Orla Wind Farm Project
Non-technical summary

Multiconsult

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1 Introduction

C&C Wind Sp. z o.o. (subsidiary of Eurowatt Green Energy Group SA) is the operator of a wind farm in the area of Orla village near Bielsk Podlaski, in eastern Poland. 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 Orla wind farm was constructed in two phases. The first stage included the construction of 9 wind turbines located in the western part of the Orla commune. The wind farm was completed in spring of year 2015 for the Phase 1 (9 turbines) and by the end of 2015 for the Phase 2 (6 turbines).
The wind farm configuration includes:

- 15 wind turbines type Nordex N100 (2.5 MW each),
- transformer station (GPZ),
- underground infrastructure of transmission lines and control wires,
- access roads to individual turbines as well as manoeuvring and assembly yards.

The total capacity of the wind farm is 37.5 MW.

The Banks, including PKO BP as the facility agent and EBRD are considering financing the continued 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, a set of documents has been prepared, which includes:

- the Environmental and Social Action Plan;
- the stakeholder engagement plan and
- this non-technical summary.

This non-technical summary presents the information contained in two environmental impact assessment (EIA) reports developed at two stages of the project and other environmental documentation prepared for the wind farm.

2 Where is the Project located?

The Orla wind farm is located in the municipality of Orla – Bielsk Podlaski county, Podlaskie voivodeship. According to information obtained from publicly available sources, the municipality of Orla covers an area of about 160 km^2, of which 80% is occupied by agricultural land and 12% by forests. Based on data from 2021, the municipality has approx. 2,541 inhabitants.

The project includes 15 turbines with 100 m high towers and rotors with a diameter of 99.8 m. The area occupied by one turbine is approx. 300 m^2, and 15 turbines occupy an area of approx. 0.5 ha.

The location of the turbines has been divided into two groups:

- 9 turbines were placed west of the village of Orla, in the area designated by the village of Spiczki in the north and Topczykały in the south and the national road no. 66 from the west, and
- 6 turbines were built on plots located east of Orla on the northern and southern side of the Orla-Krywiatycze local road.

The wind farm was built on two areas located respectively to the east and west of the town of Orla. The location was chosen with the potential negative impact of wind turbines in mind, i.e. maintaining a distance of at least 500 m from residential buildings.

On the basis of observations made during the site visit, review of aerial photographs and topographic maps, it can be determined that the investment area is rural. The terrain is slightly hilly (elevation ranges from 150 m to 164 m above sea level), mainly occupied by farmland and small forest complexes located a few hundred meters from wind turbines. There is a network of local, unpaved road connected to local asphalt roads and then to national road No. 66.

The windfarm is located outside of large and dense forest complexes, swampy areas, areas identified as valuable for scientific interest. The investment areas are located at a distance from sensitive natural areas. The detailed location of the turbines is presented in the topographic map below.

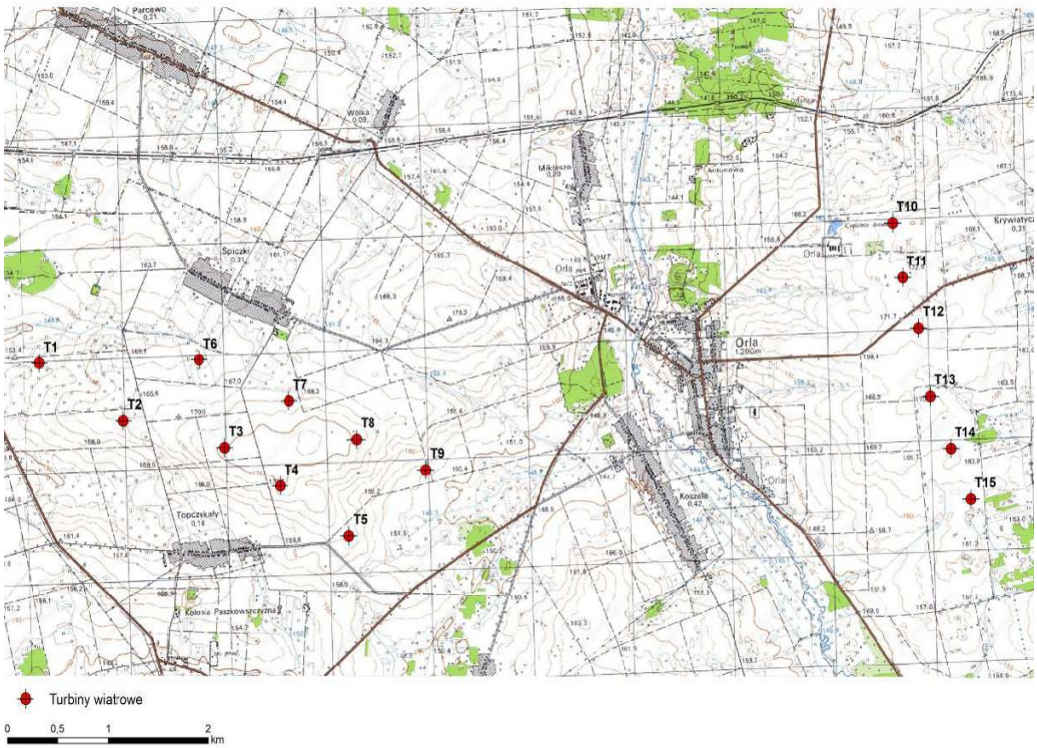

Fig. 1 Location of the turbines of the Orla Wind Farm Source: *Environmental Impact Report of the project: construction of the Orla wind farm*

3 What is a wind turbine?

A typical wind 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 bearings. 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 transfer into the grid.

All turbines are Nordex N100 (2.5 MW each) shown in the figures below. The towers are 100 m high and rotors are 99.8 m in diameter.

The turbines were installed as new, with the same geometry, power, height and the same painting.

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 CO2 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, SO2, dust and others during energy production.

Wind energy is considered one of the cleanest, in fact, during the operation phase of turbines there are no emissions of pollutants into the atmosphere. According to the information contained in the *"Orla Wind Farm:*

Operational report 2022", the annual energy production in 2022 amounted to approx. 82,860 MWh. Nevertheless, the average energy production in 2016 – 2022 period was at the level of 90,767 MWh. Annual production data is presented in the table below:

Year	2016	2017	2018	2019	2020	2021	2022	Average
Black energy production [MWh]	88 175	96 169	81 477	105 292	94 566	86 829	82 859	90 767
Green energy production [MWh]	89 811	97 716	83 017	107 220	96 284	88 463	84 435	92 421

Therefore, the project is environmentally beneficial, as (in average) it will provide a reduction in CO2 gas emissions of 69,000 tonnes annually (calculated on the basis of an emission factor, representative for coal power plants supplying 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, CO2 – 0.255 kg/MWh and dust – 0.023 kg/MWh):

- particulate emissions: approx. 2 tonnes per year,
- SO2 emissions: approx. 49 tonnes per year,
- Emissions of nitrogen oxides: approx. 49 tonnes per year.
- CO2: approx. 23.1 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.
Issues related to the social benefits of the project were extensively discussed with representatives of the municipality of Orla. In discussions with representatives, the following direct benefits were identified:

- the project increase the municipality's income thanks to taxes paid by the operator for conducting business activity in the municipality,
- the project increase the income of the owners of the plots on which the wind farm and its infrastructure will be located,
- the project help local government bodies to promote a pro-ecological lifestyle of local residents,
- The operator participated in improving the quality of local roads in the municipality.

Over the last years, the wind farm continued its regular operations, which since the beginning of 2022 are affected by unstable market conditions and regulatory interventions affecting the operation of renewable energy sources across Europe. The impact of those is regularly monitored by the company's management.

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

The procedure concerning the location of the wind farm was initiated by the development of documentation related to local spatial development, including: development of amendments to the study and directions of spatial development of the municipality and preparation of a local spatial development plan. The procedure was carried out 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 (RDOŚ) in Białystok. Positive opinions were also issued by the State Provincial Sanitary Inspectorate in Białystok and the State Sanitary Inspector in Bielsk Podlaski.

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 Orla wind farm complies with Polish and EU law.

Information about the planned investment, together with EIA reports, has been made available for comments to the public, the local community and potential interested parties, such as nature conservation organizations or environmental organizations.

After completion of the environmental impact assessment, on 27 July 2009 the Mayor of Orla issued an announcement informing about the proceedings and public consultations. As the authorities evaluated assessment of the wind farm impact on birds and bats (which covered a half-year period only) as insufficient, the developer was required to apply for the second environmental permit before the project was granted a building permit. In October 2012, a second environmental impact assessment was carried out by RDOŚ in Białystok as part of the administrative procedure for obtaining a building permit. The assessment was carried out in accordance with the relevant legal requirements and included public consultations supervised by the Bielski Starost, as well as consultation with the State Sanitary Inspectorate in Bielsk Podlaski.

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

The investment areas are located at a distance from sensitive natural areas. The nearest sensitive natural areas are located at a distance of 7-10 km from the investment area, these include: Protected Landscape Area "Puszcza Białowieska", Natura 2000 site No PLH 200021 "Ostoja w Dodolin Górnego Nurca"; Natura 2000 site No PLH 200019 "Jelonka"; Natura 2000 site No PLB 200004 "Dolina Dolnego Nurca"; nature reserve "Bohemia Orlańskie", Natura 2000 area no. PLH 200015 "Murawy w Haćki", nature reserve "Jelonka".

In June 2009, the areas of the planned wind farm were reviewed for the presence of valuable habitats of flora and fauna. No such areas were identified in the planned locations of wind turbines and ancillary infrastructure, but two protected plant species (Viburnum opulus and Lycopodium clavatum) were found in the project area. Traces of mammals (e.g. European roe deer and wild boar), as well as various amphibians (e.g. frogs) and insects were also identified in the investment area. The potential impact of the wind farm on this type of flora and fauna was assessed in the EIA report as insignificant.

Below is a map showing the distance of the wind turbine locations from the nearest protected nature areas.

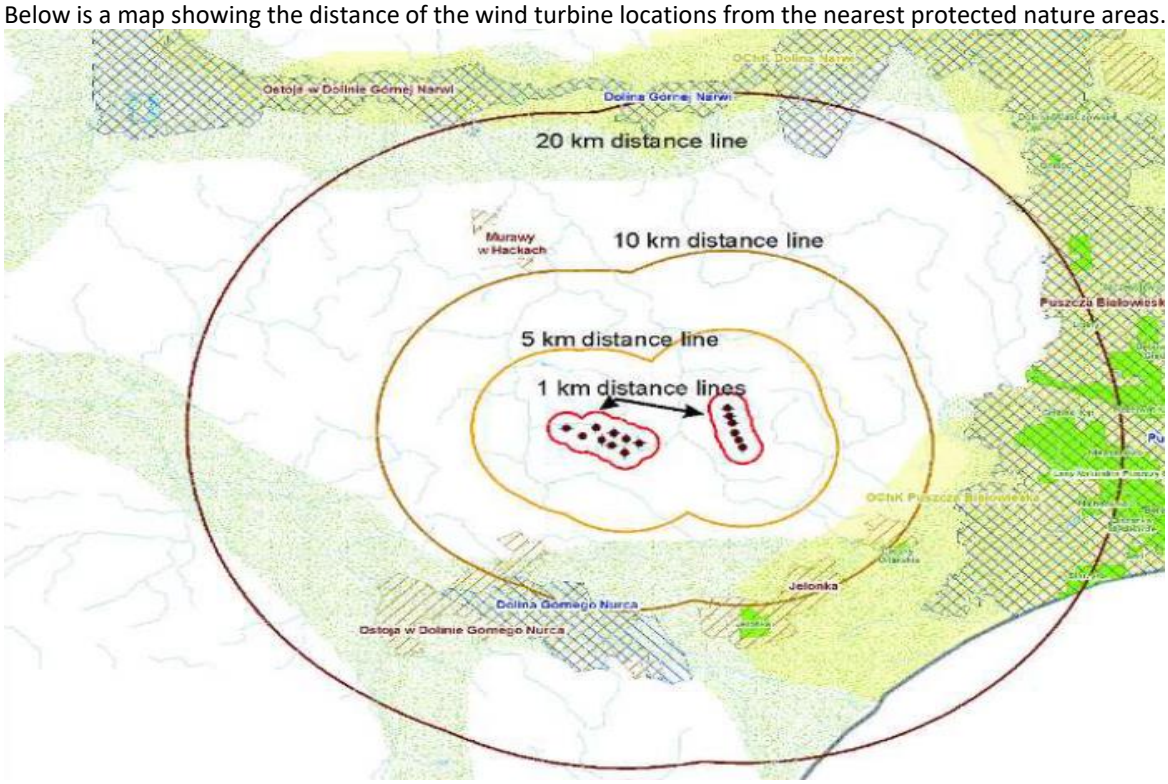

Figure 1 Turbine distances to the nearest nature protected areas *Source: Environmental impact report of the project: construction of the Orla wind farm*

7 Will the project affect societies?

The development of the Project did not require the resettlement of people or enterprises. The land for the sub-projects was acquired on the basis of lease agreements signed with the landowners.

The project has a direct socio-economic impact on the development of the Orla municipality and local residents. The following direct impacts have been identified:

- an increase in the municipality's revenue from taxes paid by the operator for commercial activities in the area;
- increasing the annual income of landowners renting their land for turbines and underground cabling;
- improvement of local transport routes (approx. 10 km of local roads have already been built or renovated by the Company).

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

8 What are 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 operation of the wind farm relate to increased noise levels, landscape changes and impacts on avifauna and bats. In addition, this summary describes issues related to shadow flickering.
The decommissioning of the plant is expected after 30 years of operation and will involve similar inconveniences as the construction of a windfarm. The main effects associated with the decommissioning phase of the project are related to earthworks, increased traffic and the operation of heavy machinery.

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.

The results of the calculations indicated that the operation of the wind farm would not exceed the noise level standards in any acoustically protected area, both during the day and at night, and that the maximum noise levels at the boundaries of these areas would be between 30.9 and 41.7 dB(A). Monitoring conducted after wind farm commissioning confirmed lack of excessive noise impact.

Landscape

The wind farm was built in a purely agricultural area, i.e. the local landscape has already been changed by human activity. The wind farm introduced new visual dominants (wind turbines and roads) into the landscape.

As dominant of the landscape, wind turbines are visible mainly to local residents and to a lesser extent to those traveling on local asphalt roads. For the latter, no cumulative visual impact has been recorded and is not expected.

In line with the Environmental decision, the visual impact of wind turbines was 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),
- no fencing around wind turbines,
- as far as possible, access roads were routed 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 15 wind turbines poses a bit of a threat to birds and bats. It should be noted, however, that a large number of observations and reports on operating wind farms and their impact on bird populations indicate that birds avoid collisions with wind farms. The number of bird deaths from wind turbines is much lower than deaths caused by collisions with cars, power lines or homes.

As part of the pre-investment process, which included the preparation of EIA reports, an annual monitoring of birds and bats was carried out, consisting of two independent series of ornithological observations, made as part of two environmental impact assessment reports. Bird monitoring was carried out between November 2008 and November 2009 and bat monitoring from March to November 2009 and additionally in January 2012.

Bird monitoring included monitoring along the transect and observation of point surfaces, its intensity depended on the season. In winter and autumn, only observations along the transect were carried out, and in other seasons monitoring along the transect and observations of point surfaces were carried out. The total monitoring program included over 30 field expeditions (26 in spring, summer and autumn, and repeated expeditions approximately every 10 days in winter). The numbers of birds identified during the monitoring are typical for the territory of Polish and do not differ from similar reports from other parts of the country.

Based on the monitoring results, it was determined that the investment area is not a national or regional ecological corridor for migrating birds, however, numerous flights of large flocks of geese and golden plovers were identified, which may mean the occurrence of an ecological corridor of a local nature.

The most valuable species observed in the area of the planned investment belong to those listed in Annex I of the Birds Directive: crane, corncrake, quail, yellowhammer, lapwing, starling, hoopoe, passerine and field sparrow, marsh harrier, meadow harrier, common lark, magpie, gander. Several nests were observed from each species, with the exception of the lark, whose nests occurred in large numbers in the area of the planned investment.

In the 2.5 km zone around the wind farm, the following species of birds of prey were identified: vulture, sparrow hawk, hawk, marsh harrier, meadow harrier, and falcon. The most valuable of them is the marsh harrier, regularly observed in the area of monitoring. In a given zone, there is probably a nest of one pair, and three pairs have a nest outside the zone. Other nests of large birds in the area have also been identified: a stork and a crane.

The monitoring of bats included field observations along the transect, during which sound detection was carried out. Three species of bats have been identified in the area of the planned investment: late bat, great blueberry and mopek.

In accordance with the guidelines for assessing the impact of wind turbines on bats, an activity index was calculated for the bats observed. For most transects, bat activity based on the activity index ranged from small to medium, except for five transects where bat activity was high during the seasonal period. These transects were located at a distance from the planned locations of wind turbines.

Based on the results of three years birds and bats mortality monitoring, conducted after wind farm commissioning, it was concluded that the potential impact of the planned wind farm was assessed on a low to medium scale. The overall conclusion of the report: the wind farm does not cause a significant negative impact on the birds, the overall probability of negative impact was assessed as low or medium, nevertheless limited mitigation measures have been implemented for bats protection.

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, additional monitoring programme will be implemented (as part of ESAP) during operation of wind farm.

Noise

The environmental conditions of the investment consent obliged the investor to carry out post-implementation measurements of noise and impact on acoustically protected areas. The measurements conducted after commissioning of the wind farm showed that the permissible noise levels are not exceeded.

Birds and bats

Post-project monitoring of birds and bats was suggested in the environmental decision, and was also required by RDOŚ in Białystok during the reassessment of the project's impact on the environment. Monitoring was carried out for 3 years from the moment of completion of construction works.
The monitoring confirmed limited impact of the turbines on birds and bats, nevertheless, some limitations were imposed on selected turbines (WT01, WT05, WT12 and WT15). The turbines have to be stopped from 15 August to 15 September after dusk, when wind speed is below 6 m/s and it is not raining.

Future bat monitoring should be aimed at investigating bat mortality (searching for dead animals in the vicinity of wind turbines) and their activity at the height of the turbine rotors. If significant bat mortality is detected, the monitoring program should be continued for another 3 years and the C&C Wind will be required to develop and implement appropriate bat protection measures.

Bird monitoring will include the examination of bird mortality, distribution and species composition using the same methodology that was used during the pre-investment monitoring.

10 General monitoring of project performance

As EBRD and PKO BP are considering financing the continued operation of the farm, the overall performance of the project will be continuously monitored during the operational phase. Under the agreement with the lenders, the Company undertook, 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 to the EBRD on the results of the project on annual basis (as required by the Bank).

- 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?

If you have additional questions about the wind farm, please contact
Jarosław Stokowski (tel. +48 608 144 996) with a copy to Stanislaw Popow (tel. +48 601 202 662, email: s.popow@eurowatt.com).