup power, earthing system, control panel of internal systems, low-voltage distribution equipment for auxiliary equipment and protection, control and instrumentation systems, UPS uninterruptible power supply, SCADA equipment, service staff accommodation, rest and welfare rooms, material storage, workshop, boat landing, helideck, occupational health and safety as well as emergency equipment including Diesel generators, emergency lighting, lifeboats.

An offshore AC/DC converter station may be built if the Investor decides to use a DC transmission technology as a separate facility or as an additional element of an AC station.

The AC/DC converter station will be built on the basis of a platform based on monopile, jacket, tripod or gravity-base foundations. The necessary power infrastructure, in particular equipment for converting alternating current into direct current, will be installed on the working platform. The main components of the converter station are converter transformers, converter thyristors, harmonic filters, capacitor batteries, reactive power compensation reactors, an external pumping station (cooling system). A typical transmission capacity of the station is 600 to 900 MW. The working platform will be 70 - 100 m long, 40 - 60 m wide and up to 40 m high.

The substations can also be used as a place of installation of equipment for environmental measurements and monitoring, e.g. meteorological data or wave information.

Pursuant to Article 61 § 4 of the Code of Administrative Procedure, the parties to the procedure, identified on the basis of the data in the application and its supplements, were notified of the initiation of the procedure.

Pursuant to Article 59 section 1 point 1 of the EIA Act, the implementation of the planned project that may always have a significant effect on the environment requires an environmental impact assessment to be conducted. In accordance with the definition contained in Article 3 section 1 point 8 of the EIA Act, such an assessment includes in particular:

1) verification of the project environmental impact report, 2) obtaining opinions and agreements required by law, 3) ensuring the possibility of public participation in the procedure. The above activities are the main determinants for the submission of evidence in this case.

Pursuant to Article 79 of the EIA Act, prior to issuing the decision on environmental conditions, the authority competent to issue this decision ensures the possibility for the public to participate in the procedure under which the environmental impact assessment is to be conducted. Consequently, in the course of the procedure concerning the environmental impact assessment, the local authority made public, in the form of a notice of November 20, 2015, the information defined in Article 33 of the EIA Act, particularly about the possibility to submit comments and requests, indicating the place and the 21-day period for their submission. The notice was placed on the notice board of the Regional Directorate for Environmental Protection, in the Public Information Bulletin of the local authority, on the notice boards of the following authorities: Director of Maritime Office in Gdynia, Director of Maritime Office in Słupsk, President of the City of Gdańsk, President of the City of Gdynia, President of the City of Sopot, Head of the Ustka Borough, Mayor of the Ustka Town, Head of the Smołdzino Borough, Mayor of the Łeba Town, Head of the Wicko Borough, Head of the Choczewo Borough, Head of the Kosakowo Borough, Mayor of the Władysławowo Town, Mayor of the Hel Town, Mayor of the Jastarnia Town, Head of the Krokowa Borough, Head of the Puck Borough, Mayor of the Puck Town, Head of the Stegna Town, Head of the Sztutowo Borough, Mayor of the Krynica Morska Town. In connection with the request within the above-mentioned

deadline, from PGE Energia Odnawialna S.A. to extend the time for reviewing the documentation, the above procedure has been extended. The notice about this fact was published in forms and places as at the beginning of the procedure with the participation of the public, stating the date of extending the deadline for submitting comments and requests until January 11, 2016. Since, due to the Christmas and New Year's Eve period, many boroughs received the announcement late and it was posted beyond the above-mentioned date, the procedure with public participation in each borough was extended in accordance with the 21-day time limit from the announcement in a given borough.

The Polish Offshore Wind Energy Society (PTMEW) has submitted an accession to the procedure and a willingness to participate in it holding such rights as a party. Having analyzed the statutory objectives of the aforementioned organization, with the letter of January 28, 2016, the local authority admitted the aforementioned Society to participate in the procedure as a party.

During the procedure with the public participation, the Regional Director for Environmental Protection received in total 10 comments and requests from the following entities: Gniazdo Orła association, the Krokowa borough, Generpol Sp. z o.o., the Polish Offshore Wind Energy Society, Elektrownia Wiatrowa Baltica - 2 Sp. z o.o., Elektrownia Wiatrowa Baltica - 3 Sp. z o.o., Baltic Power Sp. z o.o. and PGE Energia Odnawialna S.A. The Investor responded to the issues raised in the comments in the letters of January 25, 2016 and February 4, 2016.

The Gniazdo Orła association submitted a total of five comments and requests.

The first application of the Gniazdo Orła association concerned taking of additional evidence by drawing up an independent expert opinion in the field of ornithology on the necessary minimizing, compensating activities and a post-development analysis, supported by comparisons of bird activity results with other offshore wind farms.

In the opinion of the authority, such a request did not deserve to be taken into account, since it concerned circumstances already established by other evidence whose correctness and reliability are beyond doubt and which the authority believed in.

As it results from the report and explanations sent by the Investor, two independent teams of experts - ornithologists - carried out the research on the activity of birds staying in the area of the planned BSIII OWF and the monitoring of birds flying over it. The first of them is the team of the Pomarinus company, led by Prof. Włodzimierz Meissner, Ph.D., who is responsible for the research of sea birds, staying at least seasonally in the area of the project (visual observations during ship cruises). The report from this research by Prof. Meissner constitutes Chapter 8 of Volume III of the report. The second team is the Danish company DHI, which has extensive experience in the research for the needs of offshore wind farm projects. Its work was led by Ramunas Žydelis and Henrik Skov - renowned experts who have been studying sea birds on the Baltic Sea for years. DHI monitored migratory birds using a horizontal and vertical radar, visual observations during the day and listening at night. Their results are presented in Chapter 9 of Volume III of the report.

The team led by Prof. Meissner, as ordered by the Investor, additionally performed parallel ornithological research of sea birds in the area of Natura 2000 Ławica Słupska PLC990001 and they were also included in the study (Volume III, Chapter 8 of the report).

On the basis of the environmental research (surveys) described above, both teams assessed the impact on avifauna, and one of the most important analyses, i.e. the study of potential bird mortality due to collisions with power plants, was carried out by DHI and additionally, by another independent team - the ENINA company, under the supervision of Prof. Piotr Tryjanowski. Finally, on the basis of these analyses, the final impact assessment report was prepared by SMDI, a company with extensive experience in environmental impact assessments of wind farms (Volume IV, Chapters 5.1. and 5.2. of the report).

The person submitting a comment did not contest either the assessment methodology used, the completeness of the results or the credibility of the contractors. They did not identify any specific doubt in the conducted assessment of impact on birds to be verified by an independent expert. In the opinion of the authority, the scope and methodology of the research, as well as the assessment of the impact on birds carried out on the basis of the results obtained, are adequate to the subject

and purpose of the research, referring to the recognized research methods and scientific knowledge. These arrangements constitute a sufficient basis for the findings of this Decision. The competence of the team preparing the impact assessment in this area does not raise any objections either.

Moreover, in the opinion of the Regional Director for Environmental Protection, it should be noted that the report on the results of seabird research (Chapter 9 of Volume III of the report) did not find "very high activity of birds", as described by the Gniazdo Orła association. For example, the number of all long-tailed ducks (sitting on water and flying), i.e. the most numerous species of a sea bird in the area of investment, amounted to: 340 specimens in autumn, 1,668 in winter and 2,625 in spring. In summer, no long-tailed duck was found in the area of the farm (cf: Tables 9 - 12 in Chapter 8 of Volume III of the report - part concerning the BSIII OWF). These small numbers can be compared with those found at the same time on the Ławica Słupska, which is an important wintering site for this species: 19,724 specimens in autumn, 69,268 in winter and 8,406 in spring (cf: Tables 8 - 11 in Chapter 8 of Volume III of the report - part concerning Ławica Słupska).

Migratory bird surveys showed high autumn migration of geese (estimated 103,000 specimens) as well as significant spring migration of velvet scoters (estimated 18,493), long-tailed ducks (estimated 13,369 specimens) and common woodpigeons (estimated 13,126 specimens) as well as autumn migration of common cranes (estimated 8,311 specimens) - Tables 33, 38, 40, 44, 54 - Chapter 5.2, Volume IV of the EIA Report.

In the view of the authority, finding of significant numbers of migrants is not tantamount to a significant impact on them. The collision estimates in the above tables (and additionally, in the same chapter, in ENINA's tables with independent calculations) indicate that for geese this could result in approximately 81 fatal collisions per year, which is negligible compared to the safe yield limits calculated in the report for individual geese species (the lowest of which is 20,748 for bean geese), as well as from the point of view of the biogeographical abundance of the species population (1,656,000 birds, Wetlands International 2014). In the case of the remaining above-mentioned species, one only can talk about occasional, single collisions with power plants, without affecting their populations.

Referring to the postulate to compare the results of the bird activity with other offshore wind farms, it should be noted that such comparison with the Danish Kriegers Flak offshore wind farm with similar technical and location parameters (cf.: <http://www.4coffshore.com/windfarms/kriegers-flak-denmark-dk37.html>) was made in point 5.8. of Chapter 9 of Volume III of the EIA Report. Depending on the species, this activity was sometimes higher and sometimes lower in both analyzed areas. It should be emphasized that the research (survey) conducted for the BSIII OWF was the first such comprehensive ornithological research and analyses for the offshore wind farm projects in the Polish maritime areas, and probably also in the whole Baltic Sea area, which makes it impossible to make a reliable comparison with other available results.

The report does not propose measures to minimize negative impacts on birds, as no significant impacts on this group of animals have been identified. However, recommendations were presented to limit even relatively small impacts found in the study, the most important of which is to leave a minimum of 20 m clearance between the lower position of the wing and the sea surface. It was found that the majority of bird species recorded during the survey moved close to the sea surface, below 20 m. Additionally, the recommendations concern:

- building new wind farms starting from one place, so that the water region intended for the investment can be filled with structures gradually, expanding the area of the farm to include neighboring wind farms,
- maximizing the pace of construction works in May - September, when the number of birds in this area is the lowest, however, taking into account possible restrictions related to lighting of the structure at night during the autumn migration period, limiting the sources of strong light at night during the migration periods,
- painting the wing tips with bright colors, which should increase the probability of seeing the working turbine by flying birds,
- using solid structure towers and not using truss structures.

In addition, potential impacts in the form of bird collisions may be reduced by shutting down wind turbines during periods of most intense migration of sensitive species. The migration peak of some

species, such as common cranes, usually takes place only during a few days of the migration season. Knowing the migration dates of the species, the prevailing atmospheric conditions and carrying out the visual and radar monitoring, it is possible to predict the period during which several days of intensive migration of birds will take place. Recommendations in this respect are included in the assessment sections concerning both the migrant birds as well as sea birds.

These recommendations are reflected in the essentials of this Decision.

Referring to the issue raised in the comments concerning the lack of recommendation regarding the environmental remedial measures in the report, it was stated that the results of the conducted environmental research and impact assessment do not indicate that there is a need to undertake remedial measures, hence they were not recommended in the report (cf: Volume V, point 8 of the report).

Referring to the issue raised in the comment concerning the lack of recommendation to perform the post-execution analysis, it was stated that in accordance with Article 82 of the EIA Act, the environmental decision may impose both the obligation to monitor the impact of the project on the environment (Article 82 section 2 letter b) as well as the obligation to present the post-development analysis, specifying its scope and time of presentation (Article 82 Section 5), which was used by the Authority. The post-development analysis compares the findings contained in the project environmental impact report and in the decision on environmental conditions, in particular the findings concerning the anticipated nature and scope of the impact of the project on the environment and the planned preventive actions with the actual impact of the project on the environment and actions taken to limit it (Article 83 section 1 of the EIA Act).

The scope of the post-investment environmental monitoring program was presented both in chapters of Volume IV of the report with the assessment of the impact on individual elements of the environment, and in Volume V, summarizing the report. According to the proposal presented in the report (Volume V, Chapter 9, p. 33), the results of all post-investment environmental studies should be sent to the Regional Director for Environmental Protection in Gdańsk within the specified time limits, and if the interim or final report shows significant negative impacts on a given environmental resource or other significant hazards, the monitoring report should propose preventive or minimizing actions, suggested method of implementation and control of the results. Thus, the post-investment monitoring reports, prepared in the form recommended by the authors of the EIA report, will serve as a post-development analysis, because, apart from the research results, they must contain an analysis of the real impact of the investment on the environment, together with an indication of possible further mitigation measures. In the opinion of the authors of the report, separating the post-development analysis from the post-investment research results of a given element of the environment would adversely affect the quality of such a study. It was proposed that the decision on environmental conditions should specify the form of final monitoring reports in such a way that the first part of the reports will contain the results of the post-investment research from a given period, and the second part will compare the findings contained in the report and in the environmental decision, which will give them the character of a post-development analysis. Taking into account the above-mentioned proposals of the Report, the Regional Director for Environmental Protection established in the essentials of this Decision the scope of the post-investment environmental monitoring program and reporting standards.

The third request of the Gniazdo Orła association concerned the indication of the location of the wind farm connection. It was stated that although the location of the connection point of the planned farm, i.e. the Słupsk - Wierzbicino substation, is known, the exact location of the cable connecting the farm with the NPS (National Power System) was not indicated, both on land and in water. Moreover, the location of the EHV substation adapting the energy parameters on the farm to the NPS parameters was not indicated. It was only stated that the station would be located on land or sea or on land and sea. Moreover, the Association alleged that although the report indicated that the above-mentioned elements are technologically related to the planned wind farm, they were excluded from the scope of the study. The Association requested that the exact location of the power line between the farm sub-station and the connection point be indicated.

According to the report and explanations provided by the Investor, the connection infrastructure of the BSIII OWF is not covered by the impact assessment as it is a separate project (point 8 of

Chapter 1 of Volume II of the report entitled "Transmission of electricity generated by the farm") entitled: offshore transmission infrastructure for electricity ("OTI"). It is subject to a separate procedure for the issuance of a decision on environmental conditions, for the purposes of which environmental studies and an impact report have already been carried out. The OTI has been described in great detail in point 7 of Chapter 3 of Volume II of the report, for the purposes of analyses of potential impacts accumulated with the BSIII OWF. Such an assessment can be found, e.g. in the chapter on the impact on the abiotic environment, where it is indicated that export cables will only be constructed at very short distances near the farm and then, as they will approach the shore, at a distance causing no or negligible accumulation (Volume IV, Chapter II, point 9.1.14. "Cumulative impacts").

The fourth request of the Gniazdo Orła Association concerned the lack of the analysis in the report of an alternative option consisting in the construction of a coal-fired or lignite-fired power plant with a biomass-fired boiler. The request to analyze the additional option referred to above was justified, in particular by the fact that it is much more economically rational.

Pursuant to Article 66 section 1 point 5 of the EIA Act, the EIA report should contain a description of the analyzed options, including: a) the option proposed by the applicant and a rational alternative option, b) the most beneficial option for the environment, together with the justification for their selection. The description of these options is presented in Chapter 2 of Volume II of the report and the assessment of their impact on particular elements of the environment is presented in Volume IV. Thus, the report fulfills all legal requirements in this respect.

As it results from the report and the explanations sent by the Investor, the investment objective assumed by the applicant is to generate electricity using a renewable source, i.e. wind power (cf. e.g. Volume II, Chapter 2, point 4.1. "Rational alternative option"). The construction of a coal-fired power plant does not meet this objective and therefore cannot be considered as a rational alternative option. Therefore, there is no factual or legal justification for including the alternative project option proposed by the Gniazdo Orła Association in the variant analysis.

The authority also did not take into account the request of the Gniazdo Orła Association to carry out an administrative hearing referred to in Article 33 of the EIA Act.

The Gniazdo Orła Association did not provide any justification for the request. A similar request has not been lodged by any party making comments in the course of the procedure. The Investor provided a very wide and open access to information about the project, among others, by publishing the project website www.baltyk3.pl on the Internet and by organizing a six-month information campaign addressed to all stakeholders of the project. The Investor also tried to establish direct contact with the Gniazdo Orła organization in order to undertake a direct discussion on the comments made and the answers given, which remained unanswered by the Association. These facts justify the absence of a need to organize an administrative hearing in the procedure in question.

The application of the Krokowa Borough Office concerned supplementing the report with the analysis of the investment project impacts on the cultural and landscape values of the borough, taking into account the visualization of the investment project from the side of the sea shore, including the decrease in tourist attractiveness and the decrease in the revenues of the borough.

One of the elements of the report is the analysis of the impact on the landscape, included in Chapter 9 of Volume IV of the EIA Report. The report contains visualizations of the wind farm, among others, photographs taken from the beach in two tourist resorts of the Krokowa borough - Dębki and Białogórze, located about 40 km and 36 km from the BSIII OWF respectively (Volume IV, Chapter 9, Figure 9 - "Map of places from which the photographic documentation was made"). The visualizations include both the BSIII OWF project and other farms planned in this area (potential cumulative impact on the landscape). Both for a single wind farm and in the accumulation, the BSIII OWF is almost invisible from both locations (as white points on the horizon line) in good weather and completely invisible in case of greater cloudiness, which is shown in the visualizations in points 9.2.8. and 9.2.9. The significance of the impact of the BSIII OWF described above (independently and in accumulation) on the landscape was assessed in the report as small, for both analyzed localities (cf: Volume IV, Chapter 9, points 9.2.8.1 and 9.2.8.2). Whereas, the potential impact of

the project on tourism and other forms of sea use, including: commercial fishing, cultural heritage, sea shipping, exploration, recognition and exploitation of mineral resources of the sea bed, coastal tourism, recreational fishing, water sports (windsurfing, kitesurfing, sea sailing, wreck diving), maritime industry, at all stages of the project, was assessed in the report as negligible (cf: Volume IV, Chapter 11, point 7 of the report). The Regional Director for Environmental Protection believed in these findings. Therefore, also in the opinion of the authority, there are no grounds for accepting the thesis of the decrease in tourist attractiveness and revenues of the Krokowa borough as a result of the impact of the BSIII OWF on the landscape, independently and in accumulation. Moreover, according to the Investor's information, the Investor met with the Head of the Krokowa borough, after submitting the said comment, in order to clarify any doubts concerning the impact of the project on the interests of the Krokowa borough. During the meeting, the representatives of the borough confirmed the adequacy of the presented explanations and that they have no further doubts as to the potential impacts of the BSIII OWF.

The comments and requests submitted by Generpol Sp. z o.o., Polish Offshore Wind Energy Society, Elektrownia Wiatrowa Baltica - 2 Sp. z o.o., Elektrownia Wiatrowa Baltica - 3 Sp. z o.o., Baltic Power Sp. z o.o. and PGE Energia Odnawialna S.A. have similar content and concern the issue of a possible designation of migration corridors for birds between wind farms planned on the north-eastern slope of Ławica Słupska presented in the report.

According to the report and explanations sent by the Investor, the analysis of the permits for erection and use of artificial islands, structures and equipment in the Polish maritime areas issued in the recent years allows to conclude that the offshore wind farms planned on the north-eastern slope of the Ławica Słupska (Bałtyk Środkowy II and II OWF, Baltica 2 and 3 - holding conditions for connection, as well as Baltic II, Baltic Power and C - Wind, which do not have such conditions yet) may, in time, create a latitudinally located barrier of up to approx. 70 kilometers.

The authors of the report estimate that as far as the implementation of the first farms will not cause a significant barrier effect for birds, as they will be sufficiently distant from each other, it cannot be excluded that the construction and operation of a larger group of wind farms on the north-eastern slope of Ławica Słupska may potentially have a significant negative impact on the integrity of the Natura 2000 areas: Ławica Słupska (Słupsk Bank) PLC990001 and Przybrzeżne wody Bałtyku (Baltic Coastal Waters) PLB990002, by hindering migration, especially of sea ducks, to wintering grounds located in their areas, and the return of birds from wintering grounds. It cannot be ruled out either that such a large barrier can have a significant negative impact on avifauna by hindering local flights, e.g. in search of food.

The report proposed that during the administrative procedure of the EIA for offshore wind farms, which will be constructed in this area after the execution of the first OWF, the authority conducting the procedure should each time consider the need for minimizing action in the form of leaving at least 4 km wide corridors between the farms in order to ensure free migration of birds. It should be stressed, however, that these conclusions are based only on research carried out in the OWF areas of BSII and BSIII. There is no environmental research available for other projects.

Presentation of the proposals of activities minimizing the negative impact is an obligatory element of each EIA report, so the proposals of such activities will be included in the EIA reports for subsequent OWFs. Their authors, on the basis of their own environmental research and environmental data from reports for the OWFs of BSII and BSIII (as publicly available documents), i.e. knowledge much broader than the current knowledge, will be able to present their own proposals for mitigation measures.

The authors of ornithological analyses stated that perhaps the optimal solution would be to leave only one corridor between the groups of farms, which would be 4 - 5 km wide (optimally 8 km), properly located, in accordance with the main directions of movement of migrants in autumn to wintering grounds and in spring from wintering grounds, free of power plant buildings. Such an action, however, would require the cooperation of other OWF investors, and first of all - access to environmental research for the whole area mentioned above.

The Investor also pointed out that there may be no need to create "artificial" corridors, because they may be created "naturally" at the stage of building permit designs, e.g. if, after deep drilling, it turns out that the geological structure of the seabed in some areas does not allow for the

foundations of the wind turbines to be located there. Therefore, the need to create special corridors facilitating bird migration will largely depend on the final shape of the planned OWFs.

In the opinion of the Regional Director for Environmental Protection such a conclusion of the Authors of the report cannot become the basis for the contents of the decision on environmental conditions, because at the present stage there is no sufficient data concerning the conditions for the implementation of subsequent projects, and because this decision cannot create obligations or prohibitions on the part of third parties, as it decides only about the rights and obligations of the Applicant. Possible occurrence of cumulative impacts caused by the construction of many farms, including in the context of the indicated issue, became one of the grounds for determining the obligation to conduct another environmental impact assessment procedure for the issuance of the building permit.

With regard to the specific issues to be clarified in this procedure, this Decision indicates the guidelines for the methodology for determining possible corridors, taking into account an equal treatment, approach to the planned, neighboring wind farms, taking into account the economic costs of the projects and the need to ensure a high level of environmental protection.

For the needs of the environmental impact assessment in question, abiotic elements were examined: hydrological and hydrochemical conditions (water quality, sea currents and waves, temperature, turbidity and electrical conductivity of water, meteorological conditions), seabed geology, mineral resources, physico-chemical properties of bottom sediments and the acoustic background.

Biotic elements were also examined: benthos, fish, birds (seabirds staying in the area of the project and flying over the farm, including migratory birds), marine mammals and bats. In addition, studies related to archeology, fishery and vessel traffic were carried out in the project area.

Assessment of the impact of the project on the environment and Natura 2000 sites was based on determination of the facts as well as research and development concepts included in the environmental impact report of the project presented by the applicant.

The report was preceded by a comprehensive study of biotic and abiotic elements of the marine environment conducted in the years 2012 - 2014.

Water quality tests included sampling at several dozen measurement points and in several layers, including surface and bottom layers. The samples were then subjected to laboratory analyses. In all samples the following parameters were determined: pH, alkalinity, suspension, biogenic substances (ammonium nitrogen, nitrite nitrogen, nitrate nitrogen, mineral nitrogen, total nitrogen, phosphates and total phosphorus), total organic carbon (TOC) as well as oxygen conditions (dissolved oxygen, BOD₅). In some samples the content of particularly harmful substances was determined: PAHs, PCBs, metals (Pb, Cd, Cr, Cr(VI), As, Ni, Hg), phenols, free and bound cyanides, mineral oils and radioactive activity of: ⁹⁰Sr and ¹³⁷Cs. It was found that the physico-chemical parameters of the water in the area of the BSIII OWF did not generally differ from the typical contents of waters of the southern Baltic Sea. The waters of the studied region were characterized by a low content of particularly harmful and radioactive substances.

The examination of marine currents and waves was carried out with the use of two measurement sets, recording continuously the surface waving and water flows in the entire cross-section of the body of water. The collected data was processed by a computer. The greatest variability of sea currents was recorded in the layer at the depth of 0-4 m below sea level, where at the beginning of February and in autumn, the maximum water flow velocities reached 102 cm/s (during a strong storm). Water flow velocities in deeper layers oscillate between 0 and 50 cm/s and are much less variable. The direct influence of current atmospheric conditions on the the value and character of water flows, seasonal differences in the velocity values of currents and large differences in the maximum velocity values of flows in both parts of the field, is visible. The most intensive water waving was in the autumn and winter period, while it was calmest in spring and summer. The highest wave recorded was 6.14 m, and the average wave height was about 0.5 m. Wave traffic was mainly from west and north-east.

Water temperature measurements were taken at several dozen measurement points, in surface and bottom layers, using an oceanographic probe, sensors placed on a measuring buoy and integrated with current meters. The results of temperature measurements were obtained both in the body of water and at the bottom, together with its distribution in the whole area of the farm. The measured temperature values do not differ from those typical for the South Baltic area. An increase in the average temperature of the Baltic Sea was observed (from 6.3°C to 7.8°C). The bottom temperature is stable, not modified by dynamic phenomena in the water and atmosphere.

The turbidity and electrical conductivity of water over the sea bed were tested using two measurement sets, enabling continuous recording, located in the central and southern part of the farm. The collected data was processed by a computer. The measured turbidity values of the water above the bottom range from 0.215 to 3.556 NTU. The average value for the whole measurement cycle is 0.553 NTU. Numerous temporary increases in this parameter relative to the average trend can be observed. The electrical conductivity of water above the sea bed varied from 7.82 to 11.37 mS/cm. The highest values were measured in summer while the lowest in winter. The average conductivity value for the whole measuring period is 8.77 mS/cm.

No offshore research was carried out in terms of ice conditions. On the basis of information on ice conditions on the Baltic Sea published on an ongoing basis by the Institute of Meteorology and Water Management in Gdynia in the winter season 2012/13, as well as on the basis of information obtained during service cruises to the buoy, it was found that ice phenomena in the area of the BSIII OWF did not occur.

The meteorological conditions were measured by means of an automatic, compact meteorological station placed on a measuring buoy anchored in the central place of the BSIII OWF field. The wind speed and direction, air temperature, air pressure and humidity as well as the intensity of solar radiation were measured. The measured wind speeds ranged from 0 to 5 on the Beaufort scale. Higher speeds were recorded only during strong storms at sea (maximum 23 m/s). The area of the farm is dominated by winds from the west-south and east-north sectors. The period when the stronger winds blow is the autumn-winter period. During this time also most of the storms at sea occur. The wind speed and wind directions are typical of the southern Baltic Sea. The minimum recorded temperature is -8,5 °C and the maximum temperature is 23,6 °C. The measured air temperature features the annual course compliant with the average temperature course in the Baltic Sea area.

Geological surveys of the seabed in the area of the BSIII OWF included: bathymetric measurements (depths), geophysical measurements (recognition of the deep structure) and sonar measurements (recognition of the character of the seabed surface), as well as collection of core samples of sediments in order to determine the type of rocks building the seabed. On the basis of the analysis of the image obtained from the recording with the multibeam side scanner probe, seismoacoustic profiling and the elaborated core and bucket tests, the relief and structure of the sea bed of the BSIII OWF area was elaborated in detail. Five areas with a varied bottom relief and a different genesis were distinguished and marked as the following areas: P1 - moraine upland slope; P2 - higher level of a set of kame terraces; P3 - lower level of a set of kame terraces; P4 - valley within the higher level of kame terraces; P5 - accumulation plain. It was found that the geological and geomorphological conditions of the BSIII OWF area are generally favorable for the foundation of elements of wind farm infrastructure. The least favorable conditions (depending on the technology/ method of foundation) for the location of the farm elements, due to the bottom relief, occur in the southern and south-western part of the P1 area. The area has a strongly raised relief resulting from the erosion processes associated with the mass flow excavation of this part of the sea bed. Denivelations reach up to 3 m and are associated with patches, ridges and isolated tops of moraine relief relics. These are dissected parts of clays. The cavities between the ridges and humps are irregular, of the nature of both isolated cavities and elongated creases. Grain size distribution analyses of the bucket samples show a high degree of variation due to the nature of the structure of this field (clays in patches, sands and/or gravel in cavities). This may affect the final

location of individual elements of the wind farm infrastructure and/or may affect the costs of the ground preparation for the foundation. However, this does not disqualify the area from the possibility of the building development.

Research on mineral resources was based on the material collected during geological surveys of the seabed and on literature analysis. Four small fields of potential placer deposits (gravel sands) were found in the investigated area (farm and buffer). These are accumulations lying underneath the overburden of fine and very fine sand with a thickness of 2 or more meters. At present, the management of these potential accumulations seems to be unprofitable from the equipment and economic point of view. No amber or heavy minerals were found there. The area of the farm overlaps in small pieces with the areas covered by concessions for explorations for oil and gas, as well as shale gas (Gaz Południe and Słupsk E).

Physico-chemical properties of sediments were begun with sampling. The material for tests of the physical properties of sediments was collected in the amount of 1 sample per 1 km² and the material for testing the chemical properties of sediments in the amount of 1 sample per 3 km². Sediment samples were collected from the surface layer with a grab (Van Veen sampler) from a vessel. The samples were tested in a laboratory. The following physico-chemical indices were analyzed: moisture, calcination losses, total content and labile form of metals (Pb, Cu, Zn, Ni, Cd, Cr, As, Fe), polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), mineral oils, ¹³⁷Cs radioactive activity, tributyltin (TBT) and twice a year (due to seasonal changes) the content of biogenic substances (total nitrogen and total phosphorus). The analyzed sea bed surface sediments from the BSIII OWF area belong to inorganic sediments with organic matter content below 10%. Concentrations of total phosphorus and total nitrogen did not exceed the values typical for biogenic substances in sediments of the southern Baltic Sea. The investigated sediments were characterized by low heavy metal content and low concentrations of PAH analytes, mineral oil and radioactive ¹³⁷Cs. The results of the concentrations of the sum of seven compounds from the PCB group were below the determination limit of the method. TBT concentrations in the studied area were also at a low level characteristic for sandy sediments in the southern Baltic region.

Background noise surveys were conducted using an acoustic recorder with a built-in hydrophone. The instrument recorded all ambient noise between 2 Hz and 22 kHz on a microprocessor card. The underwater recorder was installed with a porpoise sound recorder, referred to as C-POD. The data obtained was then processed by a computer. A significant difference was found in the background noise levels for particular seasons of the year. The highest values were recorded in the winter of 2012/2013 and spring of 2013. (114 dB re 1pPa). The study results show that the background noise levels in the BSIII OWF area are typical for coastal areas, with value differences depending on the season of the year and sea conditions. Based on the results of the measurements conducted in spring 2013, when the highest background noise levels were obtained, it can be concluded that these levels exceed the known hearing thresholds in the water of common and ringed seals and probably also of gray seals, although no audiogram is available for the latter species. At frequencies above 400 Hz, the background noise in the BSIII OWF area can be detected by porpoises. The sound pressure levels determined during tests do not exceed the threshold values for hearing loss of seals and porpoises. However, masking of sounds produced mainly by seals may occur.

To sum up, it was concluded that the background noise recorded in the survey area has a potentially minor impact on seals and harbor porpoises, but it can mask sounds produced mainly by seals.

The benthic surveys covered phytobenthos and macrozoobenthos. The scope and methods of phytobenthos surveys included filming the seabed with a remotely operated underwater vehicle (ROV) at previously selected sites of potential vegetation occurrence, i.e. at the hard bottom (boulders, pebbles, clay) not exceeding 25 m depth (the area meeting these criteria covered only 1% of the surveyed area and was located in the south-western part of the buffer zone of the BSIII OWF area), identification of species and determination of seabed coverage by analyzing the recordings. The scope and methods of macrozoobenthos survey included sampling at the

previously determined 170 points covering uniformly the area of the planned farm and buffer around it and their laboratory analysis – determination of species composition, size, mass and length.

Four species of algae were recorded (*Furcellaria*, pipefish, *Pylaiella*, *Ectocarpus siliculosus*) attached to stones or mussel beds moving on the sandy seabed in the south-western part of the buffer zone. One of the species – *Furcellaria lumbricalis* – is under strict protection. Phytobenthos grew very scarcely on stones and mussels – seabed cover up to 1%, which is typical for regions with depths exceeding 20 m. The surveyed area is characterized by low natural values of phytobenthos, and single specimens of protected algae do not affect this assessment.

27 macrozoobenthos species or communities have been recorded, with 2 communities inhabiting different seabed types. Both communities are largely composed of the same species, but differ in the dominant species. Community 1 occurs in the project's north-western part, at an average depth of about 40 m, settling coarse-grained settlements (coarse sands, gravels and pebbles). *Mytilus trossulus* is the dominant species in this group in terms of population size. The mussel attaches firmly to hard surfaces to form clusters. Community 2 was located in the remaining shallower part of the farm, with an average depth of 29.5 m, where mainly sandy sediments of varying degrees of grain size can be found. The dominant species in this group in terms of population size is the common sand-inhabiting polychaete *Pygospio elegans*, which lives in pipes made of clumped sand grains. The species composition, population size and biomass of the macrozoobenthos in both communities were typical of the shallow and medium deep seabed of the open area of the southern Baltic Sea; no rare and protected species were found.

15 fish species were found in the OWF area and buffer zone. Larvae of 10 fish species and spawn of *Sprattus sprattus* sprat were found in the ichthyoplankton samples.

Of all the species encountered, 6 species: herring *Clupea harengus*, sprat, cod *Gadus morhua*, flounder *Platichthys flesus*, plaice *Pleuronectes platessa* and turbot *Scophthalmus maximus* are caught commercially by Polish fishermen, but only 4 of them: sprat, herring, cod and flounder were more numerous in the exploratory fisheries. The population size of other fish species was small, or incidental, from one specimen (saithe *Pollachius virens*, the garfish *Belone belone*) to 43 specimens (great sandeel *Hyperoplus lanceolatus*). In the exploratory fisheries, sprat (77.9%), cod (9.5%), herring (7.6%) and flounder (4.4%) were the most numerous species in the OWF and buffer zone. The surveyed BSIII OWF area is located in the shallow water zone, where the waters in the whole column are well mixed and oxygenated all year round. This results in a high seasonal variability of their thermal properties. This parameter may limit the availability of these waters for herring: in winter due to excessive cooling and in summer due to excessively high temperatures, especially for adult fish, as this is a psychrophilic species. Their presence was recorded in the whole region only at the turn of late spring and early summer (June-July), which was related to feeding migrations of spring herring from the coastal spawning grounds towards the open waters of Słupsk Furrow (Rynna Słupska). No herring mature for spawning was recorded in the survey area during the entire annual survey cycle in both spring and autumn populations, which would clearly indicate the existence of spawning grounds for these populations in the survey area. Such confirmations were also not provided by underwater diving surveys. Low results of herring exploratory fisheries, as well as the observed lack of a cutter industrial fleet presence in the BSIII OWF area in the whole annual cycle indicated that the fishing utility of the investigated area with its buffer zone in the targeted exploitation of this species is negligible.

The area of Słupsk Bank, including the area intended for the foundation of the wind farm, lies on the edge of the sprat spawning ground, especially in relation to the second breeding phase, which takes place at the end of spring and the first days of summer. The examined region is also an additional area of periodical habitation and movement of a small fraction of young sprats. Relatively shallow waters of Słupsk Bank, which are susceptible to cooling and vertical thermal equalization, are not (January-March) a wintering place for sprat shoals. The planned BSIII OWF technical facilities will not have a significant impact on the course and efficiency of the late spring pelagic spawning of Baltic sprat and the condition of its stock. However, they may hinder larvae and fry

drift towards traditional feeding and shelter sites of young specimens, i.e. the southern part of the Gulf of Gdańsk and Kolobrzeg-Darłowskie fisheries, during the preliminary construction phase due to elevation of seabed sediments and water turbidity and acoustic disturbances from operating machines.

The conducted survey showed that the area is a permanent habitat for cod, especially in younger age groups. The conducted surveys show that in the exploratory fisheries there were mainly (in some surveys even 80% of the population size) juvenile cods (below the minimum landing size – 38 cm), most often representing age groups 1 and 2. Due to their size and associated food preferences, these cod mainly inhabit shallower areas of the Baltic Sea, such as coastal zones or offshore shallow water areas (e.g. under design farms). They find their favorite food there (mostly crustaceans). Analysis of cod's nutritional composition (occurrence of food typical for juvenile cod) also indicates that the study area is favorable mainly for young cod. The area of the planned farm is important for cod because in the last few years there has been an increase in the population size of this species. In order to avoid intra-species competition for food related to shoal density (resulting from increasing population sizes of cod), cod searched for new areas to inhabit.

The European flounder was present in the fisheries in all the survey periods. In terms of population size, it was the second largest demersal species, with cod being the first largest one. In all exploratory fisheries, the flounder population size in the OWF zone was higher than in the buffer zone, except in November 2012 when the yields in both zones were almost equal. The benthic survey shows that the BSIII OWF area is inhabited by organisms constituting an appropriate food for European flounder. However, the observation of the degree of contents of the European flounder's digestive tract shows that the feeding intensity was not adequate to the food availability found (on the basis of benthic surveys). Low foraging activity should be explained by seabed temperatures found during the survey period, as they reduced the demand for food. On this basis it can be concluded that the area is not an attractive feeding ground for this species. High European flounder presence in the OWF area and the buffer zone in January may indicate that this area lies on the European flounder migration route from feeding grounds in shallow coastal waters to the spawning grounds in the Słupsk Furrow (possibly in the Gdańsk or Bornholm Deep).

Sprat eggs and larvae were the most common ichthyoplankton component. This is a sign of the occurrence of quite intensive summer spawning of this species in the area of the planned project. Among other ichthyoplankton taxa, the most numerous species were European flounder larvae originating mainly in the spawning in Słupsk Furrow. An important ichthyoplankton survey result (in terms of natural assets) was finding the occurrence of larvae of two protected fish species: common seasnail *Liparis liparis* and sand goby *Pomatoschistus minutus*. For some time after hatching, the larvae of both species live a pelagic life. Therefore, it cannot be excluded that spawning of these species may occur in the OWF area or in its vicinity. However, the occurrence of a small number of pelagic larvae moving along with the water does not necessarily indicate their hatching at the place where they are caught.

The group of seabirds includes species of waterbirds, which, during the breeding season, are mostly found in sea waters. Most of them reach their highest population size in the high sea zone located over 1 km from the coast. Seagulls, which accompany fishing boats in fishing grounds, are an exception to this rule, and their occurrence in the open sea is strongly dependent on human activity. The survey was conducted in the area of the planned BSIII OWF and in the buffer zone with a width of 2 nautical miles from the borders of the area designated in the permit for erection and use of artificial islands, structures and devices in the Polish maritime areas (hereinafter referred to as the Permit). The area covered by the analysis of bird densities included an area of approximately 769 km², including approximately 117 km² of area designated for the construction of an offshore wind farm and approximately 222 km² of the buffer zone surrounding the farm area. The survey period was divided into 4 seasons covering consecutive annual periods of life cycles of seabirds: summer, autumn migration, wintering and spring migration. Observations were made along 4 transects with an interval of approximately 0.5-1 mile after each turn to minimize the likelihood of counting the same specimens twice. The cruise course was planned so that the counting of birds takes place not only in the area intended for the project, but also in the adjacent water area in the two-mile buffer zone designated outwards from the borders specified in the

Permit. The total length of the four transects was 89.42 km (49.67 NM) and the area within them was about 54 km². Each time, the counting of birds along all four transects took about 6-7 hours. It should be noted that for non-breeding birds in sea areas, the counting time has no impact on the results. In the open sea, birds do not have roosting sites and feeding grounds located far from each other, hence their regular movements are not observed during the bright part of the day as is often the case in onshore areas or in the coastal zone with shallow bays and estuaries of large rivers. 24 survey cruises were carried out in the period in question. The observations were conducted by 3 people each time, and a total of 11 people took part in the survey. Additionally, during the survey, birds flying over the project area associated with the terrestrial environment were recorded. During 24 survey cruises carried out in the BSIII area, a total of 34 species of water birds were found, including 15 species of sea birds and 23 species associated with the terrestrial environment. The total population size of birds observed was 9746, and the average bird number per survey cruise was 406. The share of seabirds among all observed birds was 72%, for other species of waterbirds it was 23% and for birds associated with habitats it was 5%.

The following species of seabirds have been recorded: long-tailed duck *Clangula hyemalis*, European herring gull *Larus argentatus*, common scoter *Melanitta nigra*, razorbill *Alca torda*, velvet scoter *Melanitta fusca*, common murre *Uria aalge*, lesser black-backed gull *Larus fuscus*, little gull *Larus minutus*, great black-backed gull *Larus marinus*, arctic loon *Gavia arctica*, black guillemot *Cephus grylle*, black-legged kittiwake *Rissa tridactyla*, red-throated loon *Gavia stellata*, common eider *Somateria molissima* and parasitic skua *Stercorarius parasiticus* (in order of decreasing population sizes).

The following species of waterfowl have been observed to migrate above the farm area, but they are not permanently associated with the marine environment: Eurasian wigeon *Anas penelope*, bean goose *Anser fabalis*, common gull *Larus canus*, greater white-fronted goose *Anser albifrons*, great cormorant *Phalacrocorax carbo*, common teal *Anas crecca*, northern pintail *Anas acuta*, black-headed gull *Chroicocephalus ridibundus*, northern shoveler *Anas clypeata*, mallard *Anas platyrhynchos*, mute swan *Cygnus olor*, black tern *Chlidonias niger*, red-breasted merganser *Mergus serrator*, whooper swan *Cygnus cygnus*, tufted duck *Aythya fuligula*, greater scaup *Aythya marila*, common tern *Sterna hirundo*, goosander *Mergus merganser* and sandwich stern *Sterna sandvicensis* (in order of decreasing population sizes).

The following bird species associated with terrestrial habitats have also been observed to migrate over the farm area: Eurasian skylark *Alauda arvensis*, common starling *Sturnus vulgaris*, Eurasian curlew *Numenius arquata*, chaffinch *Fringilla coelebs*, siskin *Spinus spinus*, grayback *Calidris canutus*, common crane *Grus grus*, common ringed plover *Charadrius hiaticula*, song thrush *Turdus philomelos*, European gold plover *Pluvialis apricaria*, great tit *Parus major*, rook *Corvus frugilegus*, short-eared owl *Asio flammeus*, swift *Apus apus*, goldcrest *Regulus regulus*, robin *Erithacus rubecula*, white wagtail *Motacilla alba*, dunlin *Calidris alpina*, willow warbler *Phylloscopus trochilus*, Eurasian wren *Troglodytes troglodytes*, lesser whitethroat *Curruca curruca*, brambling *Fringilla montifringilla*, barn swallow *Hirundo rustica* (in order of decreasing population sizes). Birds closely associated with the terrestrial (onshore) environment were found in small population sizes. For the largest population (Eurasian skylark), only 145 individuals per year were observed.

Out of the total number of 57 species found, 49 are under full and 3 under partial species protection in Poland. Five species have the status of game species. The whooper swan, black-throated loon, red-throated loon, little gull, common tern, sandwich stern, black tern and short-eared owl are listed in the Appendix I of the EU Birds Directive. Three species – the velvet scoter, the long-tailed duck and the Eurasian curlew – were classified into increased category of endangerment by International Union for Conservation of Nature (IUCN). 5 species have an increased SPEC2 category, and further 14 have been received the SPEC3 status, two of which apply not to breeding populations, but to populations that winter in Europe. Of these species, only the long-tailed duck, velvet scoter, little gull, black-throated and red-throated loons were observed within the surveyed area, and the rest of them only flew over it. The long-tailed duck was the only more numerous species from the group with a higher endangered status.

Sea birds in the survey area were at low densities. The average density of waterfowl in the buffer zone and in the planned project area was similar. It did not exceed the values of 15 specimens/km² in any of the four phenological periods, and in the individual phenological periods it amounted to

0.7 and 0.9 specimens/km² for the farm and buffer area in summer, to 3.2 and 3.4 specimens/km² in autumn, to 13.1 and 10.6 specimens/km² in winter, to 8.5 and 9.2 specimens/km² in spring and to 8.5 and 9.2 specimens/km² in spring respectively.

The highest concentrations of seabirds were found at the end of the wintering period during the cruise on February 22, 2013. However, even then the area of the highest density ranging from 50 to 87 specimens/km² covered only a narrow strip in the western part of the buffer zone and overlapped the planned project area to a small extent. In spring, the highest densities from 10 to 30 specimens/km² persisted in the area covering about 1/3 of the area designated for the project, while in the remaining phenological periods, low densities, not exceeding 10 specimens/km², prevailed in the examined sea area. At the same time, the surveys carried out in the area of Słupsk Bank, located about 5 km to the east, showed the water bird density in December and January significantly exceeding the value of 100 specimens per km². The observations in this area carried out as part of the domestic monitoring of Wintering Sea Birds carried out by the Chief Inspectorate for Environmental Protection in January 2014 showed an average long-tailed duck density of 248 specimens/km². According to literature data, the highest densities of seabirds in the Baltic Sea exceeding 100 specimens/km² are found in the shallower water zone than 30 m, where rich zoobenthic communities can be found. Therefore, it can be concluded that the BSIII OWF area is of little significance for seabirds both during migration and wintering as well as in summer. Slightly more birds stop here in winter and during spring migration, but even then the average population size and density of birds in the project zone were not high.

The distribution of birds in the examined area in subsequent phenological periods was very variable, and it is difficult to identify a single part of the examined area that was clearly preferred by seabirds. In summer and autumn, when the avifauna population size was low, in the OWF area there were mainly densities below 5 specimens/km², with slightly more birds staying north of the planned project area in the buffer zone and beyond. In winter, when the sea bird population size was the highest, the area of the highest density ranging from 50 to 87 specimens/km² covered only a narrow strip in the western part of the buffer zone and overlapped the planned project area to a small extent. The distribution of avifauna during this period was very diverse with neighboring areas with different densities. In spring, after a decrease in the population size of birds, their preference for the eastern part of the sea area could be observed. However, the average density at the sites with the highest concentrations of avifauna reached only 35 specimens/km² in the spring. The reason for the lack of preferences for a single part of the examined sea area is most probably a poor food base with low biomass of zoobenthos.

During the observation, the flight height of birds was recorded, broken down into the following altitudes: 0-15 m, 15-60 m, 60-200 m and above 200 m. These altitudes correspond approximately to the height of the wind turbine structure. During the entire survey period, 59% of all flights were at low altitudes (up to 15 meters above water), approximately 23% at altitudes of 15-60 meters and 18% at higher altitudes. Only during autumn migration, when the population size of migrating birds was the highest, flights at altitudes below 15 m were less than 40%. It results from a very high number of geese moving over the surveyed sea area in October at heights above 15 m.

The two most numerous bird species by far are the long-tailed duck and the European herring gull. The long-tailed duck was the most numerous species in the examined sea area. Its share among all observed birds ranged from 16.5% in autumn to 61.2% in spring. It nests on a vast area of North American and Eurasian tundras. The Baltic Sea is the most important wintering place for this species. Long-tailed ducks travel low above water, which significantly reduces the risk of collision with wind turbine rotors. The average altitude of their flights in the area of offshore wind farms located off the coast of North America was only 1.9 m. A much more serious impact of wind turbines on this species involves the reduction of the area of their feeding grounds. long-tailed ducks avoid the area occupied by wind turbines and their population size decreases significantly at a distance of 2 km. Therefore, the location of wind farms in rich feeding grounds may have a significant harmful impact on this species, especially in the Baltic Sea, where the population of long-tailed ducks has decreased rapidly, which has resulted in an increase in the category of endangerment by the International Union for Conservation of Nature (IUCN).

The second largest species in terms of population size was the European herring gull. Its share among all observed birds ranged from 8.2% in spring to 73.8% in summer. European herring gull

nests around the Baltic Sea, where the largest populations inhabiting Finland and Estonia are estimated at 65-90,000 pairs. According to data collected from 19 offshore wind farms, on the basis of flight altitudes of 25,153 European herring gulls, the species showed a high risk of collision because 28.4% of the flights were within the range of 130 m diameter rotors with a clearance of 20 m between the water surface and the lowest rotor position. Surveys performed at other locations show significant variation in flight altitudes (from 1 to 300 m) with an average of 33 m. During the construction of an offshore wind farm, European herring gulls show more frequent occurrence in its area than in the period preceding the construction. After completion of the construction, the interest in the offshore wind farm decreases. European herring gulls use structures protruding from water, including inactive wind turbines, as a resting place. It seems, however, that the factor that most strongly limits the occurrence of this species in the area occupied by turbines is the limited opportunity for fish catches in the neighboring areas.

The remaining species of waterfowl appeared in the BSIII OWF area in a small population size, and only in autumn their share was high and amounted to 67%. This result was caused by the presence of geese, which were flying over the examined sea area in large numbers in October. In the remaining phenological periods, the total share of the two most numerous species of long-tailed duck and European herring gull exceeded 75%.

To sum up, the results of thirteen-month observations of marine avifauna in the BSIII OWF area showed that the area intended for the construction of the offshore wind farm is not a place of high concentration of seabirds. Most birds stayed here in winter, when their average population size was estimated at 1530 specimens in the area designated for the wind farm construction and 2350 specimens in the buffer zone. In spring, the number of birds using both parts of the surveyed sea area was slightly lower, and in summer and autumn it did not exceed 1000 specimens in the buffer zone and in the project zone. The most numerous seabird species present in the area of the "Bałtyk Środkowy III" OWF area were the long-tailed duck and the European herring gull, which is typical for most of the Baltic Sea areas with depths ranging from 25 to 40 m located off the coast. The remaining species appeared here rarely and in low quantities, and most of them were not connected with the surveyed sea area, but flew over it.

There was no intensive migration of birds over the area during the daytime in the period of spring migration. In autumn, migrating geese appeared more numerous over the surveyed area. They accounted for 54% of all birds observed in flight in that period. Approximately 60% of all bird movements took place at altitudes below 15 m.

During the surveys, the species composition, population, density and migration height of sea birds in the Natura 2000 PLC990001 Ławica Słupska (Słupsk Bank) site were determined. The methodology adopted in these surveys was the same as for the birds in the area of the planned OWF. The cruise route ran along 8 sections, referred to as transects, of a total length of about 84 km, which were designated so as to achieve representative results for the varying conditions resulting from the changes in depth, and 18 survey cruises were carried out.

A total of 31 species of water birds were found during all the survey cruises carried out in the area of Natura 2000 PLC990001 Ławica Słupska (Słupsk Bank) site, including 15 species of sea birds and 12 species associated with the terrestrial environment. The total population of birds observed was 102134, and the average bird number per survey cruise was 5674. The share of seabirds among all observed birds was as high as 99.5%, which is due to a very large number of long-tailed ducks in this area, which in total constituted over 94% of all observed birds. The following species of seabirds were recorded: long-tailed duck, velvet scoter, European herring gull, common scoter, razorbill, guillemot, black guillemot, black-throated loon, lesser black-backed gull, great black-backed gull, little gull, red-breasted loon, parasitic skua, common eider and black-legged kittiwake (in order of decreasing population sizes). The following species of waterfowl have been reported to migrate during the daytime over the Słupsk Bank area, but are not permanently associated with the marine environment: mute swan, common gull, bean goose, Eurasian wigeon, great cormorant, greylag goose, northern shoveler, mallard, common teal, goosander, black-headed gull, Canada goose *Branta canadensis*, tundra swan *Cygnus bewickii*, greater scaup, common tern and black tern (in order of decreasing population sizes). The following bird species associated with terrestrial habitats were also observed flying over the examined area: Eurasian skylark, chaffinch, swift, European gold plover, white wagtail, common starling, barn swallow, great spotted woodpecker

Dendrocopos major, long-eared owl, osprey *Pandion haliaetus*, icterine warbler *Hippolais icterina*, black redstart *Phoenicurus ochruros* (in order of decreasing population sizes).

Seabirds periodically stayed in the Natura 2000 PLC990001 Ławica Słupska (Słupsk Bank) site at high and very high densities. The average density of the whole group of waterfowl in particular phenological periods was 1.1 specimens/km² in summer, 164.2 specimens/km² in autumn, 251.5 specimens/km² in winter and 67.9 specimens/km² in spring. In autumn, winter and spring, the long-tailed duck accounted for over 90% of all birds observed, hence the species had a decisive impact on the observed changes in the population, density and distribution of avifauna in the surveyed area.

The distribution of birds in the surveyed sea area in subsequent phenological periods was variable. In summer, when the population of avifauna was very low and the densities in the Słupsk Bank were mostly below 3 specimens/km², slightly more birds were present in its eastern part. In the period of autumn migration, the average local density reached 230 specimens/km². The highest concentrations of birds were observed in the north-eastern part of the area. In winter, when the population of seabirds was the highest, the area of the highest density ranging from 1,000 to 1,800 specimens/km² covered the western and central part of the surveyed sea area. In spring, after a decrease in the population of birds, their preference for two areas located in the eastern and north-western part of the sea area was observed. However, the average density at the sites with the highest concentrations of avifauna slightly exceeded 100 specimens/km².

During the entire survey period, 92% of all flights were at low altitudes (up to 15 meters above water), approximately 6% at altitudes of 15-60 meters and 2% at higher altitudes. Only during autumn migration, when the population of migrating birds was the highest, flights at altitudes below 15 m were slightly lower than 90%.

The conducted survey of sea birds allowed to collect material whose quantity and quality are appropriate for the assessment of the natural assets of Słupsk Bank in terms of marine avifauna. It has been confirmed that this area is a place of very high concentration of the long-tailed duck. The long-tailed duck was by far the most numerous species of bird encountered in autumn, winter and spring in Słupsk Bank. It represented 97- 98% of all birds observed in these three phenological periods. The average population size of long-tailed ducks wintering in this area was estimated at about 120,000. It should be emphasized, however, that in winter there are sudden changes in the population of birds in this area, which means that the results obtained from one cruise, as in the case of previous surveys, may reflect only a temporary situation with exceptionally high or low population of long-tailed ducks. The result presented in this study is based on data collected during seven survey cruises in winter, so it can be considered as a good representation of the average population size of long-tailed ducks using this overwintering area.

Number of birds migrating over Słupsk Bank associated with terrestrial habitats was very low during the migration period. However, the observations were made only during the daytime, so it cannot be excluded that there might be intensive migrations over this area at night. Approximately 92% of all observed bird movements took place at altitudes below 15 m, i.e. within the lowest designated altitude zone.

Surveys of birds migrating over the OWF area, including migratory species, were carried out in the periods of spring and autumn migration, i.e. from late March to late May and from mid-July to mid-November. A total of 11 survey cruises were carried out: 5 spring and 6 autumn ones, each lasting 2-6 days. The scope of survey included visual observations during the day, radar detection during the day, radar detection during the night and listening at night.

On the basis of the above surveys, a large species diversity was observed: 97 bird species were identified in spring, including 32 aquatic species and 65 terrestrial species, and 56 species in autumn, including 26 aquatic species and 31 terrestrial species. In terms of frequency of observation and estimated population size of daily migrating birds, sea ducks were most numerous in the BSIII OWF area, in particular long-tailed duck, common scoter and velvet scoter. These birds are numerous in overwintering areas located further south from the OWF area, hence they fly over it during seasonal migrations. Ducks migrating over the planned OWF area do not fly in clusters, but migrate in a dispersed way. The most numerous migratory species in autumn were geese; the total estimated number of birds flying over the farm area is about 100,000 specimens, which is

about 4% of the population of geese species altogether. During the survey, two species of loons were also observed, but in small amounts. It has been estimated that about several hundred birds of these species fly over the OWF area. The presence of 3 razorbill species was recorded, the most numerous of which was razorbill. Estimates based on data from observations indicate that over 6,000 razorbills may fly over the OWF area. The observations showed quite numerous flights of common cranes in the autumn. It is possible that this species flies over the southern Baltic Sea leaving areas somewhere between Latvia and Poland and heads for the island of Rügen.

Most of the water birds recorded were flying low during the day, below the potential height of the wind turbine rotor. For marine species, a relatively large proportion of the recorded specimens flew at altitudes above 20 m above sea level only among loons and great cormorants. Similarly, a large proportion of terrestrial birds migrating during the day flew at low altitudes. However, a significant proportion of migratory geese, common cranes and Charadriidae flew at or above the collision height. A large majority of night migrating birds flew at altitudes above 200 m above sea level; most birds were recorded at altitudes of 400-600 m.

Most migratory birds showed a clear migratory flight trajectory, mainly eastwards and in the north-eastward direction in spring and southwestern in autumn. Some common cranes and Passerine pointed to the northern direction of the flight in spring, hence it is possible that these birds were heading for Sweden, starting the flight from the Polish coast. To sum up, the BSIII OWF area does not lie on the main migration route through which is passed by birds in large groups during seasonal migrations. However, birds of different species migrate over the area scattered over sea areas.

Four species of marine mammals have been identified in the survey area: harbor porpoise *Phocoena phocoena*, gray seal *Halichoerus grypus*, harbor seal *Phoca vitulina* and ringed seal *Pusa hispida*. The construction, operation and disassembly of the OWF involves various activities, such as piling, seabed preparation, sediment removal, cable laying and boat traffic. These activities may have an impact on marine mammals. In order to determine the project's impact on this group of animals, it was necessary to collect data on the occurrence of porpoises and seals in the project area and in adjacent waters. The focus was particularly on porpoise as a species that may be most affected by the OWF construction. The monitoring survey methods complied with international standards for similar projects (e.g. German standards for environmental impact assessment of offshore wind farms) and Polish guidelines. The scope of surveys included passive acoustic monitoring and aerial observations. Passive acoustic monitoring was carried out using three recorders (C-PODs), which recorded the echolocation "clicks" used by these mammals to communicate. Aerial observations were conducted in an area larger than the OWF area, along transects distant from each other by about 10 km. There were six observation flights.

The conducted monitoring revealed the presence of three species of marine mammals in the area of the planned OWF and in the adjacent waters: harbor porpoise, gray seal and harbor seal. Passive acoustic monitoring showed only 5 days of porpoise presence per year. A total of 9 marine mammals were observed during visual monitoring: five of them were harbor porpoises and four were seals. One of the seals was a gray seal, two were harbor seals; one species has not been identified. All the animals were adults, no young were observed. Marine mammals were found in all seasons of the year, with the highest number in spring.

Monitoring of marine mammals conducted in the BSIII OWF area confirmed the presence of porpoises in the open waters of the Polish Baltic Sea, indicating at the same time a low level of their activity. These results are consistent with the results of other surveys conducted and published so far. Based on data from aerial visual monitoring, it can be assumed that the BSIII OWF area and its neighboring areas are not a breeding ground for porpoises as no young specimens were observed during the monitoring. The ichthyological monitoring showed an increase in sprat and herring population in early summer, which coincides with a higher number of porpoises being detected/observed during the monitoring. Therefore, it can be concluded that the BSIII OWF area is a feeding ground for harbor porpoises. However, given the very low number of detections/observations of porpoises, it is unlikely to be an area of major importance for this species. Furthermore, there is no absolute certainty about the reason for the presence of porpoises in the area since visual monitoring has not made it possible to identify clear trends in the behavior

of these animals. It is therefore possible that the animals observed only migrated through the survey area. Seals were observed in autumn and winter, but due to the small number of specimens and the small number of aerial surveys carried out, it is not possible to draw conclusions on the seasonal trends of seal presence in the area. As in the case of porpoises, it can be concluded that the survey area may be a feeding ground of gray seal. Gray seals migrate to areas with affluence of fish and can move for long distances for this purpose. They feed on many species of fish, the most popular of which are herring, sprat, cod, whitefish and salmon. The presence of these fish in the BSIII OWF area is likely to attract gray seals and encourage the use of the area as a feeding ground. The situation is different for harbor seal. It is unlikely that this species will use the survey area as a feeding ground. Unlike gray seals, harbor seals do not migrate for food, but hunt near onshore resting places. As no such sites were found in the Polish Baltic Sea, it can be concluded that harbor seals do not appear in the BSIII OWF area for foraging purposes. The same is true for the ringed seal, which is rare in Polish waters, and there are no known onshore resting places for these animals in this area.

For all species of marine mammals it was found that the BSIII OWF area may be the area through which the animals migrate.

About 10 bat species have been observed in the Baltic Sea Region so far. In the planned BSIII OWF area, the following species were expected to occur, which are characterized by seasonal migrations over long distances (based on the study for the project entitled "Guidelines for the assessment of the impact of wind turbines on bats", commissioned by the General Director for Environmental Protection, 2011): Nathusius' Pipistrelle *Pipistrellus nathusii*, Te Noctule Bat *Nyctalus noctula*, parti-colored bat *Vespertilio murinus*, lesser noctule bat *Nyctalus leisleri*, Soprano Pipistrelle *Pipistrellus pygmaeus*.

Survey on bat activity was carried out during ship cruises on the designated line transect and at two listening points, visited alternately in each period of autumn and spring migration. In the period of spring migration, 13 monitoring cruises on the transect were carried out, during which point listening in was also conducted. In the autumn migration period, 9 monitoring cruises were carried out on the transect and point listening was also conducted. Additionally, two days of listening took place 2-4 hours before sunset in this period.

A total of 13 sounds emitted by bats were recorded in the area of the Central Baltic III offshore wind farm and the buffer zone with a width of two nautical miles during monitoring cruises on the transect and at listening points during two migration periods (spring and autumn migration).

One bat species – the Te Noctule Bat *Nyctalus noctula* – was observed at the listening points and transects located in the north-eastern part of the planned project area during the registration in the spring migration period. Due to its wide area of occurrence, it is commonly regarded as a species migrating from north-east to south-western Europe in autumn. It migrates long distances, up to 1,600 km between summer (north-eastern Europe) and winter location (south-western Europe). It can be seen over the open sea during migration.

No sounds emitted by bats on the transect and at the listening points located in the BSIII OWF area and in the buffer zone were recorded during the autumn migration, during the monitoring cruises.

To sum up, from the natural point of view, it can be concluded on the basis of the conducted survey that the area of the planned Bałtyk Środkowy III offshore wind farm is not a valuable area for bats. The number of observed specimens does not clearly indicate the existence of a permanent migration corridor of this species in the surveyed area. This fact is also confirmed by the lack that no bats were recorded during autumn migration. Additionally, it is worth noting that the number of recorded activities does not correspond to the actual number of bats in the surveyed region. Sometimes the same bat flies several times in the vicinity of the recorder, especially during hunting, and thus the activity result gets overestimated. However, the activity may also be underestimated if there is a group of bats that is registered as one specimen. Therefore, the number of recorded sequences is used to determine the activity.

The aim of archaeological survey was to estimate the probability of occurrence of items and structures depicting human cultural heritage from the Stone Age to the present day in the area of

the planned BSIII OWF on the the Baltic Sea bed and to develop the necessary methodological recommendations and survey procedures necessary for their identification. During the survey, analysis of archival materials, analysis of sonar and seismic data, analysis of material from geological survey (analysis of shallow cores) were conducted to determine the occurrence of anthropogenic residues. The items/structures have also been verified by means of a ROV. Archival searches concerned two types of archaeological monuments. These were the remains of prehistoric settlement and the wrecks of historic transport vessels.

The archives of the Polish Maritime Museum in Gdynia and the Hydrographic Office of the Polish Navy did not contain any information on the cultural heritage in the area under survey. In the course of archival searches for transport vessel disasters, information was found about the disappearance of 84 ships built between the 16th and late 18th century in the area covered by the study. This information was not confirmed by field surveys. One shipwreck was discovered as a result of the measures taken. The wreck dates back to the beginning of the 20th century. This is evidenced by both the steam drive and the mixed steel-wood sheathing. The wreck is not of high historic value and can be used for tourist diving. No archaeological relics were found in shallow cores during the analysis of the material from geological surveys. No relics of areas that could potentially be located in the settlement impact zone were observed during the survey. No valuable archaeological items were found at the bottom of the BSIII OWF area. No military items, in particular torpedoes and minefield weapons, were found in the course of measurements within the planned project area. This does not mean that there are no residues of these weapons, unexploded ordnance or chemical weapons in the area. Chemical tests on the sediments and water did not show any elevated indicators that could be a sign of the presence of chemical weapon residues in sediments. It should be kept in mind, however, that the survey was conducted at points and its range is local, giving a general picture of the chemical properties of sediments and water in the BSIII OWF area. The survey has shown that the BSIII OWF area is not valuable from the archaeological point of view.

The aim of the fishery survey conducted by the National Marine Fisheries Research Institute was to analyze the activity of the fishing fleet in the area of the planned BSIII OWF in terms of the potential impact of the farm on the activity of fishing vessels and economic losses of fishery related to reduced fishing opportunities in the area occupied by the farm. The analyses showed that the fishing productivity (catches per unit of area) in the area occupied by the BSIII OWF in 2009-2013 was lower by over 80% compared with the average productivity of the Polish Baltic Sea zone. The estimated value of catches in the BSIII OWF area ranges from PLN 95,000 to PLN 257,000. This value range can be taken as potential values for maximum annual fishery losses when the planned project area is completely excluded from fishing. The analysis of seasonal activity of the fishing fleet showed that it is the lowest in winter (December-February) and summer (July-August) months.

Vessel traffic survey was carried out by means of a measurement set installed in the BSIII OWF area, including an AIS (Automatic Identification System) sensor with a recorder enabling measurement and registration of AIS signals from vessels visible to the receiver for the purpose of navigation analysis. The recording results underwent computer processing. As a result of the measurements, information was collected on the positions, traffic and berths of 2,653 ships of various types and destinations that were temporarily in the area with a radius of 15 km from the central point. Due to the location of the planned project outside the area of intensive shipping traffic, there is no threat from commercial ship traffic of all sizes, tankers and passenger ships. The project will generate some difficulties for fishing vessels heading from the ports of Łeba and Ustka to fisheries located to the north of the BSIII OWF. The number of fishing vessels currently passing through the project area is estimated at 123 per year. The yacht and non-commercial vessel traffic will also not hinder or affect the project's safety.

The impact of the project was assessed on the basis of the conducted survey and analysis of its results. The results of this assessment are presented in the report on the project's environmental impact and briefly described below.

Abiotic environment impact assessment of the option selected for implementation and the reasonable alternative option

The project's impact assessment was carried out in accordance with the framework methodology adopted in the project. The most far-reaching scenario of the project (MFRS), i.e. the one that may potentially have the greatest impact on the abiotic environment (i.e. the seabed and its sediments, sea waters and mineral deposits), is the construction of a wind farm using 208 gravity-base foundations with a diameter of 40 m because this scenario will have the greatest impact on the seabed. The MFRS can occur in a reasonable alternative option (AO). The option selected for implementation (OSI) assumes the use of approx. 40% less foundations.

The works during the construction phase, in particular the laying of foundations, the laying of power cables and the associated need for frequent anchoring of vessels, will disturb the structure of seabed sediments. This will cause a large amount of suspended matter to rise and float in the water. Various substances, including pollutants and biogenic substances, will be released into the water from this suspended matter. However, their quantities will be relatively small. In addition, if there are layers of stones and boulders around the foundations to prevent leaching, the sediment composition will change. The construction of the BSIII OWF will result in a certain area of the seabed being occupied within the farm area, which will also make it difficult or impossible to access the deposits of mineral resources. During construction works, seabed sediments will be disturbed and the structure of the seabed will be disturbed, which may result in their washing out or additional covering. Sand from the uncovered deposits may also be used as ballast for gravity-base foundations or for their production.

During the operation of the farm, disturbances in the structure of bottom sediments in the immediate vicinity of the foundations and associated leaching of harmful substances from them to the water will occur at a much lower level than during the construction, especially if protective layers against leaching are applied. In addition, zinc or aluminum used to protect the foundations against corrosion will penetrate into the water. It is also possible that the temperature of water and sediments in the immediate vicinity of cables will increase slightly as a result of their heating. Access to deposits of mineral resources on the surface will be much more difficult or impossible during the operation of the farm, and the processes of leaching bottom sediments in the immediate vicinity of foundations may affect sand deposits, yet to a minimal extent. Impact occurring during the project's decommissioning phase will be similar to that occurring during the construction phase, but will be less intense. The extent of seabed interference works will not be as large as for driving foundation piles. Some structural components may be left on the seabed, e.g. heavy gravity-base foundations. The piles will be cut 3 m below the seabed. Transmission cables can be partially removed. Decommissioning works may affect mineral resources by covering them with an additional layer of agitated seabed sediments. After removing the farm elements, the whole farm area will be available for survey and exploitation of mineral deposits, if any.

The results of the above-mentioned environmental impact assessment indicate that no significant impacts will occur. The overwhelming majority of MFRS impacts have been assessed to be of minor or negligible significance, with moderate impacts in several cases only. The impact of the option selected for implementation will usually be proportionally smaller (due to the smaller number of foundations).

During the construction, operation and decommissioning of the farm, unplanned events may also occur, e.g. spill of oil-derivative substances, which may contaminate the water column and seabed sediments. Potential contaminants will be largely dispersed in the water and both the amount of substances potentially released and the likelihood of an emergency is low. The significance of impacts arising from unplanned events has been assessed to be negligible or low.

Due to the negligible or low significance of most impacts of the BSIII OWF on the abiotic environment, the Investor was obliged to adopt, among other things, a work method related to the assembly of individual farm facilities protecting the sea water against pollution by solid and liquid waste as minimizing activities.

As regards mineral deposits, simultaneous construction, operation or decommissioning of the BSIII OWF and other wind farms planned in the vicinity could result in the occupation of relatively large fragments of the seabed by several farms designed to the north and east of Słupsk Bank and with areas overlapping with the areas of the Słupsk-E and Gaz-Południe concessions. A joint occupation

of large parts of the sea by these farms may limit or prevent the exploration, prospecting or production of hydrocarbons in their area. However, it is very unlikely that several projects will be carried out at the same time in this region, and if so, only the first stages will be carried out. However, it is not expected that any impacts on the seabed or sea water will accumulate during the simultaneous operation of several neighboring projects in the farm area as the impacts, if any, will be limited to the immediate vicinity of individual farm facilities.

The BSIII OWF is located at a distance of approx. 5.5 km from the nearest Natura 2000 site. Due to the local scale of the impacts, no significant negative impact of the farm on Natura 2000 sites due to impacts on the seabed, seabed sediments and sea waters is expected.

The wind farm will be located in the exclusive economic zone of Poland. Impacts on the abiotic environment are local. It is not expected that the BSIII OWF will cause cross-border impacts, i.e. in the sea areas of the neighboring countries. Continuous hydrological monitoring of the farm area will be carried out, which will provide immediate and accurate information about the upcoming improvement or deterioration of local conditions at sea and the associated need for interrupting or possibility for resuming construction or maintenance works. This shall include surface waves, water column's full depth and water turbidity, and – during operation – substrate leaching control and degree of ice formation on structures.

It is recommended to monitor the impact of the BSIII OWF on seabed sediments after its decommissioning. Monitoring should include testing of metals, mineral oils, biogenic substances and contaminants.

There is no need to conduct separate monitoring of the project's impact on deposits of mineral resources.

Benthic impact assessment of the option selected for implementation and the reasonable alternative option

The main assumption of the applied concept of the environmental impact assessment was to determine which offshore wind farm parameters are of major importance for the extent of its environmental impact and consequently which environmental conditions and how formulated in the environmental permit should limit the project so as to guarantee that its implementation does not cause any significant damage to the natural environment.

Under the most far-reaching scenario, i.e. the construction of a wind farm using 208 gravity-base foundations with a diameter of 40 m (the scenario with the highest impact on the seabed), the most significant negative impact will be on macrozoobenthos. This impact will mainly consist of the physical destruction of habitats as a result of the laying the foundations and laying of submarine cables. During construction, works will be carried out that cause local disturbance to the structure of seabed sediments. It will apply to 1% of the farm area. Moreover, in the areas marked in the report as P2, P5 and P4 in the central, eastern and south-western part of the farm, there is an unstable substrate, therefore it is necessary to replace it before the erection of gravity-base foundations. More intensive turbidity of suspensions (re-suspensions) may occur in these areas. The most important impacts on macrozoobenthos during the operation phase will be related to the loss of habitat due to seabed surface occupation and the construction of artificial structures. These changes will apply, as indicated earlier, to approximately 1% of the farm area. The surface of the hard substrate of underwater structures to be installed will be almost the same as the surface degraded as a result of the construction works. It is expected that it will be colonized by plant organisms within a short period of time, in the daylight illuminated zone also by phytobenthos species. In the analysis of the associated impacts it was concluded that the habitat loss due to the construction of the farm will be very low and that the depletion of the food base, which is formed by benthos for seabirds and fish, will not be permanent. The introduction of hard substrate into the environment will create an "artificial reef" effect, and the area around the foundations will become a place of concentration and a feeding ground for many fish species. The "artificial reef" effect will be caused by the introduction of hard and stable ground for the foundations of wind turbines with a layer protecting against leaching, built of stones, boulders or rock rubble. As a result, a new habitat is created through very rapid colonization by plant communities. This leads to an increase in biodiversity of biocenoses and an increase in the food base for fish and diving birds. An increase in the biological production of the seabed is also reflected in an increased load of organic matter in

the form of dying organisms or feces and pseudo-fecal matter from mussels sinking to the seabed. The process of succession – growth of macroalgae and invertebrates on underwater wind farm structures – starts already in the first vegetation season of the organisms from the moment the facility is erected, and stabilizes relatively after about 3-5 years, when the longest living mussel species reach their maximum size. A clear result of the OWF's impact on benthos, which has already been observed in the example of operating farms in the North Sea, will be the "mytilization" process. The hard substrate of the underwater farm structure is a new artificial element for the macrozoobenthic communities, but different from the natural one. The mussel dominant in bottom fauna is – through filtration – an important part of the energy flow through the ecosystem. The process of biodeposition of suspended matter by the mussel is more beneficial for the functioning of the ecosystem than natural sedimentation and it is itself an attractive substrate for epifauna.

The only significant impact of the farm on Natura 2000 sites is the potential transfer and sedimentation of suspended solids raised as a result of seabed works during the implementation phase. Within the boundaries of the PLC990001 Ławica Słupska (Słupsk Bank) Natura 2000 site, there are two types of natural habitats that are subject to protection, for which the area has been designated: sandbanks permanently covered with shallow water (code: 1110) and reefs (code: 1170). Sandbanks in the southern Baltic Sea are primarily an important overwintering area for many species of sea birds: Słupsk Bank, next to Odra Bank, has been classified as an overwintering area of major importance in Europe. Rocky and stony seabed, the reefs, form a unique community in the southern Baltic Sea due to the predominance of sandy sediments in this region, which make it impossible for bottom vegetation (macrophytes) to attach to the substrate. Moreover, the uniqueness of the plant communities of the stony bottom of the Słupsk Bank consists in the occurrence of sedentary vegetation so far away from the shore and at a depth of almost 20 m; it is the only place in the Polish Maritime Areas so distant from the shore where the mass occurrence of benthic vegetation communities occurs. There are species that are no longer found in the Gulf of Gdańsk or are very rare. Therefore, Słupsk Bank serves as a reserve and enables the preservation of species endangered in the coastal zone. The varied hard seabed and the presence of plant communities also create favorable conditions for the development of benthic invertebrates and many fish species. Thus, this habitat is important for the preservation of natural biodiversity. The threats to the conservation of the above-mentioned natural habitat types are physical seabed disturbances, which may be caused by aggregate mining or construction of offshore wind farms. The resulting sedimentation of fine-grained fractions raised during mining changes the structure of the sediments. Therefore, the basis for the preservation of the habitat is the preservation of the intact bottom structure, which allows for the development of communities of benthic organisms, which are food for birds at the same time.

Due to the distance (approx. 5.5 km at Ławica Słupska PLC990001 and approx. 8.2 km from Przybrzeżne Wody Bałtyku PLB990002), the sediment layer will not exceed 0.2-0.4 mm. The amount of suspended solids carried is so small that it can be compared with a sedimentation rate in the Baltic Sea, which ranges from 0.005 to 0.2 mm/year. On this basis, the authors of the report concluded that the amount of suspended matter transferred to the above-mentioned Natura 2000 sites is unmeasurable from the practical point of view. Therefore, this impact has been assessed to be negligible.

At the same time, disturbance of seabed sediments may slightly improve their quality (increase in oxygenation and decrease in the amount of pollutants and nitrogen compounds in the sediment due to their transfer to the water column). Better oxygenation of sediments may reduce phosphorus transfer from sediments as this process takes place under anaerobic (reducing) conditions.

To sum up, the results of the assessment of the impact of the farm implementation and operation indicate that there will be no significant impact. Under the most far-reaching scenario, the impact should be considered low or negligible, so the impact of the option adopted for implementation will be proportionally lower.

In order to verify the EIA results and identify areas of uncertainty associated with changes in seabed geological processes (local erosion – undermining of foundations or excessive accumulation of sediments in the vicinity of foundations, exposing or covering of cables laid on the seabed or buried in the seabed), monitor using a ROV underwater television system will be necessary after the completion of construction.

At the operation stage, the ROV inspection at the beginning should take place in the 6th and 12th month after the completion of the construction (preferably after the spring and autumn seasons – increased dynamics of the environment, vertical water mixing, storm surges) and then, depending on the intensity of the environment dynamics, once every 2 or 5 years during the whole life period of the BSIII OWF. To locate cables, equipment for detection of cables below the seabed surface should be used. Monitoring planned this way will make it possible to locate possible cable failures and the degree of the sediments leaching effect around the foundations.

It is suggested to additionally perform bathymetric measurements near the foundations on each type of seabed surface (P1, P2, P3, P4, P5) to determine the rate and degree of sediment leaching depending on the substrate type. The monitoring should be performed in two measurement stages, in time intervals – the first one after 6 months and the second one after a year from the completion of the construction stage.

Fish impact assessment of the option selected for implementation and the reasonable alternative option

The most far-reaching scenario, generating the most significant impact on fish, is the construction of a wind farm using 208 monopile foundations with a diameter of 7.5-10 m. This project option is expected to generate the greatest underwater noise. According to the report, the greatest impact caused by the raising of seabed sediments will occur when gravity-base foundations are used.

The most significant negative impacts on fish will occur during the construction phase of the project and will consist in noise and vibration emission during the driving of foundation piles and an increase in suspended matter concentration in water.

The significance of impact of a suspension on ichthyofauna depends on a number of factors related to the characteristics of the suspension particles, including density, particle size and shape distribution, adsorption and absorption capacity of the particles and their mineral composition. Environmental conditions, such as temperature and oxygen concentration in the seabed water, can also play an important role. At the same time, the higher the concentration of suspended sediment and the longer the exposure time, the greater the negative impact on marine organisms. The phase of development of the analyzed specimens is a very important factor determining the intensity of the suspension's impact on ichthyofauna. The larval period is the most sensitive stage of fish development. Unlike adults, larvae have a limited ability to move and thus escape from unfavorable environmental conditions. Insofar as lethal suspension effects for juvenile and adult fish can be expected at gram/litre concentrations, milligram/litre concentrations may already be dangerous for earlier phases of development (eggs and larvae).

On the basis of literature data, the authors of the report classified the effects of the negative impact of an increase in suspended solids concentration on fish as medium to low. This assessment has been influenced by the moderate impact of this factor in terms of spatial extent, a low impact in terms of duration and a moderate impact in terms of sensitivity of fish.

The sediment transport model developed by DH1 showed that the concentration of suspended matter resulting from the works (without natural background) during the construction of the BSIII OWF will not exceed 20 mg/l. Additionally, the relatively high velocity of currents observed during the tests, amounting on average to about 0.1-0.2 m/s and a maximum of about 0.5 m/s, will be conducive to dilution of the suspension. This concentration of suspended matter may adversely affect the early phases of juvenile fish development. Literature data indicate that increased mortality of cod and herring larvae can be expected at a suspended matter concentration of approximately 10 mg/l, which is expected for the construction phase of the BSIII OWF (maximum 20 mg/l). A possible effect of increased suspension concentration may therefore be increased mortality of herring larvae, although surveys have shown that this area is of minor importance as a spawning ground for this fish. Cod larvae have not been found. It should be kept in mind that the concentrations given will be very limited in time and space. Such high concentrations will occur only during the erection of gravity-base foundations, which require deepening and leveling of the seabed, and only during dredging operations. With other types of foundations, these impacts will be many times smaller.

Due to the spawning of sprat in the examined area, the impact of the suspension on pelagic eggs of this species may be significant due to a decrease in egg buoyancy, egg dropping and dying on

the bottom. This effect was observed for pelagic eggs already at the concentration of 5 mg/l. The BSIII OWF area lies directly in the sprat second stage spawning area (in late spring and early summer). Intensive surface spawning of sprat takes place in the entire South Baltic area in late spring and summer. However, the BSIII OWF area is a small sea area in comparison with the extensive spawning grounds of sprat, hence its significance for the population of this species is not significant.

Therefore, under the most far-reaching scenario, the significance of this impact has been assessed to be negligible and low.

Acoustic disturbance is one of the most important environmental factors resulting from the construction of offshore wind farms. It is emitted primarily by works related to the construction of foundations for turbines and increased traffic of vessels. Surveys to date have shown that noise can have a significant negative impact on the development and life of fish. The effects of anthropogenic sounds include tissue damage, permanent and temporary loss of hearing ability, as well as changes in fish behavior. It has also been shown that environmental stress associated with noise can induce endocrine and physiological reactions in fish. Ambient sounds can also affect fish communication skills, their ability to locate prey through acoustic masking and their spatial orientation. Moreover, human-made sounds and vibrations can induce fish to leave their feeding grounds and hideaways and to change their spawning territory, thus affecting the survival of individuals and their reproductive success.

Habitat changes caused by the construction of a wind farm may affect the ichthyofauna through changes in the morphology of the seabed and the sediment type, which may directly affect the living and reproduction conditions of the ichthyofauna and indirectly through the impact of habitat changes on benthic organisms, which are a source of food for fish. Moreover, the emission of noise and vibration may cause the occurrence of the avoidance effect in areas in the immediate vicinity of the turbine, but the range of this impact should not exceed a few meters.

The report describes in detail the most far-reaching scenario, which assumes maximum exposure peaks of up to 260 dB in case of sound waves accumulation over a 24-hour period. For the purpose of impact significance analysis, ranges of sound exposure values were adopted to determine the impact intensity:

- <140 dB – low impact,
- 140-170 dB – medium impact (avoidance reaction),
- 170-210 dB – high impact (temporary shift of the hearing threshold),
- > 210 dB – very high impact (permanent shift of the hearing threshold, mortality).

Table data included in the report part on acoustic analyses indicate the spatial range of the impact of the above values at the level: above 200 dB at a distance of 300-600 m, 170 dB at a distance of approx. 3 km and approx. 140 dB at a distance of approx. 70 km (for single impacts). In the case of daily calculations, the accumulated sound exposure shows an even wider spatial range – above 210 dB at a distance of about 2 km and about 170 dB at a distance of about 60 to 80 km. It can be assumed that the avoidance reaction (140 dB limit) can be observed even 100 km away from the impact source. The avoidance reaction may adversely affect spawning processes in the vicinity of construction works. This effect poses a much greater threat to the population when avoidance occurs in a region where environmental conditions are particularly favorable for spawning and there are no similar areas nearby. Within the range of 80-100 km from the BSIII OWF there is the most important cod spawning ground (Bornholm Deep) and wide spawning ground for herring, sprat and other fish species. The BSIII OWF area itself is not a place of cod spawning nor a target spawning ground for the dominant deep water spawning European flounder in this area due to the prevailing hydrological conditions. During ichthyological surveys, sprat spawning and probably herring spawning were found, but the sea area is small compared to a large area of spawning grounds of pelagic fish. Due to the high significance of the noise impact during the driving of the monopiles, which are considered to be the most far-reaching scenario in terms of the impact on the ichthyofauna, a mitigation measure will have to be applied during the construction phase (during pile driving) if such a foundation is selected. The data contained in the report clearly show that the reduction of the range of negative sound exposure is achievable already with measures that are now common on the market. For example, the territorial range of impact for a 170 dB with a bubble curtain will decrease 5-fold (to about 7-10 km). Similarly, the avoidance reaction (140 dB) will be

detected up to approx. 15-20 km from the sound source.

A change in the sediment structure may, among other things, have a negative impact on the reproductive success of fish. This is particularly important for herring, which prefers specific habitats with a shallow depth and a suitable substrate to ensure that the roe can be attached. Changes in the sediment structure and chemicals released from the sediment also affect bottom biocenoses (phytobenthos, plants, invertebrates). This may result in a deterioration of the food base for benthivorous fish.

The directly altered seabed area estimated based on the technical concept (foundation pits and trenches for connection cables inside the farms) will amount to approximately 1% of the total seabed area. However, the works will result in the suspension of fine fractions of sediment in the water column, which will then sink to the bottom and cover it with a layer of fine sediment. The results of sediment scattering and sedimentation modeling showed that the process will cover the entire area of the planned project and the maximum additional sediment layer thickness will not exceed 3.5 mm. However, such a relatively small change in habitat may disturb the development of benthic eggs (herring, common seasnail, Gobiidae) by covering already deposited grains or making it more difficult for them to be deposited in the modified sediments. For the former of these species, this effect was confirmed by literature data. A change of habitat during construction will lead to the complete destruction of benthos in the foundation excavation and cable trench areas. This will result in a depletion of food resources for benthivorous fish. However, the area where habitat change completely eliminates benthic organisms will be relatively small. Given the active movement of fish in search for food, this loss of organisms in the benthophagic fish diet can be considered insignificant. Also the reduction of the fish food base due to the negative impact of the seabed covered with a layer of fine sediment from the water column should not be of major importance. Given that the significance of this impact to fish is negligible or minor even in the most far-reaching scenario and minimization measures are not required.

The occurrence of new elements in the environment, such as turbine structural elements, mainly their foundations and erosion protection structures, entails the emergence of a new habitat with a hard substrate. The colonization process of artificial reefs often starts immediately (a few hours or days) after the erection of the structure. The presence of invertebrates and fish was observed on artificial reefs shortly after their formation. Fish populations often become very numerous in such places within a few months. However, the development of a stable artificial reef system usually takes 1-5 years. When the construction stage has been completed, the specimens of numerous fish species return to their previous habitats. Also, opportunities for the settlement of new habitats emerge. Fish populations similar to those observed in the natural environment were recorded in the area of artificial reefs, although biodiversity may also increase.

Natura 2000 sites: Dolina Łupawy PLH220036, Dolina Słupi PLH220052 and Ostoja Słowińska PLH220023 are important sites for the occurrence of fish and lamprey species listed in Appendix II of Council Directive 92/43/EEC, which are also subject to protection in those areas where the project in question may have an impact on the populations. Within the above-mentioned Natura 2000 sites, a total of 10 fish species were found, which are subject to protection of these areas. Among the above-mentioned species, 4 are typically freshwater species (spined loach, European weatherfish, amur bitterling, European brook lamprey), for which the analysis of probable negative impacts arising from the project in question is significantly simplified. The distance separating and isolating the habitats of inland fish and lamprey species from the area of the planned wind farm clearly excludes the possibility of occurrence of any negative impacts that may deteriorate the conservation status of the above-mentioned species or their habitats. A similar situation is observed for diadromous or freshwater species, periodically occurring in the coastal zone and spending their whole life cycle outside the impact zone of the planned project. These species include European river lamprey *Lampetra fluviatilis*, sibel *Pelecus cultratus* and occasionally European bullhead *Cottus gobio*. Species may be periodically typical of estuaries, estuarine river sections and coastal marine waters. The open waters of the Baltic Sea, characterized by much higher salinity, do not provide a favorable habitat for them. This is evidenced not only by the lack of these species in survey catches (carried out as part of the environmental impact assessment for the project in question), but also by the lack thereof in other scientific exploratory catches conducted for many years in the waters of the South Baltic Sea. Therefore, just like for freshwater fish, the analysis of

potential negative impacts arising from the project in question indicates that there is no possibility of any negative impacts on the habitats of these species or on the species themselves. Even at the implementation stage, when the negative impacts on the ichthyofauna will be relatively greater, there is no reason to assume that these impacts will be significant. The distance of the BSIII OWF area from the coastal zone excludes the occurrence of disturbances in the coastal habitats caused by the moving suspension of bottom sediments. The technical maintenance of the construction area will be carried out on the basis of the existing port infrastructure, so that increased vessel traffic in the coastal zone will be concentrated in zones with already existing increased anthropopressure and will not cause additional disturbance to coastal protected natural habitats and habitats of fish and lamprey species for the protection of which Natura 2000 sites have been established.

Of the species listed in Appendix II of Council Directive 92/43/EEC, only the Atlantic salmon *Salmo salar*, the sea lamprey *Petromyzon marinus* and the twait shad *Alosa fallax* may potentially and periodically occur in the zone of direct and indirect impacts of the project in question. During the operation period, both the positive (creation of new habitats, cessation of fishing, attraction of predators) and the possible negative impact of the BSIII OWF on the ichthyofauna (creation of a spatial barrier, generation of an electromagnetic field, vibrations, etc.) will occur solely within the OWF area and its buffer zone itself. Therefore, it is not possible for them to have a direct impact on the ichthyocenoses protected within the Natura 2000 sites covered by this assessment.

The only expected negative impact involves migratory species that migrate (actively or passively) outside the above-mentioned Natura 2000 sites.

Adult specimens of sea lamprey, Atlantic salmon and twait shad are rarely caught in the open waters of the South Baltic Sea. The specimens of these species, which have their key habitats in inland waters, remain outside the impact zone of the project in question for the most part of their life cycle. For this reason, it is assumed that the above-mentioned factors affecting their populations will not have a significant negative impact on the conservation status of these species and on the conservation status of their habitats.

The possible negative impact of the BSIII OWF on fish species for which Natura 2000 sites have been established is limited to noise, water pollution and seabed sediments raised during construction. However, it was assessed as unlikely and insignificant. Therefore, there are no grounds for confirming the existence of significant impacts on ichthyofauna that is subject to protection in Natura 2000 sites.

Given the relatively poor knowledge and experience on the processes of settling offshore wind farm areas by organisms in the operation phase, it is necessary to agree with the opinion of the report authors that periodical monitoring surveys should be conducted to make it possible to follow the successive stages of formation of plant and animal communities in the OWF regions against the background of adjacent areas. Such monitoring should be based on the use of standard multi-panel research networks used in pre-project surveys. In the first year after the completion of the construction works, it would be necessary to deploy 2000 meters of nets inside the OWF in an annual regime in 4 periods – spring, summer, autumn and winter – with the net deployment twice in each period. At the same time, for comparison purposes, the same set of survey tools should be deployed at a distance of 20 km from the project in an area of similar bathymetry. The buffer zone of the BSIII OWF may not be suitable for such comparisons because of the possibility of attracting fish by artificial reefs of the wind farm. Another survey should be carried out 3 and 6 years after placing the structure on the foundation. Furthermore, sampling of ichthyoplankton should be carried out at the same locations and with the same frequency in accordance with the methodology recommended by the Food and Agriculture Organization of the United Nations (FAO). This methodology is one of the recommended ways of sampling of ichthyoplankton as listed in the "Report of the Study Group on Standards in Ichthyoplankton Surveys" 2010 (SGSIPS) and applied by member countries of the International Council for the Exploration of the Sea (ICES).

Impact assessment of the option selected for implementation and the rational alternative option on birds

The most far reaching project scenario of the project in the context of the impact on seabirds is the construction of a wind farm with the use of 200 turbines with a minimum clearance of 20 m, a rotor

diameter of 192.5 m and a maximum total height of 212.5 m. At the stage of construction of the project in question, the most significant negative impacts on seabirds resulting from the emission of noise, light and increased vessel traffic shall cause their deterring from the area of the project and their migration to places with more favorable living conditions. The potential impact of the wind farms in operation on seabirds shall mainly relate to increased mortality due to collisions with turbines and changes in the distribution and behavior of birds (avoidance of the water regions occupied by the project). It should be noted that these changes in bird behavior shall significantly reduce the risk of collision. Negative impacts of the decommissioning stage on seabirds (detering) shall mainly be caused by the emission of noise and light during the demolition works or by increased vessel traffic.

The assessment of the environmental impact of the BSIII OWF took into account the most numerous species of seabirds, whose average density in the project zone in at least one phenological period exceeded 1 individual/km². The adopted threshold value does not apply to species listed in Appendix I of Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds and having an increased risk category according to the International Union for the Conservation of Nature (IUCN). Such species are considered in this assessment irrespective of the number of individuals found.

The assessment considered a total of 9 species of seabirds: long-tailed duck, European herring gull, velvet scoter, melanitta, razorbill, guillemot, black-throated loon, red-throated loon and little gull.

Long-tailed ducks travel low above water, which significantly reduces the risk of collision with power plant rotors. The average altitude of their flights in the area of offshore wind farms located off the coast of North America was only 1.9 m. This was also confirmed during the research conducted in the area of the planned project. A much more serious impact of wind turbines on this species involves the reduction of the area of feeding grounds. Long-tailed ducks avoid water regions occupied by wind farms and their density is significantly lower within a radius of up to 2 km from the borders of the farm. Hence, these projects limit the access of long-tailed duck to feeding grounds. In the case of the BSIII OWF area, this effect may be considered to be of minor importance for the population wintering in this part of the Baltic Sea, as the number of birds of this species was low here and there are rich feeding grounds located in the Natura 2000 sites in the vicinity: Ławica Słupska (Słupsk Bank) PLC990001 and Coastal Waters of the Baltic Sea PLB990002. Long-tailed ducks displaced from the site of the planned project shall be able to move to other water regions. Although the construction of one wind farm shall not significantly extend the flight routes of birds bypassing its area, several farms located very close to each other may cause an increase in energy outlays incurred by long-tailed ducks on migration-related flights, as well as on shifts between feeding grounds. For this reason, it is necessary to keep sufficiently wide corridors between adjacent sites occupied by adjacent offshore wind farms, which, in the opinion of the authority, shall be important for the development of investment plans related to the construction of offshore wind farms in the vicinity of the Natura 2000 sites Słupsk Bank PLC990001 and Coastal Waters of the Baltic Sea PLB990002.

The European herring gull shows a high risk of collision with offshore wind turbines, as observations in Western Europe showed that 28.4% of the displacements were within the range of 130 m diameter rotors, with a clearance of 20 m between the water surface and the lowest rotor position. Surveys performed at other locations show significant variation in flight altitudes (from 1 to 300 m) with an average of 33 m. These results were confirmed by research conducted in the area of the planned project, where as much as 42% of movements of this species were recorded within the range of rotors. During the construction of an offshore wind farm, European herring gulls occur more frequently in its area than in the period preceding the construction. After completion of the construction, the interest of gulls in the offshore wind farm decreases. European herring gulls use structures protruding from water, including inoperative wind turbines, as a resting ground. However, the factor that most strongly limits the occurrence of this species in the area occupied by turbines is the limited operations of vessels associated with fishing in adjacent water regions. This means that at the operation stage, the presence of European herring gull shall depend primarily on the fishing effort in the area of the wind farm and at this stage it shall be difficult to estimate how this factor will change after the construction of the wind farm.

During 13 months of the survey, 524 velvet scoters were found in the water region covered by the survey, out of which only 10 individuals were sitting on the water and the remaining ones were observed as they flew by. This means that the area of the BSIII OWF is not an important place for the concentration of velvet scoters, and in this area only a low intensity migration of this species is observed. The data on the reaction of melanittas to the presence of offshore wind farms are very scarce, as melanittas are rare in those parts of the Baltic Sea where power plants are already operating. Literature data indicate that out of 20 flights registered in the area of 3 farms, all of them took place at an average height of 1 m, i.e. below the range of operating rotors. There are no data based on sufficient observations concerning changes in the distribution of melanittas after the construction of a wind farm. Flights of this species recorded during the survey were also rare and concerned 169 individuals, out of which 77% of movements were at the lowest altitude, below 15 m. These data indicate that, like other species of sea ducks, melanittas will not be more likely to collide with the power plants. The species is also likely to avoid the area occupied by offshore wind farms, which further reduces the risk of collision. Very low melanitta populations recorded during the survey show that the area of the planned project is not an important feeding ground for this species and its exclusion shall not have a negative impact on the populations wintering in the Baltic Sea.

Data from 22 offshore wind farms located in the water of Great Britain, Belgium and the Netherlands show that only 0.4% of razorbills and 0.01% of flying guillemots were on the collision altitude with rotors, which indicates a low threat to these species from this type of structure. Similar results were obtained during the survey conducted in the area of the BSIII OWF, where as much as 99.6% of these birds flew at an altitude below 15 m above the water. Razorbills and guillemots clearly avoid the area occupied by wind farms, thus these structures decrease the area of feeding grounds available for these birds. Both species are ichthyofagous and their distribution in sea water regions is conditioned by the availability of food base. In the area of the planned project, the resources of pelagic fish constituting the main component of the diet of razorbill and guillemot were assessed as low, except for a short period in July, when herring and sprat moved through the survey area to feeding grounds. In summer the number of both razorbill species is very low and therefore the exclusion of the offshore wind farm area BSIII OWF as feeding grounds should not have a negative impact on the Baltic populations of these species, as the birds should easily find alternative feeding grounds.

The loons avoid the area occupied by offshore wind farms even within a radius of up to 4 km, and these birds were found at a closest distance of 1.6 km from the wind farm. It has also been noticed that during the migration the loons change their route after noticing the wind farm and avoid it. Such behavior of loons makes them less susceptible to collisions with power plants and the potential negative impact of construction of an offshore wind farm may concern exclusion of some feeding grounds. Avoidance of areas occupied by power plants by loons is the reason why there is little data on the flight altitude of these birds in the vicinity of such structures. Data on flight altitudes collected in the area of 6 offshore wind farms are based on observations of only 126 birds of this species. Almost all individuals (99.9%) flew low above the water, beyond the reach of the rotors. In the case of the area of the BSIII OWF, the share of birds flying over 15 m was significantly higher and amounted to 26%. However, this result should be treated with caution, as it is based on the observation of only 27 individuals. The data obtained for the purposes of the project show that the area of the BSIII OWF is not an important place of concentration of loons. The route of their intensive migration does not run through this area either. Both species are ichthyofagous and their distribution in sea water regions is conditioned by the availability of food base.

The largest number of little gulls in the surveyed water region was found in the autumn migration period, while during 6 research cruises a total of 27 individuals of this species were recorded. Therefore, the area of the BSIII OWF is not located on the route of intensive migration of little gulls. In winter and spring only single individuals were found, whereas in summer this species was not observed. These results show that the area of the planned project is not an important place for little gulls, and about 60% of the observations concerned birds flying over this area during the autumn migration.

At the stage of construction of the farm one should expect increased vessel traffic and periodically increased noise level. Skittish species with long escape distances (loons, melanittas) shall be

deterred up to a distance of approximately 2 km from the worksite. The presence of vessels and fixed structures protruding from the water shall result in a higher number of gulls (mainly the European herring gulls) that use such elements as resting grounds and seek food in the vicinity of the vessels. For 4 species, the size and significance of the impact of the wind farm during the construction stage on the populations of these birds has been determined to be moderate and for the remaining species to be small and moderate or negligible. Destruction of benthic communities during the construction of the farm shall be of temporary nature as zoobenthic recolonization of the seabed is expected after approximately one year. The presence in the vicinity of rich feeding grounds (e.g. the Słupsk Bank area) resulted in the impact significance being assessed as moderate to low. However, in order to limit the impact – first of all, to limit the impact of deterring – the project should be carried out starting from one place, and the water region intended for the project should be filled up with structures gradually.

Birds navigate as they migrate according to natural light sources such as stars and the sun. It has been noticed that at night they also head towards lighthouses, drilling towers and other structures illuminated by artificial light. Research on the behavior of birds near oil platforms has shown that lighting causes gathering of seabirds around these structures not only during the migration period. Therefore, during the execution of the project, it is essential to limit the use of strong light sources during the night.

Seabirds staying in the area of BSIII OWF shall inevitably be exposed to the risk of collision with the structures of the wind farm built in their habitat. The probability of collision depends on the density of the species in the area, the time it spends flying, the avoidance response, the flight altitude and the wind farm parameters (number and size of turbines). The collision risk was determined using the widely used Band risk model (Band et al. 2012), in a version dedicated to offshore wind farms.

Due to the above fact and high avoidance rate of operating wind farms by the species of loons it can be concluded that red-throated and black-throated loons can collide with turbines only very occasionally. Precise calculations are not possible due to the small number of individuals (during the survey 35 individuals of both species were found) recorded in the area of the BSIII OWF. The impact shall refer to a negligible part of the regional populations of these species (red-throated loons – 150,000 individuals, black-throated loons – 250,000 individuals), hence it is estimated that the impact, in the form of risk of collision, on loons residing in the project water region shall be small.

According to the data collected during the pre-investment monitoring, most of the long-tailed ducks flew at altitudes below 20 m above sea level. The collision calculations for this species indicate that a larger number of birds shall experience a collision with the wind farm in the rational alternative option compared to the option chosen for the project and that in the option chosen for the project the wind turbines with high towers (175 m) would be safer than the lower towers (120 m). Sea ducks show a very strong avoidance response, e.g. avoidance rate of 99.3% or even higher than 99.9%. Therefore, the avoidance rate of 99.5% can be assumed to be a suitable scenario, which results in 0-9 collisions per year depending on the chosen wind farm option.

Taking into account the very low density of velvet scoters in the area of the BSIII OWF, their very strong avoidance response to wind farms and the fact that most of the individuals fly at altitudes below the typical height of the rotor of the offshore wind farm, it is concluded that the collision of these birds is negligible. Like the velvet scoter and other sea ducks, the melanitta also operates at heights below the typical rotor height of an offshore wind farm.

Like other gull species, the European herring gull does not avoid offshore wind farm areas and can even be attracted by them, as turbine towers can provide a resting ground for the gull. The European herring gulls fly at quite high altitudes. Available survey results indicate that approximately 34% of birds fly more than 20 m above sea level at an altitude corresponding to the potential rotor height. It was also shown that gulls show a high degree of avoidance response – 98% and even a higher value (>99.9%). A 99% avoidance rate has been set as the most appropriate value, in line with the new bird avoidance indicator recommendations. The result of applying this rate value is the estimation of the annual number of bird collisions at the level of 1 09 - 1 407, depending on the option of the wind farm.

Due to very low density of little gulls staying in the area of the BSIII OWF (39 individuals in total

were found during the survey) and the fact that only 11% of the birds of this species were flying at heights above 20 m, i.e. the potential height of the wind turbine rotor, it is estimated that only single individuals of little gulls staying in the area of the farm may occasionally collide with the turbines of the BSIII OWF after its construction. For the regional population of this species (approximately 2,000 birds overwintering across the Baltic Sea, data from 1988-93) the impact shall be insignificant and the significance of the impact on this species is assessed to be low.

None of the razorbills observed in the Polish open waters flew at heights corresponding to the potential rotor height. Therefore, taking into account the low density of birds of this species, the high avoidance rate of offshore wind farms by razorbills and the low altitude of flights, it should not be expected that any of the razorbills in the water region could collide with the BSIII offshore wind farm. However, sporadic collisions cannot be ruled out completely. The significance of the impact on this species is assessed to be negligible. A similar situation applies to the guillemot.

For the assessment of impacts of the BSIII OWF on seabirds, it is extremely difficult to determine the extent of potential impacts, especially in the context of assessing the impact on wintering birds in a given sea area. This farm, located in close proximity to a sea area which is an important wintering area for some Eurasian seabird populations, may, in combination with other similar projects planned in direct proximity, affect the condition of seabird populations migrating to this wintering area through the barrier effect or significant mortality from collisions between birds and rotors, and thus it may also affect the ecosystems to where these populations migrate for the hatching season. In the area of the BSIII OWF, species wintering in these areas are of key importance among seabirds and the impact assessment must be linked to aspects of migration to and from wintering grounds. The literature indicates that seabirds have a strong bond to the wintering ground and therefore it is unlikely that after the construction of the BSIII OWF, the overwintering birds in the surveyed area would change their autumn migration destinations to those situated at a distance of more than 20 km. During the migration period, flying birds mostly avoid offshore wind farms and the maximum observed radius of such passing of the obstacle is 5 km. The construction of a wind turbine field in a sea water region should not, therefore, result in shifting the bird migration routes to a distance of tens of kilometers.

The planned project shall not be located in the boundaries of the Natura 2000 special bird protection area. Taking into account the above statements and the existing practice in the assessments of the impact of offshore wind farms on birds both in the Baltic Sea and the North Sea, there are no grounds to consider the impact of the project on Natura 2000 sites located more than 20 km away. Two special bird protection areas are located within 20 km from the location of the planned project:

- approx. 5.5 km to the west: Słupsk Bank PLC990001;
- approx. 8.3 km to the south: Coastal Waters of the Baltic Sea PLB990002

The Coastal Waters of the Baltic Sea PLB990002 Natura 2000 site includes the Baltic coastal waters from 0 to 20 m in depth. Its boundaries extend over 200 km, starting from the base of the Hel Peninsula, and reaching as far as the Pomeranian Bay. Two bird species from Appendix I to the Directive 2009/147/EC of the European Parliament and of the Council: black-throated loon and red-throated loon spend winter at the area. In winter, over 1% of the population of the long-tailed duck migration trail and at least 1% of black guillemot and melanitta are present. All these species are subject to protection in the area. The overwintering populations of the razorbills, long-tailed duck and European herring gull are also subject to protection.

The Natura 2000 site of Słupsk Bank PLC990001 covers the water region of the southern Baltic Sea, including the area with a strongly shallow seabed, whose border have been defined conventionally according to the course of the 20 m isobath. In this area, the overwintering populations of long-tailed duck and black guillemot are subject to protection.

Additionally, the area which has been considered in the context of impact on migratory birds is the Słowińskie Coast PLB220003 special protection area of birds, where migratory species are the subjects of protection: geese – greater white-fronted goose *Anser albifrons* and taiga bean goose *A. fabalis*, whooper swan *Cygnus cygnus* common crane, smew *Mergus albellus* and common merganser *M. merganser*.

During the construction stage, a gradual increase in bird deterring from the construction site is expected. This shall result in changes in the distribution of individual species in the area of the BSIII OWF. More skittish species such as loons, razorbills, long-tailed ducks and melanitta shall move

to neighboring water regions. It is likely that some of them shall move to the nearby Natura 2000 sites of Słupsk Bank PLC990001 and Coastal Waters of the Baltic Sea PLB990002, where there are important concentration grounds of Baltic Sea birds. The impact of increased vessel traffic on birds in the Natura 2000 site of Coastal Waters of the Baltic Sea PLB990002 is also to be expected, as vessels heading for the installation works shall have to pass through the area. Increased vessel traffic may result in more frequent bird deterring than before. But the strength of this impact shall depend on the schedule of works.

During the operation stage there shall be a continuous flow of loons, razorbills, long-tailed ducks and melanittas from the BSIII OWF area. These birds are likely to move to places where they can find an abundant food base. It can, therefore, be assumed that some of them will move to nearby Natura 2000 sites, causing an increase in the number of birds staying there. Due to small numbers of these species in the area of the BSIII OWF project, these relocations should not cause a significant increase in competition for food resources in the Natura 2000 sites.

After the analysis of possible impacts that the assessed project may cause, independently and in cumulation with other projects, it should be stated that the BSIII OWF shall not significantly affect the integrity, coherence and subject of protection of "bird" Natura 2000 sites in any of the considered options through the impact it will cause on seabirds, which are the subject of protection in Natura 2000 sites.

Post-investment monitoring of seabirds should include both the observation of the flight by means of a radar and counting of the birds staying in the area of the OWF during the day. Radar surveys of birds during their migration period should cover the period from the beginning of July to mid-November and from the beginning of March to mid-May. Outside this period the migration of birds, if any, is not very intensive. In winter, the frequency of birds flying through the area occupied by wind turbines should be monitored. The optimal survey option would consist in combining radar-based flight registration and species identification observations: visual daytime observations and night-time listening to bird voices. Observation sessions should be performed from a vessel anchored in a place ensuring visibility of the wind farm from the side from which the majority of birds come during the migration period. In spring, birds move from west and south to north and east, and in autumn in the opposite directions. In each of the migration periods, the number of days on which 24-hour observations are conducted should not be less than 20, and 2-5-day observation sessions should be distributed as evenly as possible over time. Data collected during monitoring should be supplemented with counting from transects. The route of the survey cruise should be marked out in such a way as to include the 5-kilometer zone around the borders of the OWF and so as to assess the changes in the density of birds staying at different distances from the power plant and to compare the results obtained with the data from the pre-investment monitoring. These surveys must cover, first of all, the period of the most abundant occurrence of birds in the southern Baltic Sea, i.e. they should last from October to May with a frequency of not less than two inspections per month at an interval of at least one week. In the remaining months the number of birds in the area of the BSIII OWF is very low and in summer it is enough to carry out two survey cruises, one in mid-August and one in mid-September. This survey should be carried out over five consecutive years. The authors of the report proposed a 2-year monitoring period, however, in the opinion of the local authority this period is insufficient, not allowing to obtain an adequate amount of data. In the first season, birds shall gradually get used to the situation in which the water region intended for the project becomes inaccessible to them (the so-called habituation), which shall result in changes in their distribution. Therefore, this period can be treated as a temporary one and only in the following years the scale of the impact of the BSIII OWF on the seabirds staying in this region shall stabilize.

Due to the possibility of a new potential feeding base (mollusk colonies on the underwater structures of the farm), the observations conducted should take into account the possible use of the BSIII OWF area as a bird feeding ground. If it is found that birds do feed in the area, it is necessary to determine the composition of species and number of birds staying within the boundaries of the farm.

For migratory birds, the most far reaching scenario is the same as for seabirds. The assessment of the impact on this group of birds was carried out on the basis of studies of birds flying over the water region of the BSIII OWF carried out from anchored vessels during spring and autumn

migration in 2013. These comprehensive studies included daytime visual observations, daytime radar (horizontal radar) and night radar (vertical radar) surveys, and listening to migratory birds at night. Moreover, the investor commissioned an independent assessment of the risk of collision of birds flying over the farm area.

The surveys carried out in the area of the planned farm provided information on the species composition, number and spatial distribution of migratory birds in subsequent seasons of the year. It was found that 109 species of birds flew over the farm, out of which 14, due to their number and/or conservation status, were included in the detailed assessment. These are red-throated and black-throated loons (assessed together), great cormorant, swans, *Cygnus ssp.*, geese, Eurasian wigeon, long-tailed duck, velvet scoter, melanitta, common crane, Eurasian gold plover, little gull, black-headed gull, razorbill and common wood pigeon *Columba palumbus*.

Monitoring on the existing OWF included visual and radar observations of behavioral responses of birds migrating to the turbine structures. In the Baltic Sea, data on the response of individual species were collected at the Nysted wind farm. Seabirds (ducks, geese, razorbills) responded at a distance of 5 km from the turbines and generally changed the direction of flight at a distance of 3 km from the wind farm. At a distance of 1-2 km, more than 50% of the birds flying towards the wind farm have resigned from flying through the area of the wind farm. Seabirds that flew into the area of the wind farm minimized the risk of collision by flying between turbine rows, often maintaining equal spacing between wind turbine, reducing flight altitudes below the rotor height and choosing the shortest route to exit the wind farm area. The barrier effect for migratory birds during the construction stage shall be negligible as the changed route associated with the avoidance of the construction site shall only represent a small part of the overall migration route, so the additional energy costs shall be very low. Bird to vessel collisions have been assessed as negligible to small as vessel traffic shall be limited to a relatively small area. Therefore, at the construction stage it is expected that mitigation measures shall be applied, consisting in the concentration of works between May and September, i.e. in the period of the lowest number of birds, and in the gradual construction of the farm, starting from one point.

The barrier effect during the operation stage is a low intensity impact for all bird species, as bypassing or passing over the farm area (or construction vessels) involves low additional energy outlay. Therefore, this impact is assessed as small or negligible for all species. Migrating loons will avoid the operating wind farm by circling it. The consequences in terms of additional energy outlays and reduced physical efficiency due to the increased distance of the flight are considered low. A similar assessment applies to other long-range migratory seabirds, i.e. long-tailed ducks, velvet scoters and geese.

The barrier effect on great cormorants was also considered negligible due to the short additional distance cormorants will have to travel to avoid the wind farm area.

During the pre-investment monitoring in the area of the BSIII OWF in autumn 2013, the migration of common cranes (the subject of protection in the Słowińskie Coast PLB220003 special protection area) on a large scale in the southern direction was recorded. The impact due to the barrier effect resulting from the presence of the farm has been assessed as low. It has been estimated that the distance the common crane travels will potentially increase by 0.22% or 2 km as a result of bypassing the farm by the birds compared to the common crane route. Such an increase in the distance was considered negligible.

Seabirds migrating over the area of the BSIII OWF will be exposed to the risk of collision with the structures of the wind farm built in their habitat. The probability of collision depends on the density of the species in the area, the time it spends flying, the avoidance response, the flight altitude and the wind farm parameters (number and size of turbines). The scale of the impact on bird populations due to the collision has been determined by two independent teams of experts. The results obtained were compared with the limit values of potential biological removal. For all species, the numbers of annual collisions estimated by both teams are insignificant compared to the limit values of potential biological removal (PBR), as well as from the point of view of the population's biogeographical number. As a result, the magnitude of the impact has been assessed to be insignificant and the importance of the impact has been assessed to be negligible or low.

In the impact assessment, special attention was paid to the risk of common crane collision,

as a relatively large number of individuals of this species migrating through the area of the BSIII OWF was found, of which about half (48%) flew at the height of the rotor. Several collision risk scenarios have been considered. Finally, a 98% avoidance rate was adopted to avoid the risk of underestimation or overestimation of this impact. In this way, the result of 9-14 common crane collisions per year was obtained, depending on the analyzed farm option, which corresponds to a very small part of the biogeographical population of this species (the European breeding population is estimated at 57,000-88,000 pairs). Such mortality was assessed as low.

Another group of birds migrating in large numbers through the area of the BSIII OWF in the period of autumn migration are geese. The predicted number of collisions per year is 0-1 individuals in spring and 67-124 individuals in autumn, depending on the analyzed option, with the assumption of 99% avoidance rate. For the option of the farm selected for implementation, the predicted number of collisions during the year is 31-84 birds, assuming 99% avoidance rate. This value is not high considering the size of the biogeographical population and is less than 0.01%. The impact on migratory geese has, therefore, been assessed as negligible.

Proposed minimizing measures at the stage of operation concern painting of blade tips in bright colors, relevant lighting of the turbine at night, use of solid towers, determining the size of the clearance between the lower position of the rotor wing and the sea surface at a minimum of 20 m. The risk of collision for seabirds and passerine birds migrating during the night can be reduced by adjusting the lighting system of the wind farm and the vessels used for its construction. In general, it is assumed that the lower the lighting, the better, and the lights should be placed as low as possible, because the lower the lights, the less birds they will attract.

In addition, potential impacts in the form of bird collisions may be reduced by shutting down wind turbines during periods of most intense migration of sensitive species. The migration peak of some species, such as common cranes, usually takes place only during a few days of the migration season. Knowing the migration dates of the species, the prevailing atmospheric conditions and carrying out the visual and radar monitoring, it is possible to predict the period during which several days of intensive migration of birds will take place. Therefore, it is necessary to equip the farm with a system that constantly records the nature of birds flying through the farm area and enables its shutdown in the event of a threat.

The assessment of the impact on integrity, coherence and objects of protection in Natura 2000 sites, carried out for migratory birds, focused on the assessment of the impact of the BSIII OWF on the migratory birds stream in its area, especially on the assessment of the scale of impacts on the size and quality of the Eurasian population of migratory birds subject to protection within the Natura 2000 network, as a result of the barrier effect and potential depletion of their numbers as a result of collisions with turbines. In addition, the impact of the BSIII OWF on Natura 2000 sites within a radius of 25 km from the farm boundaries, which were established to protect wintering grounds and migration corridors of birds, was investigated. In this impact zone, the BSIII OWF may potentially affect the integrity of these areas. After the analysis of possible impacts that the assessed project may cause, independently and in cumulation with other projects, it should be stated that the BSIII OWF will not significantly affect the integrity, coherence and subject of protection of Natura 2000 sites in any of the considered options through the impact it will cause on birds. In the absence of significant impacts in terms of a barrier to migratory Eurasian populations and mortality due to collisions, affecting the conservation status of these populations, the BSIII OWF is not expected to cause transboundary impacts on birds.

Impact assessment of the option selected for implementation and the reasonable alternative option on marine mammals

The most far reaching project scenario, i.e. the one that may potentially have the greatest impact on marine mammals – porpoise, grey seal and harbor seal – is the construction of the wind farm using 208 monopile foundations with a diameter of 7.5-10 m, as this scenario will cause the greatest underwater noise. However, it should be noted that in the case of impacts associated with the disturbance of bottom sediments, the most far reaching scenario will not be the use of monopiles, but gravity-base foundations.

The most significant negative impacts on marine mammals will occur at the stage of construction of the BSIII OWF, mainly the emission of noise and vibration, associated with driving of foundation

piles (with the highest intensity during the driving of monopoles) and the increase of suspended matter concentration in water (with the highest intensity when gravity-base foundations are used). Jacket-type, tripod-type and monopile foundations require pneumatic hammers to be installed that cause a high sound pressure level. Measurements of this noise when driving steel piles with a diameter of 3.9 m on the Horns Rev II farm showed that the peak sound pressure level for one impact exceeded even 190 dB re 1 pPa at a distance of 720 meters from the construction site. Although most of the pile-driving noise is low frequency (< 1 kHz), hardly audible particularly by porpoises, a significant part of the noise has a frequency to which porpoises and seals are very sensitive. Hence, due to the intensity and frequency of the sounds, it is possible to disturb the functioning of marine mammals in the area of the planned project. Survey in the Danish part of the North Sea has shown that the porpoise responds negatively to pile driving at distances of up to 18 km. The activity of the porpoises decreased significantly during the construction period compared to the baseline period. The effects of driving the piles lasted up to 72 hours. No negative response was observed in the vicinity of the research station located at a distance of 21.2 km. This may mean that, at such a distance, porpoises no longer respond to construction work, and animals from closer locations have moved out of the impact zone.

Most of the noise generated by trailing suction dredgers has a frequency below 1 kHz. However, depending on the type of substrate, higher frequencies may also occur, especially if there are larger grains of sand and gravel as they move through the dredger's pipe and pump. Even if only sand is extracted, the acoustic energy can exceed 1 KHz, potentially affecting porpoises and seals. It should be noted that the noise from dredging is more or less continuous. The results indicate that if the porpoises do not spend too much time near the dredgers, they will not be physically injured in any way. Sand extraction surveys indicate that after a dredger vessel left the area, the frequency of registration of porpoise activity ("clicks") returned to pre-extraction levels.

The estimated range of actions for the option selected for implementation indicates that for a single impact, hearing loss due to permanent changes in the hearing threshold (the so-called permanent threshold shift – PTS) can be expected in both seals and porpoises at relatively short distances from the source – 20 m and 300 m respectively. Periodic changes in hearing sensitivity (temporary threshold shift – TTS) may be expected at distances of up to 5.7 km for porpoises and 2.7 km for seals and up to 3.0 km for fish. Behavioral responses are expected at a distance of 68 km for porpoises and 2.7 km for seals. In order to reduce this type of impact, it is necessary to apply mitigation in the form of an air curtain. This action will reduce the range for a single impact to a large extent: dozens for periodic threshold shifts and behavioral responses of porpoises at a distance of respectively: 1 km and 15.7 km. A similar effect occurs in the case of multiple impacts. The PTS in seals and porpoises will occur at distances of 5 and 20.9 km, respectively (assuming no animal movement and 1-hour exposure to sound); the TTS will occur at 22 and 83 km, respectively. The range of impact for fish, assuming 24-hour exposure to sound, for the TTS was approximately 35 km from the sound source. After the air curtain was used, the PTS was 4.7 km for seals and approx. 400 m for porpoises (TTS was at 3.5 and 20.7 km, respectively). The impact zone for fish, with assumptions the same as above, was 7.2 km for the TTS.

Marine mammals tend to inhabit waters with a high degree of turbidity and many of them use an advanced sonar system that allows them to orient in the environment. Increasing turbidity during the execution of the farm will thus have a negligible impact on marine mammals in the area of the BSIII OWF. Such impact may, to a minor extent, happen to marine mammals that do not use echolocation but at least part of their vision for feeding and detection of predators, but there is no direct evidence of this. In connection with the construction of the farm, sedimentation is expected to be raised during the laying of cables in the seabed between power plants and during erection of gravity-base foundations. Based on the modeling of the increase in sediment concentration in the water column it was found that the increase will not exceed 20 mg/l within the boundaries of the wind farm and 10 mg/l outside the farm area. Similarly, the level of deposition of the raised sediments will reach a maximum of 2-3 mm during and after the completion of dredging works. This relatively small value indicates that the raised material is deposited over a large area, which makes the long-term effect minor. The results obtained indicate that the generated impact is negligible.

The most important impacts on marine mammals during the operation stage will be related to the creation of an "artificial reef" (positive impact) where mammals can find potentially rich fish stocks

constituting their basic food.

Moreover, the surveys on the distribution of porpoises during the construction and operation stages of the OWF in Germany, Denmark and the Netherlands, where turbines with a capacity of 2 to 5 MW were used, in two cases did not show any negative impact of noise during the operation of the farm. The surveys carried out at the OWF in Nystedt (the Danish part of the Baltic Sea) showed a decrease in the number of porpoises for two years after the completion of construction. Then the situation slowly returned to the initial state. According to literature data, surveys based on numerical noise modeling and impact assessment of 6 MW turbines using jacket-type, gravity-base and monopile foundations showed that the modeled noise associated with monopile foundations (6 MW turbines) was audible to porpoises and seals up to 18 km away. In the case of seals, however, no behavioral response was observed. Porpoises sometimes reacted at high wind speeds (15 m/s) at a distance of 18 km from the source. However, these responses affected only 10% of animals. This means that 90% of the modeled porpoises have not shown any response to operational noise from turbines on monopile foundations.

In addition, operating turbines will cause flashes of light and cast moving shadows on the surface, which can be seen by seals and possibly also by porpoises. The two phenomena mentioned above are well known for onshore turbines. The first one is the so-called stroboscopic effect, which consists in cyclic, intensive reflections of sun rays from moving blades of the turbines. The second is the so-called shadow impact. It consists in cyclical covering of sun rays by rotating blades of the turbine, which causes the appearance of a shifting shadow, in this case – on the sea surface.

The stroboscopic effect will be eliminated by painting the blades of the turbine with special paints that reduce the reflections of sunlight (it is a commonly used solution on onshore farms). It should also be assumed that these phenomena will not be relevant, as porpoises and both seal species spend most of their time underwater. Negative impacts of the decommissioning stage on mammals will mainly consist in noise emission during demolition works, destruction of the artificial reef (reduction of food base) and negative impacts of increased suspension in water. The scope of impacts will be similar to those generated during the construction of the project.

One Natura 2000 site is located close to the farm site and two more are located slightly further away, which have been established for the protection of marine mammals. These include:

- Ostoja Słowińska PLH220023 (Ostoja Słowińska Protected Area);
- Zatoka Pucka i Półwysep Helski PHL220032 (Puck Bay and the Hel Peninsula);
- Kaszubskie Klify PLH220072 (The Kashubian Cliffs).

The responses of porpoises to noise from pneumatic hammers at distances of more than 20 km have been documented. The impact range can be as much as 68 km. As the distance between the construction site and the Natura 2000 site of Ostoja Słowińska Protected Area is 19 km, the noise level will be high enough to trigger a response in porpoises. At this distance the cumulative noise level may cause temporary shift of the hearing threshold in porpoises. However, noise levels are not expected to be sufficiently high in this Natura 2000 site to cause responses among gray seals. But the increased vessel traffic due to the construction process may mask the noise significant to seals.

Behavioral response to noise can be triggered even from a long distance and can be important for long-term, continuous emission caused by the piling of successive foundations. In the most far reaching scenario, there is a likelihood that both seals and porpoises may develop temporary shift of the hearing threshold. As noise can – in the most far reaching scenario – lead to behavioral responses in a small percentage of porpoises (if any) within 68 km of the area, the impact of noise on porpoises or gray seals in the Natura 2000 site of Ostoja Słowińska PLH220023 is expected. These large-scale behavioral responses can also lead to a barrier effect, but only if the migration or local/regional movement of animals is hindered, for example in narrow corridors. The situation in the BSIII OWF area is different as the behavioral impact zone is in open waters, providing the possibility of movement in all directions. According to the sound propagation modeling carried out, even in the most far reaching scenario without mitigation, a corridor with a width of several kilometers remains between the coastline in the Sanctuary area and the avoidance zone, allowing free movement of mammals. The analyses have shown that in some cases (e.g. during pile driving in the southern part of the OWF area), impacts may occur that result in behavioral responses in the Natura 2000 site and cause deterring of marine mammals. But only a small percentage of animals

would be affected and its individual significance is described as negligible. In case of a series of impacts of a pneumatic hammer (exposure time: 5h for a single monopile in the most far reaching scenario and 18h for a tripod and jacket), the porpoises present in the Natura 2000 site will be outside the area where temporary shift of the hearing threshold may be caused. For gray seals, the Natura 2000 site is within the range of the noise level causing temporary shift of the hearing threshold from the series of impacts, if construction works are carried out in the central part of the OWF. Therefore, it is possible that some animals may leave the temporary shift of the hearing threshold zone during the accumulation period (1 h) due to avoidance behavior – this refers at least to porpoises. Therefore, it should be stated that without the use of mitigation measures to reduce the noise level, the impact on the Natura 2000 site may be significant and may cause negative effects on the integrity of the subject of protection.

In order to limit the scope of impact, it is expedient to take as justified the proposal of the authors of the report related to the need for minimizing measures. One of them is the use of a bubble curtain (it is assumed that it reduces noise by 14 dB). In simple terms, air curtains are systems that consist of a compressor and perforated pipes connected to it, releasing small air bubbles around the bottom. The bubbles floating to the surface block the sound of the driven pile. The use of an air curtain or other similar solutions will greatly reduce the level of sound emitted, and thus significantly reduce the impact zone.

In addition, in order to limit the possibility of a long-term barrier effect, a minimizing measure may be used, consisting in the proper organization of the construction process, so as to avoid continuous (with intervals of less than 72 hours) piling for more than a few months. Correct length intervals may result not only from deliberate scheduling of work (e.g. technical intervals necessary to deliver further foundations from the construction port), but also from inappropriate weather conditions at which construction works cannot be carried out. During these intervals, marine mammals will be able to move freely in the zone of potential behavioral impacts.

In addition, the work schedule should take into account the concentration of the most onerous works during the period between May and September. This is also due to the observation of the etiology of the Baltic population of the porpoise. On the basis of the SAMBAFI project studies, it was concluded that the Baltic porpoises are concentrated in two populations: the Baltic Proper and the Western Baltic, which clearly separate during the breeding season, i.e. from May to December. The Baltic Proper individuals are then concentrated in the area south-east of Öland (mainly in the Midsjö area, within the boundaries of the Exclusive Economic Zone of Sweden). Although the distance from the BSIII OWF area to the Puck Bay and Hel Peninsula PLH220032 cause that temporary shift of the hearing threshold may occur in this area in seals and behavioral responses in porpoises in the area, the results of acoustic modeling clearly showed that the peninsula protecting the bay is a specific sound barrier, thus minimizing the potential impacts on marine mammals in the Natura 2000 site. Thus, it can be concluded that the significance of the impact on marine mammals in this area will be negligible.

Due to the distance of the BSIII OWF from the Kashubian Cliffs PLH220072 (55 km), the only possible source of disturbances may be underwater noise. While it is possible that sounds relevant to gray seals will be masked, acoustic modeling has shown that noise levels fall very sharply in willow waters south of the OWF. Therefore, most of the noise is suppressed and the noise level will be too low to cause any impact. Impacts on marine mammals will be negligible.

Post-investment monitoring is aimed at verifying whether the analyzed water region will be re-used by porpoises as in the pre-investment period (i.e. identified in the pre-investment environmental survey). In addition, the monitoring process is intended to enable verification of the impact of construction noise on the local sound level. This should help in further identification of the range of impacts of the construction and operation stage of the BSIII OWF on marine organisms and verification whether the implementation of the farm does not significantly increase the level of acoustic background in the BSIII OWF area.

Monitoring should be performed with the use of C-POD “click” detectors, in a similar way to pre-investment monitoring. In the absence of Polish guidelines, the acoustic monitoring should be consistent with the German guidelines for the Environmental Impact Assessment for the OWF – Bundesamt für Seeschifffahrt und Hydrographie of 2013. Measurements of construction noise should be carried out during the period of intensive work (e.g. driving of foundation piles).

Measurements of operational noise should cover three ranges – low, medium and high (according to wind classification).

At least three detectors of “clicks” emitted by porpoises (C-POD) should be placed in the vicinity of the farm during the construction stage, preferably in the same locations as during the pre-investment monitoring. In addition, it is recommended to install 3 C-POD devices in two different reference surfaces, located at least 20 km from the impact source (i.e. within the range of behavioral response to pile driving). The key parameters of the measurement campaign are as follows:

- measurements should be made with calibrated underwater microphones (hydrophones) in the frequency range of 10-20 kHz;
- the measuring point must be sufficiently distant from the site of operation of the pneumatic hammer. The BSFI guidelines recommend a distance of 750 m and 5,000 m from the foundation and in the nearest protected area (if it is located further than 5,000 m from the project site).

Monitoring of the acoustic background is necessary to verify the predictions made at the stage of the environmental impact assessment. Data should be collected randomly from the various turbines within the OWF. Acoustic measurements must be carried out at a distance of about 100 m from the sound source and in the central part of the OWF. Proper research should be carried out as at the stage of implementation.

Additionally, measurements should be made outside the OWF area, at a distance of 1000 m, as well as in the nearest area covered by nature protection, provided that it is located at a maximum of 5 km from the project area. If there is no such area in the vicinity, the acoustic measurements should be carried out at a distance of 5 km from the OWF.

Monitoring of porpoises should start no later than 6 months before the start of construction and should continue throughout the construction period. During the operation stage (after the construction stage), post-investment monitoring for porpoise should be carried out for 24 months, using the same methods as during construction.

Measurements of underwater noise during construction should be carried out during piling, at regular intervals. Measurements of noise emitted by the operating farm should be carried out once, for 3 different wind forces (sea states) – 2, 4 and 6 Bft.

Impact assessment of the option selected for implementation and the reasonable alternative option on bats.

The most far-reaching project scenario, i.e. one that may potentially have the greatest impact on bats, is the construction of a wind farm with the use of 200 wind turbines with a minimum clearance of 20 m, rotor diameter of 192.5 m and maximum total height of 212.5 m. This scenario will possibly cause the highest mortality of bats.

During the environmental survey, single observations of one species of bat – common noctule – were found in the area of the BSIII OWF and in the buffer zone.

Further farm facilities created during the construction process may be used as new hiding places and stops on the migration route. In addition, increased vessel traffic and structures above the water surface are associated with increased insect concentration. Bats, attracted to the construction area in this way, will be exposed to collisions with vessels and wind turbines under construction.

A potential major cause of bat mortality during the operation stage will be collisions with wind turbine structures and barotrauma (death as a result of alveolar rupture). The farm facilities themselves and the lights they are equipped with, can attract insects. They can also be attracted by the temperature raise caused by the operation of the blades. Thus, feeding grounds for bats may potentially be created. No high bat concentration was recorded in the surveyed area, which indicates the lack of a permanent migration corridor.

In addition, bats, according to the previous research results, migrate in dispersion, in groups of 2-3 individuals, which also affects the magnitude of the impact.

Service vessels used at the operation stage will not reach high speeds, thus feeding and migrating individuals shall not have problems with bypassing obstacles.

The farm facilities themselves, as well as the lights they will be equipped with, can attract insects. The insects can also be attracted by the increase in temperature caused by the rotation of the rotor blades. This way, feeding areas may form which could attract bats to the area of the planned wind farm.

However, bats can feed in suitable weather conditions, such as wind speeds of up to 6 m/s and no rain. The monitoring carried out for the purposes of the report recorded the presence of the common noctule (*Nyctalus noctula*) at comparable wind speed. During the hydrological conditions survey in the area of the planned wind farm during spring migration the average wind speed was 5.6 m/s with a maximum of 12 m/s, whereas during autumn migration, the average wind speed was 7.1 m/s with a maximum of 19.7 m/s. Days were also recorded when the wind speed was 0 m/s. As a consequence, few days during migration may occur when insects and hunting bats will appear at the time of the turbines operation. However, the significance of this impact was considered to be low.

Mitigation measures are not required because, even in the case of the most far reaching scenario, which may occur in the rational alternative option, the significance of the mentioned impact on bats is low.

Impacts occurring during the decommissioning phase of the project will be similar to impacts occurring during the construction phase, but will be less intense.

After commissioning the project in the form of an offshore wind farm, it is recommended to carry out the post-development monitoring, which should be carried out during the first five years of the farm's operation, covering at least three seasons. The survey should cover the first two years of the farm's operation, and the last season of surveys may be carried out at a later date, but not exceeding the period of 5 years of operation of the completed project.

Post-development monitoring should consist of two elements, such as bat mortality studies and monitoring of bat activity in the vicinity of wind turbines. Post-development monitoring should be based only on the bat activity survey and carried out in accordance with the same principles as monitoring prior to the implementation of the project. The equipment used should allow automatic recording and meet the minimum requirements for equipment used in the pre-investment research. Monitoring should be carried out in the period covering spring and autumn migrations. Number and distribution of recorders should be specified after the location has been determined on the farm area. According to the "Temporary guidelines for the assessment of the impact of wind turbines on bats" (2009), the recording should be carried out for at least 1/3 of the wind farms during all seasons of bat activity. The authors of the report proposed the placement of one recorder. Therefore, due to the size of the farm and the number of turbines, but also due to the relatively low activity of bats in the area, it was assumed that at least 6 recorders would provide sufficient data on the activity. Where significant negative impacts on bats or significant hazards are identified, appropriate mitigation or preventive measures must be specified and applied, including periodic shutdowns of turbines.

Safety zones will be designated around the elements of the BSIII OWF, where limited traffic of vessels not belonging to the Investor will be in force. The creation of such a zone is aimed primarily at reducing the risk of collisions and thus the hazard to human health and life, environmental pollution and serious economic losses. Depending on the width of these zones, they may also constitute the part of migration routes for birds and bats through the farm area. Therefore, during the repeated Environmental impact assessment, with the safety zones already established, their significance for migratory birds and bats should be indicated.

Assessment of landscape impact of the option selected for implementation and the rational alternative option

Assessment of impact for the project was carried out in accordance with the framework methodology adopted in the project with minor modifications or clarifications. On the basis of available literature data, parameters of the project and analyses carried out, it was estimated that the potential impact range of the BSIII OWF may reach up to 50 km. The greater range of visibility than that found in the existing projects results from significantly higher maximum size parameters of the BSIII OWF (maximum total height of the structure, maximum range of the rotor zone).

The following towns and villages are within this range: Ustka (urban borough of Ustka), Rowy (rural

borough of Ustka), Łeba (borough of Łeba), Lubiato (borough of Choczewo), Białogóra (borough of Krokowa), Dębki and Karwia (borough of Krokowa).

Based on the available literature data, the significance of landscape (as a resource on which the BSIII OWF may have an effect) was classified as medium.

Two main social groups were found to be exposed to visual impacts from the location of the BSIII OWF in the maritime area: residents of coastal towns located in the impact zone and tourists visiting the Polish coast in the impact zone.

Locations with special exposure to the sea include: sea ports in Ustka and Łeba, hotels with sea views (e.g. the Neptun hotel located by the beach near Łeba), lighthouses near Ustka, Łeba, Stilo, the seaside promenade in Ustka.

For the purpose of the assessment, observation points have been selected which, due to their exposure and their significance to the public perception of potential impacts, have been identified as potentially sensitive to impacts from the BSIII OWF. The following lookout points in the surroundings of the project, with a view of the sea, have been selected:

- jetty in the vicinity of Ustka,
- beach in the vicinity of Rowy,
- dunes within the Słowiński National Park,
- beach within the Słowiński National Park,
- beach in the vicinity of Łeba,
- lighthouse in Stilo,
- beach in the vicinity of Białogóra,
- beach in the vicinity of Lubiato,
- beach in the vicinity of Dębki,
- beach in the vicinity of Karwia.

These points were assigned an appropriate category of importance, photographic documentation and visualizations were prepared for them and the impact on the landscape was subsequently assessed. During the assessment meteorological conditions, which directly contribute to the increase or decrease of visibility, were taken into account. The meteorological parameters of particular significance in the context of visual impact of the planned BSIII OWF include sunshine duration and the number of sunny days (without cloud cover and precipitation) per year, which will increase the visibility of the project, as well as precipitation, haze, fog and cloud coverage, which will lead to reduction of the OWF visibility from the land.

The climate on the coast is classified as coastal strip climate with the lowest amplitudes of air temperatures, high humidity, mild winters, cooler summers and strong winds. The dominating winds are from the west and southwest directions.

The obtained data on visibility for 2013 show that very good visibility (from 20 km) dominated for the most part of the year, especially in the summer months (June, July, August).

For the purpose of this analysis it was assumed that the accumulation of impacts of the BSIII OWF with other projects may take place in the case of the implementation of the following projects: BSII OWF, Baltica 2 OWF, Baltica 3 OFW, Offshore Electricity Transmission Infrastructure (OTI).

WindPRO software was used to prepare the visualization.

For visualization and analytical purposes it was assumed that wind farms were painted with paints in colors commonly used by turbine manufacturers for offshore wind farms.

During the construction phase there will be impacts on the landscape related to specific works such as: construction and transport of components, assembly/installation of turbines at sea and construction of internal and external infrastructure and cable for the transmission of energy to land. The magnitude of the impact of vessel traffic during the construction phase of the BSIII OWF (for both accepted options) has been classified as insignificant, mainly due to the significant distances between transport routes, construction ports and the construction site. Landscape significance has been classified as medium, therefore impact significance has been assessed as negligible.

The analysis carried out for each of the selected observation points showed that regardless of the considered option, the visual impact of the project on the landscape during the operation phase will be similar.

The visibility of the BSIII OWF decreases with increasing distance of the observer from the project and is reduced to zero within a radius of about 45-50 km.

The project will have the greatest visual impact on observers located within the boundaries of the Słowiński National Park (dunes and beach) and on the beach near Łeba. However, even from these points the significance of the impact was assessed as moderate. At the remaining points the significance of the impact was assessed as low. In none of the cases considered will the BSIII OWF be dominating the landscape, significantly affecting the change of perception of the marine landscape from the main lookout points.

At the stage of project decommissioning, the aesthetic values of the landscape will be temporarily reduced as a result of demolition works. These impacts will consist in the increased movement of vessels taking part in the decommissioning of the farm.

The significance of the impact on the marine landscape for this stage was assessed as negligible for both considered options.

The results of the visualizations performed indicate that the wind farm may be slightly visible from the sea shore. Painting in appropriately selected color schemes, consistent with the environment, will result in a total loss of visibility or reduce the visibility to a minimum.

There was no need to apply other measures to mitigate the impact of the BSIII OWF on the marine landscape. The main factor influencing the minimalization of visual impact on the marine landscape is the significant distance (over 20 km) of the project from the coast.

The significance of the cumulative impact during the construction phase for the option chosen for implementation and alternative option has been assessed as negligible.

In the event of the implementation and operation of the BSII OWF, BSIII OWF, Baltica 2 OWF and Baltica 3 OWF, their visual impact will be cumulative. The degree to which it will be cumulative shall be dependent on the observation point. The scale of accumulation will be small and will not significantly affect the change of visual perception of these projects from the indicated observation points. Large or very large cumulative impacts were not indicated for any observation point.

During the decommissioning phase, regardless of the considered option, there will be no or negligible accumulation of impacts with other projects in this respect.

Due to the distance of the BSIII OWF from the borders of other countries it was found that there will be no transboundary impact of the project on the landscape.

Monitoring of the project's impact on the landscape was determined to be not required.

Assessment of impact on cultural heritage of the option selected for implementation and the rational alternative option

Assessment of impact for the project was carried out in accordance with the framework methodology adopted in the project with minor modifications or clarifications. The most far-reaching project scenario, i.e. one that may potentially have the greatest impact on cultural heritage, is the construction of a wind farm with the use of 208 foundations. The most far reaching scenario can occur in a rational alternative option. The option chosen for implementation assumes the use of approx. 40% lower quantity of foundations.

The assessment is related to the impact of the BSIII OWF on the objects of great importance for the protection of cultural heritage. "Underwater cultural heritage" means all traces of human existence of a cultural, historic or archaeological nature which have been, or are, totally or partially submerged under water, temporarily or permanently for at least 100 years, including sites, structures, objects, artifacts and human remains, together with their archaeological and natural context, vessels, aircraft and other vehicles or parts thereof, cargo or other content, including their archaeological and natural context, as well as objects of prehistoric nature. Cables, pipelines and existing installations that are currently in use are excluded from the definition.

The following potential impacts on the underwater cultural heritage have been identified during the implementation of the BSIII OWF project: damage or complete destruction by anchors of vessels, damage during the installation of pile foundations, subsidence of soil, exposure of archaeological objects and settlement of disturbed sediments.

In addition, unplanned emissions may occur at each stage of the project, such as pollution of the water column and seabed sediments by oil derivative substances, pollution of the water column by accidentally released chemicals, which may indirectly affect the sites that are important from the perspective of cultural heritage protection. During construction works, military objects, including unexploded ordnance, may also be encountered. In such cases appropriate procedures should be

followed.

In the course of archaeological research a shipwreck has been found. The identified object is of low historical value and its importance as a resource in the context of cultural heritage protection has been identified as medium.

During the geotechnical surveys and construction works new, unidentified archaeological objects may be discovered which, due to a lack of knowledge about their existence at this stage, have not been included in the impact assessment presented in the report.

For the purpose of the impact assessment it has been assumed that in order to ensure the safety of the teams working in the farm area at all stages, i.e. construction, operation and decommissioning, a protective zone will be established around the identified wreck within which it will be forbidden to anchor vessels or lay farm components, including the laying of cables. Initially, the 50-meter protection zone was established, but its size should be verified after detailed magnetometer research carried out at a later stage of the project.

All potential impacts of the BSIII OWF on the discovered wreck have been assessed to be of negligible significance except for impacts associated with the installation of pile foundations and the spill of oil derivative substances during an emergency, which have been assessed to be of minor significance.

The results of the assessment showed that the project consisting in the construction of the BSIII OWF will not have a significant negative impact on objects of great importance for the protection of cultural heritage in any of the considered options of the project, at any of the stages, i.e. construction, operation and decommissioning.

At the environmental research stage at the farm area, a shipwreck was found which was subsequently entered into the Register of Underwater Archaeological Sites (Ewidencja Podwodnych Stanowisk Archeologicznych, EPSA) under the symbol B96.1. The wreck is initially dated at the beginning of the 20th century. This is evidenced by the steam drive and the mixed steel-wood sheathing. The wreck is approximately 60.4 meters long 9 meters wide. The identified object is of low historical value and its importance as a resource in the context of cultural heritage protection has been identified as medium.

The object may be damaged during construction works. Vibrations caused by the driving of monopiles and jacket or tripod foundations that are located close to the wreck may cause the top layer of the sediment to liquefy, which could lead to wreck damage, even though a protection zone is in place. The direct effect of vibrations may be felt at a distance of several meters from the driven pile. It should be noted that such an impact can only occur if pile foundations are used in the project. Therefore, a conservation zone of min. 50 meters will be designated around the wreck in which it be forbidden to place any elements of the farm, including foundations and cables. This is an initial assumption and the final zone size should be determined at the stage of construction design.

In addition, during the geotechnical surveys and construction works new, unidentified archaeological objects may be discovered which, due to a lack of knowledge about their existence at this stage, have not been included in the impact assessment presented in the report. In that case any damage caused to them by the works performed must be prevented and the relevant administrative authorities must be notified of the finding.

Due to the local character of the potential impacts of the OWF at the stage of decommissioning and the location of the discovered wreck, it was stated that accumulation of impacts of the BSIII OWF and impacts of other projects is unlikely.

The wreck of the steamer found in the area of the planned BSIII OWF does not constitute an object of high historical value. Nevertheless, according to the provisions of the UNESCO Convention on the Protection of the Underwater Cultural Heritage of 2001 and the United Nations Convention on the Law of the Sea of 1982 there is an obligation to protect the wreck from damage. Attention should be paid to the intercultural character of historic objects located in maritime areas. In most cases shipwrecks located off the coast of a country come from a completely different area. Destruction of the wreck would reduce the resources of the international cultural heritage of sea areas.

Due to their local character, impacts of the BSIII OWF will not have a transboundary effect on other archaeological sites located within the boundaries of the exclusive economic zones of other countries.

In the area of the planned BSIII OWF no risk of impact on the objects of great importance for the protection of cultural heritage was found, therefore there is no justification for indicating monitoring activities in this respect.

At the stage of geotechnical research performed on the edges of paleovalleys, detected during geological research in the southern and south-western part of the field, the decision imposed an obligation to inspect the obtained drilling material by a paleoarcheologist in order to confirm or eliminate the possibility of occurrence of artifacts related to ancient colonization.

If there is a significant movement of sediments found during the post-investment monitoring phase, the areas where the sediment layer has been watered out should be reassessed for a possible revision of the areas excluded from anchoring and other forms of use.

Assessment of fishing activity impact of the option selected for implementation and the rational alternative option

Assessment of impact for the project was carried out in accordance with the framework methodology adopted in the project with minor modifications or clarifications. The BSIII OWF will occupy approximately 7% of the total area of 4 fishing squares: M7, M8, N7, N8. Fishing productivity (surface fishing) in the area of the planned wind farm, as well as in its immediate vicinity, is low in relation to the average fishing productivity in the Polish maritime areas. In 2013, 71 fishing vessels were operating in the four Baltic Sea squares (M7, M8, N7, N8), including 25 boats of up to 12 meters and 46 vessels of over 12 meters in overall length. The structure of fishing for vessels operating in this area was dominated by cod and flounder, which accounted for over 80% of the share in 2013. The area under consideration was of limited importance for the fishing activities of the vessels mentioned above, which, in addition to the four squares, also fished in other, sometimes very distant, fisheries. Of the 71 vessels that fished in the four squares analyzed, 21 vessels reported activity in a total of 6 to 10 squares, 14 vessels fished in 11 to 15 squares and only 10 vessels fished in 5 or less Baltic squares. According to 2013 data only 6% of the total value of fish catches of units active in M7, M8, N7, N8 squares came from these four squares. This rate was higher for fishing boats - it was 24%, while for vessels bigger than 12 meters it was only 3%.

All potential impacts of the BSIII OWF on fishing activity will be of negligible significance or will not result in significant changes, regardless of the assessed option. It was found that the maximum fishing losses determined by the amount of lost revenue calculated on the basis of actual data for 2009-2013 may amount to PLN 257,000 annually. In the scale of the whole fishing activity these values are negligible. Additionally, it is expected that the fishing vessels which previously fished in the BSIII OWF area will move to other fishing areas.

The results of the assessment demonstrated that the project consisting in the construction of the BSIII OWF will not have a significant negative impact on fishing activity at any stage of the project, i.e. construction, operation and decommissioning.

No activities to minimize the potential negative impact of the wind farm are planned.

In the assessment of cumulative impacts, the following were taken into account: OWF electricity transmission infrastructure, neighboring offshore wind farms, concessions for exploration and prospecting of oil and natural gas deposits and shipping routes. It was concluded that in most cases there would be no or negligible accumulation of impacts. The exception is the possibility of accumulation of impacts of the BSIII OWF with impacts of other offshore wind farms in the furthest reaching scenario, i.e. the construction of the BSII OWF, BSIII OWF, Baltica 2 OWF and Baltica 3 OWF and the exclusion of their areas from fishing activity. The cumulative effect of the four adjacent wind farms was assessed as moderate. The fisheries occupied by these projects are of minor importance for fishing activity and the vessels fishing there will be able to move easily to other fishing areas.

No transboundary impacts of the BSIII OWF on the fishing industry of other countries were identified.

There is no justification for recommending monitoring activities. The fishing activity of the fleet is monitored by the fishing administration on an ongoing basis. There is no need to collect additional information.

Assessment of impact on other sea users of the option selected for implementation and the rational alternative option

"Other users of maritime areas" is a concept that, for the purposes of EIR, includes:

- coastal tourism,
- recreational fishing,
- water sports,
- military operations,
- radio determination and communication systems,
- civil and military aviation,
- maritime shipping,
- exploration, investigation and exploitation of mineral resources of the seabed and the interior of the earth beneath it,
- maritime industry,
- health and life of people.

Social conflict possibility is also an element of the assessment of the impact on other users.

Coastal tourism

Coastal tourism is an important branch of the tourist industry in Poland. Due to the proximity of the sea coast, coastal boroughs are considered as areas of high natural value which are attractive to both domestic and foreign tourists.

It was concluded that the OWF could potentially cause the following types of impacts on coastal tourism:

- 1) at the construction stage: impact on the landscape due to increased movement of vessels involved in the construction of the farm and the appearance of individual farm facilities within the progressing construction process of the project, emission of surface noise in connection with construction activities;
- 2) at the operation stage: the impact of wind turbines and other components of the farm on the landscape (e.g. transformer stations, measuring and research station), emission of surface noise by wind farms and ships servicing the farm, light phenomena (shadow flickering, light marking);
- 3) at the decommissioning stage: impact on the landscape due to increased movement of vessels involved in disassembly of farm components, emission of surface noise due to disassembly works; disappearance of a tourist attraction in the form of the OWF.

The impact assessment commenced with the determination of the project scenario which will potentially have the greatest impact on coastal tourism (the most far reaching scenario). It was assumed that the most far reaching scenario can occur in the alternative option.

It was determined that the impact of the BSIII OWF on coastal tourism will be mostly related to the impact of this project on the landscape. The BSIII OWF has the potential to visually impact the coastal section from Ustka on the west side to Karwia on the east side. Coastal tourism has therefore been determined as the recipient of the impact of the BSIII OWF in this entire section.

The importance of coastal tourism (as a recipient of the BSIII OWF impact) has been categorized as medium. It was determined that the potential impact of the BSIII OWF on coastal tourism related to the visual impact of the project on the landscape at all stages will be negligible.

The results of the assessment showed that the project consisting in the construction of the BSIII OWF will not have a significant negative impact on coastal tourism in any of the considered options of the project, at any of the stages, i.e. construction, operation and decommissioning, or cumulatively with other projects.

Additionally, it should be emphasized that visual issues are very subjective - what by some will be perceived as a disturbance of the landscape leading to a decrease in the tourist attractiveness of the region may be perceived even as an attraction in itself by others. Therefore, the impact of the BSIII OWF may also be positive - the farm may become an additional tourist attraction for the region.

Recreational fishing

Based on the results of vessel traffic monitoring it cannot be ruled out that the area of the BSIII

OWF is an area of recreational fishing. However, there is no data available that would make it possible to determine the exact intensity of such activities. The analysis of the impact on commercial fishing did not show the existence of any particularly valuable fisheries within the boundaries of the BSIII OWF. On that basis it was found that it was also not a particularly attractive fishery for recreational fishing.

It was found that the OWF may at all stages, i.e. construction, operation and decommissioning, potentially cause the following types of impact on recreational fishing:

- 1) necessity to change the existing sailing routes,
- 2) necessity to move to other fisheries,
- 3) emission of surface noise.

At the stage of operation, attractive fishing areas may be created on the outskirts of the farm due to the so-called "artificial reef" effect - it is a positive impact.

The impact assessment commenced with the determination of the project scenario which will potentially have the greatest impact on coastal tourism (the most far reaching scenario). Such a scenario was considered to be the complete exclusion of the farm area from the possibility of vessel traffic, including vessels offering sea angling services. It was found that all of the above mentioned impacts could potentially occur in the BSIII OWF project, provided that the impact consisting in the emission of surface noise only applies to the construction stage and the potential decommissioning of the farm. The importance of recreational fisheries (as an impact receptor) for the assessment of the significance of impacts of the BSIII OWF has been classified as low. It was concluded that the demonstrated potential impacts of the BSIII OWF on recreational fishing at all stages would be negligible. The results of the assessment have shown that the project consisting in the construction of the BSIII OWF will not have a significant negative impact on coastal tourism in any of the considered options of the project, at any of the stages, i.e. construction, operation and decommissioning, or in cumulation with other projects. It should be stressed that in connection with the implementation of the BSIII OWF positive impacts may occur - the so-called "artificial reef" effect may lead to an increase in stocks of fish species being the subject of recreational fishing, and the farm as a tourist attraction may cause increased interest in angling voyages, if offers of such voyages also include the opportunity to see the OWF up close.

Water sports

Windsurfing and kitesurfing are sports that are practiced in the coastal zone, usually at a distance of up to 1 nautical mile from the shore. It was found that the BSIII OWF would not be a source of impacts on windsurfing and kitesurfing (also in cumulation with other projects) in any of the considered options.

No separate assessment of the impact of the BSIII OWF on marine sailing was made - it was found that the impacts of the BSIII OWF on marine sailing were similar to those of other types of vessels of similar sizes and having similar navigation equipment.

It was not found that the BSIII OWF could be the source of potential impacts on wreck diving (also in cumulation with other projects) in any of the considered options.

Military operations

The BSIII OWF does not occupy water bodies where naval maneuvers are carried out. Therefore, no impact assessment was carried out in this respect.

Radio determination and communication systems

In order to meet the formal requirements resulting from the provisions of the Permit for erection and use of artificial islands, structures and devices in the Polish maritime areas, for the purposes of the project an expert opinion was prepared on the impact of the BSIII OWF on the communication systems and radar systems of the Border Guard, Navy, Maritime Search and Rescue Service, Maritime Communication System in Distress and for Ensuring Safety and the National Maritime Safety System. This is a document independent of the EIA report. The EIA report only presents conclusions resulting from the expert opinion.

It was found that offshore wind farms might potentially cause the following types of impacts on communication and radio determination systems:

- 1) lack of signal of shore-based and shipborne communication systems and radar systems - turbines are a physical obstacle to waves, thus blocking the signal of transmitter/receiver stations,
- 2) difficulties in the correct location of ships by shore-based radar stations due to the occurrence of the radar echo phenomenon,
- 3) difficulties in the proper functioning of shipborne radar systems,
- 4) communication difficulties caused by interference in communication systems - interference caused by radio waves reflected by wind turbines.

Where, based on simulations performed for the most far-reaching scenario assuming the maximum number of turbines being 200, it was found that negative impacts reached beyond a 2-kilometer zone from the turbine boundary, corrective actions were proposed being the installation of additional transmitting devices on chosen turbines. Those devices would compensate for e.g. lack of signal or interference caused by the OWF presence. The zone width of 2 km was adopted on the basis of a risk analysis, review of publications and simulation results contained in the expert opinion. Possible keeping of the distance of 2 km from the wind farm by vessels will eliminate all hazards with a risk level defined as high and very high. It should be emphasized that the expert opinion will be updated at a later stage of the project, once the final number and parameters of wind turbines are known together with their layout. Then, on the basis of the results of the updated expert opinion, possible mitigation measures will be consulted with competent administrative authorities, if necessary.

Civil and military aviation

It was found that offshore wind farms could potentially affect civil and military aviation primarily during the operation stage, resulting in the following impacts:

- 1) wind turbines (under construction or constructed) may, due to their height, be a physical obstacle for aviation (including for helicopters operating drilling rigs or participating in rescue actions),
- 2) components of the offshore wind farm (in particular turbines) may cause disturbances in the operation of radar systems used in aviation.

Based on the approval of the planned project location by the President of the Civil Aviation Authority and positive opinion by the Military Air Traffic Service Office of the Polish Armed Forces, it was determined that the BSIII OWF will not affect the civil and military aviation in any of the options of the project considered in the report. Accumulation of impacts of the BSIII OWF and other OWFs is potentially likely to occur, primarily at the stage of operation of those projects. However, it should be remembered that for all subsequent offshore wind farms, the location of the project will also have to be consulted with the relevant civil and military aviation services, which will verify the threats to air transport posed by the subsequent projects in the course of their opinions.

Maritime shipping

Based on the results of vessel traffic monitoring in the BSIII OWF area, it was found that the planned project is located outside the area of intensive shipping traffic. Many vessels passed through the BSIII OWF area in all directions, although the distribution was clearly getting denser in the area south of the planned project, which is related to the Traffic Separation Scheme established in this area - Słupsk Bank, and east and north of the OWF where the usual shipping route for tankers and large bulk cargo vessels (planned as the future deep-water route D, set for the largest merchant ships and for tankers) passes.

It was found that due to the increase in vessel traffic in the area of the project at all stages (i.e. construction, operation and decommissioning), compared to the original situation - i.e. the pre-investment stage, offshore wind farms might potentially have a negative impact on maritime shipping, causing:

- 1) disturbance of the existing order and restriction or hindrance to shipping, which necessitate changes to the existing vessel routes (if they passed through the farm area). An increase in vessel traffic volume is particularly evident at the construction stage (or the potential decommissioning of the farm). At the operation stage the situation stabilizes, the traffic volume of vessels involved in the farm operation decreases, and the traffic is characterized

- by certain regularity and predictability resulting from the schedule of maintenance works;
- 2) electric shock hazard in case of emergency anchor dropping by the vessel and cable damage. However, that risk is minimized because substations are equipped with protection automation which switches off the cable in case of damage;
- 3) disrupted operation of radar and communication systems;

OWFs may also be a source of positive impacts:

- 1) generating additional revenues in ports handling ships involved in the construction/operation or possible decommissioning of the farm;
- 2) OWF components may be a place of refuge for castaways;
- 3) assisting navigation and allowing for better spatial orientation (thanks to marked farm components).

It was found that due to the increase in vessel traffic volume, the BSIII OWF might be a source of impacts on maritime shipping as described above, including on existing and planned shipping routes, however, those impacts would not be significant. In case of restriction of the right of passage through the farm area, it will be necessary to change customary routes of some vessels and direct them to the north or south of the BSIII OWF area, depending on planned destination. Based on results of a complex navigation expert opinion to be developed at a later stage of the project, the investor will implement, in consultation with the maritime administration and in compliance with the applicable legal regulations, appropriate actions aimed at minimizing the navigational risk (e.g. marking farm components, marking the farm on maps, messages). Therefore, it is assumed that possible collisions between vessels or between vessels and farm components will be unplanned events, caused mainly by human error, mechanical failure (resulting, e.g. in the loss of vessel steerability) or difficult weather conditions.

Simultaneous construction of two OWFs or construction of an OWF near another OWF being operated or decommissioned may necessitate bigger changes to shipping routes. At the current stage, however, there is no actual data on other planned OWFs that would allow for a precise estimation and assessment of such a risk.

Exploration, prospection and exploitation of mineral resources of the seabed and the inside of the Earth underneath it

In order to meet the formal requirements resulting from the provisions of the Permit for erection and use of artificial islands, structures and devices in the Polish maritime areas, an expert opinion has been prepared at the request of the investor on the impact of the Polenergia Bałtyk II OWF on the safety of exploration, prospection and exploitation of mineral resources of the seabed and the inside of the Earth underneath it. This is a document independent of the EIA report. The report discusses the conclusions of that expert opinion. It was stated that offshore wind farms might limit the possibilities of exploration, prospection and exploitation of mineral resources of the seabed and the inside of the Earth underneath it in the case when in the area of the OWF the process of installation of particular components of the farm has started or the farm has been already built. Then, traditional methods of prospection are not used, and the possibility of setting up a drilling rig (in order to identify a deposit) or a production rig is limited, due to the need to maintain certain safety zones.

The scale of conflict between offshore wind energy and the mining industry in the area of the BSIII OWF and the Słupsk E and Gaz Południe licenses, which overlap with the area of the planned farm, is small due to the minor common area of those projects - a total of 9.25 km². In practice, a theoretical problem may arise in relation to one well in the Słupsk E license area and apply to several wind turbines in the BSIII OWF area. Considering the above, no significant impact of the BSIII OWF on the possibilities of exploration, prospection and exploitation of mineral resources of the seabed and the inside of the Earth underneath it was found at any stage of the project or in cumulation with other planned OWFs.

Maritime industry

An important factor in the development of service and logistics back-up facilities for the BSIII OWF will be the close distance between potential centers which might perform such functions and the area of the planned project. Both the cost of maritime transport and downtimes related to the need

to take into account weather conditions are of great importance. An important factor ensuring construction capacity of the offshore wind energy market is the availability of specialized vessels for transport and construction of offshore wind turbines. There are currently more than 35 such vessels on the European market, and the demand is still growing.

If the extension and modernization of Polish ports are carried out properly, it is estimated that they may play the role of both production ports and construction ports. At the farm operation stage, smaller ports and back-up facilities located on the central coast (Ustka, Darłowo) will gain importance.

On the Polish market there are currently several manufacturers of OWF components for export. Those are mainly steel structures with low process requirements, such as foundations and wind towers.

Due to the demand for qualified personnel, the offshore wind energy sector may have a significant impact on the directions of education and the labor market in Poland, especially in the shipbuilding, electrical machinery and maritime construction sectors, and lead to the creation of a number of new jobs.

Health and life of people

None of the impacts of the BSIII OWF were identified as likely to have a significant adverse impact on health and life of people on the basis of the studies carried out. A hazard to health and life of people may occur mainly in the event of a collision of vessels or vessels with OWF components, but such situations are classified as so-called unplanned events, which are very unlikely to occur. Extensive seabed surveys were carried out at the environmental research stage. Among other things, a very precise sonar bottom map was created. As part of archaeological studies, that map was analyzed in order to determine the occurrence of anthropogenic remains. On the basis thereof, 218 points were initially identified where such objects could be located, out of which 54 were finally selected for verification with a ROV. The points selected for verification were small objects visible on the bottom. Photographic documentation and a verification description are included in the report. No chemical warfare agents or weapons were encountered in the course of the aforesaid studies. It should be noted, however, that at the stage of the EIA report no surveys of the farm area were carried out using a magnetometer. It has been planned to carry out such surveys only at the stage of the building permit design. Therefore, it cannot be ruled out that despite such a high level of accuracy of the surveys carried out so far, some remains of military activities will be discovered at the construction stage, especially as the archival data indicates that the area of the BSIII OWF was used for the installation of offshore minefields in the past.

Therefore, it was recommended to develop and implement, before starting the construction of the farm, appropriate procedures intended to prevent accidents related to unexploded ordnance, in particular to chemical warfare agents, at each stage of the project implementation, and similar procedures for situations related to accidental extraction of conventional military objects.

Impacts arising from unplanned/extraordinary events

Unplanned impacts are a result of sudden unplanned events or failures which are not related to activities included in the project execution schedule. The report identified the following potential unplanned events that may occur in relation to the implementation of the BSIII OWF:

- leakage of oil derivative substances during normal operation or as a result of collision, failure or construction disaster,
- accidental release of municipal waste or domestic sewage to the environment,
- accidental release to the environment of construction materials or waste from construction, operation or decommissioning of the farm,
- pollution of water column and seabed sediments with antifouling agents.

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 (1st degree) spills, up to 20 m³. A leakage may also occur as a result of a vessel failure or collision, construction disaster at one of the farm facilities, and during maintenance works. In the event of a collision or crash of vessels, a 3rd degree spill, i.e. one exceeding 50 m³, may be expected.

During construction or service works vessels develop low speeds, and then the risk of damage to

the fuel tank is very low. A vessel generally holds fuel in several tanks, which in the event of a collision reduces the risk of a major leakage. According to the report, vessels used in the construction of wind farms may have fuel tanks with a total capacity of approx. 1200 m³. Assuming a failure or collision of the largest vessels used at the stages of construction, operation or decommissioning of the BSIII OWF (during inspection, servicing and emergency repairs) and destruction of the largest tanks, a maximum of about 200 m³ of diesel oil, 15 m³ of machine oil and approx. 2.5 m³ of hydraulic oil may escape from one vessel. In the event of a construction disaster, an additional risk will arise on an already operational farm, related to a potential leakage of transformer oil (up to 80 m³) as a result of a vessel collision with an offshore substation. Wind farms themselves are designed to prevent leakages of relatively small volumes of transformer or lubricating oils.

During the maintenance of wind farm components, leakages of various types of oil derivative substances or operating fluids may occur as they are replaced while servicing wind turbines and substations. As a standard, substations have tight oil basins or other technical solutions ensuring to collect all the oil contained in them. For that reason, no significant spillover beyond the facility is expected to occur.

A visible effect of an oil spill is an oil stain which, under the influence of gravity and surface tension, spreads at a speed depending on the type of oil and ambient conditions. The spilling volume is influenced by factors such as oil volume, density, viscosity, temperature, wind speed and time. The oil film formed on the surface of water may cause difficulty in gas exchange, especially oxygen, between water and the atmosphere, a decrease in light intensity under the surface of water by 5 - 10% (mainly due to the presence of heavy fractions of oil and sulfur) limiting photosynthesis, an increase in water temperature during the day as a result of absorption of light rays by the oil layer. At the same time as an oil stain spreads, other degradation processes are in place, aimed at lowering the concentration of hydrocarbons on the water surface (e.g. releasing low molecular weight hydrocarbons). Heavier oil fractions may be subject to sorption on the surface of organic and mineral suspensions, which may increase their specific gravity and gradually make them sink to the bottom. Thus, heavier oil fractions may be bound by bottom sediments, causing pollution.

According to the HELCOM report for 2014 ("Annual report on shipping accidents in the Baltic Sea area during 2012"), the likelihood of a failure or collision of vessels in the Baltic Sea is low. Approx. 2 thousand vessels sail on the Baltic Sea waters every day (including 200 tankers with oil and other liquid substances), and the number of collisions and failures in recent years has remained more or less constant (with a slight increase), i.e. approx. 120 - 140 sea accidents every year. However, most accidents in the Baltic Sea do not cause significant pollution. The number of accidents with penetration of pollutants into the water column remains at the level of approx. 10 - 11 per year. In 2012, 149 vessel accidents occurred in the Baltic Sea area, 10 of which resulted in pollution. None of the accidents that resulted in water pollution occurred in the area of the Polish economic zone.

It should be noted that unplanned events may directly contaminate the abiotic environment, especially marine waters and, to a lesser extent, bottom sediments. Indirectly, those events may also have an impact on living organisms that inhabit or otherwise use the seabed, the water column and the sea surface. No significant impacts are expected from oil derivative substance spills of the above scale on habitats, benthos, fish, marine mammals, birds flying above the farm surface (including migratory birds) and bats, including Natura 2000 protected habitats and species.

A leakage of oil-derivative substances in the area of the BSIII OWF may potentially be the greatest threat to seabirds. As the report shows, it is not so much the magnitude of a spill that is crucial, but the place where it occurred. There are known cases of high mortality of birds after small oil spills to the sea. Extensive oil spills drifting away from the coast, in water regions with very low bird populations, do not entail such high population losses as a small spill in a place with numerous concentrations of marine avifauna. In the area of the planned BSIII OWF, the density of seabirds was not high and the estimated average number of the whole group did not exceed 1000 individuals in the whole water region designed for the project. An analysis of the rate and direction of oil spills in the area of the wind farm in question suggests that only with a wind force above 3 °B can the stain be expected to reach the eastern part of the Natura 2000 area of Ławica Słupska PLC990001. Taking into account the average wind distribution for the South Baltic, a drifting pollution stain will not reach the nearby marine Natura 2000 areas after 24 hours. With the expected maximum spill

range at the boundary of the wind farm area, it could reach the boundaries of one of the two Natura 2000 areas after 18 - 24 hours: Ławica Słupska (Słupsk Bank) PLC990001 or Coastal Baltic Waters PLB990002. However, assuming the rate of movement of the stain being 30 cm/s, it should be emulsified and disappear after 12 - 18 hours of drifting on the surface. Therefore, it can be assumed that leakages of oil derivative substances as a result of a failure will not entail high losses among seabirds.

In connection with the potential hazards described above, it was recommended to supply vessels used at the BSIII OWF with means to eliminate leakages of oil derivative substances and to apply technical solutions at offshore substations which will enable them to take over, in an emergency, the entire volume of transformer oil present at the substations.

During the construction, operation or decommissioning of a wind farm, on vessels and in the construction site back-up facilities located on land (in the port handling the project) and in the place where the project is to be carried out, municipal waste and domestic sewage will be generated. Waste and sewage may be accidentally released to the sea during their collection from vessels by another vessel and in the event of a failure, resulting in a local increase in nutrient concentrations and deterioration in the quality of water and sediments. Construction materials and waste directly related to the construction process may also be accidentally released to the sea. Those may include e.g. damaged parts of farm components being installed, cement, grouts, mortar, binders used to join the foundation and turbine components, and other chemical substances used during construction works. During the operation of the farm, the maintenance of its facilities will be carried out. One cannot rule out a possibility that small quantities of waste or operating fluids may be accidentally released to the sea. During the decommissioning of the farm, it seems inevitable that bottom sediments will become contaminated with waste from the process. The magnitude of this impact will depend on the adopted method of carrying out works, and the greatest pollution may occur in case of the necessity to crush gravitational foundations.

In order to protect the hulls of vessels against fouling, biocidal substances are used, which may include e.g. copper, mercury, and organotin compounds (e.g. tributyltin - TBT). Those substances may pass into the water column and eventually be retained in the sediment. It should be assumed that emissions of those compounds will be limited by dilution in water column. Among the listed substances, organotin compounds are the most harmful (toxic) to aquatic organisms. The use of TBT (the most harmful substance) in antifouling paints is currently prohibited, but the presence of those compounds in older vessels cannot be ruled out. Therefore, it was recommended to use at each stage of the project vessels whose hulls were not coated with antifouling paint containing TBT.

Due to the existence of the hazards described above, it was recommended to update the preliminary contamination and risk preventions plans during the construction, operation and decommissioning of the farm, prepared for the purposes of the BSIII OWF. They should be updated before starting the construction of the first stage of the farm, i.e. at the moment when its final shape is known (at least for the first stage), including the locations of the facilities, the location of the construction port and the types and number of vessels and helicopters that will participate in construction works.

It was found that unplanned events and failures in the area of the BSIII OWF did not pose a direct hazard to coastal tourism (an oil spill, considering its most probable range, will not reach the shoreline). Potential oil spills will be a direct constraint on recreational fishing and water sports, and they will prevent such activities within the range of the spill. However, the likelihood of such unplanned events and failures is very low, from 1 in every 100 years (50% chance of an occurrence within 50 years) up to 1 in every 10,000 years (1/200 chance of an occurrence within 50 years).

It was found that the BSIII OWF would not be a source of cross-border impacts on users of other maritime areas.

Analysis of potential social conflicts

The process of analyzing and assessing the risk of social conflicts included three stages, described below.

The first stage consisted in examining the possibility of occurrence of significant negative spatial, environmental and economic conflicts and took place at the stage of selecting the location for the

OWF BSIII.

The second stage consisted in identification of all social and professional groups and areas of activity using the sea resources, which are exposed to potential impacts of the OWF BSIII, and carrying out the assessment of the impact of the project on the hitherto forms of using the marine space.

In the third stage the sensitivity of local communities to potential factors triggering conflicts related to the feeling of threat to changes in the quality and comfort of life, as well as the susceptibility of local communities to protests related to investment activity in their neighborhood were analyzed.

The analysis covered the following borough: municipality and rural borough of Darłowo, Postomino, municipality and rural borough of Ustka, Smołdzino, Słupsk, Łeba, Wicko, Choczewo, Krokowa.

Within the framework of the performed analysis, the following factors triggering conflicts were analyzed:

- 1) visibility of the OWF BSIII from permanent residence places (exposure to the sea from places of residence, rest or work)
- 2) impacts (noise, EMF) from the transmission infrastructure,
- 3) limiting access to fishing areas,
- 4) limiting access to tourist shipping areas,
- 5) limiting access to tourist use of beaches,
- 6) impact on tourism income – significance of the impact,
- 7) impact on fisheries income – significance of the impact,
- 8) impact on coastal and marine protected areas (national parks, Natura 2000 sites),

- 9) impact on landscape protection areas (landscape parks and protected landscape areas).

It was stated that the risk of potential social conflicts caused by the preparation and execution of the OWF BSIII will vary from one borough to another. The risk seems to be greater in borough where social protests have already occurred or where there are strong interest groups. Such boroughs include the Łeba borough, the Ustka municipality and the Choczewo borough. The lower risk of social conflicts relates to borough which derive income from existing onshore wind farms or other power sector projects and/or whose inhabitants are highly aware of such projects. This group includes the borough of Postomino, Smołdzino, Wicko, Krokowa.

The Investor conducted a comprehensive social communication campaign addressed to particular communities exposed to potential conflicts. In the framework of the campaign, it provided broad access to information about the project, its potential impacts and the results of analyses and evaluations. The information was provided through a dedicated website www.baltyk3.pl, posters, press publications and during direct meetings with vulnerable professional groups (fishery communities in Darłowo, Ustka and Łeba), representatives of borough self-governments and inhabitants (Darłowo, Łeba, Słupsk, Smołdzino, Ustka, Krokowa). Potential exclusion of the wind farm area from the fishing activity and from the possibility of passing by fishermen moving between ports and fisheries through the farm area have been identified as the main factors that may cause conflicts. At the request of the fishery communities, the Investor obtained the opinion of the Director of the Maritime Office in Słupsk, in which the body competent to introduce traffic restrictions in maritime areas presented the following rules in this respect concerning the area of the OWF BSIII:

- at the construction stage – the project area where the construction works will be carried out will be gradually and temporarily closed for shipping and fishery,
- at the operation stage – it will be possible to conduct shipping in the area of the OWF BSIII after establishing 100 m safety zones around the wind turbines and other components of the farm infrastructure. Vessels with an overall length of up to 45 m and a visibility of at least 3 nautical miles will be accepted for shipping. Fishing will only be possible with pelagic gear.

Due to its character and location, there is no threat that the OWF BSIII could cause the failure to achieve the environmental objectives included in the river basin management plan.

It is estimated that the project at the construction, operation and decommissioning stages will not have a significant impact on exacerbating climate change. The potential impacts of the OWF BSIII on the climate should be considered in two aspects – as negative impacts and positive impacts. Negative impacts of the OWF BSIII on the climate will be mainly related to the emission of air pollutants, especially at the construction stage, when particularly intensive vessel traffic is expected. During construction, operation and decommissioning, only vessels which comply with the emission standards will operate, which will most often navigate on fixed, standard shipping routes from and to ports.

A positive impact on the climate will be the generation of electricity from a renewable source by the OWF BSIII at the estimated level from approx. 2500 GWh per year (at the installed 600 MW) to approx. 5000 GWh of non-emissionable electricity per year (at the installed 1200 MW).

Furthermore, the climate and its changes are not expected to have a significant impact on the functioning of the project in question. The conditions of the execution, operation and decommissioning of the wind farm imposed in the decision settlement take into account the deepening of climate change.

The environmental impact report complies, in terms of the structure, with the contents of Article 66 of the EIA Act and its arrangements are consistent, logical and convincing.

While assessing all the evidence collected in this case, Regional Director for Environmental Protection divided the findings and assessment presented in the reconciliations between the Director of the Maritime Office in Słupsk and the Director of the Maritime Office in Gdynia and partly the opinion of the State Border Sanitary Inspector in Gdynia (in the part related to the sanitary supervision zone and sanitary and radiation hygiene, i.e. issues related to material properties of the aforementioned cooperating body).

The assessment of the impact of the said project on the environment presented in the report, taking into account the impact assessment within the meaning of Article 6.3 of the Council Directive 92/43/EEC, showed that in the overall assessment the planned OWF will not have a significant negative impact on the environment and will not cause negative effects on the environment, as well as it will not generate a significant negative impact on the objects of protection for which the Natura 2000 sites were established and on the cohesion of the sites and network of Natura 2000 as a whole.

As a consequence of the above arrangements, in this decision, a number of conditions to mitigate the potential or identified negative impacts of the project on the environment were provided. In order to minimize the impact on the particular components of the environment, the recommendations resulting from the report were assumed.

Conditions and obligations specified in point 1.2 of this decision were imposed based on the conclusions and recommendations of the submitted report, the opinions of the cooperating bodies, as well as the requests and comments submitted in proceedings with social participation. The conditions specified for the project implementation stage were formulated taking into account, i.a., the following obligations:

- ensuring economic use of the land during preparation and execution of the project (Article 74 section 1 of the Environmental Protection Law),
- considering the environmental protection on the area where the works are carried out, in particular protection of soil, greenery, natural topography and water conditions (Article 75 section 1 of the Environmental Protection Law),
- use and processing of natural elements during the construction works only to the extent, to which it is necessary in connection with performance of a specific project (Article 75 section 2 of the Environmental Protection Law),
- taking measures to repair damage including, in particular, environmental compensation (Article 75 section 3 of the Environmental Protection Law),
- conducting waste management in a manner ensuring protection of human life and health and the environment, in particular in such a way that waste management does not cause a threat to water, air, soil, plants or animals (Article 16 of the Waste Act).

The above requirements were specified taking into account the most important among the identified emissions, the lack of management of which could be the source of negative impact on the environment, including human health or, in extreme cases, could lead to hazard to the environment. The provided conditions include the supervisory and prevention actions, and technical means of emissions management. The conditions specified for the building permit design constitute a direct guideline for the design engineer and are aimed at ensuring an economic use of environmental resources, minimization of emissions, proper management of emissions. The basis of the above guidelines covers, i.a.:

- principles of prevention, caution and incurring costs of environmental impacts, resulting from Article 6 and 7 of the Environmental Protection Law;
- prohibition of causing deterioration of the condition of the environment to a large extent or hazard to human life or health (Article 141 section 2 of the Environmental Protection Law);
- the obligation to comply with environmental quality standards and emission standards (Article 141 section 1 and Article 144 section 1 of the Environmental Protection Law);
- prohibition of operation of the plant resulting in introduction of gases or dusts to the air, noise emission and generation of electromagnetic fields to the extent causing exceeding of the environment quality standards outside the area, to which the plant operator has the legal title (Article 144 section 2 of the Environmental Protection Law);
- prohibition to undertake activities which may, separately or as combined with other activities, significantly negatively affect the objectives of protection of the Natura 2000 site (Article 33 section 1 of the Environmental Protection Act);

Due to the necessity to obtain additional survey data and assessment of effectiveness of the applied prevention and mitigation measures, the obligation of monitoring was imposed on the applicant concerning changes in the environment caused by implementation of the project and operation of the plant in the scope specified in point II.2 of this decision. Pursuant to Article 82, section 1, point 5 of the EIA Act, the obligation was imposed on the applicant concerning the submission of the post-implementation analysis. The post-implementation analysis shall enable to compare, on the basis of the results of the monitoring in progress, the impact on the environment, including the one caused within the protected habitats and for the protected species within the Natura 2000 site, as well as to assess the effectiveness of the compensatory measures – in relation to the arrangements and recommendations contained in the report prepared in these proceedings and in the re-assessment of the environmental impact. The timing and scope of the post-implementation analysis were linked with the obligations imposed on the applicant in terms of the environmental monitoring, at the same time including the period necessary to collect reliable data to enable the potential planning of any further measures aimed at reducing the negative environmental impact and of protective actions included in the protection plan for the Natura 2000 sites.

By virtue of this decision, the obligation was imposed on the applicant to prepare documentation for the re-assessment of the environmental impact of the project. In accordance with Article 82, section 2 of the EIA Act, the necessity to carry out a re-assessment shall be determined taking into account that:

- data obtained at the stage of issuing the decision on environmental conditions, concerning the project or natural elements of the environment covered by the scope of expected project environmental impact, are insufficient for the assessment of its environmental impact;
- due to the type and characteristics of the project and its relations with other projects, it is possible that impacts of the projects located in the area, on which the project will have impact, will cumulate;
- the project may also have impact on the areas that require special protection due to occurrence of species of plants and animals or their habitats or natural habitats that are subject to protection, including the Natura 2000 sites and other forms of protection of nature.

The factual circumstances that support the need for the re-assessment in this case are in the opinion of the Regional Director for Environmental Protection: multiple variants of the technical solutions adopted in the program and spatial concept being the basis of the assessment in the EIA report, and therefore the need to confirm the conclusions regarding the scale and intensity of the

environmental impact, as well as the lack of significant negative impacts of the project on the Natura 2000 sites on the basis of the final solutions adopted in the construction and process design, and additional survey results; no detailed hydrogeological survey at the stage of the current assessment.

Pursuant to Article 135, section 1 of the Environmental Protection Law, the creation of a limited use area is permissible provided that, in total: 1) the project concerns or concerned wastewater treatment plants, municipal waste landfill, composting plant, transport route, airport, power line and substation as well as radiocommunication, radionavigation and radiolocation system; this catalog is exhaustive; 2) the environmental audit or the assessment of the environmental impact or the post-implementation analysis shows that despite the use of available technical, technological and organizational solutions, the environmental quality standards cannot be complied with beyond the area of the plant or other facility. Wind turbines are not included in the catalog of plants for which a limited use area can be created. This means that the investor's legal title should include an area which guarantees the compliance with the environmental quality standards along the borders of this area.

The limited use area can be created only for power lines and substations, in the event of exceeding the standards concerning electromagnetic fields or noise in the environment. It is not expected that any environmental quality standards could be breached by these facilities, and therefore there is no need to create a limited use area for the project.

In accordance with Article 3, sections 23, 24 and 48 of the Act of April 27, 2001 – Environmental Protection Law, the major failure means an event, in particular emission, fire or explosion, taking place during an industrial process, storage or transport, in which occurs one or more hazardous substances, leading to the immediate hazard to life or health of people or to the environment or the delayed occurrence of such a hazard. A major industrial failure means a major failure in a plant. A plant means one or more systems together with the land to which the operator holds a legal title and with the equipment located thereon.

In accordance with Article 248, section 1 of the Environmental Protection Law Act, a plant posing a hazard of a major industrial failure occurrence, depending on the type, category and quantity of hazardous substance present in the plant, is considered a plant with an increased risk of a failure or a plant with a high risk of a failure, depending on the expected quantity of hazardous substance that may be present in it.

The criteria for plant classification to one of the categories listed above are specified in the Regulation of the Minister of Development of January 29, 2016 on the types and quantities of hazardous substances present in a plant, which decide on classification of a plant as a plant of increased or high risk of major industrial failure (Journal of Laws of 2016, item 138).

However, it should be noted that pursuant to Article 2 section 4 of the Environmental Protection Law, the principles of protection of the sea against pollution by vessels and administrative authorities competent in matters related to such protection are determined in separate regulations. However, due to the relatively small quantities of dangerous substances, the farm would not be included in any of the above categories.

Having analyzed the scope of the planned project and identified its impact on the environment along with their scale, it was found that the planned project shall not cause a transboundary environmental impact. Such impacts, taking into account the recommended actions in case of emergency situations, will not be caused by the identified possible emergency/unplanned situations. For these reasons, in this case it was not necessary to carry out the procedure on transboundary impact as referred to in Article 104 and the following of the EIA Act, as well as to specify the conditions related to such impact in the contents of this decision.

Regional Director for Environmental Protection acting pursuant to Article 10 §1 of the Code of Administrative Procedure, by a letter dated March 21, 2016, notified the parties to the proceedings of the opportunity to review and comment on the material collected and the demands made. No additional comments or requests were submitted within the set timeframe.

The implementation of the project according to the conditions laid down by this decision and the subsequent operation of the facilities resulting from the project does not absolve the investor from the following obligations, regardless of the provisions of this decision:

- application of the provisions on technical conditions established pursuant to Article 7 of the Act of July 7, 1994 – Construction Law;
- obtaining permits, opinions and approvals required by law;
- fulfilling the obligations arising directly from the provisions of law, including in particular the obligations concerning the proper operation of a plant, determined by the provisions of the Act of April 27, 2001 – Environmental Protection Law, and waste management as defined in the Act of April 27, 2001 on waste, such obligations, as existing and binding by law, are not subject to repeated imposition and disclosure in the decision.

Therefore, the decision should be as aforementioned herein.

Regional Director for Environmental Protection

in Gdańsk

Danuta Makowska

Instruction

The information on this decision is subject to announcement on publicly accessible data list.

The decision on environmental conditions does not replace the permit pursuant to Article 56 of the Environmental Protection Act of April 16, 2004 (Journal of Laws of 2015, item 1651 as amended). Any possible derogation from the prohibitions listed in Article 51 of the aforementioned Act must be granted a permit pursuant to Article 56 section 1 of the Environmental Protection Act.

This decision may be appealed against to the General Director for Environmental Protection in Warsaw through the Regional Director for Environmental Protection in Gdańsk within 14 days following its receipt, pursuant to Articles 127 and 129 of the Code of Administrative Procedure. The decision shall be treated as delivered after fourteen days from the day of the public announcement.

For the issuance of this decision a stamp duty in the amount of PLN 205 was paid – Appendix no. 1, part I, item 45 of the Act of November 16, 2006 on Stamp Duty (consolidated text, Journal of Laws of 2015, item 783 as amended).

To be received by:

1. Maciej Stryjecki, representative, Polenergia Bałtyk III Sp. z o.o., ul. Krucza 24-26, 00-526 Warsaw
2. Minister of Development, Plac Trzech Krzyży 3/5, 00-507 Warsaw
3. Minister of Infrastructure and Construction, ul. Chałubińskiego 4/6, 00-928 Warsaw
4. Minister of National Defense, ul. Klonowa 1, 00-909 Warsaw
5. Minister of Agriculture and Rural Development, ul. Wspólna 30, 00-930 Warsaw
6. Minister of Environment, ul. Wawelska 52/54, 00-922 Warsaw
7. Minister of Culture and National Heritage, ul. Krakowskie Przedmieście 15/17, 00-071 Warsaw
8. Minister of the State Treasury, ul. Krucza 36/Wspólna 6, 00-522 Warsaw
9. Commander of the Maritime Border Guard Unit, ul. Oliwska 35, 80-917 Gdańsk 17
10. Lotos Petrobaltic S.A., ul. Stary Dwór 9, 80-758 Gdańsk
11. Inwestycje Infrastrukturalne Sp. z o.o., ul. Al. Wilanowska 208/4, 02-765 Warsaw
12. Elektrownia Wiatrowa Baltica - 2 Sp. z o.o., ul. Ogrodowa 59A, 00-876 Warsaw
13. Elektrownia Wiatrowa Baltica - 3 Sp. z o.o., ul. Ogrodowa 59A, 00-876 Warsaw
14. Polish Offshore Wind Energy Society, ul. Trzy Lipy 3, Bud. C Lok. 2.17a, 80-172 Gdańsk

For the attention of:

1. Director of the Maritime Office in Gdynia, ul. Chrzanowskiego 10, 81-338 Gdynia
2. Director of the Maritime Office in Słupsk, Al. Sienkiewicza 18, 76-200 Słupsk
3. Minister of Energy, Plac Trzech Krzyży 3/5, 00-507 Warsaw
4. Minister of Maritime Economy and Inland Navigation, ul. Chałubińskiego 4/6, 00-928 Warsaw
5. to file

REGIONAL DIRECTOR FOR ENVIRONMENTAL PROTECTION IN GDAŃSK

APPENDIX NO. 1

To decision No. RDOŚ-Gd-WOO.4211.12.2015.KP.22

pursuant to Article 84, section 2 of the Act of October 3, 2008 on providing access to information on the environment and its protection, public participation in the environmental protection and on environmental impact assessment (consolidated text, Journal of Laws of 2016, item 353).

The subject of the project is the construction and operation of the Bałtyk Środkowy III Offshore Wind Farm ("OWF BSIII"), located in the southern part of the Baltic Sea, in the Polish exclusive economic zone, at the nearest distance of approx. 23 km north of the coastline, at the level of the Smołdzino borough and the municipality of Łeba (Pomeranian voivodship). The borders of the area of OWF BSIII are defined by the following geographical coordinates specified in the permit for erection and use of artificial islands, structures and devices in Polish maritime areas (PSZW) for the OWF Bałtyk Środkowy III project No. MFW/2/2012 of March 30, 2012:

Point	Coordinates	
A	$\varphi = 54^{\circ}56'42,424''$ N	$\lambda = 17^{\circ}16'57,430''$ E
B	$\varphi = 55^{\circ}02'35,801''$ N	$\lambda = 17^{\circ}14'00,653''$ E
C	$\varphi = 55^{\circ}02'52,125''$ N	$\lambda = 17^{\circ}14'45,028''$ E
D	$\varphi = 54^{\circ}59'55,268''$ N	$\lambda = 17^{\circ}31'37,853''$ E
E	$\varphi = 54^{\circ}57'24,641''$ N	$\lambda = 17^{\circ}24'47,597''$ E
F	$\varphi = 54^{\circ}57'09,443''$ N	$\lambda = 17^{\circ}22'42,654''$ E
G	$\varphi = 54^{\circ}57'05,517''$ N	$\lambda = 17^{\circ}21'25,617''$ E

The total area of the farm is approx. 117 km² and the area for development, according to the conditions specified in the PSZW, is approx. 89 km².

Expected maximum power of the OWF BSIII is 1200 MW. The Project will be performed in stages. The project consists of:

- 1) no more than 120 wind turbines, the basic components of which are the foundation, tower, nacelle with generator and rotor,
- 2) no more than 6 offshore substations,
- 3) up to 200 km of sections of internal marine power and telecommunication cables in total.

Individual components of the OWF BSIII may be located in the whole project area intended for development, i.e. with maintaining a buffer 500 m wide from the internal border of the area intended for the execution of the farm. Specific locations of particular farm components will be determined after geotechnical surveys of the seabed and wind measurements as well as analysis of farm productivity in the building permit design.

The boundary parameters of the individual components of the OWF BSIII are specified in the table below:

Parameter	Boundary value
Maximum number of wind turbines [pcs]	120
Maximum total height of wind turbine above sea level [m]	275
Minimum clearance between the lower wing position and average sea surface [m]	20
Maximum rotor diameter [m]	200
Maximum single zone for the rotors [m ²]	31,400

Maximum total zone for the rotors [m ²]	3,768,000
Maximum number of accompanying infrastructure foundations [pcs]	6
Maximum seabed area occupied by 1 foundation [m ²]	1,257
Maximum seabed area occupied by all foundations [m ²]	158,382
Highest density of wind turbines [pcs/km ²]	1.35
Maximum cable length of the farm internal connection infrastructure [km]	200

Wind turbines and transformer stations will be placed on foundations on the seabed. 4 types of foundations can be used at the OWF BSIII: monopiles, gravity-base foundations, jacket foundations and tripod foundations.

The monopiles constructed of steel welded cylinders will be up to 80 m long and up to 10 m in diameter. The jacket foundations, consisting of four steel legs connected and reinforced by brackets made of cross-mounted tubes, will have legs up to 1 m in diameter. The maximum distance between the legs is 40 m. The foundation will be fixed to the seabed by 4 piles with a maximum diameter of 1.8 m and a maximum length of 70 m. The tripod foundations, consisting of 3 legs supporting one central leg, which forms the base for the connector and the tower, equipped with sleeves for pile fixing, will have the main column with a diameter of up to 7 m and legs with a diameter of up to 5 m. The maximum distance between the foundation legs is 40 m. The foundation will be fixed to the seabed by 3 piles with a maximum diameter of 2.5 m and a maximum length of 60 m. Gravity-base foundations, being a reinforced concrete structure, consist of a main core and a base, with a maximum diameter of 40 m.

For all types of foundations (especially for gravity-base and monopile foundations, less often for other types of foundations) a protective layer against washing out can be applied. It is usually a layer of stones with a width of a few to even 20 meters and a depth of several meters, laid around the foundation. The necessity for its placement, width and depth will be determined during the building permit design stage.

The towers of wind turbines built of steel, concrete or reinforced concrete rings, connected with each other, will be embedded on the foundations. The tower will be embedded on the foundation by means of a steel sleeve, the so-called transition piece or a connector, on which there may also be additional elements, such as the place of anchoring service vessels, ladders, intermediate platform, working platform, as well as elements of power infrastructure (flexible cable shields, the so-called *J-tubes* and power and telecommunication cables).

The towers will be equipped with wind turbines with a rotor consisting of three blades and a hub located in the front part of the nacelle. Plastics (glass fiber) will be the basic structural material for the blades. A helicopter landing platform can be installed on the nacelles of a wind turbine.

One or more models of foundations, towers and turbines can be installed on the farm. Wind turbines will be connected to the substations by a network of power cables of the voltage of 33 kV – 66 kV. The total length of cables inside the farm will not exceed 200 km. Their final length will depend on the number and set up of the wind turbines and will be specified in the building permit design. Cables will be buried in the seabed up to a depth of 3 m. If the technical conditions do not allow for them to be buried, they will be covered with a layer of stones or other specially adapted loads.

Electricity generated by the wind turbines belonging to the OWF BSIII will be prepared on the farm for further transmission. For this purpose, a maximum of 6 internal offshore substations ("OS") will be built within the boundaries of the farm.

The following types of OS can be built within the framework of the OWF BSIII:

- 1) transformer – receiving *alternate current* (AC) from wind turbines and then adjusting its voltage to an appropriate level, enabling its further transmission outside the wind farm in alternating current technology;
- 2) converter (AC/DC) – converting alternating current (AC) to *direct current* (DC), enabling its further transmission outside the farm in direct current technology;

3) combining both these functions.

The decision whether the energy will be transmitted to the shore in direct or alternating current technology will be made at the stage of building permit design.

The AC offshore transformer station will be constructed on the basis of a platform embedded on monopile, jacket, tripod or gravity-base foundations. The necessary power and staff welfare infrastructure will be installed on the working platform. Power of a single station is 150 to 350 MW. Parameters of the station of such power can amount to: 30 x 30 m area, height up to 20 m, weight up to 1500 Mg. OS AC may consist of the following elements: indoor switchgear, power transformers, MV and HV switchgears, reactive power compensation reactors and capacitors, transformers or power generators to provide backup power, earthing system, control panel of internal systems, low-voltage distribution equipment for auxiliary equipment and protection, control and instrumentation systems, UPS uninterruptible power supply, SCADA equipment, service staff accommodation, rest and welfare rooms, material storage, workshop, boat landing, helicopter landing area, operational health and safety as well as emergency equipment including Diesel generators, emergency lighting, lifeboats.

If a decision on using direct current transmission technology is made, an offshore AC/DC converter station may be built on the farm. The AC/DC converter station will be constructed on the basis of a platform embedded on monopile, jacket, tripod or gravity-base foundations. The necessary power infrastructure will be installed on the working platform, in particular equipment for converting alternating current into direct current. The main components of a converter station are converter transformers, converter thyristors, harmonic filters, capacitor batteries, reactive power compensation reactors, an external pumping station (cooling system). The maximum transmission capacity of the station is 900 MW. The working platform will be up to 100 m long and up to 60 m wide and up to 40 m high.

The substations may also be used as a place of installation of equipment for environmental measurements and monitoring, e.g. meteorological data or wave information.

The transmission of electricity generated by the OWF BSIII to the National Power System will be carried out through the offshore transmission infrastructure ("OTI") consisting of export cables and electromagnetic stations, in accordance with the agreement on the grid connection of the OWF Bałtyk Środkowy III to the transmission network. OTI as a separate project is subject to a separate environmental impact assessment procedure.

Regional Director for Environmental Protection

Gdańsk
Danuta Makowska