Non-Technical Summary

ZIELONA/DĘBSK WIND FARM PROJECT, POLAND

Polenergia

Introduction

The POLENERGIA consortium (further referred to as the Company or developer), one of the leading national wind farm operators is developing two wind farm investments (further referred to as Zielona/Dębsk Project) Zielona wind farm and Dębsk wind farm in central Poland, mazowieckie voivodeship (further referred to as Zielona WF and Dębsk WF respectively). The Zielona/Dębsk Project will comprise, at a maximum, of 57 wind turbine generators (WTGs). At the beginning The Zielona WF was developed by GRUPA PEP – Farma Wiatrowa 2 Sp. z.o.o., while Dębsk WF by GRUPA PEP – Farma Wiatrowa 2 Sp. z.o.o., however, after merging, GRUPA PEP – Farma Wiatrowa 3 Sp. z.o.o. is responsible for development of the both parts of Zielona/Dębsk Project – ZIELONA WF and Dębsk WF. Zielona WF will be located in the communes of Kuczbork Osada (larger part) and Żuromin (smaller part) at the land belonging to villages of Gosciszka, Kuczbork, Olszewko and Zielona in Żuromin commune and Kliczewo Małe, Kosewo, Sadowo and Cierpigorz in Kuczbork Osada commune. The Dębsk WF will be entirely located in the Żuromin commune at the land belonging to Chamsk, Dębsk, Franciszkowo, Kliczewo Duże, Olszewo and Wólka Kliczewska.

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 developments to enable meaningful public and stakeholders engagement process.

Attached to this document are non-technical resumes which are integral part of the Environmental Impact Assessment reports which have been submitted and approved by the Polish Competent Authorities. . Relevant Environmental Impact Assessment reports were completed for the projects by competent companiesa. The reports have been approved in accordance to Polish environmental legislation, taking into consideration best international practices and EU environmental laws.

General presentation

The POLENERGIA 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.

ZIELONA WF

POLENERGIA (the developer) intends to construct Zielona WF, which is planned to be located at the area of Żuromin county, Żuromin and Kuczbork-Osada communes.

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

- Wind turbines generators (WTGs) and relevant technical infrastructure;

- Internal roads and maneuvering areas;
- Assembly and storage yards.

Details regarding structure of the Zielona WF are given below:

Zielona WF is under development. Its total capacity will be 87 MW maximum, and it will include 25 WTGs, along with medium-voltage underground power transmission lines, a transformer station, telecommunication lines connecting the WTGs with the transformer station, and internal roads with maneuvering yards. Initially 35 WTGs were planned; however it was finally decided to build 32 WTGs.

The development of the wind farm was started by GRUPA PEP – Farma Wiatrowa 2 Sp. z.o.o., but currently, after merging, it is being developed by GRUPA PEP – Farma Wiatrowa 3 Sp. z.o.o.

Maximum capacity of an individual wind turbine will be 3 MW with a maximum hub height of the turbines reaching 176 m (depending on the chosen variant and wind turbine type). Acoustic capacity of an individual turbine will not exceed 108.4 dB. The overall area of the project is 8.35 ha.

DĘBSK WF

POLENERGIA (the developer) intends to construct Dębsk WF, which is to be located at the area of Żuromin county, Żuromin 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 Dębsk WF are given below:

Dębsk WF is under development. Its total capacity will be 99 MW maximum, and it will include 32 WTGs, along with medium-voltage underground power transmission lines, a transformer station, telecommunication lines connecting the WTGs with the transformer station, and internal roads with maneuvering yards. Initially 33 WTGs were planned, however due to the potential impact of WTG No.26 on bats and according to the recommendation included in the bats monitoring report for DĘBSK WF, its construction was cancelled.

The wind farm will be developed by GRUPA PEP – Farma Wiatrowa 3 Sp. z.o.o.

Maximum capacity of an individual wind turbine will be 3 MW with a maximum hub height of the turbines reaching 176 m (depending on the chosen variant and wind turbine type). Acoustic capacity of an individual turbine will not exceed 106.5 dB. The overall area of the project is 9.15 ha.

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

For both parts of Zielona/Dębsk Project, ZIELONA WF and Dębsk WF, the investor has still not decided on the wind turbine generator, which will be installed. It is know that each of the turbines can generate up to 3 MW of power. Several variants of the WTG model considered, comprising a total of 57 wind turbines for the whole Zielona/Dębsk Project.

ZIELONA WF Location

Both parts of the Zielona/Dębsk Project are situated within Żuromin county, which is located in north-western portion of mazowieckie voivodeship. From the geomorphologic point of view, Żuromin lies within the Rownina Raciaska (Raciska Plain), a mezoregion in north-central Poland, belonging in the Northmazovian Lowland. Zielona WF will be located in two communes, 14 WTGs will be present in Kuczbork-Osada commune, while the rest, 11 WTGs, will be situated in Żuromin commune. The project location is in compliance with two Commune Development Master Plans and two Local Zoning Plans for Żuromin and Kuczbork-Osada communes. Currently the area is used for agricultural purposes and it is surrounded with arable fields, forested areas or meadows. In the vicinity there are also developed areas, including mainly local villages' buildings and structures.

The areas of the investment are 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 areas have not been found to be important for birds (attractive feeding grounds, routes of regular migration passages, routes of regular passages to feeding grounds or roosting places).

DĘBSK WF Location

Both parts of the Zielona/Dębsk Project are situated within Żuromin county, which is located in north-western portion of mazowieckie voivodeship. From the geomorphologic point of view, Żuromin lies within the Rownina Raciaska (Raciska Plain), a mezoregion in north-central Poland, belonging in the Northmazovian Lowland. Dębsk WF will be located in Żuromin commune. The project location is in compliance with the Commune Development Master Plan and Local Zoning Plan for Żuromin commune. Currently the area is used for agricultural purposes and it is surrounded with arable fields, forested areas or meadows. In the vicinity there are also developed areas, including mainly local villages' buildings and structures.

The areas of the investment are 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 areas have not been found to be important for birds (attractive feeding grounds, routes of regular migration passages, routes of regular passages to feeding grounds or roosting places).

Both sites are located within Narew and Wkra Rivers basin.

None of the sites are located within Natura 2000 areas, or other strictly protected area.

Below you will find maps with the layout comprising locations of WTGs belonging to both parts of the Zielona/Dębsk Project – Zielona WF and Dębsk WF.

ZIELONA WF site location map

DĘBSK WF site location map

Rationale for this Project

In line with European Climate Change Program, many European countries, including Poland, have adopted national programmers 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. Currently, the UN are attempting to finales a legally binding global climate treaty to succeed the Kyoto Protocol in 2013.

Poland, currently is finalizing formal approval of its energetic policy until 2030 'Polityka energetyczna Polski do 2030 roku'. Based on this draft document Poland plans to increase the fraction 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. Conventional energy sources, mainly based on various types of coal incineration, when producing energy generate emissions of greenhouse gases, SO2, dust and others.

According to the information obtained from the developer, the expected annual energy production from Zielona/Dębsk Project will amount approximately 340,200 MWh (50% probability) or 320,700 MWh (75% probability). Therefore the environmental benefit of the project will be to reduce greenhouse gases emission in an amount of 217,047.6 tons per year (50% probability) or 204,606.6 tons per year (75% probability) (calculated based on an emission factor, representative for projects supplying additional electricity to the grid, as of 0.638 tCO2/MWh, produced for Poland in 2012).

Apart from saving the greenhouse gases emission, both parts of the Zielona/Dębsk Project – Zielona WF and Dębsk WF will also result with significant 'avoidance' of post – combustion emissions. As an example, the equivalent production of electricity by the largest Polish hard-coal power plant in Kozienice would result with the following emissions (estimations based on Elektrownia Kozienice emission factors for 2011). The estimated emissions related to the Zielona/Dębsk Project are given below:

Zielona/Dębsk Project:

- PM: approx. 29 tons/year;
- SO_2: approx. 880 tons/year;
- NOx: approx. 573 tons/year

The emissions are calculated based on typical emission factors for a regular coal fired power plant.

Exploitation of the subject wind farms is therefore a measure to avoid the emissions to the atmosphere of the comparable amounts of pollutants. Future activation of the both wind farm projects 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 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 significantly impact the environment (group I projects) or may be performed, upon authorities discretion for particular ones which can potentially impact the environment (group II projects), or may impact an area of 'Natura 2000' protected area. An EIA is carried out, among others, to obtain a decision on Environmental Conditions (environmental decision) which is obligatory for a realization of an individual project.

In the administrative procedure for the Zielona WF and Dębsk WF, the Authorities, including Sanitary Inspectorate (Polish abbrev. SANEPID) and Regional Directorate of Environment Protection, considered EIA reports for the planned wind farms to be necessary. Such EIA reportswere prepared in 2010 by the Proeko company.

Information on the planned investment together with 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 both Zielona/Dębsk Projects were 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 communes notice boards as well as articles printed in the local press, including:

- 'Kurier Żurominski' – a weekly magazine popular in the area;
- 'Tygodnik Ciechanowski'.

Following preparation of the EIA reports the investor has been granted with the relevant environmental decision for Zielona WF:

- The decision on environmental conditions Zielona WF no. GKB 7624-6/09/10/11, issued on January 4, 2011 by the Head of Kuczbork-Osada commune.

Following preparation of the EIA reports the investor has been granted with relevant environmental decisions for Dębsk WF:

- 1 Ustawa o udostępnianiu informacji o środowisku i jego ochronie, udziale społeczeńswtwa w ochronie środowiska oraz o ocenach oddziaływania na środowisko, JoL of 2008 No. 199. Item 1227 with further ammendments

- The environmental decision for Dębsk WF no. IBGKiOŚ.7624-48/09/10, issued on January 7, 2011 by the Żuromin Commune and City Head.

The decisions are attached.

The key environmental conditions for both parts of the Zielona/Dębsk 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;
- 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.

Both parts of the Zielona/Dębsk Project, Zielona WF and Dębsk WF, are at the initial stage of the projects development and all the turbines are in possession of relevant environmental decisions.

As part of the pre-development procedure, apart from the required public consultations including EIA disclosure, the developer organized additional meetings for any party interested in the project development. During the public consultation, stakeholders were informed on potential impacts associated with the investment, in particular impacts on landscape, acoustic environment, shadow flicker phenomena and infrasound. There were no complaints or protests against the planned investments.

What is the current condition of the existing environment?

The planned Zielona WF and Dębsk WF are not situated within borders of any nature and landscape protected areas.

ZIELONA WF

The nearest natural protected area is Zieluńsko-Rzęgnowski Obszar Chronionego Krajobrazu, located in a distance of 250 m and various natural monuments – 2 trees in Kuczbork village and 4 trees in Zielona village. 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:

- ‘Baranie Góry’, natural reserve, Natura 2000 area PLH140002, located approximately 5.5 km north-east;
- ‘Dolina Mławki’, natural reserve, located approximately 8.4 km east;
- ‘Olszyny Rumockie’, natural reserve, Natura 2000 area PLH140010, located approximately 12.4 km north-east;
- ‘Gołuska Kępa’, natural reserve, located approximately 13.3 km south;
- ‘Górzeńsko-Lidzbarski Landscape Park’, located approximately 12.5 km north-west;
- ‘Międzyrzecze Skrwy i Wkry’ landscape area, located approximately 6.3 km west;
- ‘Nadwkrzański’ landscape area, located approximately 11.6 km south;
- Birds protection area Natura 2000, ‘Dolina Wkry i Mławki’ PLB140008, located approximately 6.3 km west;
- ‘Ostoja Lidzbarska’ Natura 2000 area PLH280012, located approximately 8.5 km north.

As a part of the pre-investment process, , severalday long series of ornithological observations were conducted for the project to identify key risks

Additional and more detailed, ornithological monitoring was conducted between January 2009 and December 2009 at the Zielona WF area, while bats monitoring was performed between January 2009 and November 2009. 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 Environmental Agency).

At the area of Zielona WF wind farm commune and within 2 km outside the farm, 121 bird species were identified, including 18 species listed in the so-called Birds Directive, and including 103 protected ones and 7 partly protected. These included White stork (*Ciconia ciconia*), Mute swan (*Cygnus olor),* or the Great cormorant (*Phalacrocorax carbo*). According to the EIA3 the subject area is of average significance from the ornithological point of view and the wind farm development should not affect local avifauna. This opinion was expressed also by independent ornithologist, Mr. Krzysztof Kajzer, MSc., and then was confirmed by the Competent Authorities.

There were also bats observations within the area of Zielona WF, conducted between January 2009 and November 2009. This monitoring was undertaken in accordance to the national guidelines[4], compliant with these issued by EUROBATSDuring these observations, bats belonging to 5 species, depending on the season, were identified. Bats were identified mainly along local roads, particularly between Zielona and Kuczbork villages. Taking into account the status of protection, all these are included in a group with low risk of quantity change and therefore with no needs of undertaking significant conservations measures.

DĘBSK WF

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

3 „Raport o oddziaływaniu na środowisko farmy wiatrowej >Żuromin FW2< w gminach Kuczbork-Osada i Żuromin (pow. żuromiński, woj. mazowieckie)”, in Polish, Proeko, August 2010

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

The nearest natural protected areas include various natural monuments – 6 trees in Chamsk village, in a distance of approximately 800 m. These monuments will not be impacted by the wind farm, and the wind farm is not located within any Natura 2000 area.

Other protected areas include the following:

- 'Baranie Góry', natural reserve, Natura 2000 area PLH140002, located approximately 9.4 km north-east;
- 'Dolina Mławki', natural reserve, located approximately 10 km east;
- 'Olszyny Rumockie', natural reserve, Natura 2000 area PLH140010, located approximately 15 km north-east;
- 'Gołuska Kępa', natural reserve, located approximately 8.6 km south;
- 'Górzeńsko-Lidzbarski Landscape Park', located approximately 12.3 km north-west;
- 'Międzyrzecze Skrwy i Wkry' landscape area, located approximately 1.3 km west;
- 'Zieluńsko-Rzęgnowski Obszar Chronionego Krajobrazu', located approximately 5.2 km and
- 'Nadwkrzański' landscape area, located approximately 6 km south;
- Birds protection area Natura 2000, 'Dolina Wkry i Mławki' PLB140008, located approximately 1.3 km west;
- 'Równina Raciążska', located approximately 12.5 km south-west;
- 'Przyrzecze Skrwy Prawej', located approximately 13.3 km south-west;
- 'Ostoja Lidzbarska' Natura 2000 area PLH280012, located approximately 14.3 km north-west.

Birds monitoring was conducted between January 2009 and December 2009 at the future Dębsk WF area. This was undertaken in accordance to the Polish guidelines[2]. During the monitoring 131 bird species were identified, of which 115 are protected and 7 are partially protected. Among these there are 23 species listed in the so-called Bird Directive.

The Dębsk WF is not expected to impact bird migration routes, including such species as White stork (*Ciconia ciconia*) (listed in Annex I to the Birds Directive), Mute swan (*Cygnus olor),* or the Great cormorant (*Phalacrocorax carbo*) and a few others.

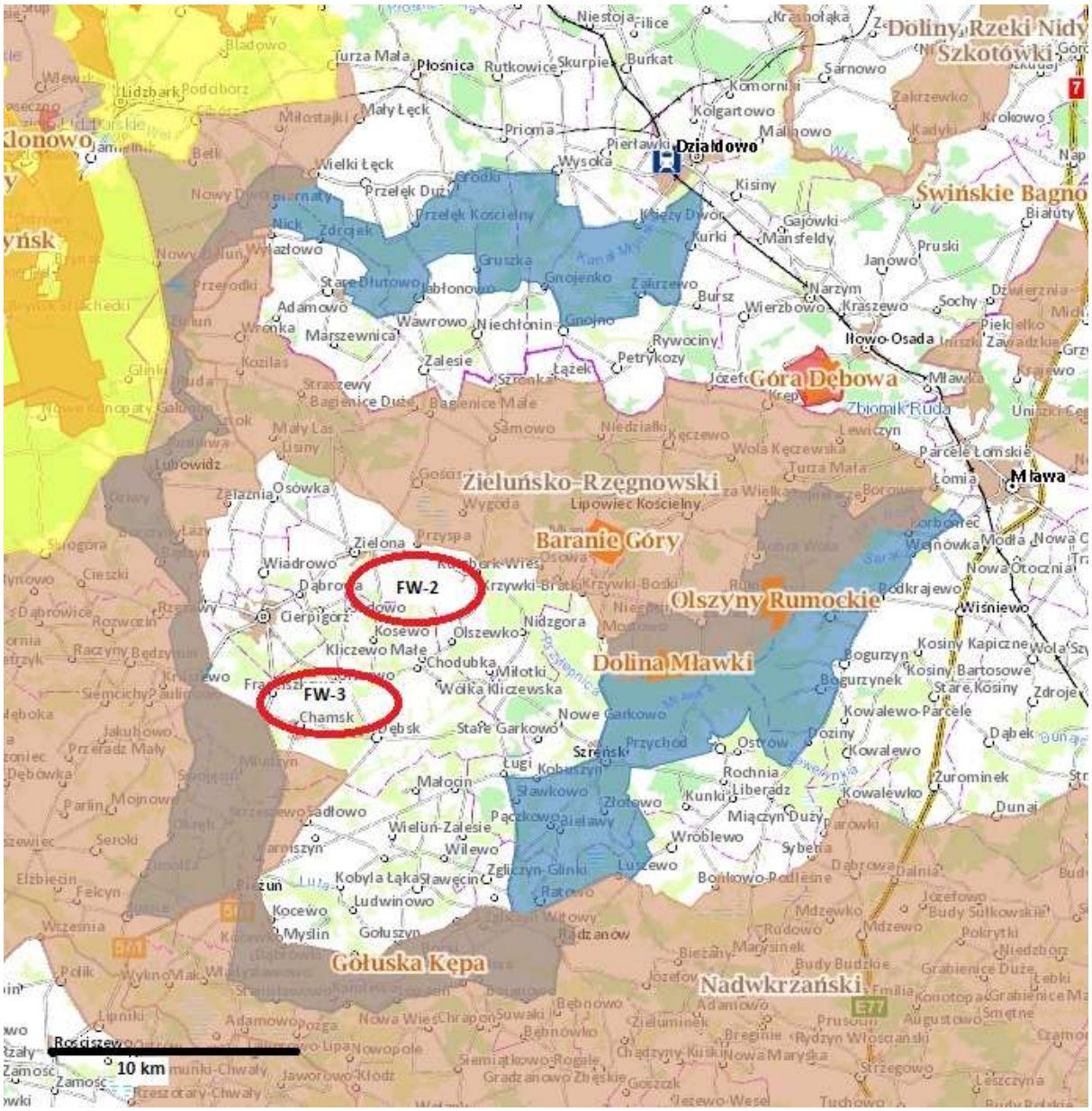
The Polish Environmental Impact Assessment[5] conducted for the Dębsk WF showed that the wind farm should not have a signifiantimpact on birds. This opinion was also confirmed by independent ornithologist, Mr. Krzysztof Kazjer, MSc and then by the Competent authorities.

Bats assessment was undertaken for the Dębsk WF between March 2009 and November 2009. This was undertaken by an independent expert using national guidelines[4] which are complaint with the EUROBATS recommended methodology. Monitoring at the Dębsk WF identified, bats belonging to 3 species (Common noctule *Nyctalus noctula*, Serotine bat *Eptesicus serotinus* and Nathsius pipstrelle *Pipstrellus nathusii*), depending on the season. Bats were identified in the vicinity of forest areas, close to local roads and in the vicinity of residential areas (Olszewo village). Taking into account the status of protection, all these are included in a group with medium risk of quantity change and therefore with no needs of undertaking significant conservations measures.

Below you will find a map presenting distances of the Zielona WF and Dębsk WF areas to the nearest nature protection areas (*source: http.geoserwis gdos.gov.pl/mapy/)*. Red circles indicate location of the wind farms.

---

5 Raport o oddziaływaniu na środowisko farmy wiatrowej >Żuromin FW3< w gminie Żuromin (pow. żuromiński, woj. mazowieckie)" in Polish, Proeko, May, 2010



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. This amounts to around EUR 20,000 – 22,5000 per turbine per 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 to 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 there be?

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 (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 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?

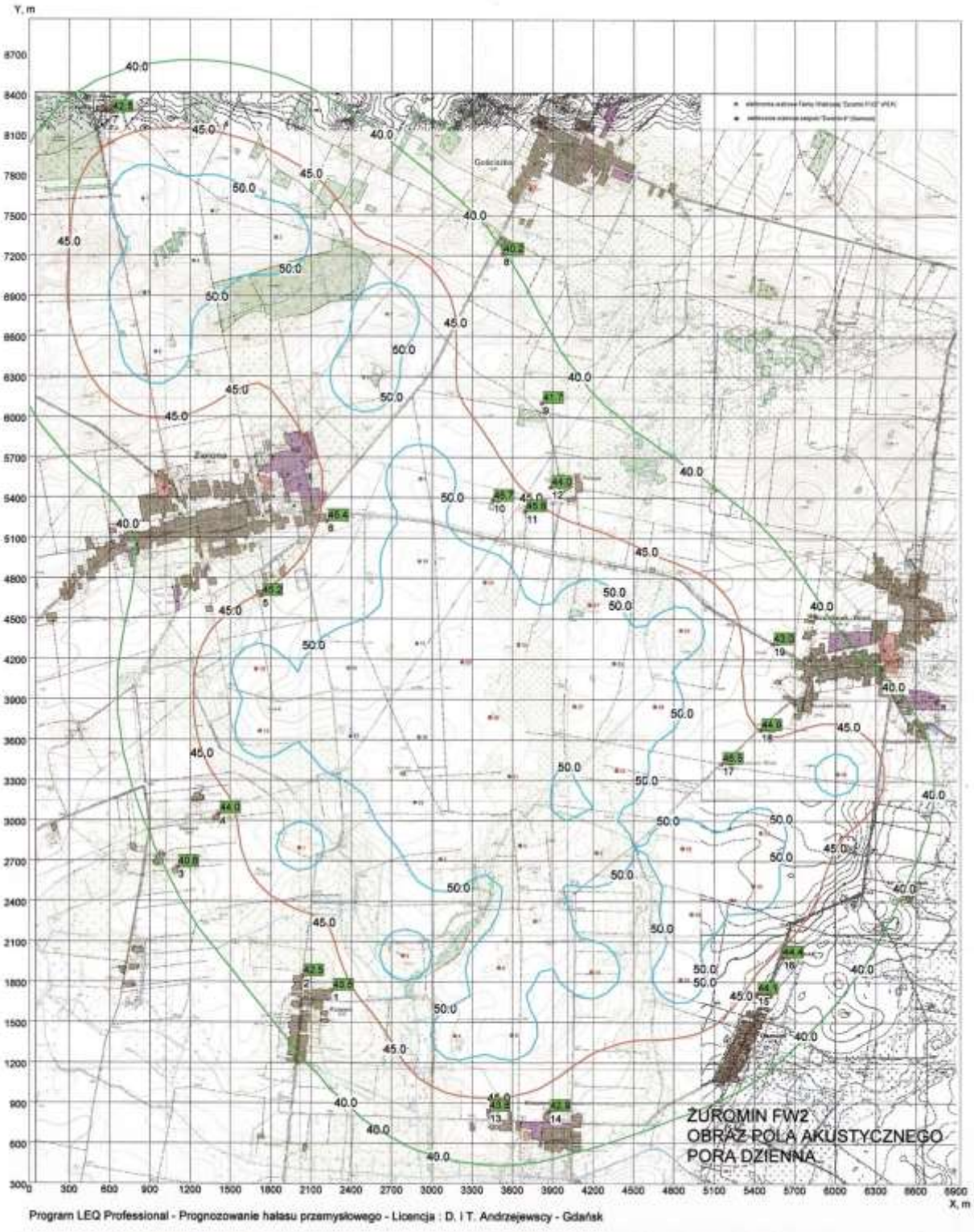
Completed investigations and public consultations conducted primarily as part of the environmental and social impact assessments procedure identified that main environmental impacts associated with the operation of the wind farm refer to increased noise levels, change in the landscape and influence on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

Noise generation

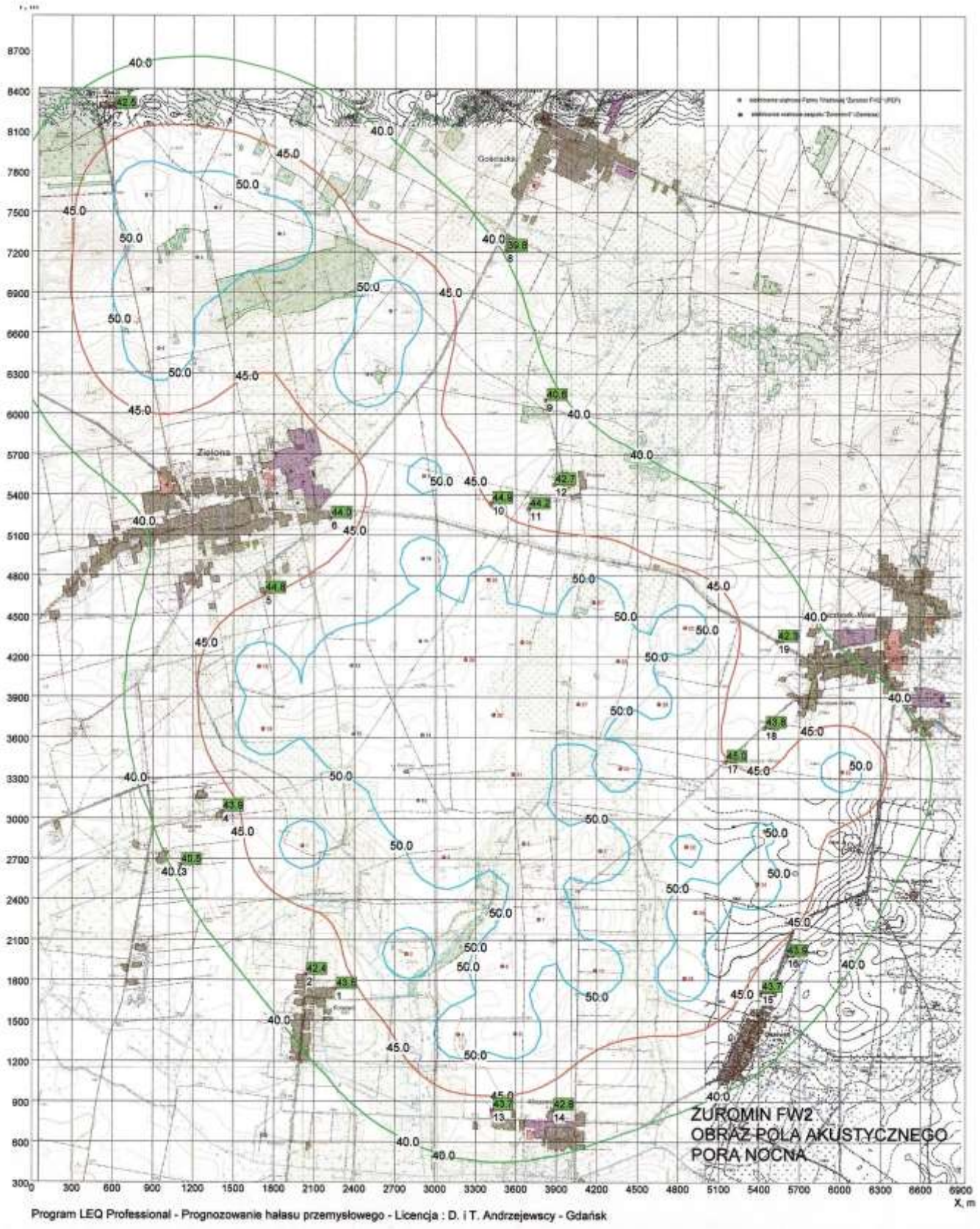
Due to the predicted impact on the acoustic climate of the neighboring areas the developer has completed noise level analyses. The purpose of such impact analysis of the planned investment was to define conditional circumstances it should comply with, in order to guarantee that its impact on acoustic climate will not exceed binding environmental quality standards, as set for homestead housing - amounting to 55 dB for daytime and 45 dB for nighttime.

Based on planned technical solutions and site development project for the investment, range and level of the acoustic impact on the environment was defined. The values of noise emissions obtained showed that the noise levels will not exceed the amounts allowed for the homestead housing for daytime in the area where the housing is situated. In the nighttime all wind turbines can be operated at both wind farms, however 7 WTGs at Zielona WF and 8 WTGs at the Dębsk WF should have their noise emission level reduced. Four maps illustrating acoustic climate at nighttime and daytime for Zielona WF and Dębsk WF wind farms are given below (*source: Environmental Impact Assessments prepared for Zielona WF and* Dębsk *WF investments by PROEKO company*).

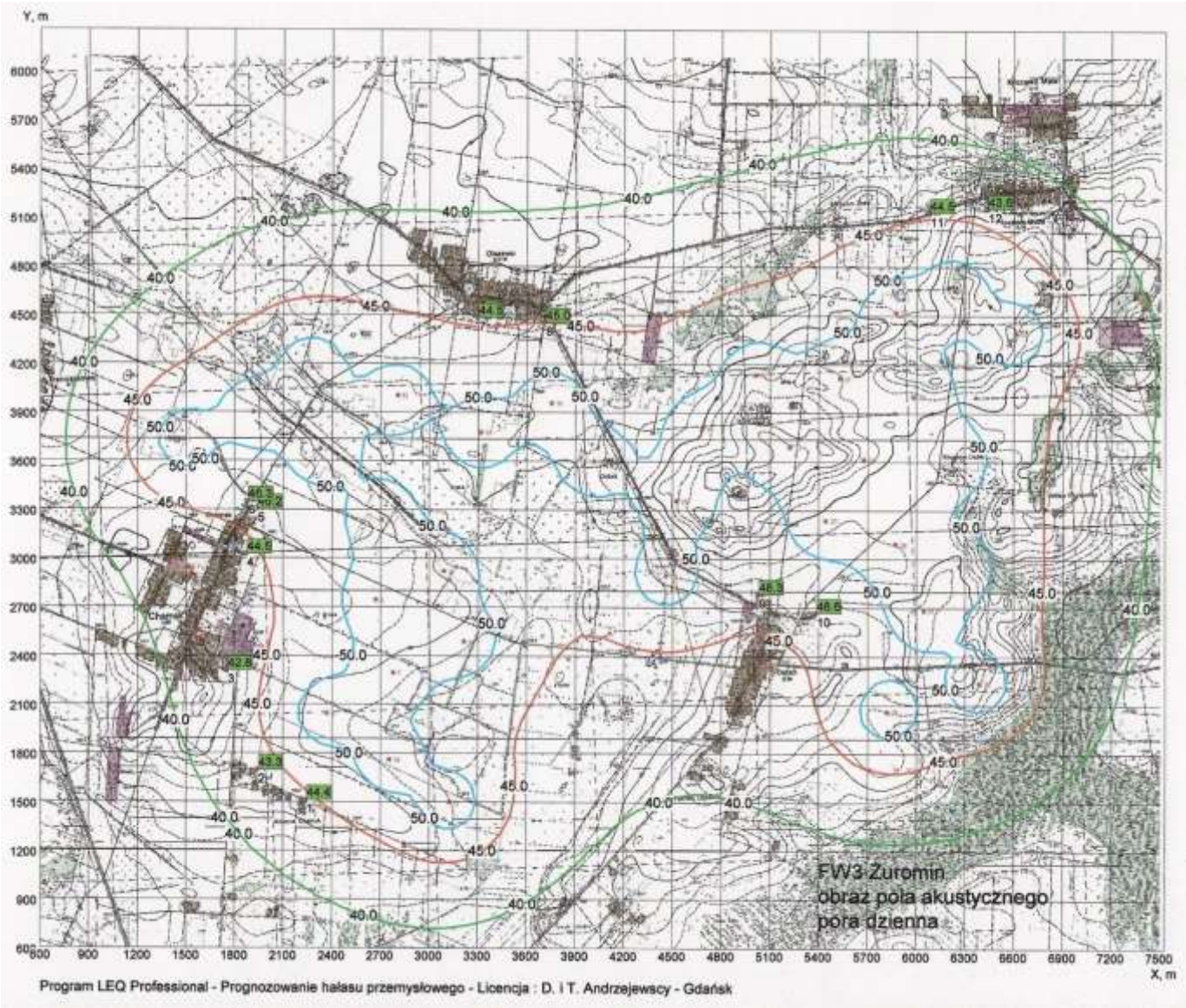
ZIELONA WF - acoustic climate at daytime



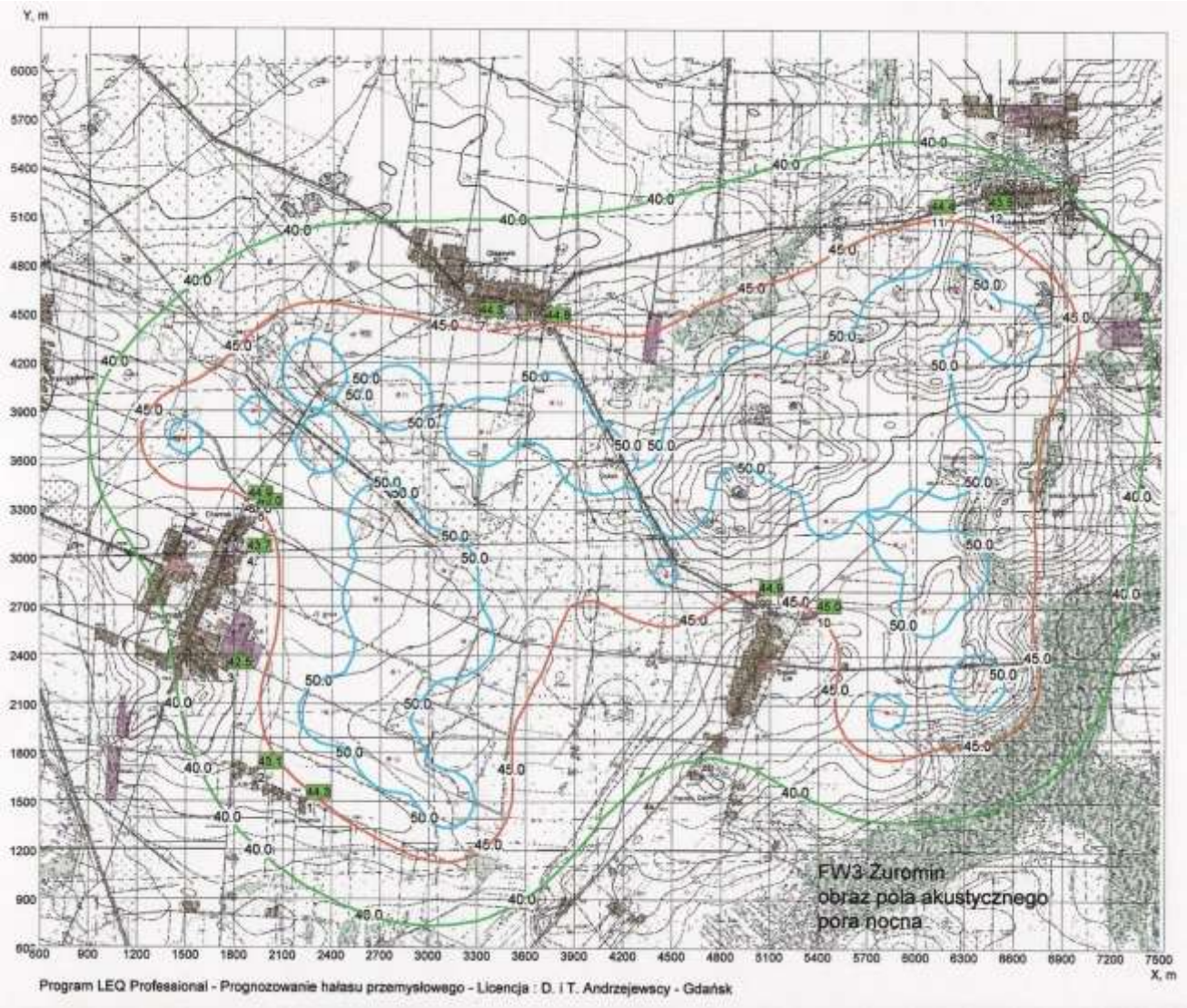
ZIELONA WF - acoustic climate at nighttime



DĘBSK WF - acoustic climate at daytime



DĘBSK WF - acoustic climate at nighttime



Birds and bats

The location of the Zielona WF, which comprises 25 WTGs and location of the Dębsk WF comprising 32 WTGs will 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 Mazowieckie 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 valuable or of special interest concerning wildlife and nature protection needs.

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 moving the turbines 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 Zielona WF (encompassing 25 wind turbines with the maximal level above the ground outlined by the blade of 176 m – tower plus blade) and Dębsk WF (encompassing 32 wind turbine with the maximal level above the ground outlined by the blade of 176 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 c 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 sites under development.

The e 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.

The WFs development apart from the stable visually intrusive change will create, so called shadow flicker, caused by rotating turbine blades. This affects residents living in a close proximity to the rotating shadow source. A detailed assessment of such impacts has not been conducted in none of the EIA reports. Commissioned by ENVIRON, the subcontractors have completed a shadow flicker analyses for Zielona WF and Dębsk WF as well as for two already existing wind farms – Żuromin I and Żuromin II.

The undertaken calculations show that there are no exceedances of 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. While lack of clouds and barriers between the receptor and wind turbine was assumed the results showed only the theoretical and maximal impact.

Moreover, based on the calculations for the cumulative impact of two neighboring wind farms it is known that the shading levels will not be exceeded neither. In fact it is expected that the real influence would be significantly lower than the outputs of the calculations.

As concluded by the shadow flicker study authors, 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. Moreover, the Zielona/Dębsk Project should not be a nuisance in terms of shading. The results of calculations for actual meteorological conditions did not show that the proposed wind turbine could cause shading on a higher level than treated as an inconvenient one.

Electric and magnetic fields

The main sources of electromagnetic fields directly linked to Zielona/Dębsk Project, is a WTG and transformer output. These elements are placed inside the nacelle on top of the tower (at a height of approx. 100 m). According to information included in the EIA report, elements of WF are working with low voltage of about 400 V. Only the output of the transformer is 30 kV medium voltage, which will be forwarded to the electricity grid.

Due to the location of the transformer 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 situation is similar in the case of the designed devices equipped with generators with relatively low power. Besides the fact that they will be located at high altitudes, they will also be encapsulated within the metallic conductor surrounded by a nacelle, which in turn causes the power plant will not affect the shape of the electromagnetic climate.

Second potential source of electromagnetic field with a frequency of 50 Hz, associated with the Zielona 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. Since the GPO will not be a part of Zielona WF project, it is clear that there will not generate a negative impact. In case of Dębsk WF, the GPO is considered to be a part of the project. Based on the information included in the Dębsk WF EIA report and according to the already existing similar experiences, it is assumed that the intensity 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, Dębsk WF will not generate a negative impact on humans and animals.

Based on the information presented in the EIA reports related to the Zielona/Dębsk Project and review of existing Regulations, and further an independent audit undertaken by ENVIRON on behalf of Lender, it can be summarized that:

- Both parts of Zielona/Dębsk Project are not the 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 Zielona 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 [Dz.U.2001.62.627], 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.

Based on the information obtained from POLENERGIA, all of the abovementioned requirements are fulfilled by the investor.

Measure 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 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[6];

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

- to be located out of birds migration routes, birds concentrations, feeding or nesting areas, which was later confirmed by the EIA reports 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,
- not to disturb the continuity of ecological corridors[7].

In case of ZIELONA WF the layout has been changed in order to exclude from the investment the most valuable areas with the biggest concentration of birds recognized within the pre-investment monitoring (one wind turbine was moved and another two will not be built).

Post construction monitoring

Noise

According to the Environmental Protection Act and based on recommendations included in EIA reports, it is suggested to conduct post construction noise level surveys for the wind farms. The first measurements should be conducted after obtaining a construction permit before construction works are initiated. The second round of measurements is recommended 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). Further measurements will be necessary if other wind farms are constructed in the vicinity of the ZIELONA WF and DĘBSK WF investments, and noise emission is accumulated; however the investors of new projects will be obliged to conduct these measurements.

Birds

Birds monitoring has been required by the local authorities 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 birds colliding with the turbines to discover any dead and hurt birds in the vicinity of the wind turbines,

- evaluation of the wind farm operation impact on life conditions of birds living at the investment area,

- description of the reaction of migrating species and species feeding within the wind farm area on the operating wind farm (particularly in spring and autumn),

- evaluation on methods used in order to minimize the probability of birds collisions with the turbines.

7 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).

Bats

Bats monitoring has been also recommended for both wind farms. In line with good practice guidelines of EUROBATS 2006 implemented in the Polish guidelines[4] a 3-year long post-development bats monitoring has been proposed. 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 Zielona/Dębsk Project should be addressed to the Environmental Specialist/EHS of the POLENERGIA:

Marta Porzuczek
POLENERGIA S.A.
24/26 Krucza Street, 00-526 Warszawa
Tel: +48 22 522 38 42
Email: marta.porzuczek@polenergia.pl

And/or

Marcin Krupiński
Project Manager
Kierownik ds Rozwoju Energetyki Wiatrowej
POLENERGIA S.A.
24/26 Krucza Street, 00-526 Warszawa
Tel: +48 22 522 38 42
Email: marcin.krupinski@polenergia.pl

Project related information and documents are available via the abovementioned. Moreover, project disclosure packages will also be available in the Commune Offices of Kuczbork-Osada and Żuromin:

Urząd Gminy i Miasta Żuromin
Pl. J. Piłsudskiego 3
09-300 Żuromin
Tel.: 23 657 25 58,
Fax.: 23 657 25 40
e-mail: ugimz@go2.pl

webpage: http://bip.zuromin.nv.pl

Contact person:
Head of the Department of Infrastructure, Construction, Spatial Planning and Environment Protection,
Ms. Marianna Budzińska
e-mail: budownictwo.zuromin@gmail.com
direct phone: 23 652 25 58 int. 42

Urząd Gminy w Kuczborku-Osadzie,
ul. Mickiewicza 7,
09-310 Kuczbork,
Tel./fax.: 23 657 62 59
webpage: http://www.ugkuczbork.bip.org.pl/

Contact person:
Mr. Andrzej Koper
e-mail: andrzej.koper@ugkuczbork.pl
direct phone: 23 657 26 37 int. 25

Additional information will be available during Public Consultations which are scheduled by Polenergia for the second half of November 2014. Information about detailed locations and dates of the Public Consultations will be published in advance in Tygodnik Żuromiński and on the communes' webpages, as well as on the information boards in the commune offices and villages in the project area of influence.