Non-Technical Summary

SZYMANKOWO WIND FARM PROJECT, POLAND

Polenergia

Introduction

The POLENERGIA S.A. (further referred to as the Company or developer), one of the leading national wind farm developers and operators, is developing a wind farm investment - Szymankowo Wind Farm, in northern Poland, pomorskie voivodeship (further referred to as Szymankowo WF). The Szymankowo Project will comprise of 11 wind turbine generators (WTGs). Szymankowo WF will be located in the commune of Miłoradz, at the land delineated by the villages of Gnojewo (northern corner), Stara Kościelnica (eastern corner), Miłoradz (southeastern corner) and Bystrze (western corner).

The aim of this non-technical summary is to summarize the project and provide information on the various stages of development, including cumulative assessments of the planned wind farm development, to enable meaningful public and stakeholder's engagement process.

General presentation

The Company has been active on the Polish market: designing, constructing and managing wind farms for a long period and it has completed numerous projects of this kind.

As one of the leading wind farm developers, the company is committed to guide the business activity in accordance with the sustainable development principles, including among others:

- Efficient use of resources, including the development of cleaner and more efficient energy technology and development of energy generation means, based on renewable sources;
- Environmental protection with minimization of the environmental impact of all business activities and participation in initiatives that contribute to the conservation of the environment;
- Support social development.

SZYMANKOWO WF

POLENERGIA S.A. intends to construct Szymankowo WF, which is to be located at the area of Malbork county, Miłoradz commune.

Completion of a typical wind farm includes construction of the following:

- Wind turbines (WTGs) and relevant technical infrastructure;
- Internal roads and maneuvering areas;
- Assembly and storage yards.

Details regarding structure of the Szymankowo WF are given below.

Szymankowo WF is under development. Its total installed capacity will be 38.115 MW, and it will include 11 WTGs, along with medium-voltage underground power transmission lines (two lines, approximately 13 km long each, of which 8 km will be constructed on a common route) , a transformer station, high-voltage aboveground power transmission line (this will connect two adjacent transformer stations and will be a few dozen meters long), telecommunication lines connecting the WTGs with the transformer station and internal roads with maneuvering yards.

Figure 1 Site location and layout maps

The Project passed the environmental impact assessment (EIA) procedure managed by the competent authorities – the Head of Miłoradz commune in 2015. During the EIA procedure the State Sanitary Inspectorate and Regional Directorate for Environment Protection (RDOS) were consulted

as required by the environmental law and the procedure allowed interested stakeholders to participate. The procedure was finished with an issue of environmental decision allowing for construction of up to 20 WTGs along with necessary infrastructure. It should be mentioned that environmental decision defines among others environmental constraints which must be taken into account in the construction design as well as conditions which must be met during construction and then operation. The Project was also granted construction permit for 20 WTGs and other infrastructure. The Company, however, ultimately decided to construct only 11 out of 20 permitted WTGs, hence the actual Project impact should be smaller than predicted during the EIA.

Planned capacity of an individual wind turbine will be 3.45 MW, with a hub height of the turbines reaching 134 m and rotor diameter 132 m (assumed wind turbine type: Gamesa G132-3.45MW HH134M). Acoustic capacity of an individual turbine will not exceed 106.5 dB. The overall area of the project is approx. 9 ha.

The project is considered for financing by the European Bank for Reconstruction and Development (EBRD) and has been categorized B in line with the EBRD Environmental and Social Policy (2014). The ESDD has been carried out by an independent consultant and concluded that the national EIA process was in compliance with EU EIA Directive and that the project is structured to meet EBRD PRs. The ESDD also confirmed that the Developer has been implementing Environmental and Social best practice, implementing the corporate Environmental and Social Action Plan agreed with EBRD in 2013 and has the institutional capacity to fully implement the Bank's Performance Requirements.

As part of ESDD the following subjects not covered by national EIA have been assessed in detail:

- Social impact;
- An ice/blade throw risk;
- Electromagnetic interference.

PROJECT BENEFITS

The Project will help the country to increase the share of renewable energy in the total energy consumption. The national plan assumes achievement of 15% renewable energy use in total energy consumption by 2020.

Based on the emission factors published by the National Emissions Management Center for the year 2017, the following annual emission savings can be expected if the Project is implemented:

- Between 93,204 and 104,192 tons/a of CO2
- Between 87 and 98 tons/a of SO2
- Between 89 and 99 tons/a of NOx
- Between 32 and 35 tons/a of CO, and
- Between 5 and 6 tons/a of PM.

The Project will increase the Miłoradz commune incomes due to the taxes paid by the Company.
The land owners of plots occupied by WTGs and supporting infrastructure will benefit from land lease and easement contracts.

During construction phase of the Project new working places will likely be created which will help local economy.

Wind turbine description

A typical wind turbine consists of a tower and a nacelle comprising a rotor and measurement apparatus. The rotor is composed of the blades and an axle, attached 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 axle speed. Mechanical energy is transferred from the multiplier to an electricity generator, which transforms it into electricity for subsequent injection into the grid.

Source: https://www.siemensgamesa.com

On Szymankowo WF Gamesa G132-3.45MW turbine generators will be installed. Each turbine generates up to 3.465 MW of power.

SZYMANKOWO WF Location

The Project is situated within Malbork county, which is located in eastern portion of pomorskie voivodeship. Malbork county lies within the Żuławy Wiślane region, a mezoregion in northern Poland, within the depression of the lower Vistula (the deepest part of the Baltic coastline declines in Poland). Szymankowo WF will be located in one commune (Miłoradz commune), where 11 WTGs will be present. The project location is in compliance with the Commune Development Master Plan and with the Local Zoning Plan for the area in the geodesic areas of Gnojewo, Stara Kościelnica, Miłoradz, Mątowy Wielkie for the location of wind farms along with the technical infrastructure in the municipality of Miłoradz.

Currently the area is used for agricultural purposes and it is surrounded with arable fields, pastures, meadows and small forested areas. In the vicinity there are also developed areas, including mainly local villages' buildings and structures.

Figure 2 Project site. View from the vicinity of Gnojewo towards east.

Figure 3 Project site. View from the vicinity of WTG No. 14 towards north.

The area of the investment is located outside major and dense forest complexes, marshy areas, areas identified as valuable for scientific interest. During the inventorying and observation works completed to date, the area has been found to be in small extent important for birds (as feeding grounds, routes of migration passages, routes of passages to feeding grounds or roosting places). However following conclusions of the EIA report:

- the location of the wind farm is planned outside the largest bird concentration sites identified during monitoring program;
- the area of Szymankowo WF was not intensively used as feeding or resting grounds during autumn migration of birds;
- the number of species and abundance of species listed in Annex I of the Birds Directive and in the Polish Red Book of Animals, breeding in the monitored area, is negligible;
- the area of Szymankowo WF does not constitute valuable nesting/breeding grounds for birds (arable fields under agricultural use) and the area occupied by WTGs is relatively small;
- The WTGs locations and location of the associated infrastructure will not significantly affect the valuable habitats from the birdlife point of view;
- the design of the project was assessed as a "location" compromise, sufficiently reducing threats to local and migratory birds.

Further, an independent assessment confirmed that the Szymankowo WF will not generate substantial impact on particularly important birds listed in the Annex I to Birds Directive. However, in order to reduce a risk for white-tailed eagle one of the WTGs should be turned off in the period between January 1and February 15, between sunrise and sunset.

Figure 4. Project site. View from the vicinity of Gnojewo towards south.

The Project site was also subject to monitoring of bats. As can be concluded from the bats monitoring campaigns, bats prefer linear elements of the landscape which are distant from the WTGs location, however, mitigation measure due to possible thread to bats in their especially intensive activity period, i.e. August was required by the environmental decision. The shutdown of WTGs No. 1in August, during 5 hours after sunset if wind speed is below 5 m/s is required.

Moreover, using measures to minimize the potential negative impact of the planned project, it can be assumed that the implementation of the Szymankowo WF project will not bring high environmental costs.

The site is located in the Basin of Zalew Wiślany and its tributary – Szkarpawa River.

The site is located outside Natura 2000 areas or other strictly protected areas.

Below you will find maps with the layout comprising locations of WTGs belonging to the Szymankowo WF.

Figure 5. SZYMANKOWO WF site location map (legend: *drogi – roads; EW – WTG, GPZ – MTS, linia SN – MV power transmission line)*

Rationale for this Project

In line with European Climate Change Program, many European countries, including Poland, have adopted national programs aimed at reducing emissions. These cover various policies, adopted at the European level, as well as national levels, includes among others:

- Planned increase in use of renewable energy (wind, solar, biomass)
- Improvements in energy efficiency in e.g. buildings, industry, household appliances.

The main regulations of EU countries to reduce emissions is the cost-effectively Emission Trading Scheme of carbon dioxide and legislation tackling with emissions of fluorinated greenhouse gases.

In March 2007, the EU approved an ambitious climate change and energy plan to limit greenhouse gas emissions by at least 20 % by 2020 (comparing to 1990 levels) and achieve, by 2020, a target of 20 % of total EU primary energy use through renewable energy. In January 2008, the European Commission proposed an energy and climate package to achieve objectives of reducing greenhouse gas emissions and boosting renewable energies by 2020. According to the 2030 climate and energy

framework (for the period from 2021 to 2030), adopted by the European Council in October 2014, the key targets for 2030 are: cuts in greenhouse gas emissions by at least 40 % (comparing to 1990 levels) and achieving of at least 32 % share for renewable energy. Currently, the UN are attempting to finales a legally binding global climate treaty to succeed the Kyoto Protocol which expired in 2013.

The current Polish energetic policy is based on a document 'Energetic Policy of Poland until 2030' ('Polityka energetyczna Polski do 2030 roku'). Based on this document, Poland plans to increase the fraction of renewable sources in total energy consumption by at least 15 %, by 2020, with its further growth. According to the draft version of a document 'Energetic Policy of Poland until 2040' (under formal approval process), the assumed targets for 2040 are: 21 % of the renewable energy in Polish energy mix, reduction of CO_2 emission by 30 % (comparing to 1990 levels).

Currently the percentage of energy produced through renewable energy is significantly smaller, although it is in line with the "road map" for achieving the goal.

The development of wind energy is one of the measures to be implemented, which leads to the limitations of air emissions and increase of energy production from renewable sources. The main benefit is that wind turbines convert the wind's kinetic energy to electricity, while producing none of the emissions to the air. Conventional energy sources, mainly based on various types of coal incineration, when producing energy, generate emissions of greenhouse gases, SO_2, dust and others.

The expected annual energy production from Szymankowo Project will amount approximately 128,000 MWh (50% probability) or 119,800 MWh (75% probability). Therefore, the environmental benefit of the project will be to reduce annual greenhouse gases emission in amount of up to approx. 104,192 tons of CO_2 (calculated, based on emission factors per MWh, presented by the National Center for Emissions Management for 2017).

Apart from saving the greenhouse gases emission, the Szymankowo WF will also result with significant 'avoidance' of post – combustion emissions. Based on the emission factors published by the National Emissions Management Center for the year 2017, the following annual emission savings can be expected if the Project is implemented: up to 98 tons of SO_2, up to 99 tons of NO_x, up to 30 tons of CO and up to 6 tons of particulate matters.

Exploitation of the subject wind farm is therefore a measure to avoid the emissions to the atmosphere of the comparable amounts of pollutants. Future activation of the farm project will increase those advantages.

The issues, which are in favor for location of the wind farm in this region, include among others, approving attitude of the local Authorities, lack of protected areas in the close neighborhood and favorable wind conditions; additionally successful realization of such investment is connected with benefits for the local communities, including reconstruction of power supply installations, new occupation and improvement of the local road infrastructure.

Legislative Context and Public Consultations

According to the *Act* of October 3, 2008 *on disclosure on environmental information, public participation in environment protection and on environmental impact assessments*[1], an Environmental Impact Assessment (EIA) procedure must be performed for projects which can always

[1] Ustawa o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeństwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko

significantly impact the environment (group I projects) or may be performed, upon authorities discretion, for particular ones, which can potentially significantly impact the environment (group II projects). An EIA is carried out, among others, as a part of the administrative procedure for obtaining a decision on Environmental Conditions (environmental decision), which is obligatory for a realization of an individual project defined as likely to always/potentially have a significant impact on the environment.

In the administrative procedures for the Szymankowo WF project, the Authorities, including Sanitary Inspectorate (Polish abbrev. SANEPID) and Regional Directorate for Environment Protection in Gdańsk, considered EIA report for the planned wind farm to be necessary. Such EIA report was prepared in 2014 by the Proeko company.

Information on the planned investment together with EIA Report were made available for comments of the public, including local communities and potential interested parties, such as nature protection bodies and ecological organizations. Announcement on Szymankowo project was presented to the public in all villages, where the project would be conducted, as it is routine and accepted practice in the region. As required, environmental and sanitary authorities were informed about the investment to come up with any potential issues. In addition, the society of the communes has been notified on the planned investment through notifications published on the commune's notice boards.

Following preparation of the EIA report, the investor has been granted with the relevant environmental decision for Szymankowo WF project:

- The decision on environmental conditions for Szymankowo WF No. R.6220.V.24.2015, issued on February 2, 2015 by the Head of Miłoradz commune.

The key environmental conditions for both parts of the Szymankowo project have been set forth:

- to conduct project installation works off the birds nesting season;
- to use materials with no adverse impact on the environment;
- not to use artificial lightening of any kind, except for the obstacle lighting in line with aircraft safety regulations;
- to construct building areas, auxiliary structures, storage yards or roads outside birds habitats;
- to use construction equipment complying with noise and exhaust fumes abatement levels while excavating for foundations and building provisional access roads;
- to survey noise levels after project completion/start-up;
- to conduct post-development bats and birds monitoring for 3 years within 5 years after project set-up;
- to comply with the ban on noisy works at night and to conduct noisy works during the daytime;
- to conduct waste management using designated containers, collect waste under proper roofing and to sign contracts with certified waste management and disposal companies;
- to turn off one WTG (No. 1) of the Szymankowo WF, in August, for the time of bats' activity (at night – 5 hour after the sunset), when the wind speed is less than 6 m/s
- to turn off one WTG (No. 12) in the period January 1 – February 15 during dayhours, i.e. between sunrise and sunset.

- in case of high mortality of birds, identified during post-execution monitoring, to apply efficient mitigation measures (i.a. lightening's changes, periodical turning off of the WTGs etc.);
- to reduce acoustic power of particular WTGs, in order to comply with the permissible noise levels- if needed;
- to use existing roads as access roads to the wind farm.

As part of the pre-development procedure, public consultations, including EIA report and other documents disclosure to all interested stakeholders were arranged by the competent authorities. No complaints or protests against the planned investments were submitted.

On the base of decision on environmental conditions, the Company has been granted with the building permit for Szymankowo WF: decision on approval of building permit design and obtaining construction permit for Szymankowo WF, no. AB.6740.364.2015.BP, issued on September 8, 2015, by the Head of Malbork county. The decision was later changed by decision by the Head of Malbork county, dated 23 May, 2016. It has to be emphasized that the fact of significant reduction of WTGs number, taking place during permitting process, significantly decreased the intensity of impacts, which were analyzed in EIA Report.

What is the current condition of the existing environment?

The planned Szymankowo WF is not situated within borders of any nature and landscape protected areas.

The nearest natural protected areas are: Special birds' protection zone 'Dolina Dolnej Wisły' (approximately 3.3 km to the west of the planned WTG), Natura 2000 protection zone "Dolna Wisła" (approximately 3.3 km to the west of the planned WTG) and 'Środkowożuławski Landscape Protection Zone' (approximately 3.3 km to the west of the planned WTG). These areas are of local protection and the wind farm will not have any impact on this. None of the wind turbines are located in protected areas such as Natura 2000. Other protected areas include the following:

Other protected areas located up to 15 km away from the planned investment include the following:

1. Natura 2000 protection zones:
   - Special birds' protection zone 'Dolina Dolnej Wisły' (PLB040003) – approximately 3.3 km to the west of the nearest WTG location;
   - Natura 2000 protection zone "Dolna Wisła" (PLH220033) - approximately 3.3 km to the west of the nearest WTG location;
   - Natura 2000 protection zone "Sztumskie Pole" (PLH220087) - approximately 7.5 km to the south east of the nearest WTG location;
   - Natura 2000 protection zone "Waćmierz" (PLH210031) - approximately 10.4 km to the west of the nearest WTG location.
2. Nature Reserves:
   - "Parów Węgry" - approximately 6.0 km to the south east of the nearest WTG location;
   - "Las Mątawski" - approximately 6.5 km to the south of the nearest WTG location;
   - "Biała Góra" - approximately 12.9 km to the south of the nearest WTG location;
3. Landscape Protection Zones:
   - "Środkowożuławski" - approximately 3.3 km to the west of the nearest WTG location;
   - "Rzeki Nogat" - approximately 4.7 km to the east of the nearest WTG location;

- "Żuław Gdańskich" - approximately 9.1 km to the north west of the nearest WTG location;
- "Białej Góry" - approximately 9.2 km to the south of the nearest WTG location;

4. Ecological areas:
   - "Strzeblowe Oczka" - approximately 10.4 km to the south east of the nearest WTG location.

As a part of the pre-investment process, several-day long series of ornithological observations were conducted for the project to identify key risks. Additional and more detailed, two one-year long monitoring campaigns were conducted between September 2, 2007 and August 21, 2008 and between March 18, 2013 and February 25, 2014. This was undertaken in line with guidelines recommended, among others, by the Polish Wind Energy Association and OTOP[2]. The scope of the assessment was later assessed as competent for the subject area by the Competent Authority and RDOS (Regional Director for Environmental Protection).

At the area of Szymankowo WF project wind farm 119 bird species were identified, including 11 species listed in the EU Birds Directive. These included: white stork (*Ciconia Ciconia*), marsh harrier (*Circus aeruginosus*), Montagu's harrier (*Circus pygargus*), red-backed shrike (*Lanius collurio*), white-tailed eagle *(Haliaeetus albicilla),* common redpoll *(Carduelis flammea),* lesser spotted eagle *(Aquila pomarina),* Eurasian bittern (*Botaurus stellaris),* wood sandpiper *(Tringa glareola),* corn crake *(Crex crex),* common crane *(Grus grus)*.

According to the EIA report[3], the subject area is of certain significance from the ornithological point of view, however, as explained above, the wind farm development should not affect local avifauna due to applied mitigation measures, limiting the potential negative impact of the planned project. Conclusions included in the EIA report were accepted and confirmed by the Competent Authorities.

There were also bats observations within the area of Szymankowo WF site, conducted between June 2007 - August 2008 and August 2011 and July 2012. This monitoring was undertaken in accordance to the national guidelines[4], compliant with these issued by EUROBATS. During these observations, bats belonging to 12 species, depending on the season, were identified. Bats were identified mainly in the vicinity of buildings, waters and surrounding trees.

The inventoried chiropterofauna was characterized by the average diversity in Poland and the majority of WTGs are to be located at a considerable distance from the most valuable areas for the chiropterofauna. Considering very high activity of one bat species on the area of Szymankowo WF, in the environmental decision there was imposed a condition to take off one WTG in August, for the time of bats' activity (at night).

The Project was assessed as of low risk to bats and no significant effects on birds were concluded. Monitoring of the impact on birds/bats, required by the environmental decision, should secure implementation of mitigation measures if animals' mortality at the site is high.

Considering no significant effects of the planned project on bats and birds and planned (obligatory) post-construction monitoring, the real impacts will be examined and in case of high mortality of

[2] Wytyczne w zakresie oddziaływania farm wiatrowych na ptaki. Chylarecki, Pasławska. Szczecin 2008. (in Polish)

[3] „Raport o oddziaływaniu na środowisko przedsięwzięcia pn.: Farma wiatrowa „Delta" w gminie Miłoradz (pow. malborski, województwo pomorskie)" (Environmental impact assessment report of „Delta" wind farm in the Miłoradz commune (Malbork county, pomorskie voivodeship)), in Polish, Proeko, June 2014

[4] Tymczasowe wytyczne dotyczące oceny oddziaływania elektrowni wiatrowych na nietoperze. 2009. (in Polish)

flying animals, it is possible to apply additional prevention measures (i.a. excluding operation of certain WTGs in selected season/period or reducing rotor's speed).

Below you will find a map presenting distances of the Szymankowo WF site to the nearest nature protection areas (*source: http.geoserwis gdos.gov.pl/mapy/)*. Red dots indicate location of the WTGs.

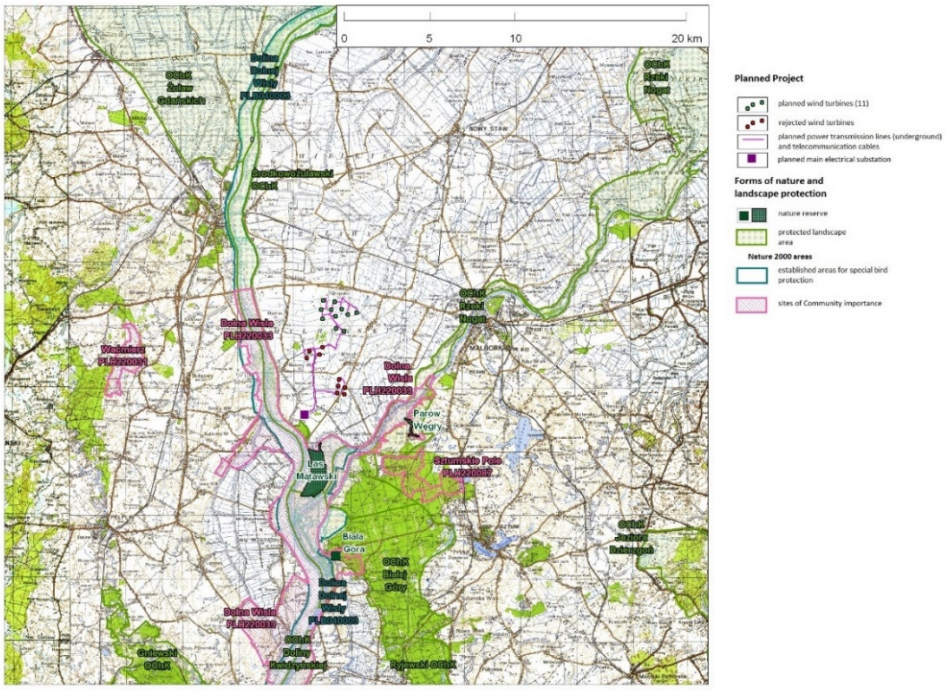

Figure 6. Location of the Szymankowo WF (with accompanying infrastructure), in a context of the nearby nature protection areas (WTGs planned for development – marked in green; WTGs excluded from the project – marked in red).

Social impacts

Development of the Project has not required any displacement of the people or business - no physical or economical resettlement had taken or will need to take place and no livelihood loss identified. The land for the Project purposes was achieved based on lease contracts signed with the land owners on mutual agreements.

The Project has direct socio-economic impacts on development of all relevant communes and local inhabitants. The following direct impacts have been identified:

- increase of the commune tax income – in line with Polish law a tax of 2% of the value of the building is to be paid to the local authority each year.
- increase of the annual income of land leasers for each;
- improvement of the local communication routes.

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

The Company will implement measures regarding compensation to farmers and land users for any damages that could result from the construction works undertaken. This is in line with Polish legislation. In general, any works-related damages reported by the land owners will be immediately verified on-site by the Company representative assisted by the land owner. Then the range of damages and a compensation level will be evaluated by the expert (appraiser). Agreed compensation will be paid to the victim.

What impacts during construction will be there?

The main impacts of the projects associated with the wind farm development relate to ground works (primarily during setting of foundations for the towers), construction works and increased transport traffic and include intrusion and disturbance within soils strata, temporary change of groundwater level (when groundwater draining is required during the construction), increased noise and vibration.

The Company will implement the best practice to limit the nuisance of the construction works. To limit the impact the investor is going to apply such measures as:

- to use construction equipment complying with noise and exhaust fumes abatement levels while excavating for foundations and building provisional access roads;
- to work out a Traffic Managenment Plan which among others will plan transport routes for cars and heavy machinery in such way, that local citizens are least disrupted; in addition, to reduce noise emissions during the investment delivery stage, construction works which could cause excessive noise emissions should be reserved for daytime and organized in such a manner to reduce the noise-related nuisance to a minimum;
- to provide protection of trees within the access roads construction site with protective bands which should be removed immediately upon completion of construction works;
- to prevent contamination of construction site with polluting substances, e.g. by well-sealed fuel distribution to equipment and vehicles operated during construction and maintenance;
- to conduct waste management in line with the provisions of Waste Act and local commune regulations.

What will be the impacts during operation?

Completed investigations and public consultations conducted primarily as part of the environmental and social impact assessments procedure identified that main environmental impacts associated with the operation of the wind farm refer to increased noise levels, change in the landscape and influence on avifauna and bats. In addition, issues connected with shadow flickers and electromagnetic fields are presented in this summary.

Noise generation

Due to the predicted impact on the acoustic climate of the neighboring areas the developer has completed noise level analyses (twice: in the EIA Report – for 20 WTGs and later, for 11 WTGs). The

purpose of such impact analysis of the planned investment was to define conditional circumstances it should comply with, in order to guarantee that its impact on acoustic climate will not exceed binding environmental quality standards, as set for homestead housing - amounting to 55 dB for daytime and 45 dB for nighttime. The noise impact has been assessed by a modeling exercise, in line with the standard methodology adopted both in Poland and the EU. The modeling included all 11 planned WTGs and their noise characteristics as per the manufacturer information. The modeling results indicated that the noise generated by a fully operating wind farm will not cause any breaches of the environmental quality standards, both during the nighttime and daytime. Noise distribution during night is presented in the following figure.

Please note, that noise modeling gives just an approximation of the possible noise distribution in the worst case scenario. The actual noise impact will be assessed after the wind farm is operational by mean of noise measurements. Should any breaches of the noise standards are observed, the Company will implement certain measures to reduce the noise impact, in line with the provisions of the environmental decision. It should be noted, that the planned WTGs allow for operation with reduced noise emission, however, also with reduced efficiency.

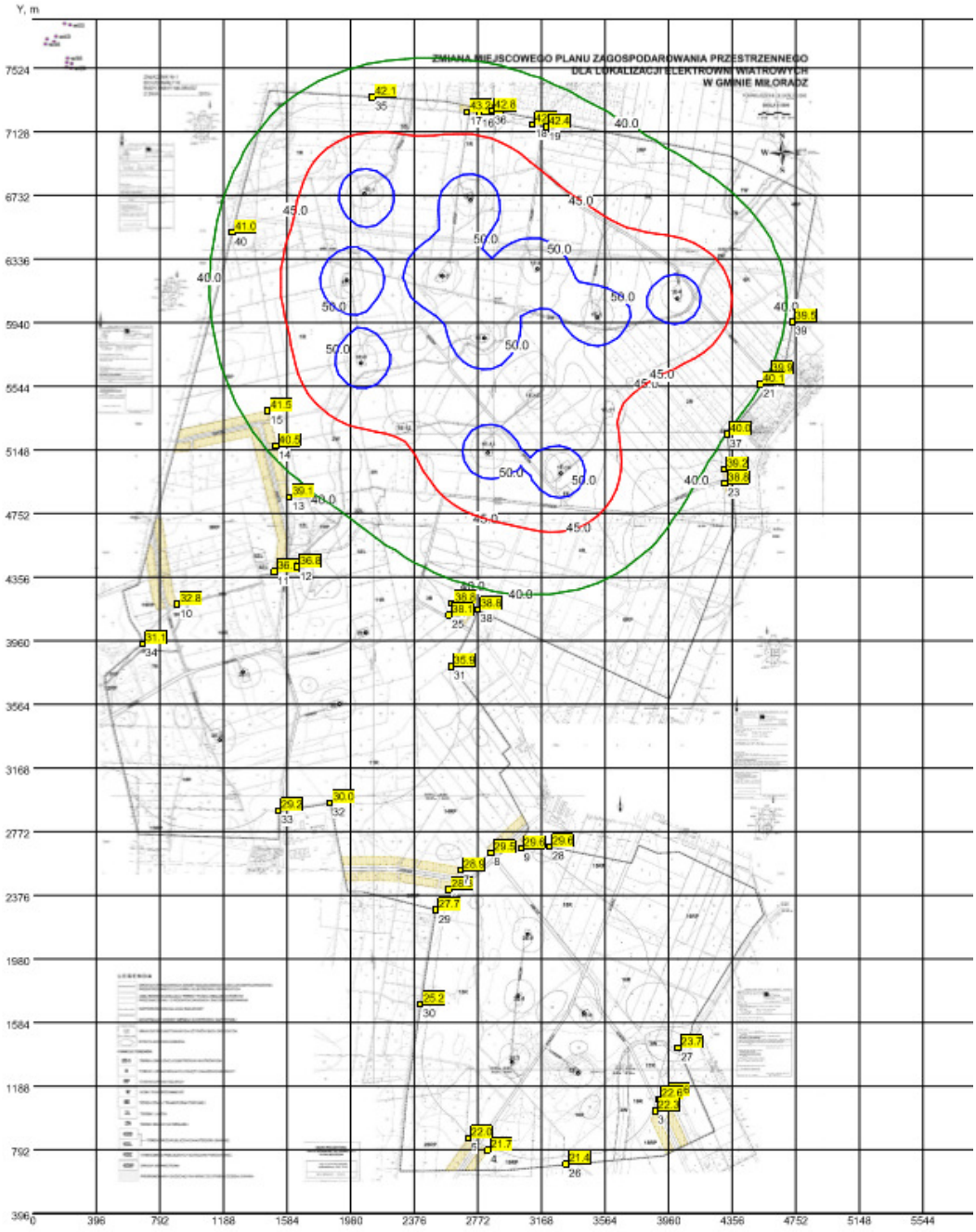

Figure 7. Distribution of noise generated by Szymankowo Wind Farm at night.

Birds and bats

The location of the Szymankowo WF may create a threat to birds and bats. Nevertheless, it should be pointed that number of observations and reports on active wind farms and its impact on birds' populations indicates that birds avoid collisions with wind farms. The number of bird kills resulting from collisions with wind turbines is significantly smaller than those caused by collisions with e.g. cars, power lines and houses.

To recognize the local birds' populations and undertake applicable measures during the planning stage, the investor has conducted a number of ornithological observations on the areas of the planned wind farms. In a view of the pre-investments monitoring results, the identified avifauna was

classified as typical for the areas of Żuławy Wiślane area, characterized as with lots of observed bird species, but insignificant records of rare and infrequent species. The areas included in this project have not been identified as relatively valuable concerning wildlife and nature protection needs, however the wind farm development should not affect local avifauna due to applied mitigation measures, limiting the potential negative impact of the planned project.

Collisions of birds with the new objects, including wind turbines, may occur, especially at night, with weather conditions resulting in limited visibility. However, observations from existing wind farms show that those would be very isolated incidents and would not have a significant effect on local bird populations. Since the wind farm is not on a migration route and is not an important breeding ground for protected species, it is therefore expected that collisions may only occur incidentally and will not have a significant effect on the populations.

In line with the national[4] and EUROBATS guidelines (dealing with impact of wind farms on bats) the identified species of bats belongs to a group with high risk of collision with wind turbines. However, taking into account the spatial distribution of wind turbines and areas where bats were observed, it was concluded that the risk may be significantly reduced by location of the turbines in the appropriate distance from forested areas and borders of residential areas – as it was in this case. Due to the need of bats conservation, the location of the wind farm has been approved by the reports on bats population. Nevertheless post-construction bats monitoring has been required and this has been included within an Environmental and Social Action Plan developed for the Project

Taking into account the characteristics of the investment, it has been concluded that the undertaking will have no negative impact on the species and habitats protected under 'Natura 2000'.

Visual impacts

The development of the Szymankowo WF (encompassing 11 wind turbines with the maximal level above the ground outlined by the blade of 200 m – tower plus blade) will influence the landscape of the subject communes. The turbines, which are currently regarded as visually intrusive to current rural landscape, will become the dominant objects in the local environment/landscape. Nevertheless, it should be stressed that the evaluation of landscape impacts of the wind farm is always subjective and depends on the individual approach. Any such investment may have some position. This has been taken into account by the investors and potential landscape impact has been discussed as part of the permitting process. This included possibility of local residents to visit other wind farms in the area.

The picture below presents the rural landscape for the site under development (and visualization of the WTGs).

Figure 8. Visualization of the Szymankowo WF – view of the northern portion of the area (buildings of the Gnojewo village on the right, buildings of the Stara Kościelnica village on the left).

The landscape impact is not permanent, given the expected "lifecycle of the investment" i.e. 25 years, when decommissioning should be undertaken.

The development, apart from the stable visually intrusive change, will create so called shadow flicker caused by rotating turbine blades. This impacts residents living in close proximity to the rotating shadow source. A detailed assessment of such impacts has been conducted in the EIA report.

The undertaken calculations show some exceedances of shading levels, which are treated as safe for the real conditions. In some of the points designated for measurements, the meteorological probable length of shading can exceed 10 hours per year (this value is below the 30h as prescribed in IFC/EU guidelines) within the homesteads of i.a. Gnojewo village, covered by the scope of the local spatial development plan constituting wind farm investment in Miłoradz commune. While lack of clouds and barriers between the receptor and wind turbine was assumed, the results showed only the theoretical and maximal impact. Considering that presented analysis does not take into account various types of terrain obstacles (overrides by buildings and trees), therefore it is expected that the real impact's scope will have lesser extent than calculated and should not be a nuisance for nearby residents.

No cumulative impact regarding shading levels is expected, taking into account considerable distance between Szymankowo WF and other existing wind farms (9-13 km).

As concluded by the shadow flicker study the planned investment is likely to be as source of impacts in terms of light phenomena. Implementation of the project will not be a source of nuisance in terms of stroboscopic effect. In order to eliminate the impact, the blades will be coated with a matt paint of translucent texture.

Electric and magnetic fields

The main sources of electromagnetic fields directly linked to Szymankowo WF Project, are WTGs and transformer output. These elements are placed inside the nacelle on top of the tower (at a height of approx. 134 m). According to information included in the EIA report, elements of WF are working with medium voltage and the output of the transformer (Szymankowo main electrical substation) is of high voltage, which will be forwarded to the electricity grid (main electrical station operated by the Distribution Service Operator). Due to the location of the transformer (fenced area, not accessible to people), the level of the electromagnetic field, generated by the elements of power infrastructure at the ground level can be generally omitted.

Second potential source of electromagnetic field with a frequency of 50 Hz, associated with the Szymankowo WF, are electromagnetic cable lines. In accordance with the applicable standards, all cables will be placed in trenches with a depth of at least 1 m and a width of about 1 m. Medium voltage cable networks generate an electromagnetic field which level is low enough that it does not threaten the environment.

Another potential source of the electromagnetic force is the construction of power stations (GPO). The investment will involve the implementation underground cable connections. In the case of modern power stations, the radiation of the electric and magnetic fields does not occur in practice. In case of Szymankowo WF, the GPO is considered to be a part of the project. Based on the information included in the EIA report and according to the already existing similar experiences, it is assumed that the maximum intensity of the electromagnetic fields should not exceed 10kV/m (in the areas available for personnel). Moreover, the electromagnetic force will not exceed the permissible value of 60 A/m (at maximum load). The area of GPO will not be available for public. Based on that, Szymankowo WF will not generate a negative impact on humans and animals.

Based on the information presented in the EIA report related to the Szymankowo project and review of existing Regulations, and further an independent audit undertaken by Ramboll Environ Poland on behalf of Lender, it can be summarized that:

- Szymankowo WF Project is not a source of the electromagnetic field with a frequency of 50 Hz or electromagnetic radiation in the range of medium wave with values higher than acceptable;
- Implementation of Szymankowo WF does not affect the quality of the received broadcast radio - television, radio relay transmission will not interfere and will not cause interference with electronic equipment;
- In accordance with Environmental Protection Act, Art. 122a states that investor has an obligation to make measurements of the levels of electromagnetic fields in the surroundings of the environment, if the voltage is not lower than 110 kV; the measurements should be undertaken immediately after the investment becomes operational or each time there is a change in operating conditions or equipment; the results of the measurements shall be forwarded to the Voivodeship Environmental Protection Inspector and to the Voivodeship Sanitary Inspector;
- In accordance with the Regulation of the Minister of Environment dated 2.07.2010, regarding types of installations, which exploitation requires special notification [Dz.U.2010.130.10844, Poz.880] and the Regulation of the Minister of Environment dated 2.07.2010, regarding special notification about installations generating electromagnetic fields [Dz.U.2010.130.10840, Poz.879], investor has an obligation to notify a designated environmental authorities.

Ice and blade throw risk

The effect of ice throw may occur when ice generated on the turbine blades under certain meteorological conditions is thrown away of the blade driven by a centrifugal force. The safe distance between WTGs and areas susceptible to such impact can be estimated according to the guidelines provided by the Wind Energy Production in Cold Climate, which suggest the following formula for calculating the safe distance: 1.5 * (hub height + rotor diameter). Considering the chosen model of WTG calculations for the planned Szymankowo WF indicate that for assumed hub height (134 m) and rotor diameter (132 m), the maximum ice throw range will be approximately 345 m.

The blade or part of blade throw risk occurs in certain circumstances, e.g. if blade structure is affected by ice or production error, or, if an accident caused e.g. by fire or thunder strike occurs, while the blades are rotating. Damaged part of the blade or entire blade is then thrown away by a centrifugal force. Theoretically, the throw range can be calculated based on the kinematic of angular throw, which, for given WTGs, correspond to a maximum range of throw of some 1500 m. However, in real conditions the thrown blade or its part is still subject to aerodynamics forces and air resistance and actual distances of throw are typically shorter, which was proved both numerically and by observations of real accidents. Following presentation of Mr. Scott Larwood of California Wind Energy Collaborative presentation (2004 Forum Palm Springs), a throw range for near 100 m tall WTGs is approximately equal to WTG overall height for entire blade, and 2.5 times WTG height for part of it. In lack of the sound scientific background it can be assumed that the blade throw range for the selected WTGs will be 500 m.

All WTGs are distant from human residences and public roads, hence a risk for human is limited. However, the throw range can affect local, dirt roads, as shown in the figure below. Please note that the ice throw may occur during winter time only hence during the season when the affected roads will be used only occasionally.

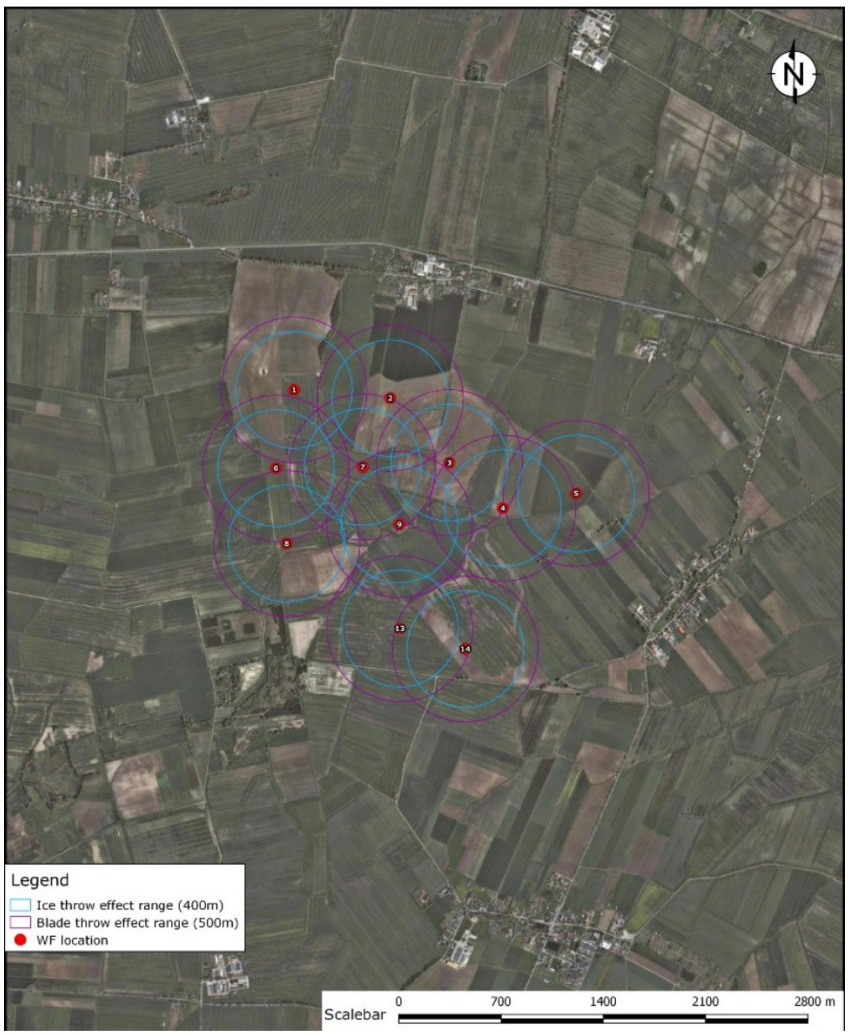

Figure 9. Expected range of ice/blade throw risk

Measure Aiming at Limitation of the Impacts

The main measure, which may be used to prevent significant environmental impact of a wind farm, is a good choice of the location. Thus, during the project preparation a number of possibilities of different locations of wind turbines have been analyzed. During preparation of the variants of the investment, apart from technological and economic issues (such as winds characteristics and costs of land purchase and use), have been taken into account the following issues, important from the perspective of environmental protection:

- existing state and way of land development and use of areas, which includes distribution of residential housing, forests, farming land,
- mutual impact on individual objects on each other, including also possible adding up of sound waves,
- necessity of protecting the objects of residential housing against noise,
- location from the perspective of birds and bats protection.

The second aspect of choice, very important from the point of view of environmental protection, was the choice of a producer and a supplier of equipment. The investor will be using state-of-the-art technology and equipment from well-known producers, which have been designed to limit noise emissions.

Works consisting of placement of WTGs and successive preparation of variants of individual WTGs' location took several months. After many analyses of the preliminary lay-out of wind turbines, considering noise restrictions, avifauna protection, soil's characteristic, adjustment to lay-out have been implemented. In summary it may be stated, the layout of wind turbines has been planned in that way to achieve the following goals:

- not to exceed the binding environmental noise quality standards, set in Executive Order of the Minister of Environment[5];
- to be located out of birds migration routes, birds concentrations, feeding or nesting areas, which was later confirmed by the EIA report and competent authorities;
- to be located out of valuable plants habitats, wetlands or forest areas
- to be located out of nature (such as Natura 2000) and landscape protected areas,
- to be located out of the areas valuable from the cultural landscape point of view,
- not to disturb the continuity of ecological corridors[6].

W przypadku projektu WF Szymankowo układ został ustalony w celu wykluczenia z inwestycji terenów mieszkalnych, najcenniejszych obszarów przyrodniczych (m.in. największej koncentracji ptaków) oraz terenów kwestionowanych przez Urząd Ochrony Zabytków - ze względu na potencjalne niekorzystne wpływ na otoczenie zamku w Malborku i konieczność ochrony dziedzictwa kulturowego.

Post construction monitoring

Noise

According to the Environmental Protection Act and based on requirements included in the environmental decision, the Company is obliged to conduct post construction noise level surveys for the wind farm. The first measurements should be conducted after obtaining a construction permit,

5 Executive order of June 14, 2007 on permissible noise levels in the environment. Unified text in JoL of 2014, item 112

6 Ecological corridor is an area which makes possible migration of fauna, flora and fungi. The ecological corridors are classified as main (of an international range) and supplementary (of a national, regional and local range).

before construction works are initiated or when turbines are constructed , but not in operation for the time of measurement. . The second round of measurements is required after the project start-up, preferably during the same season and on similar conditions as the first round of measurements. If the measurements indicate that permissible noise levels are exceeded, noise reducing action will be necessary to be completed (i.e. reduction of the acoustic power of the subject wind turbine(s)).

Birds

Birds monitoring has been required by the local authorities (in the environmental decision) for 3 years within the 5-year period after project start-up.

The scope of monitoring should be identical as during the pre-investment monitoring, should be conducted in line with the national guidelines[2] and it should include:

- investigation of the birds, including their species and number,
- in reference to flying birds, distribution of birds at 3 flight altitudes should be investigated, including the one at the height of collissions with the turbines, number of birds and use of the airspace ,
- evaluation of the birds' mortality caused by collisions with WTGs, including dead birds' investigation in the vicinity of the WTGs.

Bats

Bats monitoring has been also required by the local authorities (in the environmental decision) for Szymankowo WF. In line with good practice guidelines of EUROBATS 2006 implemented in the Polish guidelines[4], the Company was obliged to carry out a 3-year long post-development bats monitoring. The scope of the monitoring should include:

- results of the listening monitoring and comparison with results of the pre-development monitoring,
- assessment of bats colliding with turbines, taking into account local and migrating species and description of the reactions on the presence of wind turbines
- monitoring of deaths, including information on species, location and inaccuracy of the investigation, resulting e.g. from collection and consumption of death birds by other animals

Additional information and grievance procedure

The mechanism for the claim procedure will be implemented by the company as part of the project management system. The procedure assigns a coordinator of the integrated system, who will be responsible for reacting in case of complaints.

All requests for additional information related to the Szymankowo WF Project should be addressed to the Head of Environmental Protection and Sustainable Development Department of Polenergia:

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