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# **NON-TECHNICAL SUMMARY**

## **BANIE WIND FARM PROJECT, POLAND**

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## Introduction

The Wiatromill Sp. z o.o. company (further referred as the Company or Wiatromill) is developing a Banie wind farm project of up to 192MW (the "Project" or the "Wind Farm") located in northwestern Poland. The project development is divided into three separate phases, Phase I housing 25 WTGs of a total capacity of 50 MW, Phase II housing 28 WTGs of a total capacity of 56 MW and Phase III housing up to 42 WTGs of a total capacity of 84 MW.

The construction of Phase I, which consists of Kozielice 1 and a part of Kozielice 2 of a total capacity of 50 MW, is financed among others by the EBRD. The construction works of this phase have already been completed and final tests of the wind turbines are ongoing. The construction of the second phase of the Project has just been started with commencement of the ground works. The company is currently applying to EBRD for co-financing of this Phase. The Phase III of the Project will be developed separately in the future. Due to the size of the entire Project and possible cumulative impacts an assessment has been undertaken for all three phases, however the construction of III depends on, *inter alia*, the electricity market conditions, renewable energy support scheme and possibility for project financing.

The aim of this non-technical summary is to ensure that a cumulative assessment of the planned wind farms developed by the same Company is presented in one summary report to enable meaningful public and stakeholders' engagement process. In line with the Polish environmental regulations relevant Environmental Impact Assessments were completed for the Project and the Project has been permitted by the relevant competent authorities.

## General presentation

Wiatromill is wholly owned (indirectly) by Energix – Renewable Energies Ltd. an Israeli public company traded in the Tel Aviv stock exchange. Energix is a leading Independent Power Producer which initiates, develops, constructs and owns, for long term, Renewable Energy projects. Energix has developed, initiated and commissioned dozens of projects with an aggregate installed capacity of over 49 MW and has a further 400 MW under development in Israel and abroad. Energix is part of one of the largest real estate groups in Israel, Alony-Hetz, who invests in Switzerland, UK, U.S, Canada and Israel.

The Project will be located in the northwestern Poland, at the area of two counties (Pyrzyce and Gryfino) and four communes: Banie, Bielice, Kozielice and Widuchowa. As part of the project, three electrical substations are planned, one of them in the Gryfino commune.

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

- Wind turbines generators (WTGs) and relevant technical infrastructure;
- Internal roads and assembly/service yards;
- Internal infrastructure of underground power transmission lines and steering cables;
- Main electrical substations (MES) medium voltage/high voltage (MV/HV).

The configuration of the Banie wind farm includes development of up to 96 wind turbine generators (WTGs) of the following parameters:

- capacity of an individual WTG: 2 MW;
- hub height: 95 m (39 WTGs) or 125 m (57 WTGs);
- maximum WTG height (with uppermost position of blades): up to approximately 180 m.

The total potential capacity of the wind farms is up to 192 MW of which 50MW has already been built and construction of the next 56 MW has just been commenced. The construction of III is currently uncertain.

## 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: [www.vestas.com](http://www.vestas.com)

It has been planned that Vestas WTGs, type V100 and V110, with power of 2 MW will be installed at the wind farm. The turbines will be installed on 95 m or 125 m towers, rotor will be provided with blades of a length of 49 m (type V100) and 54 m (WTG type V110). The maximum height of the turbines will reach approximately 180 m (tower plus blades).

## Project Location and presentation

The Project is situated in Zachodniopomorskie Region, approximately 40 km south of Szczecin city. The entire Project Banie consists of seven separate wind farm investments, each separately permitted, including Banie 1A, Banie1B, Banie 2, Widuchowa, Kozielice 1, Kozielice 2 and Bielice, all located within a 12 km radius from the village of Banie, at the area of two counties Pyrzyce and Gryfino. Below, there is a short characterization of each of the subprojects.

The Phase I, i.e. Kozielice 1 and a part of Kozielice 2 (4 WTGs out of 22 WTGs) is very much advanced. The construction works of WTGs, underground infrastructure and access roads and assembly yards have already been completed and the wind farm is subject to operational testing.

### **Subprojects Kozielice 1 and Kozielice 2**

These subprojects are located in Kozielice commune, Pyrzyce County, Zachodniopomorskie region. The WTGs has been divided into two main subprojects:

- Subproject Kozielice 1: includes 21 WTGs located at a distance from approximately 0.5 km to 2.5 km around the village;

- Subproject Kozielice 2: it includes 22 WTGs located south of Kozielice village, between villages of Mielno Pyrzyckie, Trzebórz and Tetyń; 4 turbines are currently under construction, 18 are part of phase 2 of the project.

The Phase II of the Project includes the remaining 18 WTGs of the Kozielice 2 and the Bielice subproject. This subproject includes 11 WTGs located in the Bielice commune, Gryfino County, Zachodniopomorskie region, of which only 10 will be constructed. The WTGs are located in two main subgroups. 4 WTGs are located south of Linie village, at a distance between 0.5 km and 1.5 km from the village. 6 WTGs are located further to the south, in the vicinity of Nowe Chrapowo village, approximately from 0.5 km to 1 km from the village.

Given below are additional planned subprojects that are being developed by Wiatromill as the Phase III and are assessed as a part of a cumulative review. These are:

### **Subprojects Banie 1A, Banie 1B and Banie 2**

These subprojects are located in the Banie commune, Gryfino County, Zachodniopomorskie region. The WTGs will be located in three main groups:

- Subproject Banie 1A: in total up to 13 WTGs, located to the north of Banie village, at a distance between 0.6 km and 4.5 km from the village; over 500 m north and south of Sosnowa village.
- Subproject Banie 1B: in total up to 2 WTGs, located over 2.5 km southeast of Banie village, 1.3 km west of Piaskowo village and 1.5 km north of Piaseczno village.
- Subproject Banie 2: in total up to 24 WTGs, located approximately from 1.5 km to 3 km northwest and southwest of Banie village, including: 7 WTGs located to the northwest of Lubanowo village, 4 WTGS located to the south of Lubanowo in the vicinity of Tywice village and 13 WTGs located between Baniewice and Swobnica villages, over 1 km to the west of Długie Lake;

### **Subproject Widuchowa**

This subproject includes up to 3 WTGs located in the Widuchowa commune, Gryfino County, Zachodniopomorskie region. The WTGs are located to the west of Żelechowo village and east of Kiełbice village.

Moreover, the Project Banie includes construction of the following electrical substations:

- The 'GPO Nowe Czarnowo', which will be located in the Nowe Czarnowo precinct (land plot No. 20/6), in Gryfino commune, will be connected via 1.5 km new-build 220 kV line to the 400/220/110 Polskie Sieci Energetyczne PSE (Polish Power Grid) Krajnik substation. The connection will be provided in accordance with the Grid Connection Agreement.
- The 'GPO Kozielice', which will be connected via a new-build 28.5 km 110 kV underground power transmission line to the 220/110/30 kV 'GPO Nowe Czarnowo'.
- The 'GPO Banie' will be connected via a new-build 14.5 km long 110 kV underground power transmission line to the 220/110/30 kV 'GPO Nowe Czarnowo'.

Locations of the planned WTGs with separation of the development phases are presented on the map below.



From the geographical regionalization point of view, the Banie wind farm lies within the Równina Wełtyńska (Wełtyńska Plain) and Równina Pyrzycka (Pyrzycka Plain) mezzo-regions, belonging to the region of Pomerania, northwestern Poland.

The areas of the investment are located outside major and dense forest complexes, marshy areas, areas identified as valuable for scientific interest. Based on the site visit observations and review of aerial photos and topographic maps, the wind farm development area has a rural character. The terrain is slightly hilly (with terrain elevation varying between 30 and 90 m asl), in majority occupied by arable fields and to some extent by small forest complexes.

Due to the decisions taken by the Company, the Project is being developed in 3 separate phases. The construction of the Phase I has already been accomplished while the accomplishment of construction of the Phase II is planned by the end of June 2016. The Phase III may be constructed in the future, depending on, *inter alia*, the electricity market conditions, renewable energy support scheme and possibility for project financing.

1. Phase I, 50 MW, of the Project's development, comprises:
  - 21 WTGs VESTAS V100 2.0MW, hub height 125 m, rotor diameter 100 m, capacity 2.0 MW belonging to Kozielice 1 subproject (WTG No. KEW01 – KEW19, KEWK02 and KEWK03) and
  - 4 WTGs VESTAS V100 2.0MW, hub height 125 m, rotor diameter 100 m, capacity 2.0 MW belonging to Kozielice 2 subproject (WTG No. KEW20, KEW21, KEW23, KEW27).

2. Phase II, 56 MW, of the Project's development, comprises:
  - 10 WTGs VESTAS V110 2.0MW, hub height 125 m, rotor diameter 110 m, capacity 2.0 MW belonging to Bielice subproject (WTG No. EWB01 – EWB11) and
  - Remaining 18 WTGs VESTAS V100 2.0MW, hub height 125 m, rotor diameter 100 m, capacity 2.0 MW belonging to Kozielice 2 subproject (WTG No. KEW22, KEW24, KEW25, KEW26, KEW28 – KEW41).
3. Phase III, up to 84 MW, of the Project's development, comprises:
  - up to 39 WTGs VESTAS V100 2.0MW, hub height 95 m, rotor diameter 100 m, capacity 2.0 MW belonging to Banie 1a, Banie 1b and Banie 2 subprojects (WTG NNo. BEW01 – BEW09, BEW16 – BEW37, BEW39 – BEW46) and
  - up to 3 WTGs VESTAS V110 2.0MW, hub height 125 m, rotor diameter 110 m, capacity 2.0 MW belonging to Widuchowa subproject (WTG No. WEW02, WEW04 and WEW06).

## Rationale for this Project

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

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

According to Polish policy with respect to the planned reduction of emissions "Polityka energetyczna Polski do 2030 roku", Poland plans to increase the portion of renewable sources in total energy consumption by at least 15 % by 2020 with its further growth. 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 and very small amounts of wastes. Conventional energy sources, mainly based on various types of coal incineration, when producing energy generate emissions of greenhouse gases, SO<sub>2</sub>, dust and others.

The expected total annual energy production from the Project will amount to approximately 580-610 GWh (50% productivity probability), i.e.:

- An expected annual energy production from the phase I will be approximately in the range of 165-175 GWh;
- An expected annual energy production from the phase II will be approximately in the range of 190-200 GWh;
- An expected annual energy production from the phase III will be approximately in the range of 225-235 GWh;

Therefore the environmental benefit of the whole project will be the reduction of greenhouse gases emission in the amount of 399,117.5 tons per year (calculated based on an emission factor, representative for convention projects as of 0.638 tCO<sub>2</sub>/MWh, for Poland in 2012).

Apart from saving the greenhouse gases emission, the Project will also result in significant 'avoidance' of post – combustion emissions. As an example, the equivalent production of electricity by the largest Polish hard-coal power plant would result with the following emissions (estimations based on emission factors for 2011):

	Phase I	Phase II	Phase III
PM	approx. 14.77 tons/year	approx. 16.26 tons/year	approx. 24.02 tons/year
SO <sub>2</sub>	approx. 441.43 tons/year	approx. 485.84 tons/year	approx. 717.99 tons/year
NO <sub>x</sub>	approx. 287.69 tons/year	approx. 316.63 tons/year	approx. 467.92 tons/year

Exploitation of the subject wind farms is therefore a measure to avoid the emissions to the atmosphere of the comparable amounts of pollutants.

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 bird protected areas in the 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 environmental regulations *on disclosure on environmental information, public participation in environment protection and on environmental impact assessments*, an Environmental Impact Assessment (EIA) procedure must be performed for projects which can always significantly impact the environment (group I projects), projects which can potentially impact the environment (group II projects), or projects that may impact areas of 'Natura 2000' protected zones. The process of EIA is carried out to obtain a decision on Environmental Conditions (environmental decision) which is obligatory for a realization of an individual project and specifies environmental constraints which must be taken into account in building designs. Environmental decision may also specify special obligations for the developer, such as e.g. post-construction monitoring of environmental impacts.

In the administrative procedure for all the subprojects, the competent Authorities obligated the Investor to prepare EIA reports for the planned subprojects. The EIA reports were prepared in 2008 for Banie 1 A, Banie 1B and Banie 2 subprojects (one EIA report for the three subprojects), in 2009 for Kozielice 1 and Kozielice 2 and Rokity (part of Kozielice 1 subproject), in 2011 for Bielice subproject and 2013 for Widuchowa subproject.

Information on the planned investments together with the EIA reports were made available for comments of the public, including local communities and potential interested parties, such as nature protection bodies and ecological organizations. Announcements on the subprojects were presented to the public in all villages where the Project would be conducted, as it is routine and accepted practice. 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 and could raise concerns, questions and comments.



Additional public consultations will be undertaken in line with the Stakeholders Engagement Plan.

Following preparation of the EIA reports, the investor has been granted by the competent Authorities with relevant environmental decisions for the subprojects:

- Subprojects Banie 1A, Banie 1B and Banie 2: environmental decision No. GK-7627/2/2008, issued on August 18, 2009;
- Subproject Kozielice 1: environmental decision No. GN.7627-3/W/K/09, issued on October 21, 2009 (for 19 WTGs) and environmental decision No. GN.7627-5/W/R/09, issued on December 28, 2009 for 2 WTGs;
- Subproject Kozielice 2: environmental decision No. GN.7627-4/W/T/09, issued on December 15, 2009;
- Subproject Bielice, environmental decision No. OCHS/AG/7644/06/10, issued on April 9, 2013;
- Subproject Widuchowa, environmental decision No. GNG:7624/2/2010-2014, issued on September 9, 2014.

Moreover, on March 15<sup>th</sup>, 2011 the Banie Commune Head moved the environmental decision No. GK-7627/2/2008 of August 18, 2009 on Wiatromill sp. z o.o. in Gdańsk (decision No. GK-7627/2A/08/2011).

On August 5<sup>th</sup>, 2013 the Banie Commune Head issued a statement No. GK-7627/2B/08/2013 and extended the expiration date of the environmental decision for the Banie 1A, Banie 1B and Banie 2 subprojects.

Additionally, on November 21<sup>st</sup>, 2013 the Head of Kozielice Commune issued three resolutions No. BI.6220.6.1/EW/RK/2013 for Kozielice 1, No. BI.6220.7.1/EW/R/2013 for Kozielice Rokity and No. BI.6220.5.1/EW/T/2013 for Kozielice 2 subproject. The resolutions state that the development of the subprojects is conducted in phases and that the conditions imposed by the environmental decisions for Kozielice 1, Kozielice Rokity and Kozielice 2 subprojects remain in force.

All of the subprojects have been developed in the communes, where appropriate Commune Development Master Plans and Local Zoning Plans (LZP) allowed development of the wind farms infrastructure. Review of the WTGs location versus constraints of the LZPs and environmental decision indicated that all WTGs are located in appropriate distance to respective roads and other terrain elements.

The competent Authorities had issued the following building permits for the Banie Project:

#### ***Banie 1A Subproject***

- Decision No. 115/2013 (AB.6740.1.1.2013.LW) dated March 14<sup>th</sup>, 2013 issued by the Head of Gryfiński County for construction of 13 WTGs;
- Decision No. 2/2015 (AB.6740.1.20.2014.LW) dated January 2<sup>nd</sup>, 2015, which changes the decision No. 115/2013 (AB.6740.1.1.2013.LW) dated March 14<sup>th</sup>, 2013 (different WTGs' type and capacity and additional land plots included);

#### ***Banie 1B Subproject***

- Decision No. 639/2013 (AB.6740.1.41.2013.LW) dated December 9<sup>th</sup>, 2013 issued by the Head of Gryfiński County for construction of 2 WTGs;

- Decision No. 584/2014 (AB.6740.1.21.2014.LW) dated November 21<sup>st</sup>, 2014, which changes the decision No. 639/2013 (AB.6740.1.41.2013.LW) dated December 9<sup>th</sup>, 2013 (different WTGs' type and capacity);

### **Banie 2 Subproject**

- Decision No. 247/2013 (AB.6740.1.11.2013.LW) dated May 27<sup>th</sup>, 2013 issued by the Head of Gryfiński County for construction of 24 WTGs;
- Decision No. 583/2014 (AB.6740.1.19.2014.LW) dated November 21<sup>st</sup>, 2014, which changes the decision No. 247/2013 (AB.6740.1.11.2013.LW) dated May 27<sup>th</sup>, 2013 (different WTGs' type and capacity);

### **Kozielice 1 and Kozielice 2 subproject**

- Decision No. 70/2014 (AB.6740.43.5.2014.RK) dated April 15<sup>th</sup>, 2014 issued by the Head of Pyrzycki County for construction of 43 WTGs along with power transmission cable lines and fibers' networks;
- Decision No. 215/2014 (AB.6740.228.9.2014.RK) dated November 28<sup>th</sup>, 2014, which changes the decision No. 70/2014 (AB.6740.43.5.2014.RK) dated April 15<sup>th</sup>, 2014 (different WTGs' type and capacity);

### **Bielice subproject**

- Decision No. 188/2015 (AB.6740.2.33.2015.MP) dated August 20<sup>th</sup>, 2015 issued by the Head of Pyrzycki County for construction of 9 WTGs along with access roads, maneuvering yards, power transmission cable lines and fibers' networks (decision is not binding).

All these building permits were issued taking into account the constraints of the valid environmental decisions. Further, following the national Building Law, the building permits were not binding for the period of 14 days of issue to allow protests by interested parties. No protests were raised.

Moreover, a building permit application for Widuchowa is planned to be submitted by the end of February 2016..

## What is the current condition of the existing environment?

The planned WTGs of the Banie project are not situated within borders of any nature or landscape protected areas. The nearest Special Protection Area, "Dolina Dolnej Odry", established pursuant to Birds Directive is located over 3 km from the WTGs of the Widuchowa subproject. Other birds' protection areas are located over 5 km from the Banie and Kozielice subprojects (i.e. from Banie 1A, Banie 1B, Banie 2, Kozielice 1 and Kozielice 2).

On the basis of the Habitats Directive (i.e. directive on the conservation of wild fauna and flora as well as conservation of natural habitats which aims at protection of approximately 220 habitats and approximately 1000 species, which are listed in the respective annexes (*source: <http://geoserwis.gdos.gov.pl/mapy/>)), the following areas, located nearby the planned wind farm complexes, have been identified:*

- Las Baniewicki (PLH320064) – 3 types of habitats belonging to the Annex I of the Habitats Directive (Annex I: 'Types of natural habitats important from the community point of view

for which designation of special protection areas is required') have been identified within that area (codes 3150, 99160 and 91E0);

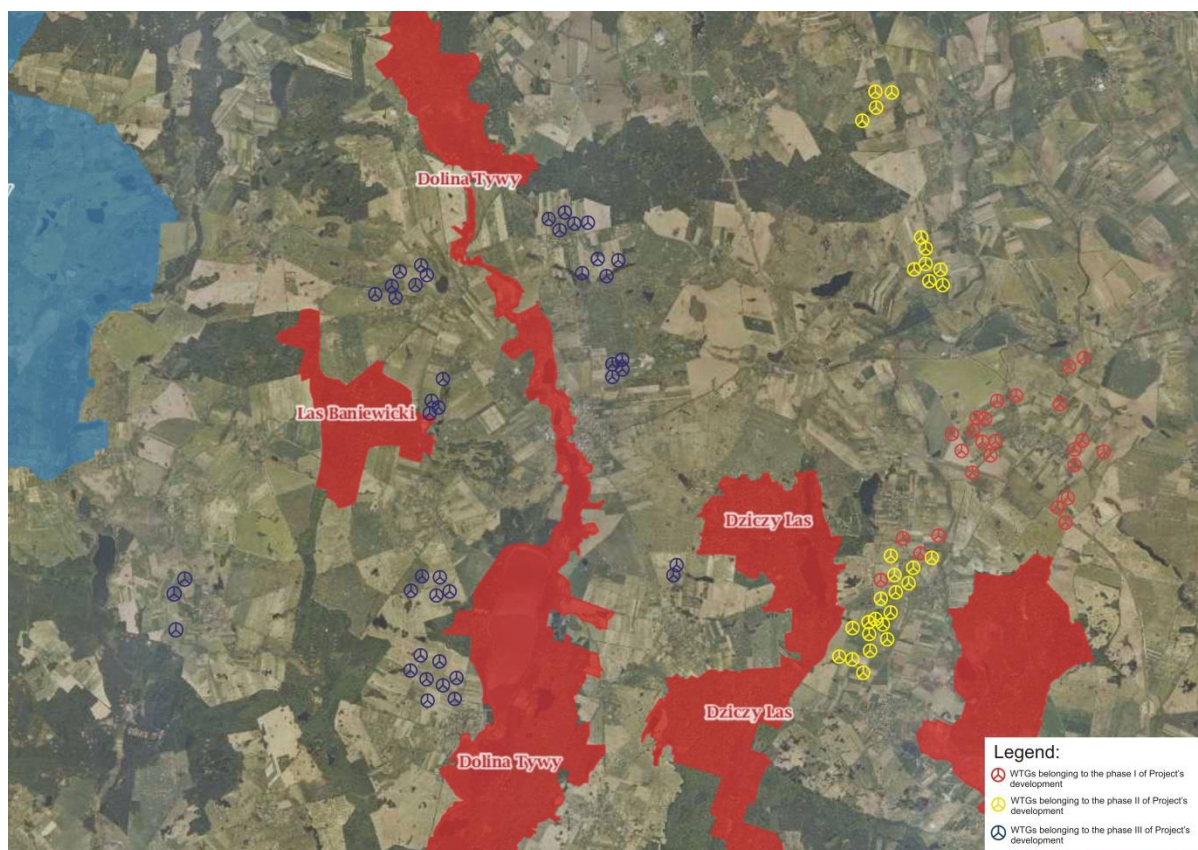
- Dolina Tywy - (PLH320050) – 16 types of habitats belonging to the Annex I of the Habitats Directive (codes 3140, 3150, 3260, 6120, 6210, 6410, 6430, 7140, 7210, 9110, 9130, 9160, 9170, 9190, 91E0 and 91F0) as well as 2 species listed under Art. 4 of Directive 2009/147/WE and belonging to the Annex II of the Habitats Directive (Annex II: 'Types of fauna and flora species natural habitats important from the community point of view for which designation of special protection areas is required') have been identified within that area (*Cobitis taenia* and *Rhodeus sericeus amarus*);
- Dżicy Las (PLH320060) - 9 types of habitats belonging to the Annex I of Habitats Directive (codes 3150, 6150, 7140, 9110, 9130, 9160, 91D0, and 91F0) as well as 5 species listed under Art. 4 of Directive 2009/147/WE and belonging to the Annex II of Habitats have been identified within that area (*Cerambyx cerdo*, *Chlidonias niger*, *Circus pygarrus*, *Grus grus* and *Osmoderma eremita*);
- Pojezierze Myśliborskie (PLH320060) - 15 types of habitats belonging to the Annex I of the Habitats Directive (codes 3140, 3150, 3160, 6120, 6210, 6410, 6150, 7140, 7210, 7230, 9130, 9130, 9160, 91D0, 91E0 and 91F0) as well as 5 species listed under Art. 4 of Directive 2009/147/WE and belonging to the Annex II of Habitats Directive have been identified within that area (*Bombina bombina*, *Cobitis taenia*, *Cottus gobio*, *Liparis loeselli* and *Unio crassus*)

The above-mentioned nature protection areas, which are situated in close proximity to Banie 1A, Banie 1B, Banie 2 and Kozielice 2 subprojects include also Special Area of Conservation (SAC), and are located in the distances presented below:

- Las Baniewicki, Natura 2000 area PLH320064, located approximately 300 m to the west from the nearest WTG of Banie 2 subproject;
- Dolina Tywy, Natura 2000 area PLH320050, located approximately 600-700 m to the east from the nearest WTGs of Banie 2 subproject, approximately 700 m to the west of Banie 1A subproject and approximately 1.7 km from the WTGs of Banie 1B subproject;
- Dżicy Las, Natura 2000 area PLH320060, located approximately 500 m to the west from the nearest WTGs of Kozielice 2 subproject and approximately 600 m to the east from the nearest WTG of Banie 1B subproject;
- Pojezierze Myśliborskie, Natura 2000 area PLH320060, located approximately 1.3 to the east from the nearest WTGs of Kozielice 2 subproject and approximately 1.3 km to the south from the nearest WTG of Kozielice 1 subproject.

A map presenting locations of the WTGs versus locations of the nearest nature protection areas (habitat protection areas are marked with red, birds protection areas are marked with blue *source: <http://geoserwis.gdos.gov.pl/mapy/>*) is presented below. Yellow circles indicate location of the wind farms.

It should be noted here, that an operating wind farm is unlikely to generate direct adverse impact on nature habitats as long as the WTGs and their auxiliary infrastructure are not located in such habitats. None of the elements of the Project are located within an area occupied by a valuable nature habitat.



A potential impact on Natura 2000 sites of the Kozielice 2 subproject has been subject to an additional screening independently of the EIA reports as part of the EBRD's due diligence process. The screening indicated that the impact of the WTGs located in a distance of approximately 500 m from the nearest Natura 2000 site may occur during construction phase only, however, significant impact on the protected area is very unlikely and negligible. The independent review confirmed the findings of the original EIA and the approvals and permits given by the Competent Authority. In line with best practice and based on the review, the Company has committed to undertake additional mitigation measures as part of a precautionary principle, inclusive of an on-site monitoring during construction phase.

Based on the information presented above, the planned investment is not likely to generate a negative impact on the already existing Natura 2000 protected areas. Moreover, the Project is not likely to be, at all stages of its existence, a source of emissions or factors, which, in relation to the natural structures already under protection or planned to be protected, will cause a significant adverse impacts.

The pre-investment process conducted for the Project, except of the preparation of the EIA reports, included a several-day long series of ornithological observations grouped into monitoring campaigns.

The birds monitoring campaigns were conducted for each of the subprojects in the following periods of time:

- Three years long pre investment monitoring between 2009 and 2014 Banie 1A, Banie 1B and Banie 2 subprojects (the monitoring program is still ongoing);
- In 2009 and additional monitoring between years 2010 - 2013 for Widuchowa subproject;

- Between 2006 and 2007 for Kozielice, Rokity and Tetyń areas, i.e. Kozielice 1 and Kozielice 2 subprojects;
- Between September 2009 and September 2010 for Linie area and between September 2009 and November 2010 for Nowe Chrapowo area, both belonging to the Bielice subproject.

The monitoring programs of birds were conducted by ornithological experts based on the Polish Guidelines for assessment of wind farm impacts on birds (*Wytyczne w zakresie oceny oddziaływania elektrowni wiatrowych na ptaki*) of 2008, recommended by Polish Wind Energy Association. The programs included in total the following numbers of site observations:

- 42 observation periods in each year between 2009 – 2012 for Banie 1A, Banie 1B and Banie 2 subprojects;
- 47 observation periods for Kozielice subproject;
- 33 observation periods for Kozielice Rokity subproject (part of the Kozielice 2 subproject);
- 33 observation periods for Kozielice Tetyń subproject (part of the Kozielice 2 subproject);
- 35 observation periods in Linie area and 37 observation periods in Nowe Chrapowo area, both belonging to the Bielice subproject.

All completed throughout the whole year (nesting/spring, summer, autumn and winter observations). The birds monitoring was conducted also according to MPPL (monitoring of common nesting birds) standard.

The birds monitoring campaigns conducted within the areas of subprojects comprised of transect and point observations, which intensity depended on the part of the year. The following results of the annual birds monitoring were obtained:

#### 1. Banie 1A, Banie 1B and Banie 2 subprojects

Within the area of Banie 1A, Banie 1B, and Banie 2 subprojects and within a radius of 2 km around, the monitoring revealed a presence of 110 birds' species in 2009, 112 in 2010, 103 in 2011 and 107 birds' species in 2012.

Among them approximately 66 species were breeding species, 54 species were migrating ones during autumn season and 56 during spring season, moreover, 89 species were identified as breeding ones.

The following species listed in the Annex 1 of the Birds Directive were observed within the area covered by the monitoring campaign: White stork, Red kite, Western marsh harrier, Common crane, White-tailed eagle and Hen harrier.

#### 2. Widuchowa subproject

Within the area of Widuchowa subproject and within a radius of 2 km around the monitoring revealed a presence of 107 birds' species. Among them 95 species were under strict species protection, 4 species were under partial species protection and 8 species were under hunting protection. The subproject's area itself was used by approx. 50 birds' species, which included 25 breeding species,

14 feeding species and 11 migrating species. Moreover, the following species listed in the Annex 1 of the Birds Directive were observed within the area covered by the monitoring program: White stork, Red kite, Western marsh harrier, Common crane, Woodlark and Red-backed shrike.

### 3. Kozielice 1 subproject

Within the area of Kozielice 1 subproject and within the neighboring areas around (radius of 2 km) presence of 77 birds' species has been identified. Among them 15 birds' species were breeding species, at least 16 species were identified during autumn migrations and 22 species during spring migrations.

### 4. Kozielice Rokity subproject

Within the area of Kozielice Rokity subproject and within the 200 m radius around the subject area presence of 17 birds' breeding species has been identified, however none of the identified species is listed in the Annex 1 of the Birds Directive. In the distance between 200 m and 1000 m from the investment's area, presence of 72 birds has been identified. Moreover, Western marsh harrier, Common buzzard, Buzzard and hawk were observed on a regular basis during winter period, however in small groups.

### 5. Kozielice Tetyń subproject

Within the area of Kozielice Tetyń subproject and within its close neighborhood revealed presence of at least 100 birds' species, 66 of them appear on a regular basis, 36 species are present within the subproject's area itself. 3 species from the Annex 1 of the Birds Directive were identified as breeding species, however these were observed outside of the subproject's area.

### 6. Bielice subproject

Within the area of Bielice subproject and within its close neighborhood (approx. 1 km radius) revealed presence of at least 40 regular birds' species. In most cases the observed species were sparrows and common buzzards. The following species listed in the Annex 1 of the Birds Directive were observed relatively rare: White stork, Western marsh-harrier and Golden plover.

The general conclusions presented in the reports were that the wind farms will not generate extensive impact on birds, the overall likelihood of negative impact was assessed as low to medium.

The actual impact of the Project on birds will be established based on a post-construction monitoring program.

Moreover, for each of the subprojects, at least a year – long monitoring campaigns of bats were undertaken in the following periods of time:

- Between 2009 and 2012 for Banie 1A, Banie 1B and Banie 2 subprojects;
- Between 2009 and 2010 for Widuchowa subproject;
- Between 2006 and 2007 for Kozielice 1 subproject;
- Between 2008 and 2009 for Kozielice Rokity subproject;
- Between 2006 and 2007 for Kozielice 2 subproject;
- Between 2010 and 2011 for Bielice subproject.

The following species of bats, which are typical for the forests and fields of the whole Poland, were identified in the area of each subproject:

- Two species of bats were observed at the area of Banie 1A, Banie 1B and Banie 2 subprojects: Daubenton's bat and Serotine bat;
- Seven species of bats were observed at the area of Widuchowa subproject: Daubenton's bat, Common pipistrelle, Nathusius pipistrelle, Soprano pipistrelle, Serotine bat, Common noctule and Long-eared bat;
- Two species of bats were observed at the area of Kozielice 1 subproject: Daubenton's bat and Serotine bat;
- One species of bat was observed at the area of Kozielice Rokity subproject, which is Daubenton's bat;
- Three species of bats were observed at the area of Kozielice 2 subproject: Natterer's bat, Serotine bat, Pipistrelle;
- In case of Bielice subproject, three species of bats were observed in the vicinity of Nowe Chrapowo village: Serotine bat, Common pipistrelle and Pipistrelle as well as at least five species of bats were observed in the vicinity of Linie: Serotine bat, Daubenton's bat, Common pipistrelle, Pipistrelle Pipistrellus and Common noctule.

According to the bats monitoring reports, the areas of the Project are characterized by low chiropterological values; it is unlikely that especially valuable bat species listed in Appendix II of the Habitats Directive will find there favorable conditions. Moreover, the 3 years long post construction monitoring should be implemented in case of Banie 1A, Banie 1B and Banie 2 subprojects and 5 years long post construction monitoring in case of Widuchowa and Bielice subprojects. Based on the information presented above it can be assumed that the planned Project should not significantly affect bats species and their living conditions in the surrounding area.

## Social impacts

Development of the Project has not required and will not require any displacement of the people or business - no physical or economical resettlement has taken or will need to take place. The land for the Project purposes was achieved based on lease contracts signed with the private land owners, based on individual 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, the local commune will receive in line with the building code approx. 20 000 EUR per 1 WTG/year. This is irrespective of operation;
- increase of the annual income of land leasers;
- improvement of the local roads.

The negative impact is related to decrease of the land area used for agricultural purposes, however, this is compensated by the land lease fees and the land excluded from agricultural purposes is a tiny percentage of the total agricultural area of the respective communes

The Company, in line with best practice, has implemented measures to compensate any damages that had occurred as a result of the construction works. 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. Agreed compensation will be paid according to Polish legislative requirements.

## What will be the impacts of the wind farm?

The main impacts of the projects associated with the Wind Farm development relate to earth 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 (in case when groundwater draining is required during the construction), increased noise and vibration. The Company has implemented the best practice to limit the nuisance of the construction works.

Completed investigations and public consultations conducted primarily as part of the environmental 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.

### Birds and bats

It is acknowledged that wind farm can have an impact on birds and bats.

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 farm subprojects. In a view of the pre-investments monitoring results the identified avifauna was classified as typical for this part of the country. The areas included in this project have not been identified as valuable or of a special interest concerning wildlife and nature protection needs.

Collisions of birds with new objects (i.e. 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 if the wind farms are not on a migration routes and are not an important breeding ground for protected species. Because the wind farms of the Project were found, on the background of the monitoring, as not located on the migration routes and being not attractive as breeding areas it can be expected that collisions may only occur incidentally and will not have a significant effect on the populations.

The Company has undertaken monitoring using best practice, such as the Polish Guidelines on assessing wind farms.

According to the results of the monitoring campaigns undertaken for the subprojects, which are parts of currently being developed Phase I, i.e. for Kozielice 1 and Kozielice 2, one and a half year observations, nature inventories and valorizations of that area indicate that this terrain is characterized by the presence of insignificant natural values. Taking into account the results of observations conducted in the commune, it can be assumed that the location of Phase I of Project Banie is not likely to generate a significant adverse impact on fauna present in the area of Kozielice commune and Pырzycki County.



In case of Banie 1A, Banie 1B and Banie 2 subprojects, the monitoring campaigns undertaken to date shown that the planned subprojects are unlikely to have a negative impact on avifauna and chiroptero fauna (birds and bats). During the ongoing monitoring a white-tailed eagle has been observed, the risk of potential collision have been judged as low, however mitigation actions will be taken to reduce the risks of collision. As part of general requirements a post construction monitoring assessment will be undertaken over 5 years following the commissioning of the turbine, and an active turbine management plan consisting of switching off any turbines off if a risk for collision is observed. After the 5 years monitoring an assessment will be made whether additional monitoring is required.

Based on the pre-construction monitoring campaigns undertaken within the area of Bielice subproject, i.e. area of Nowe Chrapowo and Linie villages as well as within the area of Widuchowa subproject, it can be concluded that the Project will not generate extensive impact on birds, It should be noted, that observations during monitoring program confirmed most of the flights to occur out above the maximum extent of wind turbines blades, which reduces the overall risk of birds collisions and casualties.

A monitoring program has included the assessment of bats which has been undertaken in accordance with Polish guidelines, which are based on EUROBATS (dealing with impact of wind farms on bats) recommendations. Following the monitoring reports, bats concentrate mainly along linear structures, such as paths of trees or road sizes. The internal space of the sites was assessed as of low attractiveness for bats. Due to the need of bats conservation location of one WTG (WTG No.4) belonging to the Bielice subproject has been changed. The post-construction bats monitoring campaigns (3 and 5 years long) have been required in case of Banie 1A, 1B and 2, Bielice and Widuchowa subprojects.

Taking into account the characteristics of the investment, it has been concluded that the Project will have no negative impact on the species and habitats protected under 'Natura 2000' European network. The competent authorities did not raise any issues related to potential for the Project to have such negative impact.

## Noise generation

Wind turbines can have a negative impact on local noise. The assessment undertaken has confirmed that the Project will not have an impact on any noise sensitive areas.

Due to the predicted impact on the acoustic climate of the neighboring areas the developer has completed noise level analyses. The purpose of the analysis 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 single family houses/homestead housing - amounting to respectively to 50/55 dB for daytime and 40/45 dB for nighttime.

As shown on the maps presented below, the nearest residential areas are located in the following distances from the subprojects:

- the WTGs belonging to the Banie 1A, Banie 1B and Banie 2 subprojects are located more than 500 m from the nearest housing areas;
- the WTGs belonging to the Kozielice 1 subproject are located more than 500 m from the nearest housing areas;
- the WTGs belonging to the Kozielice 2 subproject are located approx. 0.5 km – 1.5 km from the nearest housing areas in the villages of Mielno Pyrzyckie, Trzebórz and Tetyń;

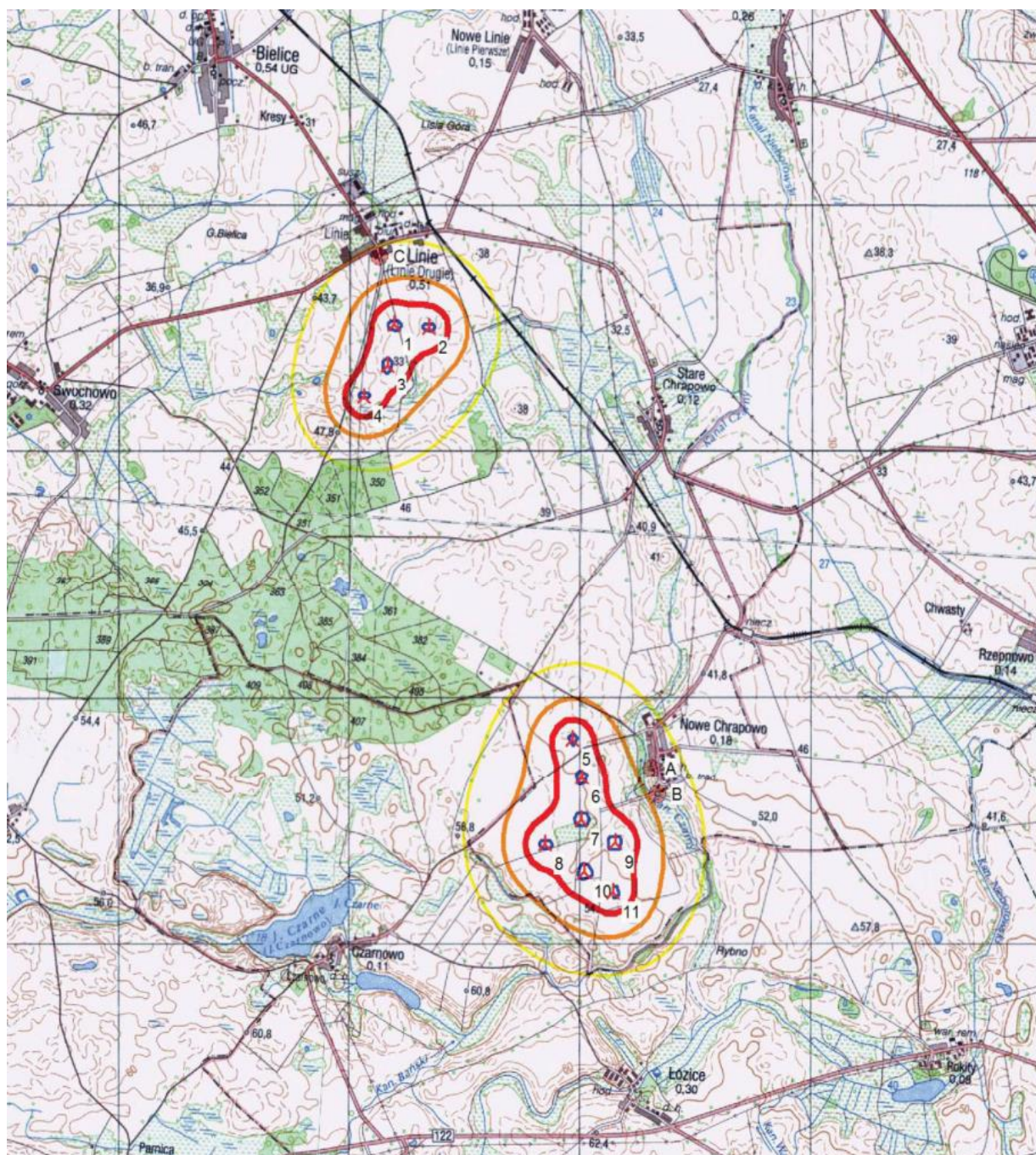
- the WTGs belonging to the Bielice subproject are located more than 500 m from the nearest housing areas;
- the WTGs belonging to the Widuchowa subproject are located more than 500 m from the nearest housing areas.

The noise analyses were conducted with use of certified models and based on the planned technical solutions of the wind farm subprojects. The values of noise emissions obtained showed that the noise levels will not exceed the noise limits specified for homestead housing as well as for single family houses for daytime and nighttime in the area where the housing is situated. To achieve this, 9 WTGs belonging to the Banie 1A, Banie 1B and Banie 2, located in Sosnowo area, will be installed with the acoustic power reduced to 103 dB, and a few more will possibly need to operate occasionally with reduced acoustic power at nights. However in case of the remaining WTGs the reduction of acoustic power will be unlikely. At all wind farms post-construction noise measurements will be undertaken to assess the actual impact on the acoustic climate. Should the noise standards are breached, the Company will implement measures to reduce the noise impact to permissible standards. Detailed description of the post construction noise measurements is presented in the sections below.

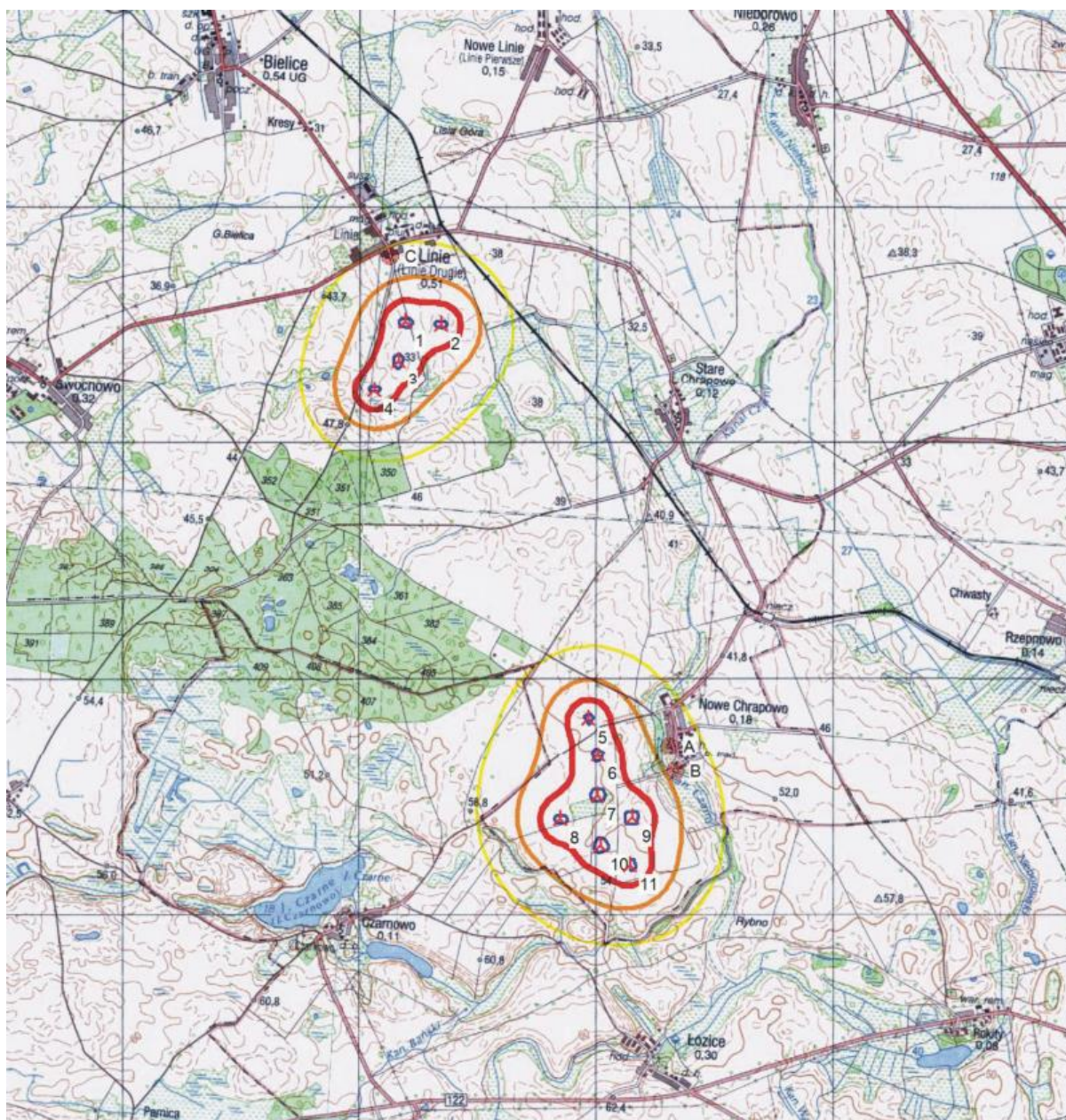
Based on the noise distribution analysis conducted for all of the subprojects belonging to the Project, if the reduction requirements are implemented and fulfilled, the potential risk of negative impact on acoustic environment will be rather low. The values of noise emissions obtained, showed that the noise levels will not exceed the amounts allowed for the homestead housing for daytime and nighttime in the area where the housing is situated - amounting to 50/55 dB for daytime and 40/45 dB for nighttime

Additional noise calculations were conducted in September 2015. The study analyzed cumulative impact generated by the already existing 2 WTGs (located approximately 340 m from the planned WTG No.9 (EWB 9) belonging to the Bielice subproject) and the planned WTGs belonging to the Bielice subproject. The results did not reveal exceedances of the permissible noise levels (55 dB or 50 dB and 45 dB or 40 dB) for daytime and nighttime respectively, therefore it can be concluded that the risk of negative cumulative impact on acoustic environment is rather low.

Exemplary map illustrating acoustic climate at nighttime and daytime for Bielice subproject are presented below (*source: Environmental Impact Assessments prepared for Bielice subproject by investments by Domrel company*).



*Bielice wind farm, acoustic climate at nighttime (yellow line – 35 dB, orange line – 40 dB, red line – 45 dB, dark blue line – 50 dB)*



*Bielice wind farm, acoustic climate at daytime (yellow line – 35 dB, orange line – 40 dB, red line – 45 dB, dark blue line – 50 dB)*

## Visual impacts

The development of the Project (encompassing 96 wind turbines with the maximal level above the ground outlined by the blade of approximately 180 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 form architectonic dominant objects in the environment. Nevertheless, it should be stressed that the evaluation of the influence of the wind farm on the landscape is difficult and depends on the individual approach. It may be assumed that the projects will gain supporters and critics taking into account the influence on landscape.

Below, there are pictures that present the rural landscape of the Project's region.



It must be pointed that the influence on the landscape is not permanent, given the expected “lifetime of the product” i.e. 25 years. After this period the disassembly of the wind farms is planned, reconstruction is also possible.

The development of the investment 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.

Polish law does not regulate in any way the issues related to the shadow flicker effect. Therefore, any recommendations or restrictions associated with it cannot be applied to the investor. However, in many European countries (eg. Great Britain, France, the Netherlands) the German guidelines which bases on a document *Hinweise zur Ermittlung Und Beurteilung der optischen Immissionen von Windenergieanlagen (WEA-Schattenwurf-Hinweise)* are used to assess this effect. According to this document, the ratio of the shading duration should not exceed 30 hours per calendar year and should be a maximum of 30 minutes per day.

A shadow flicker analyses for all of the subprojects have been done. The calculations show that for the entire Project, inclusive a cumulative effect for the Bielice part, there are no exceedances of the shading levels, which are treated as safe for the real conditions (taking into account data from long-term observations derived from meteorological stations). In none of the points designated for measurements, the meteorological probable length of shading exceeds 30 hours per year and 30 minutes per day. Therefore the planned investment is not likely to be a source of impacts in terms of the shadow flicker.

## Electric and magnetic fields

The main sources of electromagnetic fields directly linked to the Project, is a generator of the WTG and transformer, which are placed inside the nacelle on top of the tower (at a height of approx. 100 m). Due to the location o at such high altitudes, the level of the electromagnetic field, generated by the elements of power at the ground level (at a height of approximately 1.8 m) can be generally omitted.

The second potential sources of electromagnetic field, associated with the Project, are the power transmission lines. In accordance with the applicable standards, all medium voltage 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 threat the environment.

Another potential source of the electromagnetic field is the construction of transformer stations (GPO). The investment will involve the implementation underground cable connections. In the case of modern transformer stations, the radiation of the electric and magnetic fields does not occur in practice. Based on conducted analyses for the "GPO Nowe Czarnowo", the intensity of the fields will be significantly lower than the permissible value (below 10 A/m versus the permissible value of 60 A/m).

## Measures Aiming at Limitation of the Impact

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. 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 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 of 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 has already chosen a reputable manufacturer of WTGs, the Vestas Company, which equipment was successfully developed at many locations in Poland and many European countries.

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, adjustments 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 Ministry of Environment;
- to be located out of birds migration routes, birds concentrations, feeding or nesting areas;
- to be located out of valuable plants habitats, wetlands or forest areas
- to be located out of nature and landscape protected areas
- not to disturb the continuity of ecological corridors.

## Post construction monitoring

### Noise

Environmental decisions issued by the competent Authorities for Banie (1A, 1b and 2), Widuchowa and Bielice subproject oblige the investor to conduct the post construction noise level surveys for the wind farms. There is no such requirement for Kozielice subprojects, however recommendations for a completion of post-construction noise measurements are presented in the respective EIA reports for Kozielice subprojects and in the environmental action plans approved by the Project lenders.

The noise measurements have been recommended to be completed after the project start-up. As the Project Banie is being developed in phases, it is recommended to conduct noise measurements after completion of each phase, i.e. the first noise measurements should be undertaken when the 25 WTGs belonging to the Phase I of Project's development becomes operational. 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) and/or ultimately also temporal limitation in operation of the subject WTGs).

Moreover, if any other wind farms will be developed in the close vicinity to the WTGs belonging to the Phase I of the Project, then the investors/developers of the newly constructed wind farms will be responsible for undertaking noise distribution measurements and cumulative impacts calculations as well as for ensuring that the permissible noise levels are not exceeded.

### Birds and Bats monitoring

Birds and bats monitoring has been required by the competent Authorities for Banie, Widuchowa and Bielice subprojects. No monitoring is required for Kozielice subprojects, however the monitoring was proposed in the respective EIA reports as well as the environmental action plan approved by the lenders for Kozielice subprojects and the company intends to undertake such as well.

To assess the impact on birds and bats the investor will undertake additional post-construction birds and bats monitoring. Due to the fact that the Project is being developed in phases, after completion of each phase (and when the WTGs belonging to the completed phase become operational) a

separate birds and bats monitoring campaign must be undertaken. A monitoring campaign will be conducted in line with the requirements set in the environmental decision, which were issued by the competent Authorities for each subproject.

Generally the bird and bat monitoring is to be conducted over a 3 to 5 years following the project start-up, however the lender will require the minimum 3 years of post-construction monitoring, with the publishing of an annual summary of the data, and if any issues are identified the monitoring will be continued for additional 2 years.

During the monitoring program an active turbine management plan will be in place, which would allow for the switching off of any turbines if an impact is identified. All near misses and incidents will be recorded. Based on the monitoring program a more detailed management plan will be developed for the wind farm

The detailed scope of monitoring should be agreed with the Regional Environmental Authorities and it should include, among others, the following issues:

- evaluation of the wind farm operation impact on life conditions of birds and bats living at the investment area,
- investigation of birds and bats colliding with the turbines to discover any dead or hurt birds and bats in the vicinity of the wind turbines,
- evaluation on methods used in order to minimize the probability of birds and bats collisions with the turbines.

The results of the monitoring campaigns should be presented in written and electronic forms to the Regional Environmental Directorate in Szczecin and to the Heads of the respective communes.

It should be noted that the ongoing monitoring that is being undertaken will be used to design and optimize the management of the wind farm during the development and commissioning of Phase II and Phase III of the Project.

## 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 Wind farm should be addressed to:

**Katarzyna Pysiak, Site Administration Manager**

**Gryf Sp. z o.o.**

ul. Aleje Jerozolimskie 56c

00-803 Warszawa, Polska

Mobile: +48 728 856 535

biuroadmin@energix-group.com

Or

**Hillel Barak, Operation Manager**

**Wiatromill Sp. Z o. o.**

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