



Supplementary Report  
Margonin and Pawlowo  
Wind Farms  
Poland

Prepared for:  
**EDPR**  
**Warsaw, Poland**

On behalf of:  
**European Bank for Reconstruction and Development**

Prepared by:  
**ENVIRON Poland Sp. z o.o.**  
**Warsaw, Poland**

Date:  
**March/April 2013**

Project Number:  
**PL0930 (Final)**

## Contents

	<b>Page</b>
<b>1 Introduction</b>	<b>1</b>
<b>2 Project Description</b>	<b>2</b>
<b>3 Noise Issue and Impact on Birds and Bats</b>	<b>4</b>
<b>4 Power Transmission Issue</b>	<b>8</b>
4.1 Connection to the National Power Grid	8
4.2 Internal Power Connections	11
<b>5 Cumulative Impact</b>	<b>13</b>
<b>6 Social Matters</b>	<b>15</b>
<b>7 Information Disclosure and Society Involvement</b>	<b>17</b>

## 1 Introduction

EDP Renewables is developing a group of wind farms comprising of Margonin (operational), Pawłowo-Gołańcz (under construction) and Pawłowo-Budzyń (at the stage of environmental impact assessment) in the Margonin commune (Chodzież county), Gołańcz commune (Wągrowiec county) and Budzyń commune (Chodzież county), Wielkopolskie Province, central Poland. These three developments (Margonin, Pawłowo-Gołańcz and Pawłowo-Budzyń wind farms) as located in a short distance to each other and using the same power transmission infrastructure constitute a common project. The project in its Margonin part was co-financed by the European Bank for Reconstruction and Development (EBRD, the Bank). Further, the Bank is considering its financial involvement in the next phases of the project development – at the current stage in the Pawłowo-Gołańcz wind farm.

Following the Bank's Environmental and Social Policy (2008) an environmental and social due diligence and gap analysis were completed for the project. Results of the ESDD are presented in a separate report. This supplementary report presents ENVIRON's professional opinion about environmental and social matters related to the project area of influence, which were not widely discussed in the main ESDD report as not directly related to the project. As agreed with the Bank's representative, the following issues are discussed in this report:

- transmission of generated power from the wind farms to the national power grid;
- cumulative impact of the project;
- social matters related to the project.

## 2 Project Description

The project consists of three wind farm developments in the Margonin, Gołańcz and Budzyń communes, central Poland.

The wind farm in Margonin (Margonin wind farm) commune consists of 60 wind turbine generators (WTGs), type Gamesa G90, capacity 2 MW, hub height 100 m, access roads, assembly yards, underground infrastructure of medium voltage (MV) power transmission lines and steering cables as well as a local electrical substation nearby Sypniewo village. The wind farm development was commenced in 2006 with an application for environmental decision (a document stating environmental



**Margonin wind farm**

conditions to be fulfilled by the development) for the western part of the wind farm and then two other applications in 2007 and 2008 for the eastern part and additional single WTG respectively. After a full scope environmental impact assessment conducted by the Margonin authorities for the western and eastern part the environmental decisions were granted to the development. Construction of the wind farm (i.e. WTGs and infrastructure of access roads, assembly yards and underground cabling) was commenced in spring 2009 and completed in December 2009. Since early 2010 the wind farm is fully operational. The official trial run of the wind turbines started on March 2, 2010 and was gradually continued until April 26, 2010, when the concession (license) for power generation was granted to EDPR and trial run was officially completed. By June 2010 commissioning of the wind turbines was conducted which was finalized with an issue of a Provisional Acceptance Certificate for all of the wind turbines.

The wind farm in Gołańcz commune (Pawłowo-Gołańcz wind farm) was originally developed as a group of three subprojects which assumed construction of 65 WTGs at the territory of Gołańcz commune and 31 WTGs at the territory of Wągrowiec commune. In Gołańcz commune the development was divided into two subprojects: 60 WTGs which were supposed to be developed based on the decision on zoning



**Pawłowo-Gołańcz wind farm under construction**

conditions and 5 WTGs for which local zoning plan needed to be developed. As the Commune Council of Wągrowiec decided not to allow construction of wind farm in the commune, EDPR decided to suspend any activities related to development of the wind farm in this commune. Finally the project was reduced to 49 WTGs of the larger and 4 WTG of the smaller project. Both projects were granted environmental decisions in the separate full scope EIA procedures conducted by the authorities. The projects were also granted building permits and the construction works were commenced already in late 2012 and are planned to be completed by mid-2013. All of the wind turbines installed at the wind farm are of the same type, Acciona AW 82/1500 of a nominal capacity of 1.5 MW, hub height 80 m. Power generated at this wind farm will be transferred by underground MV cables to a local substation and further, through approx. 10 km of 110 kV overhead line, to the substation nearby the village of Sypniewo.

The wind farm in Budzyń commune (Pawłowo-Budzyń wind farm) is at an early stage of development. The conceptual design of the wind farm assumes construction of 41 WTGs of a capacity up to 2 MW each and a maximum hub height at 95 m. The specific type of WTGs has not been decided yet, however, the company considers WTGs produced by Vestas and Acciona. Auxiliary infrastructure of the wind farm includes access roads, service yards and underground steering and MV power transmission cabling. Generated power will be transferred to the local substation (which location has not been decided yet) and then, after transformation to 110 kV to Sypniewo substation. The environmental impact assessment of the project was commenced in April 2012 and has not been completed yet.



**Future Pawłowo-Budzyń wind farm site**

### **3 Noise Issue and Impact on Birds and Bats**

For the Margonin and Gołańcz wind farms the environmental impact assessments were completed prior to commencement of the construction works and for the Budzyń wind farm such assessment is currently conducted. The assessments based on the environmental reports prepared in line with applicable Polish law and EU EIA directive. As assessed by ENVIRON the reports properly addressed the major environmental impacts typical for the wind farms during construction, operation and decommissioning. The noise impact and impact on birds and bats, as the most commonly considered as typical for wind farms are described below.

#### **Noise impact**

The noise impact of the wind farms as assessed by mean of noise distribution modeling did not indicate excessive noise level at the protected areas nearby the wind farms. The numerical calculations, however, represent only approximation of the real conditions and as such should be confirmed by infield measurements.

The post-construction monitoring of the Margonin wind farm noise impact was conducted by the company Eko-Pomiar in March and April 2010. The measurements were conducted at eleven observation points located on the border levels of the villages of Margonińska Wieś, Lipiny, Kowalewo, Studźce and Radwanki. The measured noise levels did not reveal any breaches of the noise standards for the night time (which are more restrictive than these for the daytime). No breaches of noise standards were also revealed by measurements conducted by WIOŚ (Wojewódzki Inspektorat Ochrony Środowiska – Voivodeship Inspectorate of Environmental Protection) in May 2010 at 15 observation points during the day and night.

Both Eko-Pomiar and WIOŚ measurements were conducted in summer time, where noise propagation conditions are favorable for noise level reduction due to presence of intensive vegetation and lack of snow cover. In order to evaluate the noise impact during a presence of snow cover, EDPR requested another noise impact analysis in January 2011, which indicated possibility of the noise standards to be exceeded under certain meteorological conditions. As a mitigation measure a noise reduction systems were installed at the 32 WTGs at the site. No further complaints concerning noise issues at the Margonin wind farm were noted.

For the Pawłowo-Gołańcz and Pawłowo-Budzyń wind farms numerical simulations did not indicate any noise impact that could exceed permissible noise standards. In order to confirm a low noise impact of these projects a post-construction monitoring is planned. Should any breaches of noise standards are indicated, the company will implement similar mitigation measures as at the Margonin wind farm.



### ***Impact on birds and bats***

According to the Polish practice regulated by the Guidelines on Wind Farm Impacts on Birds<sup>1</sup> recommended by the Polish Wind Energy Association and the Temporary Guidelines on Wind Farm Impact on Bats<sup>2</sup> recommended by Polish Association for Bats Protection, a wind farm development should be preceded with a pre-construction monitoring to assess potential impact on birds and bats. Similar monitoring should be undertaken again after completion of the construction works and start of the operations.

As the Margonin wind farm was developed before the guidelines were established, no pre-construction monitoring of birds or bats was undertaken. Therefore, the post-construction monitoring that was conducted at the site was aimed at investigation of birds and bats presence at the wind farm site and on detection of mortalities.

The post-construction monitoring of birds at the wind farm site was undertaken by a reputable ornithologist in the period between March, 2011 and August 2012. The monitoring program is further continued. As assessed by ENVIRON, the monitoring program was fully compliant with the applicable Polish guidelines and international practice. The monitoring reports provide comprehensive data on birds observed in the area supplemented with detailed statistical analyses. The report authors analyze such statistics as distribution of birds versus distance to WTGs, distance to residential areas, distance to surface water and others. Birds flights below, within and above blades height were also noted and analyzed. In total, during the first year of monitoring campaign 39,443 bird individuals were observed which represented 128 species. During the first year 17 birds (inclusive of one predator – red kite) were found dead by the turbines, which corresponds to 0,28 fatalities/WTG/year. During the second part of the monitoring in 2012, 14 dead birds (among which 4 were predators - 3 sparrow hawks and 1 buzzard) which corresponds to 0,23 fatalities per WTG in this period. As an average mortality of birds at the wind farms in USA and Europe amounts 1.96 fatalities/WTG/year, the impact of the Margonin wind farm on birds shall be assessed as low.

The monitoring of bats was conducted in accordance with the guidance on bats. During the first year of observations at least 9 bats species were identified and the bats were observed 1231 times. The monitoring results were also analyzed statistically to determine relations of bats species and number versus distance to WTGs, residential areas, water, forests etc. The search for bat fatalities revealed presence of 26 casualties which corresponds to the bats mortality rate of 0.43 individuals per WTG per year. During the second, half-year long period of monitoring, 22 dead bats were found, which corresponds to mortality rates of 0,37 fatalities per WTG. No WTG of statistically increased impact on birds or bats was identified.

At the Pawłowo-Gołańcz and Pawłowo-Budzyń wind farms a pre-construction monitoring program for birds and bats was completed.

---

<sup>1</sup> Wytyczne w zakresie oceny oddziaływania elektrowni wiatrowych na ptaki (in Polish), 2008

<sup>2</sup> Tymczasowe wytyczne w zakresie oceny oddziaływania elektrowni wiatrowych na nietoperze (in Polish), 2009

At the Pawłowo-Golańcz wind farm site, a pre-construction birds monitoring was conducted by a reputable ornithologist for a whole year long period between May 1, 2008 and May 22, 2009. The monitoring program was assessed by ENVIRON as fully compliant with the guidelines. During the monitoring 107 species were identified at the site during the spring migration period and 98 species during the autumn migration season. During the nesting period 97 birds species were observed. Most of the observed were common birds, however, more attractive species (e.g. canes, eagles, storks) were observed as well. The typical observed birds fly height was 40 m, and at the height between 50 and 150 m (i.e. within the range of the wind turbine blades) only 17.8% of the observed flights took place. The observed region was characterized as typical for this part of Poland, without any special preferences for birds to nest or feed. The general conclusion of the inventory was that except for a few regions in the south-eastern and southern part of the investigated area, the potential impact on birds could be assessed as low.

The pre-construction monitoring of bats at this site was conducted in autumn 2008 and spring 2009. The applied methodology was compliant with the international methodology guide by EUROBATS in 2006, as these days there were no national guidelines available. Such were in December 2009. Polish guidelines fully adopt the EUROBATS methodological guide. The bats observations were undertaken with use of voice recorder and detector in 77 observation points distributed at the wind farm area. The field works were concentrated in the period between September-November (autumn bats migration season) and between mid-March-mid May (spring migration season). In total 173 bats belonging to 5 species were identified during the monitoring campaign, all belonging to the most common bats in Poland. According to the monitoring reports, all observed species are potentially in a risk of collision with the wind turbines, however, due to local character of bats presence (mainly in the vicinity of the villages or small forest complexes) the wind farm can be located at the planned area.

At the Pawłowo-Budzyń site a pre-construction monitoring was undertaken by a team of reputable birds and bats experts in the period between April 30, 2010 and April 23, 2011 for birds and in the period between March and November 2010 for bats. Besides, during the winter season the area was searched for presence of hibernating bats. The monitoring program was found by ENVIRON as fully compliant with the applicable guidelines.

The monitoring report presents in a comprehensive way results of the observations and their analyses. For each phenologic season a wide discussion on species composition and quantities is provided. In the nesting season, 3479 birds were observed that belonged to 77 species, in post-nesting one respectively 4234 individuals of 69 species, during autumn migration – 10236 individuals of 52 species, during winter season – 1868 individuals of 37 species and during spring migration - 5943 of 84 species. In all seasons common birds dominated for which the development should not generate negative impacts, according to the monitoring report. The nesting birds in the area were clearly indicated on the map and those areas were excluded from location of WTGs.

The bats observations indicated presence of 5 bats species in the area, all belonging to the most common bats in Poland. The bats activity index and number of noted individuals were very low, which indicates pure activity of bats in the area. According to the monitoring reports, all observed species are potentially in a risk of collision with the wind turbines,



however, due to local character of bats presence (mainly in the vicinity of the villages or small forest complexes) the wind farm can be located at the planned area.

The monitoring results for Pawłowo-Budzyń and Pałwowo-Gołańcz characterize the development sites as of limited potential for impact on birds and bats. Nevertheless, the actual impact on these will be assessed based on a post-construction monitoring program.

## 4 Power Transmission Issue

### 4.1 Connection to the National Power Grid

The wind farms constituting the projects may generate:

- Margonin WF: 120 MW;
- Pawłowo-Gołańcz: 79.5 MW;
- Pawłowo-Budzyń: up to 82 MW.

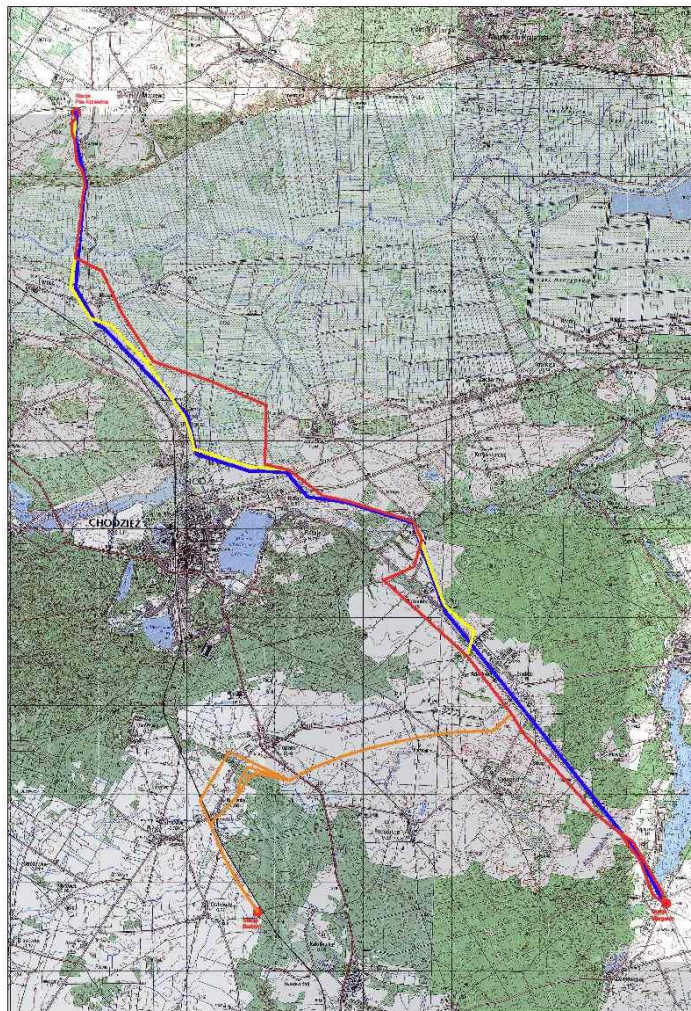
At the current stage of development, power generated by the wind farms can be transferred to the national power grid by an existing overhead power transmission line (PTL) which connects the local electrical substation of the Margonin WF in Sypniewo, and main transforming station (MTS) in Piła-Krzewina which is operated by PSE Operator – the distribution system operator. The transformer which accepts power generated by the wind farms has a nominal capacity of 160 MVA, which is sufficient in normal conditions to accept 120 MW. Following the grid connection contract, PSE Operator will make available another transformer of the same capacity at the Piła-Krzewina MTS, thus the total available nominal capacity of this substation will be 320 MVA i.e. will be sufficient to accept in normal conditions 240 MW of power generated by the wind farms.

As reported by the EDPR representative, the grid operator confirmed that the existing high voltage line between Margonin station and Piła Station can accept up to 150 MW during summer time and up to 183 MW during the winter time. Such technical conditions make it possible to accept full power generated by the Margonin wind farm and up to 30 MW (in summer) or 63 MW (in winter) by the Pawłowo-Gołańcz wind farm, which is expected to be operational in June/July 2013. Such a deficit of power transferring possibilities determine a need for a new strategic development of a power transmission infrastructure.

As reported by the company representative, there is a theoretical possibility to transfer the generated power to a MTS operated by Enea Operator (distribution system operator) which is located adjacent to the substation in Sypniewo. Reportedly, an analysis of the Pawłowo wind farms connection to this MTS was analyzed by PSE. The results of such analysis proved that power generated by the Pawłowo wind farms could be accepted by the MTS without significant impact on a distribution network stability and reliability. However, similar analyses undertaken by Enea Operator revealed opposite results, i.e. unacceptable impact on the distribution system. Consequently, Enea Operator refused to sign a grid connection contract. As reported by the EDPR representative, the parties entered a legal dispute which is currently ongoing.

Because the results of the dispute are uncertain the company considers alternative option of power transmission via a new PTL which would connect the substation in Sypniewo with the second transformer at the MTS in Piła-Krzewina. Such an option is currently at a stage of a conceptual design. Two possible PTL routes are considered:

- Preferred one: From the substation to the north-north-west in a close distance to the existing PTL line (either on its western or eastern side, the latter shall cross the existing one nearby the Rów Sypniewski creek), then to the north-west crossing a small forest complex to the southeast of the village of Klotyldzin up to the village of Pietronki, which is to be passed on its western and northern side to avoid a small forest, then turn to the northeast and cross the road No. 192 and further along a bend of a local road to the village of Rudki, then to the west-north-west in a close distance to the existing PTL up to the fields north of the village of Rataje, where the new line turns north and then nearby the village of Strzelęcin to the west-north-west and further north-west to return to the existing PTL route north of the village of Milczek and follow this route by the MTS.
- Alternative one: This one follows the preferred route by the vicinity of the village of Adolfowo (few hundred meters south of the village of Pietronki), where the line crosses the road No. 192 and further follows in general the existing PTL route.



**Considered variants of 110 kV PTL and connection of Pawłowo-Budzyń wind farm**

The preferred route of the new preferred PTL was visited by Mr. Maciej Rozkrut, Senior Manager of ENVIRON on March 4, 2013. The following observations were made:

- The planned PTL like the existing one pass in large extent cultivated agricultural land, in a reasonable distance from human residences.
- Forest complexes are avoided as far as possible – only nearby the village of Sypniewo the new PTL will need to cross a forest in a distance of approximately 200 m, however, the existing one in this area crosses the forest in a distance of approx. 800 m.
- Up to the area of the village of Milcz, the existing and planned PTL routes pass away of protected Natura 2000 areas (Dolina Środkowej Noteci i Kanału Bydgoskiego established based on the Birds Directive and Dolina Noteci established based on the Habitats Directive). The preferred PTL route enters the Natura area approximately 1 km to the east of the existing PTL, however, the Noteć river which is considered by ENVIRON to be of primary importance for this protected area is crossed more or less on the same path by both the planned and existing PTL.
- It was observed, that despite the rules stated by the environmental decision, no birds' dissuasive coils are installed on the existing PTL. As established by EDPR the coils were not installed due to the negligence of a contractor - SAG Elbud Gdańsk S.A. as well as ENEA utility that was responsible for supervision of the construction of the line (the contractor had the installation of birds' dissuasive coils on PTL in his scope of work as they were included in the building design). The contractor is supposed to install the birds' dissuasive coils at his own expense by the end of August 2013. Detailed date will have to be agreed between EDPR, ENEA and the contractor because the works would require the PTL to be switched off for several days. Based on the site inspection results ENVIRON does not expect any significant environmental or social issues related to construction of the new PTL out of the Natura 2000 area. Despite the finally selected route, the new PTL will not cross large forests or urban areas. The new line will affect the visual properties of the area, however the landscape is already affected by the existing PTL and other, medium voltage overhead power lines present in this area. This may be an issue of concern in the northern part of a new line as the area adjacent to the southern part of the Natura 2000 constitutes a landscape protection zone "Dolina Noteci". No other protected areas will be affected, as established based on a map available at the website of the General Directorate of Environment Protection (<http://geoserwis.gdos.gov.pl/mapy/>).

A separate issue is a need for the PTL to cross the Natura 2000 areas established based on birds and habitats directives. As observed at the site, the ground conditions in the Noteć river valley are complex and require specific measures to be applied for construction of the pylons and their foundations. At the designing stage this issue will need to be carefully investigated, both from the perspective of civil construction safety and a need for the habitats protection. The PTL line will also cross the river valley in perpendicular direction thus will form additional "barrier" for birds which use the valley as an over-regional ecological corridor.



The measures to minimize impact on birds will be proposed by ornithologist after completion of monitoring in this area.

Following the applicable law, the overhead 110 kV overhead power lines may, upon discretion of the authorities, be in need of an environmental impact assessment procedure. Further, all developments which may affect subject of protection or integrity of Natura 2000 areas are obligatory under a need for an EIA. Taking into account that the new PTL length will exceed 30 km and that it will cross the Natura 2000 area, the full scope EIA will be with high likelihood required by the authorities. The procedure will need all environmental and social impacts to be properly assessed. For the purpose of this procedure an EIA report will need to be prepared. Such report shall strictly follow requirements of the EIA procedure and Polish EIA act and will need to address also an issue of a cumulative impact of the development with the existing 110 kV and other overhead power lines in the area.

As the total capacity of all three wind farms is 281.5 MW, the nominal capacity of two transformers at the Piła-Krzewina MTS is 320 MVA and the total grid connection rights granted to EDPR amounts 240 MW, the development of Pawłowo-Budzyń wind farm will likely be conducted in phases. At the first instance only 40.5 MW will be installed at this wind farm. At the later stage, upon the grid connection possibilities the project will be further developed. Such possibilities may result either from increased by PSE connection rights or positive conclusion of the dispute with Enea Operator.

## **4.2 Internal Power Connections**

Each of the wind farm constituting the project have or will have its own electrical substation. For the Margonin and Pawłowo-Gołańcz wind farms the substations are already completed. The role of substations is to transform the medium voltage of power generated by the wind turbine generators to 110 kV prior energy transfer to the power grid. Energy generated by the wind turbine generators are transferred to the substations by a network of underground power cables. The substation serving the Margonin wind farm has also direct connection with the national power grid via the overhead PTL to Piła-Krzewina substation.

The substation to serve the Pawłowo-Gołańcz wind farm is located nearby the village of Rybowo. This substation is connected with the Margonin substation via an overhead, 110 kV PTL of approx. 10 km length. The line is connected with a separate field at the Margonin substation which is further connected to the overhead PTL to Piła-Krzewina. Both the substation and the PTL were constructed based on environmental decisions which were issued without detailed EIA procedures but were based on the developments' screenings. The PTL does not cross any sensitive areas.

The substation for the Pawłowo-Budzyń wind farm will be constructed to the north of this wind farm, in a distance of approx. 2 km. Precise location and configuration of this substation has not been established yet. The concept of the wind farm assumes, however, that the substation will be connected with the one serving Margonin wind farm, via an overhead 110 kV PTL (which occasionally can be changed for underground one if needed). The route of this PTL has not been ultimately decided yet. Based on the conceptual layout, the PTL will pass to the east of the village of Ostrówki along the forest border and will cross it in the vicinity of the village of Podanin at a distance of approx. 200 m. Further, the line will turn south-east and pass along the forest border to turn again to the east-north-east to join the

route of the existing PTL to the south of the Studźce village. From this point the line will follow the PTL route, likely through an underground cable, up to a dedicated field at the Margonin substation. Based on the site inspection in January 2013, the line will be constructed in a rural area. Based on the available map, no protected areas will be affected by this line.

As the Pawłowo-Budzyń substation and related PTL were not assessed in the EIA report for the Pawłowo-Budzyń wind farm, the environmental and social issues related to these developments will need to be addressed in a separate EIA procedure. Following the Polish EIA act, a need for a full scope EIA procedure in this case will be decided by the relevant authorities upon provision of the project identification card (a document which shall include project description and summary of expected environmental and social impacts) by the developer. The company is aware of this fact which is reflected by a relevant action included in the Environmental and Social Action Plan for the company.



## 5 Cumulative Impact

Wind farm may generate numerous environmental and social impacts, among which:

- noise emission;
- electromagnetic fields;
- impact on landscape;
- impact on birds and bats;
- shadow flicker effect

are commonly considered as the most important ones. As proved in numerous environmental impact assessments undertaken for onshore wind farms, such impacts in general have local rather than regional character. However, these impacts may cumulate if a number of wind farms or even single wind turbine generators are located in close distance to each other.

All of the wind farms that constitute the project were subjected to environmental impact assessment. The most recent EIA has been conducted for the last out of the three developed wind farms, namely for the Pałowo-Budzyń one. As one can read from the EIA report for this development, despite relatively low distance between the wind farms the noise distribution will not overlap so the noise standards should remain not exceeded at all protected areas. Similarly, the electromagnetic fields have a very short range of influence so will not cumulate. The shadow flicker effect, despite its nuisance for humans, is visible to a maximum distance of a few hundred meters so it may cumulate for the wind turbines of the same rather than different wind farms.

The impact on the landscape will cumulate, based on the EIA report, so the wind turbine generators will be visible from a distance of a few to several kilometers. It is necessary to highlight that the projects is not located in any protected area in terms of landscape protection regulations and no valuable cultural heritage monuments are directly affected. The wind turbine generators and other elements of infrastructure (mainly overhead PTL, electrical substations) are and will be visible mainly by the local inhabitants and users of the local roads. For the latter, a repeatedly appearing wind turbines at a distance of a few kilometers drive may cause a nuisance, however, this effect can be expected rather for the non-citizens of the area as the local citizens should get accustomed to it in a relatively short time. The perception of wind turbines as elements of the landscape is purely subjective and depends on individual preferences. For some people wind turbines may appear a “waste” of the landscape while others can see them as interesting symbols of ecology and modern technology.

Some negative impact on the landscape may have the newly planned PTL, in particular in the area of Dolina Noteci landscape protection zone and Natura 2000 areas Dolina Dolnej Noteci i Kanału Bydgoskiego and Dolina Dolnej Noteci. The PTL will introduce a substantial dissonance in a wild landscape of this area. Its visual effect will cumulate with the existing

110 kV PTL and other medium voltage PTLs present in this area. As a mitigation measure the new PTL could be constructed close to the existing 110 kV one, in order to affect limited part of the landscape which is already anthropogenically transformed. Nevertheless this aspect will be addressed in the EIA procedure

The wind farms may generate various risks for birds, among which the barrier effect can be considered the most typical as in terms of a cumulative effect. All three wind farms are situated in a close distance to each other, the Margonin and Pawłowo-Golańcz ones are adjacent to each other and the Pawłowo-Budzyń is situated approximately 6 km to the west of the Margonin one. All of the farms after their final development will consist of 154 wind turbine generators. In the same area there are also other developments of the same type, so the total number of turbines will exceed 160. Such number of turbines may potentially generate a cumulative impact on birds.

The wind farms, based on literature search and birds monitoring undertaken prior and in case of Margonin also after construction of the wind farm indicated, that the wind farms are not located in a way that affect local, regional or over-regional ecological corridors important for birds. The wind farms development areas were found to be not of particular importance for birds in all seasons of the year, inclusive of nesting and migration periods. This fact is reflected in the observed impact on birds during a post-construction monitoring at the Margonin wind farm. The monitoring results for the first year of observation revealed 17 birds killed by the wind farm, which corresponds to a mortality rate of 0.28 casualties per wind turbine. Such mortality rate shall be classified as low, as the average rate for European and US wind farms is 1.96 casualties per wind turbine per year. The monitoring also revealed that the birds concentrate mostly on the outermost parts of the wind farm, however, some species penetrate also its internal parts. As all of the wind farms are located in the similar areas of rural character it can be expected that birds will behave similarly at both Pawłowo wind farms, however, no significant barrier effect will be generated as the wind turbines are located unevenly so the birds locally present should be able to travel avoiding the turbines.

Construction of the new PTL may generate cumulative impact with the existing 110 kV PTL and other medium voltage PTLs present in the area, as these cross in perpendicular direction the Natura 2000 area which is also a birds migration corridor of an over-regional importance. Potential for such cumulative effect should be subject to detailed analyses as a part of environmental impact assessment that will need to be undertaken for this development. At this stage it is hard to choose appropriate mitigation measures to mitigate a cumulative effect of the existing and newly planned 110 kV PTLs. As a precaution measure it can be predicted that the PTLs should be equipped with birds' dissuasive markers.

The areas of the wind farms were also monitored for potential impact of the wind farms on bats. At the Pawłowo sites a pre-construction monitoring was undertaken and at the Margonin one a post construction one. In all cases the sites were found to be of a limited attractiveness for bats. The monitoring at Margonin wind farm indicated low mortality of bats (mortality rate of 0.43 casualties per wind turbine per year). As the bats operate there rather locally and wind turbines are located far from potential migration corridors, no cumulative impact on bats is expected. Such impact is also not expected for newly planned and existing 110 kV PTL.

## 6 Social Matters

Social benefits of the project were discussed in the ESDD report. As established during the site inspection tour in January 2013, at all involved communes the developments are considered to be a source of substantial income to commune budgets. In 2012, the taxes paid by EDPR for buildings, structures and infrastructure amounted approximately 5.5 million PLN, which was approximately 20% of the commune budget. Proportionally similar amounts will likely be paid to Gołańcz and Budzyń communes and will constitute approximately 20% and 10% of the communes' budgets respectively. As established during discussions with the local authorities, these incomes are not intended for certain communal developments, but rather support general spending of the communes on development and maintenance of local infrastructure and other communes' needs. It was also stressed by the authorities that such additional incomes help the communes in applying for the EU financial programs by increasing available own financial contributions required by such programs.

Apart from taxes the company also supports local societies by donating local initiatives and arranging pro-ecological events. In 2012 the company spending on such supporting in the Margonin and Gołańcz communes exceeded 1 million PLN. The company intends expand such supporting activities also in Budzyń commune.

Land lease fees are paid by the company to landlords on whose properties either wind turbine generators or other elements of wind farm infrastructure (e.g. access roads) have been developed. These impact in a positive way the local economy.

As part of the investment, the company also develops local roads, either by mean of construction of new or remodeling of existing ones. Such infrastructure remains in the communes after completion of the construction works and improves local road network which is also used by the citizens of the communes.

As confirmed in the commune offices during the site visit in January 2013, the authorities do not observe social conflicts related to development (Pawłowo sites) or operation (Margonin site) of the wind farm. The protests raised by the groups of individuals in Margonin and Gołańcz communes had an incidental character and were likely initiated by a limited group of people of definitely negative attitude to wind farms at all. The positive attitude of the communes' citizens is confirmed by the results of a survey conducted on request of EDPR by an independent PR company along with Pentor (public opinion research company) in 2010 and 2012 in the Margonin and Gołańcz communes. The survey indicated, that number of citizens who represent negative attitude in the wind farm in their communes dropped within these two years from 35% to 15% in the Gołańcz commune, and from 20% to 9% in Margonin commune. Although in the Margonin commune number of citizens of a positive attitude decreased from 47% to 45%, the number of these with a neutral attitude increased from 33% to 47%. These figures indicate that the negative social impact generated by the Margonin wind farm is small and acceptable by the majority of citizens. This also confirms

**FINAL**

that the social actions conducted by EDPR along with information campaigns and adequate reactions in response to the submitted grievances are effective in the Margonin commune. As the company continues the practice of wide information campaigns also in Gołańcz commune and intends to do the same in Budzyń commune, no significant social matters are expected to appear after the entire project is operational.

## 7 Information Disclosure and Society Involvement

EDPR maintains an active disclosure of project related information and external communication focused on building a good understanding of the project among the local society, NGOs and authorities. The engagement activities conducted so far by the company have been focused on the following fields:

- communication with administration, environmental and sanitary authorities and other institutional stakeholders as well as with the local communities and NGOs, as part of the project developments, in particular at the stage of environmental impact assessments of the wind farm projects, and
- propagation of facts about renewable energy in general and wind energy in particular, and
- distribution of basic information about project development milestones among the citizens of communes at which the company operates or develops the wind farms.

Following the Polish EIA act, the responsibility for information disclosure and public participation in the process of project environmental impact assessment bear the authorities in charge. However, the company, apart from standard communication with respective bodies (commune offices, environmental authorities, different institutions that consult the reports, consultants involved in on-site nature inventories and monitoring, environmental consultants preparing EIA report etc.), also actively participate in public consultation process during EIA assessments. Among others, the company participated in a public hearing in October, 2010 which was part of the consultation within the Pawłowo-Gołańcz wind farm EIA procedure. For the next two days the company arranged public consultations points in four villages in an influence range of the wind farm. Similar public hearing for the 6 MW part of the Pawłowo-Gołańcz wind farm was organized in December 2010. In both cases, information about the public hearings and distribution points was widely distributed by announcements on the Communes websites, in local press and periodical bulletins. Similar actions are planned to be conducted in the Budzyn commune in order to support public consultations process conducted by the authorities within the EIA procedure for the planned Pawłowo-Budzyń wind farm.

Apart from the information disclosure via media and notifications, the company arranged the Project Information Points (PIP) at the authorities' offices of Margonin and Gołańcz communes. Copies of documents comprising the disclosure package are available there for review. Public grievance forms are also available as well as contact details to the company. The PIPs are maintained by the authorities, no EDPR staff is involved directly there..

Since mid-2010 the company uses an assistance of a professional PR company to maintain communication with citizens of Margonin and Gołańcz communes in a professional way. It is planned to expand this cooperation also to the Budzyń commune.

Communication with the citizens is focused on:

- to keep the citizens informed about the project;
- to distribute knowledge about renewable energy principles and impacts generated by the project;
- to build-up environmental awareness of the society.

In order to keep the local society up-to-date about the project development, a periodical bulletin is published and distributed per free to the households. The bulletin, which is published on as needed basis (from one to few times a year), presents facts about the wind energy and project development. In each edition also all contact details to EDPR are provided.

Apart from the bulletins, the information about the project is also published in the local newspapers (Głos Wągrowiecki and Tygodnik Wągrowiecki, Chodzieżanin), in a form of ecology-oriented pull-outs or interviews with EDPR specialists and local administration representatives.

An important part of the company PR activities are social events arranged to promote environmental awareness and support provided to local schools and kindergartens. Among others, the following were organized:

- educational events at schools;
- provision of multimedia classrooms for foreign languages in the schools in Gołańcz commune and computer classroom in Margonin;
- financial support to cultural events arranged by the Gołańcz commune;
- sponsoring of an ecological performance “The Wind Mills Family” for kindergartens;
- arrangement of acoustic workshops for pupils from the secondary schools;
- founding, preparation and distribution of 800 giftpacks for children in local schools in Margonin
- founding of scholarships for best students in ecology issues from schools in Margonin and Gołańcz;
- sponsoring of Wiatrakalia festival in Margonin,

and others.