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## **18. NON TECHNICAL SUMMARY**

Relax Wind Park company intends to build the 5<sup>th</sup> district of the Margonin Wschód Wind Farm consisting of 9 items of power station of 2MW of power each. The power stations will be installed on 100-metre-high pipe structures. The investor is going to install GAMESA turbines, type G90.

The electric power from individual turbines will be transmitted through cable routes of 30 kV voltage to the subscriber station Margonin 110/30 kV where the energy is going to be transformed into the 110 kV voltage. From the subscriber station Margonin to the PKE, belonging to Polskie Sieci Elektroenergetyczne where the energy reception point is, the energy is going to be transmitted through the modular line of 110 kV, which is 25 km-long and belongs to the Investor. This line will be hung on the pylons belonging to Zakład Energetyczny ENEA which will lease “the room on pylons” to the Investor.

The study analyses all impacts of the investment on the environment in the course of construction and later use of the wind power plant. The analysis includes the following elements of the natural environment: the land surface and the ground substrate, surface and subterranean waters, atmospheric air, acoustic climate, landscape, flora, fauna and avifauna surrounding the investment as well as health and live of people. The conclusions of this analysis are the following:

Interference in the land surface and ground substratum connected with performing construction pits for the foundations. The depth of the earthwork may reach 4 m under the surface area and may cause collision with the first water-bearing horizon. Therefore, designing the foundations must be preceded by a detailed hydro-geological as well as geological and engineering study. Specialist knowledge will permit to choose the optimal way of laying foundations, the optimal size of them and the way of possible draining of the pits.

After filling in the pit the rich layer removed and stored will be spread evenly on the whole surface of the filled in pit. In this way the initial features of the ground will be restored.

The excess of the soil removed while laying the foundations will be used to restore the degraded areas in the Margonin commune.

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Bigger noise, vibrations and traffic will also be a temporary nuisance to sensitive species of birds and mammals which will leave the areas migrating to the neighbouring areas. The exception will be the species which easily undergo synanthropization and have high adapting

skills in changeable environmental conditions. The occurrence of have high adapting skills in changeable environmental conditions.

Producing waste which will be managed in accordance with the regulations in force At the stage of the implementation of the investment, attention should be paid to health and safety of employees who should have proper qualifications and be trained in safety and hygiene regulations including rescue procedures.

At the stage of exploitation the most serious impact on the environment has been identified in the area of landscape and acoustic climate change.

Due to the predicted scope of impact of the wind power complex, there has been an analysis carried out of the level of noise produced in the environment within the limits of the existing residential housing and in the housing areas connected with permanent or many-hour stay of children and teenagers.

The basis for calculations and identifying the scope of impact of wind power stations, the data included in the documentation and technical information delivered by the turbines' producer, the GAMESA company has been assumed.

In order to illustrate the impact on the environment of the wind farm discussed, the calculated levels of noise immision were compared with the levels allowed in the homestead housing which amount to 55 dB for daytime and 45 dB for nighttime. The values of noise immision obtained and presented on the map which illustrates the acoustic climate in the vicinity of the wind farm discussed do not exceed the amounts allowed for the homestead housing for daytime and nighttime in the area where the housing is situated. The maps illustrating acoustic climate constitute annexe No 3.

The implementation of the investment will result in building 10 items of wind power stations in the form of 100-metere towers with a gondola installed at the top and with a rotor of 90-metre blade span. The maximal level above the ground outlined by the blade is 145 m. These objects will tower over the surroundings including forests and will be seen even from significant distance.

Undoubtedly, these will be objects as alien to the landscape fixed over the years as initially any object introduced to the environment as part of any investment.

It should also be remembered that the expected "lifetime of the product" given by the producer is 25 years. After this period the disassembly of the power station is planned.

Probably already the next generation will make a decision on the possible reconstruction of the objects or replacing them with new, more modern ones.

It should be stressed that the assessment of the influence of the wind farm on the environment is a subjective one and depends on the individual approach.

The pictures below present the visualization of the landscape after implementation of the project. The couple of photographs present the landscape before the construction works (real background) and a simulation of the view after building the farm. The pictures have been taken from defined vantage points at the level of human dwellings.

The existing investment may also be the cause of collisions with birds dwelling in the area. In order to limit the adverse impact of the Margonin Wschód wind farm on avifauna, there have been area observations of birds carried out in the neighborhood of the planned investment. Analyzing the conducted studies and the map including power station locations in the area of the Margonin commune it can be stated that having implemented the investment there should be no collisions of birds with the wind farm.

The location of the farm should not have influence on the migration of birds in the Noteć Valley (Nature 2000).

The planned Margonin Wschód wind farm **will not be** located on marshy areas with gatherings of bog and meadow plants or on permanently wet and flooded areas so it will not be located on areas attractive to birds. The area designed for the investment is also located outside dense forest complexes, precious plants gatherings or bogs. During the inventorying and observation works the area was not found to be important for birds (attractive feeding grounds, routes of regular migration passages, routes of regular passages to feeding grounds or roosting places).

It is proposed, after completing the investment, to carry out a two-year observation of birds with special intensity in migration periods. This will permit to obtain close to real information on real dangers or lack of danger to the avifauna, both the migrating one and the one dwelling in the vicinity of the Farm.

Having completed the Margonin Wschód wind farm it is assumed that the wind power plant will undergo control concerning the measurement of noise level and observation of birds.

Finally accepted version of location of 10 power stations fulfills all requirements and conditions following from the environmental protection regulations and principles of sustainable development.

The power stations proposed to be installed are highly modern and take full advantage of technological innovations regarding methods of producing energy from the power of wind.

The possibilities of preparing variants have been analyzed on the basis of material gathered in the initial designing phase. Preparation of variants of investment, important from the perspective of environmental protection included the following choices:

/ Location in the chosen region of the country from the perspective of winds characteristics, the speed and frequency of them with interesting, possibly high speeds,

/ Location from the perspective of possibilities and costs of construction being the result of the prospects for winning the land, geological-engineering conditions, conditions for transport of construction elements,

Location from the perspective of acoustic protection of developed areas,

/ Location from the perspective of birds' protection,

/ Choice of power station from the perspective of the effectiveness of work, efficiency ratio, costs of purchase and use.

Distributing individual object of the wind farm, division into location groups follows from the computer analysis which takes into account:

- dominant wind directions,
- existing state and way of land development and use of areas, which includes distribution of residential housing, forests, farming land, existing access roads,
- 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.

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 chosen the products of GAMESA company for the following reasons:

- the chosen model is a turbine with three blades with a changeable angle of wind friction,
- this model has a diameter of 90 m and is equipped with a technology which allows for work with variable rotation speed and in the same way enables optimal use of aerodynamic efficiency of the rotor,
- the chosen model has a technology for fluent and steady regulation of the gradients of blades , optimal for the current state of wind. This enables maximizing of power and at the same time minimizes the level of emitted noise.

Works consisting in placement of power stations and successive preparation of variants of individual power stations' location took several months.

Too much density of power stations on a small area results in immisions of noise accumulating and exceeding the permitted levels of noise with regard to protected areas. According to the ordinance of the Ministry of Environment of 23 December 2004 on requirements concerning measurements of the volume of emission, (Dz.U. No 283, item 2842) the measuring-computing methodology has been chosen as one of recommended methods which allows for objective assessment of the analyzed installation.

The analysis of noise conducted with the use of computer programme HPZ'2001 version November 2006 and the manual 338/2005 „Methods of defining emission and immision of industrial noise in the environment” stated that the power station no 10 should be soundproofed from the level of 106 dB(A) to the level of 104. In the Margonin commune there can be observed strong social support for the idea of building a wind farm. Both meetings with the authorities and the inhabitants of the commune as well as the process of signing agreements for lease and letting the land be used for building power stations, laying underground 30 kV cables and temporary roads, indicates that the local community pin their hope to the construction of the wind power plant.

The investor has located the wind power plants in such a way as not to cause collision with the residential or settlement housing with regard to safety or necessity of protection against noise.

The society of the Margonin commune has been notified of the planned investment through advertisement printed in the local press: “Tygodnik Pilski” and in “Margoniński Informator Samorządowy - Biuletyn Urzędu Miasta i Gminy Margonin”. “Tygodnik Pilski” is the most popular weekly in the area of the former Pilskie Province including the area of the Margonin commune. While “Biuletyn” is a free newspaper delivered together with the mail to every inhabitant.

The above mentioned report on the impact of the planned undertaking on the environment will be made available for inspection of the interested inhabitants of the Margonin commune. The inhabitants, after acquainting themselves with its contents, will be invited to ask questions touching the bothering issues with regard to the planned investments.

The existing farm in the area of Margonin commune will bring the commune income in the form taxes: the land tax on construction sites reserved for building a power station, roads and squares, tax on the value of installed facilities – power station and GPZ.

Also the inhabitants of the communes where an individual power station will be located will receive the annual payment from the Investor for the lease of lands.

After completing the investment there will be a special educational programme run at schools concerning the renewable sources of energy.

One should express hope that the actions of the investor taking into consideration the basic interest of environmental protection will lead to peaceful completion of the plan.