Grąbkowo Wind Farm
Non-technical summary

Multiconsult

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1 Introduction

BALTIC SEA POLSKA II Sp. z o. o. (subsidiary of Eurowatt Green Energy Group SA) is at the stage of commissioning a wind farm project called the Grąbkowo wind farm in northern Poland, in the Potęgowo commune, hereinafter referred to as the "Grąbkowo Wind Farm" or "Project". The Eurowatt group was founded in 1994 and has an experience of nearly thirty years in the origination, development, construction and operation of renewable assets and production of renewable energy in Europe. Besides its activities in Belgium, Poland, Portugal and Spain, Eurowatt is an established independent renewable energy producer in France.

The Project has been implemented since the beginning of 2010 and now, after completion of construction works, it is prepared to start operation.

The wind farm consists of 9 wind turbines with the necessary technical infrastructure and communication system in the Potęgowo commune, with a total maximum capacity of up to 31.5 MW. The configuration of the wind farm includes the construction of elements:

- 9 wind turbines with a maximum turbine height of up to 200 m (the height of the turbine tower depending on the type and manufacturer can range from 116.5 m to 143 m, and the rotor diameter from 110 m to 120 m) and nominal power for one turbine from 2.2 MW to 3.5 MW,
- transformer station for each turbine (depending on the turbine manufacturer, it can be placed in the tower or as a separate object next to the turbine),
- the main power supply point (GPZ) medium and high voltage located on the plot number 217/3,
- linear investments: electric underground cables and tele-technical fiber optic cables connecting wind farms, used to transmit the electricity produced,
- road investments: access roads and assembly sites, reconstruction of municipal roads and intersections.

The Banks, including PKO BP as the facility agent and EBRD are considering financing the operation of the farm. Taking into account the rated capacity of the installation, the Project was classified as "B" in accordance with the EBRD's Environmental and Social Policy (ESP) (2019). Moreover, the installation has limited environmental impact and there are no significant natural resources in the vicinity of the farm. All identified effects can be immediately identified and mitigated by taking effective mitigation actions.

EBRD requires projects to be subject, to constructive public consultation and that the stakeholder engagement process is properly carried out. In order to meet this requirement, Baltic Sea Polska II prepared a set of documents which include:

- Environmental and Social Action Plan;
- Stakeholder engagement plan and
- This non-technical summary.

This non-specialist summary presents the information contained in the environmental impact assessment (EIA) report and other environmental documentation prepared for the wind farm.

All necessary permits for the project have been granted, including; environmental permits, building permit and grid connection agreement.

2 Where is the Project located?

The area intended for the location of the planned 9 wind turbines is located in the central-southern part of the Potęgowo commune in the Pomeranian Voivodeship, about 15 km west of Lębork and south of the E28

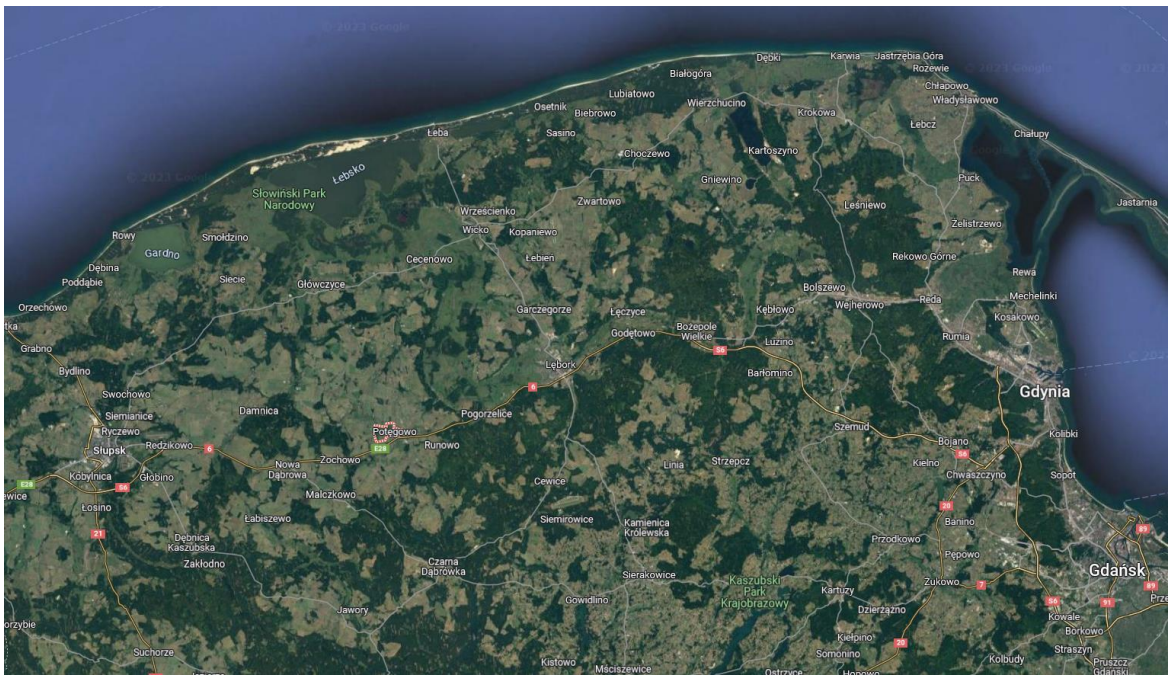
Lębork-Słupsk route. It covers the area of the village of Grąbkowo and areas located to the east and south of this village.

The Potęgowo commune covers an area of about 228 km^2, of which about 80% is occupied by agricultural land, and only 28% are forests (data from 2016). A characteristic feature of the commune is the dominance of the agricultural landscape. On the basis of data from 2022, the province is inhabited by approx. 6,533 inhabitants.

The vast majority of the area includes land previously used for agriculture and the densely built-up areas of the village of Grąbkowo, as well as the areas of dispersed buildings of the villages of Grąbkowo-Kolonia I, Grąbkowo-Kolonia II and Darżynko.

The area borders from the west, east and partly to the south with forest areas, connecting the forests stretching along the Łupawa River and the forest complexes of the western part of the Kashubian Lake District. The northern part of the border runs along the E28 road and watercourses, which are tributaries of the Łupawa.

The commune's surface is gently undulating to plain, diversified by numerous valleys of various sizes and character. The contemporary landscape on the site of the planned "Grąbkowo" wind farm is the result of anthropogenic activity, mainly agricultural land use.



The area of the planned investment lies in the immediate vicinity of the Natura 2000 area:

- PLH Dolina Łupawy (PLH 220036) – approx. 300 m to the west.

In addition, within a radius of 10 km there are a number of forest complexes, rich in breeding birds of prey, and other valuable natural areas.

The project was constructed on land designated for the development of wind farms based on appropriate, applicable local development plans. These plans have been adopted in accordance with national legislation, ensuring the participation of local communities and other stakeholders. The detailed location of the turbines is presented in the topographic map below.

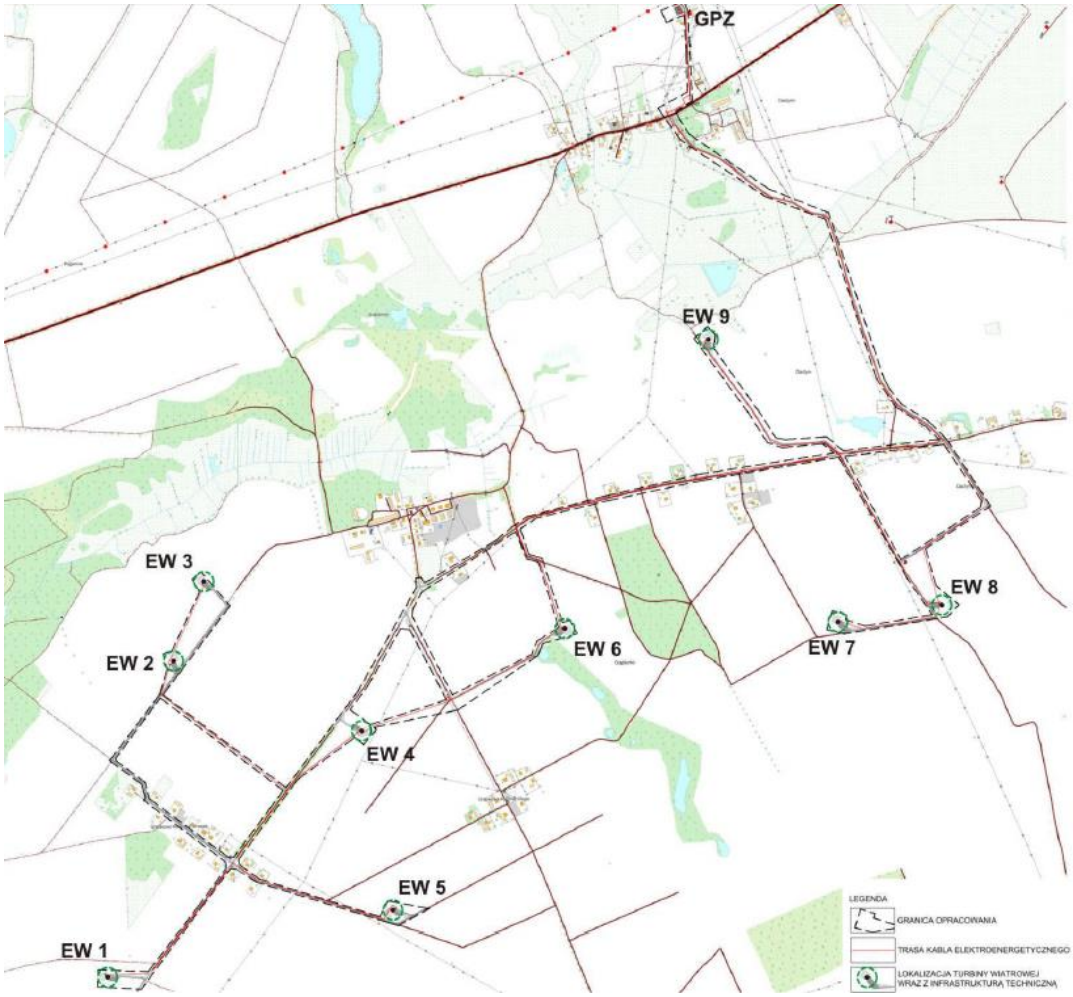
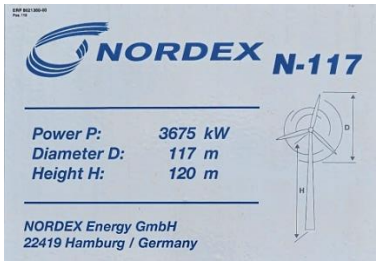


Fig. 1 "Grąbkowo" wind farm with technical and communication infrastructure in the Potęgowo commune
Source: Report on the environmental impact of the project: construction of a wind farm in the Potęgowo commune

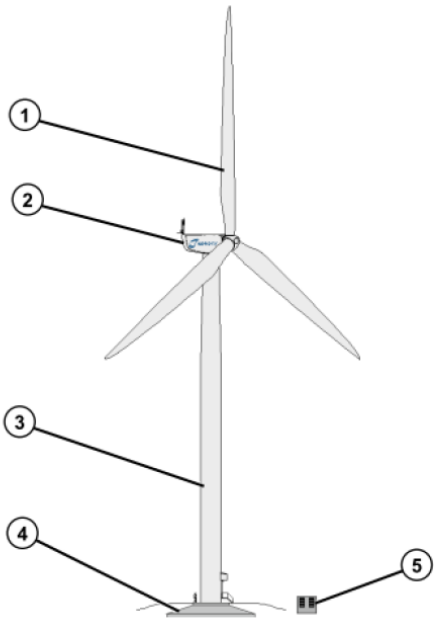
3 What is a wind turbine?

A typical elevator turbine consists of a tower and a nacelle containing a rotor and measuring equipment. The rotor consists of blades and axes, connected to each other by a bearing. The blades are moved by the wind and transmit this force to the bearing, which is connected to a multiplier that increases the speed of the axis. Mechanical energy is transferred from a multiplier to an electricity generator, which converts it into electricity for later introduction into the grid.

The model of wind turbines for the Grąbkowo Wind Farm is Nordex N117 turbine.



The selected wind turbines feature a proven individual blade angle control system that incorporates the latest improvements in load control, low noise, efficient power conversion and reliable efficiency. The turbines will be new with the same geometry, power, height and the same painting.



1. Rotor
2. Nacelle
3. Tower
4. Foundation
5. Transformer station

Fig. 2 Main components of a wind turbine
Source: technical description Nordex N117

4 What is the rationale for the project?

In accordance with the European Climate Change Programme, many European countries, including Poland, have adopted national programmes aimed at reducing greenhouse gas emissions. These include a variety of policies adopted at European as well as national level, including:

- planned increase in the consumption of energy from renewable sources (wind, solar, biomass),
- improving energy efficiency, e.g. in buildings, industrial facilities, household appliances.

The main regulations of EU countries aimed at reducing emissions are a cost-effective carbon trading system and legislation on fluorinated greenhouse gas emissions.

In March 2007, the EU approved a climate change and energy plan aimed at reducing CO_2 emissions by at least 50% by 2040 (compared to 1990 levels) and achieving a target of 32% of the EU's total primary energy consumption from renewable energy by 2030.

Poland has adopted its energy policy until 2040 in 2021" Polish energy policy until 2040". On the basis of this document, Poland declared to achieve 27% of renewable energy consumption in total energy consumption by 2030.

The development of wind energy is one of the activities that will be implemented. It leads to a reduction in emissions to air and an increase in the production of energy from renewable sources. The main benefit of wind energy is the conversion of kinetic energy into electricity by wind turbines with zero greenhouse gas emissions into the air. Conventional energy sources, based mainly on various types of coal combustion, generate emissions of greenhouse gases, SO_2, dust and others during energy production.

Wind energy is considered one of the cleanest, as during the operational phase there are no emissions of pollutants into the atmosphere. Based on the technical estimates, the Grąbkowo farm will generate ca. 83,600 MWh. Therefore, the project is environmentally beneficial, as it will provide annual reduction in CO2 gas emissions of 63,620 tonnes (calculated on the basis of an emission factor, representative for coal power plants supplying additional to the grid, of 0.761 tCO2/MWh).

In addition to reducing greenhouse gas emissions, the project will also result in a significant 'avoidance' of combustion emissions. Considering emission factors for coal fired power plants KOBIZE 2021 (SOx – 0.543 kg/MWh, NOx – 0.543 kg/MWh, CO – 0.255 kg/MWh and dust – 0.023 kg/MWh):

- particulate emissions: approx. 1.9 tonnes per year,
- SO2 emissions: approx. 45.4 tonnes per year,
- Emissions of nitrogen oxides: approx. 45.4 tonnes per year.
- CO: approx. 21.3 tonnes per year.

The operation of this wind farm can therefore be regarded as an action aimed at avoiding the emission of comparable amounts of pollutants into the atmosphere.

The reasons for locating a wind farm in the region include: local authority approval, the lack of protected areas in the vicinity and favourable wind conditions. In addition, the successful implementation of such an investment is associated with benefits for local communities, including the reconstruction of energy installations, opportunities for new employment and improvement of local road infrastructure.

5 What is the legislative context of the project and has there been a public consultation?

According to environmental regulations on environmental disclosure, public participation in environmental protection and environmental impact assessments, the environmental impact assessment (EIA) procedure must be carried out for projects that may always have a significant impact on the environment (group I projects) or may be carried out at the discretion of the competent authorities for those projects that may have a significant potential impact on the environment (projects II groups) or may affect the sites of Natura 2000 protected areas. The EIA is carried out in order to obtain a decision on Environmental Conditions (environmental decision) for projects from group I and group II. The planned wind farm is, in accordance with the regulations, classified in group II.

The procedure concerning the location of the wind farm was initiated by the development of documentation related to local spatial development, in accordance with the provisions of the Act on Spatial Planning and Development of 27 March 2003 (as amended). It included, among others, obtaining positive opinions from the Regional Directorate for Environmental Protection in Gdańsk and from the Pomeranian State Provincial Sanitary Inspector in Gdańsk.

The project was classified in accordance with the Polish Regulation of 9 November 2010 on projects that may have a significant impact on the environment and European Union regulations as potentially requiring an Environmental Impact Assessment due to the type of investment that may potentially have a significant impact on the environment. All necessary permits for the Project are valid, including building permits containing all the requirements set out in previous environmental permits and the connection agreement. The operation of the Grąbkowo wind farm complies with Polish and EU law.

Information about the planned development, together with EIA reports, has been made available to the public for comments, including local communities and potential stakeholders such as nature conservation associations and environmental organisations. Notices concerning sub-projects were presented to the public in the manner adopted by the competent local authorities, i.e. on their websites, on information boards in government offices and surrounding villages, and often also in local newspapers, e.g. "Głos Pomorza". During the public consultation, stakeholders were informed about the potential side-effects associated with the investment, in particular the impact on the landscape, acoustic environment, shadow flickering and noise. There were no complaints or protests against the planned investments.

6 What is the scale of the Project and how will it affect protected areas?

The closest to the designed wind farm are: ecological area "Seven ponds" and a special area of protection of habitats PLH220036 "Łupawa Valley".

Fig. 3 Rural landscape of Grąbkowo wind farm

The location of the planned wind farm against the background of the nearest forms of nature protection is presented on the map below.

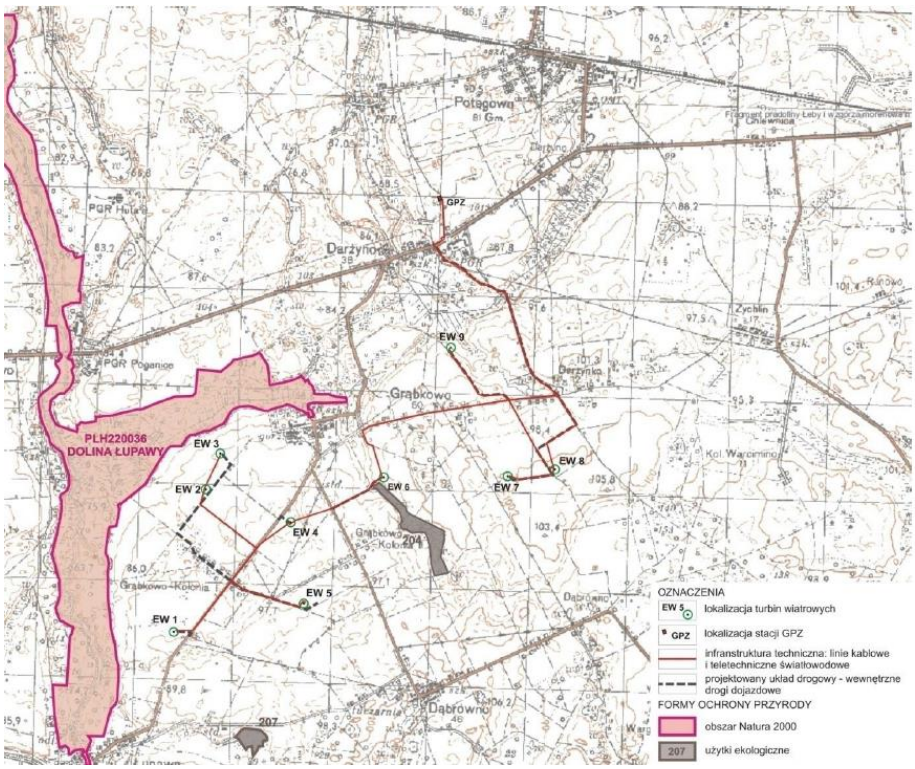


Fig. 4 Nature protection in the vicinity of the Grąbkowo wind farm
Source: Report on the environmental impact of the project: construction of the Potęgowo wind farm

Natura 2000 Łupawy Valley PLH220036

The area includes the valleys of the rivers Łupawa and Bukowina from the outflow from Jasień Lake. Within the area there are:

- natural, deep river beds of Łupawa and Bukowina;
- springs and small streams (tributaries);
- remote areas of submontane riparian forests;
- wet meadows, transitional and high bogs, and dystrophic lakes in drainless areas.

The main threats to the "Łupawa Valley" area, listed in the Standard Data Form, may be:

- hydro-engineering works;
- cessation of use (e.g. grazing or mowing) of meadows and peatlands;
- intensification of forest management, cutting down trees, especially on the steep slopes of the valley, ravines and springs;
- locating investments causing water pollution within the boundaries of the area and in its vicinity.

Ecological use "Seven ponds"

The ecological use "Seven Ponds" was approved by the Regulation of the Słupsk Voivode No. 5/98 of April 28, 1998. It includes a complex of mid-field peat bogs with an area of 14.04 ha wooded with spruce, birch, aspen, alder, oak, beech and willow aged 35-60 years with ponds covered with yellow oak-hornbeam. This is a mating place of amphibians and reptiles.

Proposed forms of nature protection

One of the very valuable areas of the Potęgowo commune is the Łupawa valley range, indicated for protection as an ecological corridor of national importance in the concept of the ecological network ECONET - Poland (1996). The Commune Study proposes the creation of the "Łupawa Valley" Protected Landscape Area covering the Łupawa Valley within the boundaries of the commune. Other forms of nature protection located in the vicinity of the wind farm (up to 10 km). The area in the vicinity of the planned investment should be assessed as beneficial for the implementation of the wind farm, not causing both significant ecological conflicts and significant conflicts in spatial development.

7 Will the project affect societies?

The implementation of the project does not require resettlement of people or enterprises. The land for the purposes of the sub-projects was obtained on the basis of lease agreements signed with the land owners.

The project has a direct socio-economic impact on the development of all surrounding municipalities and the lives of residents. The following direct effects of the project have been identified:

- an increase in the municipality's revenue from taxes paid by the operator for commercial activities in a given area;
- an increase in annual income for each of the tenants of the land;
- improving local transport routes;
- creation of new jobs on the local market during the investment implementation phase.

The negative impact is related to the reduction of the area of land used for agricultural purposes. However, this is compensated by land lease fees. The footprint of wind farms and infrastructure is limited, and agriculture can be maintained around turbines.

In addition, some negative social effects can be expected during the construction phase of the Grąbkowo Wind Farm due to increased car traffic. These include:

- noise and vibrations to which citizens will be exposed generated by trucks;
- increased traffic on local roads;

- increased likelihood of road accidents;
- damage to the road surface and possibly also to building structures;
- temporary restrictions on road access due to the need for the transport of oversized cargo.

The Company will implement measures to compensate farmers and land users for any damage that may arise in connection with the commencement of construction works.

8 What will be the effects of the wind farm?

Based on the results of the environmental impact assessment procedure and the public consultation, the main environmental impacts associated with the construction and operation of the wind farm will relate to increased noise levels, landscape changes and impacts on avifauna and bats. The cumulative impact assessment, including other wind farms located in the area of Darżyno was conducted during the EIA procedure. Mitigating measures to reduce noise emission were included in the Environmental Consent decision.

The decommissioning of the plant is expected after 30 years of operation and will involve similar inconveniences as the construction of a farm. The main impacts associated with the decommissioning phase of the project are related to earthworks, increased traffic and vibration, and a temporary change in the groundwater level.

Noise emission

Noise emissions are considered to be one of the most common impacts of wind farms on the environment. Noise distribution calculations were carried out using appropriate software in accordance with EU Directive 2002/49/EC on noise assessment and management. The calculation results were then verified with permissible noise levels of 55 dB (A) and 45 dB (A) for day and night respectively.

For the purpose of the assessment, data on external wind farms located within 10 km of the project were collected and analysed. The results of noise modelling indicate that if the noise level emitted by the wind turbines does not exceed the levels set by the environmental decisions and the complementary environmental impact assessment, then environmental standards will not be exceeded anywhere in the villages located in the vicinity of the project.

Landscape

The visual aspects of the planned wind farm are described in the individual EIA reports, but no negative impacts have been identified.
The wind farm is to be built in a purely agricultural area, where the local landscape has already been changed by human activity. The existence of a wind farm will introduce new visual dominants (wind turbines and newly built roads) into the landscape. As dominant of the landscape, wind turbines will be visible mainly to local residents and to a lesser extent to those traveling on local asphalt roads.
The impact on the landscape is not permanent, given the expected "lifetime of the product", such as 25-30 years, after which it should be decommissioned.
According to the EIA reports, the visual impact of wind turbines will be reduced by introducing the following countermeasures recommended by the European Wind Energy Association:

- use of one type of wind turbines throughout the wind farm and the use of a uniform finish (Nordex turbines are painted with anti-reflective paint limiting gloss),
- not placing a fence around wind turbines,
- as far as possible, planning the necessary access roads along existing roads,
- use of underground wiring.

Rotating turbine blades can cause a shadow flickering effect. Such impacts are described in the EIA reports, but are not subject to a detailed assessment. Polish law does not regulate in any way issues related to the shadow flickering effect. Therefore, no recommendations or restrictions related to this may be applied to the investor.

Birds and bats

The location of the Grąbkowo Wind Farm may pose a potential threat to birds and bats. Nevertheless, it should be noted that numerous observations and reports on operating wind farms and their impact on bird populations indicate that birds avoid collisions with wind farms. The mortality of birds from collisions with wind turbines is much lower than their mortality caused by collisions with, for example, cars, power lines and buildings.

And the investor carried out a number of ornithological observations in the area of planned wind farms. According to EIA reports, planning and investment should not have a significant negative impact on birds present in the area covered by the monitoring campaign.

According to EUROBATS guidelines, identified bat species are at high risk of collision with wind turbines. However, given the spatial distribution of wind turbines and areas where bats have been observed, it can be concluded that this risk can be significantly reduced by placing the turbines away from forest areas and the boundaries of residential areas – as adopted in the Project.

Taking into account the characteristics of the investment, the results of monitoring birds and bats and the location of construction sites in relation to valuable natural areas, it can be concluded that the Project will not have a negative impact on species and habitats protected under the "Natura 2000" program.
On the basis of the overall assessment carried out as part of the EIA procedure, no significant negative impact of the wind farm was found.

9 What impact of the project will be monitored?

In order to ensure that the Project meets the highest international standards, national legal obligations and lenders' requirements, a defined monitoring programme will be implemented during the construction and operation of wind farms. The monitoring programme shall include the elements required by environmental permit decisions issued by the competent authorities.

Noise

The environmental conditions of the investment consent oblige the investor to carry out post-implementation measurements of noise and impact on acoustically protected areas. If the measurements show that the permissible noise levels are exceeded, noise reduction measures will be necessary (consider reducing the sound power of wind turbines or temporarily decommissioning them, especially at night).

Birds and bats

Bird monitoring is required by the local authority and will be carried out in the 1st, 3rd and 5th year of operation of the wind farm. The scope of the monitoring programmes will be in line with the scope of pre-investment programmes and national guidelines to the extent possible1 and will include:

- observations of species and abundance of birds,
- investigation of birds' collisions with turbines to detect dead and injured birds near wind turbines,
- observation of the altitude of birds, in 3 altitude ranges (below the rotor blades, within the range of the rotor blades and above the rotor blades),
- observations of bird flight directions,

- the number of birds killed as a result of collisions with wind turbines.

Bat monitoring is also required by the authorities and will be carried out in the 1st, 2nd and 3rd year of operation of the wind farm (in accordance with the guidelines of good practice EUROBATS 2006 implemented under the Polish guidelines). The scope of work will include observations and automatic recording of bat activity in the near and distant vicinity of wind turbine locations. In addition, the monitoring programme will include the search for bats killed as a result of collisions with wind turbines. According to the guidelines, at least 25 inspections will be carried out at each location during one monitoring campaign. The results of both monitoring shall be reported to the competent authorities.

10 General monitoring of project performance

As the project will be financed by the EBRD and other international lenders, the overall performance of the project will be continuously monitored during the operational phase. Under the agreement with the lenders, the Company undertook, m.in. to:

- Implementation of an environmental and social management system adapted to the nature of the Project and the size of the company. The management system will be based on the Environmental and Social Policy developed by the Company, and appropriate procedures and instructions will apply to all operational aspects of wind farms. The commitment of the Company's management will allocate adequate resources to the environmental and social management of the Project. The system will ensure the principles of non-discrimination and equal opportunities, and full compliance with national standards with regard to child and pregnant or forced labour will be respected for own and external workers.
- As part of the environmental and social management system, the Company will develop procedures for monitoring key performance indicators, which, in addition to purely operational factors, will also include monitoring accidents and non-normal activities, complaints and others.
- Develop an OH&S policy and implement an OH&S management system that ensures compliance with all internationally recognised health and safety standards and national legal requirements through procedures and instructions. In particular, the system will ensure that all own and external staff are properly trained, undergo medical examinations and are provided with personal protective equipment appropriate to the tasks to be performed. Some procedures will constitute health and safety plans for various operations on wind farms, such as working in confined spaces, working at heights, working with electrical equipment, etc.
- Adaptation of the Stakeholder Engagement Plan (SEP), which will define the rules of communication with all project stakeholders, as well as a complaints mechanism for both own and external employees and external stakeholders.
- Implement the necessary measures to avoid or reduce excessive environmental impact.
- Report on the results of the project on an annual basis.
- Maintaining the Project website, where all the most important documents related to the Project will be posted and regularly updated, including permits, environmental monitoring results and other information related to the Project. The Project website will also allow complaints to be lodged.
- Undergo an environmental and social audit every three years during the project.

11 Is additional information available?

Full EIA report is available for the project and copies can be obtained from the relevant municipal offices. An electronic copy may be requested from the Company.

If you have additional questions about the wind farm, please contact:

Daniel Konarski (tel. +48 608 007 271, email d.konarski@eurowatt.com) with a copy to Stanislaw Popow (tel. +48 601 202 662, email s.popow@eurowatt.com).