Track One
Joint Implementation
Project Design Document

Project of 48 MW_{el} wind farm Gołdap

Goldap 2007 Management GmbH EW Gołdap sp.k

Version I

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Cracow

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BIBLIOGRAPHIC REFERENCES

1) Acts of law

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(1) Protokół z Kioto do Ramowej konwencji Narodów Zjednoczonych w sprawie zmian klimatu, przyjęty w dniu 11 grudnia 1997 i wprowadzony w życie w dniu 16 lutego 2005.

ii) European

(1) DIRECTIVE 2003/87/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.
(2) DIRECTIVE 2004/101/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 October 2004 amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms.
(3) DIRECTIVE 2009/28/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subseqEUntly repealing Directives 2001/77/EC and 2003/30/EC.
(4) COMMISSION DECISION of 10 February 2005 laying down rules implementing Decision No 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol.
(5) COMMISSION DECISION of 13 November 2006 on avoiding double counting of greenhouse gas emission reductions under the Community emissions trading scheme for project activities under the Kyoto Protocol pursuant to Directive 2003/87/EC of the European Parliament and of the Council.
(6) COMMISSION DECISION of 18 July 2007 establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council.

iii) National

(1) Environmental Law (act) of 27 April 2001 (Polish Journal of Laws no. 62 item 627).
(2) Act on the system of managing emissions of greenhouse gases and other substances of 17 July 2009 (Polish Journal of Laws no. 130, item 1070).
(3) Act on the greenhouse gas emission allowance trading scheme of 28 April 2011 (Polish Journal of Laws no. 122, item 695).
(4) Regulation of the Ministry of the Environment on the types of projects that may significantly affect the environment and detailed conditions for qualifying projects to draw up a report on environmental impact of 9 November 2004 (Polish Journal of Law no.257, item 2573) – repealed as of 15 November 2011.
(5) Regulation of the Ministry of Environment on the types of projects which may be implemented as Joint Implementation projects in Poland of 26 August 2010 (Polish Journal of Laws no.167, item 1132).
(6) Regulation of the Ministry of Environment on the detailed scope of information contained in project documentation of 3 December 2010 (Polish Journal of Laws no.240, item 1608).

(7) Regulation of the Minister of Environment dated 10 November 2010 on the report of the JI project monitoring and verification report on the number of emission reduction units resulting from the Joint Implementation project (Polish Journal of Laws no.225, item 1472).

2) Strategies and policies

a) STATE ECOLOGICAL POLICY 2009-2012 wit the prospect of the 2016 (document adopted on 22 May 2009).
b) STATE CLIMATE CHANGE POLICY – Strategies aiming at greenhouse gases reduction in Poland up to 2020 (document adopted on 4 November 2003).
c) STATE ENERGY POLICY 2025 (document adopted on 4 January 2005).
d) DEVELOPMENT STRATEGY ON RENEWABLE ENERGY SECTOR (document adopted on 5 September 2000).
e) POLAND SUSTAINABLE DEVELOPMENT STRATEGY 2025 (document adopted on 25 July 2000).
f) NATIONAL DEVELOPMENT PLAN 2007-2013 (document adopted on 11 January 2005).

3) Raporty i analizy

a) The „Wind power development in Poland by 2020 – a vision" report – Polish Wind Energy Association, January 2010.
b) The „Wind energy in Poland 2010" report – „Raport Energetyka Wiatrowa w Polsce 2010" - TPA Horwath, Domański Zakrzewski Palinka, November 2011.
c) The "Barriers for energy sector" report - Polish Confederation of Private Employers in Energy Sector, Polish Confederation of "Renewable Energy Forum", May 2011.

4) Project reference documents

Environmental Impact Assessment				
No.	Title	Company	Authors	Date
1	Environmental Impact Assessment - Wind farm in the vicinity of Goldap at the stage of setting development conditions with the addition as of 11.02.2008.	EKO-Wiatr sp. z o.o. Jabłońskie 5 street 19-500 Gołdap	mgr Ewa Tymińska mgr Edward Tymiński	July 2004
2	Environmental Impact Assessment - construction of 23 wind power plants (capacity of 3 MW each) in Gołdap municypality, in plots of land of the following registration numbers: 145/11, 122/70, 122/71, 134/3, 16/1 and 122/73 in the district of Jabłońskie, 40/13 and 48/3 in the district of Osowo, 24/37, 24/38, 24/39, 1/5, 1/6, 1/9, 24/41 and 24/34 in the district of Suczki, 162/1 in the district of Kośmidry and 155/20, 155/18,134/52, 48/9, 277/23 and 146/10 in the district of Marcinowo	EKO-Wiatr sp. z o.o. ul. Jabłońskie 5 19-500 Gołdap	mgr Ewa Tymińska mgr Edward Tymiński	March 2008
3	Report on the inventory of birds in the Wind Park Gołdap	----------	Szymon Czernek	December 2009
4	The report on the environmental noise, derived from plant or equipment, made by sampling method.	HEKO Miodowa 2A/2 street 60-591 Poznań	Halina Karmolińska-Słotkowska	April 2011

Environmental permits and regarding to spatial development			
No.	Title	Author	Date
1	Environmental decision no. GPO.7624 W.5 /49/ 2007 – Wind Farm Gołdap	Mayor of Gołdap	25.04.2008
2	Decision no. GPO.7331.cp-8/04 - location of a public investment	Mayor of Gołdap	10.06.2005
3	Decision no. GPO.7331.cp-8/04/07 - amending the decision on the location of a public investment	Mayor of Gołdap	04.07.2007
4	Decision no GPO.7331.cp-8/04/08 - amending the decision on the location of a public investment	Mayor of Gołdap	16.01.2008
5	Decision no GPO.7331.cp-29/08 - - location of a public investment (final)	Mayor of Gołdap	07.10.2008

There was no requirement to obtain environmental decision for:
1. Station
2. Cable lines
3. Access roads
4. Terminal

Construction permits			
No.	Title	Author	Date
1	Decision no. BiOS.7351-gG-87/08 - Construction permit for wind farm	Governor of Gołdap	30.05.2008
2	Decision no. BiOS.7351-gG-254/09 – Construction permit transferred to the SPV	Governor of Gołdap	03.02.2010
3	Decision no. BiOS.7351-gG-14/09 –Construction permit for terminal (2x110kV)	Governor of y Gołdap	09.02.2009
4	Decision no. BiOS.7351-gG-195/08 – Construction permit for main power station	Governor of Gołdap	19.12.2008
5	Decision no. BiOS.7351-gG-157/2010 – Main power station construction permit transferred to the SPV	Governor of Gołdap	19.05.2010
6	Decision no. BiOS.7351-gG-158/08 – Construction permit for cable route	Governor of Gołdap	07.11.2008
7	Decision no. BiOS.7351-gG-100/10 – Cable route construction permit transferred to the SPV.	Governor of Gołdap	04.08.2010

Construction permits			
No.	Title	Author	Date
8	Decision no. BiOS.7351-gG187/2010 – Replacement decision for construction permit for cable route.	Governor of Gołdap	19.11.2010

Operational Permit			
No.	Title	Author	Date
1	Decision no. PINB.7353-89/G/10 – Wind farm Gołdap – operational permit	District Inspector of Building Control in Olecko	15.11.2010
2	Decision no. PINB.7353-65/G/10 – Wind farm Gołdap station operational permit	District Inspector of Building Control in Olecko	16.09.2010

ABBREVIATIONS

Units of measurement:

CO_2	Carbon dioxide
GWh	Gigawatt hour
km	Kilometre
kV	Kilovolt
kW	Kilowatt
m	Meter
Mtoe	Metric ton
MW	Megawatt
MWh	Megawatt hour
t	Ton

Names:

EU ETS	European Union Emission Trading System
WF Gołdap	Wind Farm Gołdap
GPZ	Main Power Supply station
JISC	Joint Implementation Supervisory Committee
KfW	German Bank for Development
NFOŚiGW	National Fund for Environmental Protection and Water Management / Narodowy Fundusz Ochrony Środowiska i Gospodarki Wodnej
MŚ	Ministry of Environment / Ministerstwo Środowiska
PSE	Polish Power Grid Company / Polskie Sieci Elektroenergetyczne S.A.
PSEW	Polish Wind Energy Association / Polskie Stowarzyszenie Energetyki Wiatrowej
EU	European Union
URE	Energy Regulatory Office / Urząd Regulacji Energetyki
UNFCCC	United Nations Framework Convention on Climate Change

Definitions:

AAU	Assigned Amount Units
AIE	Accredited Independent Entity
BAT	Best Available Technology
ERU	Emission Reduction Unit
GHG	Greenhouse Gases
JI	Joint Implementation
NAP	National (Emission) Allocation Plan
RES	Renewable Energy Sources
PDD	Project Design Document

1. GENERAL AND TECHNICAL DESCRIPTON OF THE PROJECT

A. Name/Title of the project

Title of the project: **"Joint Implementation Track One Project of 48 MW wind farm Gołdap"**

Sectoral scope(s): (1) Energy industries (renewable/non-renewable sources)

B. Location of the project – voivodeship, commune, city/town, address, property parcel number

Gołdap Wind Farm is located in north-eastern part of Polish, in the Warmian-Masurian Voivodeship, the District of Gołdap, in municipality of Gołdap, about 5 km from the city Gołdap and about 8.5 km from the Polish-Russian border (Kaliningrad Oblast).

Figure 1 Localization of the project

The terrain is hilly with a number of heights of from 174 to 275 m.a.s.l. The area is rich in forests and moraine lakes. The area consists of moraine deposits from the last glacial period, Pomeranian phase. It is the northern part of the moraine plateau called Szeskie Wzgórza. Terrein rises from the North West towards the South.

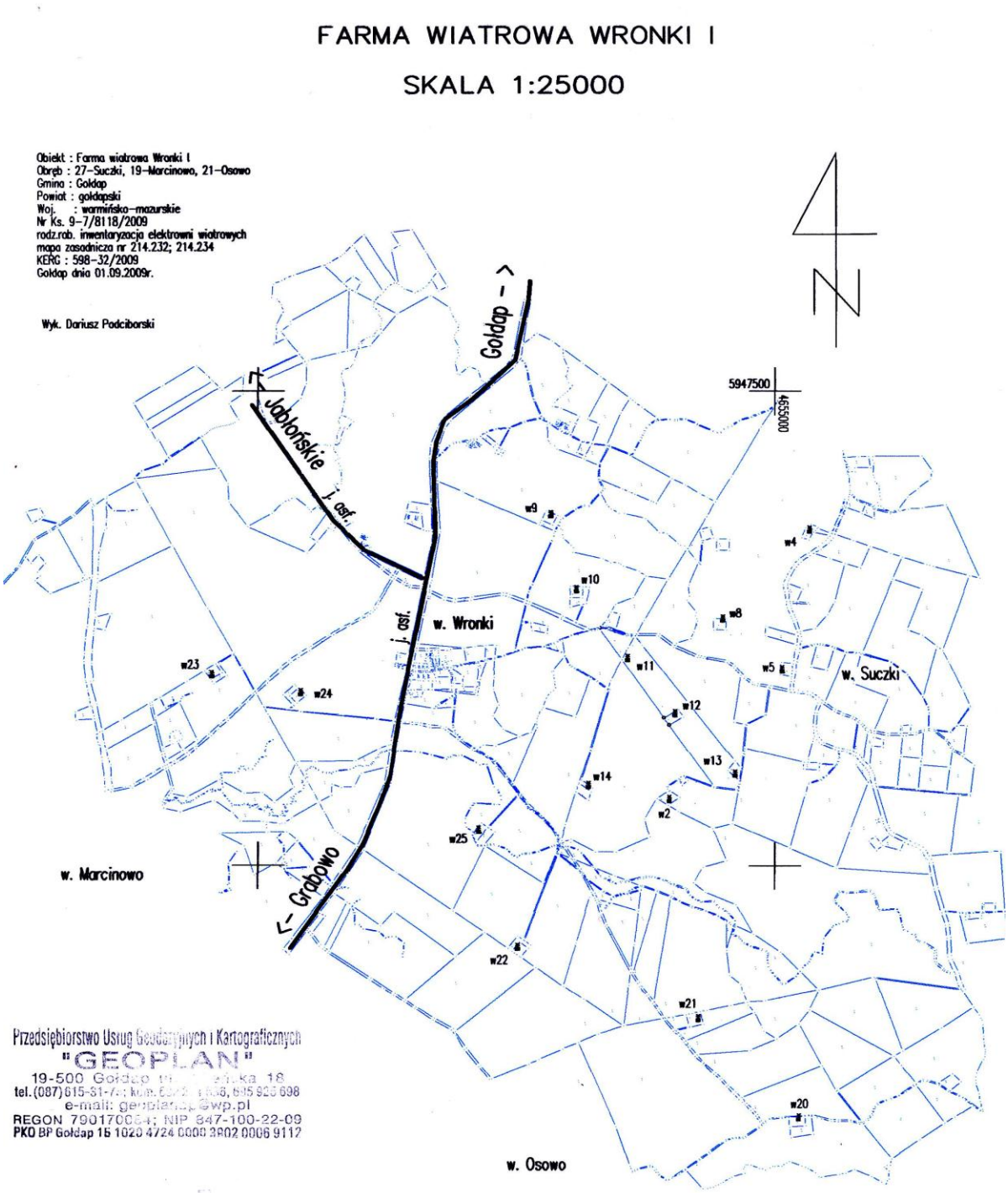

Figure 2 Location plan of the wind turbines

WF Gołdap consists of 16 Vestas V90 turbines 3MW capacity each, with possible extension for further seven plants. The project includes also an underground cable route of medium voltage (MV), access roads to the turbines and the main power station, installation site and the mainpower supply point.The masts have a height of 105m, and at the top there is a gondola with electric power generating devices, control equipment and the hub with the wind turbine blades, which describe a circle of 90m.

The project covers the area to the east of the road from Gołdap to Wegorzewo and south of the village Wronki. Distance from the nearest building is 400m. Both the distance from the point of delivery of energy and the distance between the masts are 300m. The location of the investment includes three geodesic districts of the Gołdap municypality: Suczki, Marcinowo, Osowo.

identification numbers of the parcels on which the wind farm is located:

Wind turbine no.	District	Lot
2	Suczki	24/34
4	Suczki	1/9
5	Suczki	1/6
8	Suczki	1/5
9	Marcinowo	134/52
10	Marcinowo	146/10
11	Suczki	24/37
12	Suczki	24/38
13	Suczki	24/39
14	Suczki	61
20	Osowo	48/3
21	Osowo	40/13
22	Marcinowo	155/20
23	Marcinowo	48/9
24	Marcinowo	277/23
25	Marcinowo	155/18

Table 1 Lots numeration – WF Gołdap

For the purposes of the project the GPZ station Gołdap 20/110kV and the access roads of 665m to the station were built and are located on parcels no.: 1/16; 1/17; 1/14 in the geodesic district of Suczki. Also there was built the cable line MV 20 kV with a total length of 12 809m. The measuring station was designed as overhead, double-section, single-system switch gear 110kV. Its point of connection is the station 110/kV Wronki. The energy is measured in two transformer fields 20/110kV (site 110kV) and in two linear fields 110kV, according to the conditions of PGE Dystrybucja Białystok sp. z o.o.

C. Aim, type and realization period of the project

The essence of the project is to build a wind farm in the municipality of Gołdap, in close proximity to the spa town Gołdap, located in the Warmińsko-Mazurskie Voivodeship. The total installed nominal power is 48 MWel. It consists of 16 Vestas V90 turbines, of 3 MW_{el} installed capacity each. Apart from the wind turbines, the accompanying infrastructure was also developed, which consists of technical success roads, main power station 20/110kV, cable lines connecting the power plants, measuring power station and the measuring station with the point of connection and fibre optic lines connecting plants with each other and a with a common system of supervision.

The purpose of the Project is to produce electricity from wind turbines, i.e. to transform wind energy to electricity using technical devices and to transmit this energy to consumers using 110 kV distribution grid power system, on the basis of a power purchase agreement (energy produced in wind park Gołdap) concluded with Polska Energia PKH Sp. z o.o. on 28.10.2010 in Katowice (previous energy sales contract included the commissioning was also concluded with Polska Energia PKH Sp. z o.o. on 06.01.2009).

The result of the project is the wind-generated electricity, that replaces the grid electricity (which is mainly generated by conventional power plants based on coal). It contributes to greenhouse gases (GHG) reductions within the Polish power system – in this case there is a direct double counting of CO_2 emission in EU-ETS installations.

The project belongs to the category of activities accepted for the implementation within the JI mechanism in Poland and is one of the types of activities (section 2.1 d use of renewable energy source) listed in the decree of the Minister of the Environment of 26th August 2010 on types of activities **that may be implemented as Joint Implementation projects in Poland** (Polish Journal of Laws no. 167, item 1132).

The project relate to fully implemented and finalized investments.

This project, as displacing electricity in the Polish national grid, lead to reducing or avoiding of the greenhouse gas emissions from installations covered by the EU ETS (Art. 38, section 1a of the Act on the system of managing emissions of greenhouse gases and other substances). According to the act, such activities may acquire the status of JI, even if at the time of application for a LoA had already been implemented and operated.

The project is not a method of complying with obligations deriving from the EU or national legal regulations.

Figure 3 WF Gołdap panorama

The wind conditions prevailing at the site are very favourable for the Project. The estimated annual electricity production of around 116GWh was calculated and the anticipated operational lifetime of the investment is 20 years. Calculations used for wind park has are in line with the International Standard IEC 61400-1 third edition. Calculations were made based on a conservative and cautious assumptions, the proof of this is that only in the first half of 2011 the wind farm Gołdap produced electricity in the total amount of about 55GWh. Efficiency ratio of the wind farm is estimated at around 93.5%.

The preparation process, from obtaining a report on the environmental impact of the project (July 2004), by obtaining a decision on location of a public investment (06/10/2005) and conditions for connecting to the network (14/11/2006) and ending with project work preceding obtain the building permit, **began 6 years before starting the construction of a wind farm.** The beginning of on-site construction works took place in July 2008. Completion of work took place in September 2010. In October the operational start-up took place and the farm started continuous production of electricity (in the period from 11. to 15.12.2010 farm did not work due to the modernization of 110kV lines, to which it is attached). In November 2010 the company received operational permit and it was the final launching of the project. License for electricity production has been issued 17.02.2011.

The implementation of the Project is in accordance with the assumptions of the sustainable development policy and Poland's ecology, climate and energy policies. Besides, the realization of the Project in line with the Polish environmental and power sector development policies and will help Poland to meet the indicative target of 15% of gross energy consumption coming from renewables by 2020, and what follows – it enables fulfillment of the commitments made by the EU countries within the so called 3x20% climate and energy package (towards the 7% RES share in the national energy balance by the 2009).

Among the most commonly known types of renewable energy sources (hydropower plants, biogas plants, wind farms, solar), according to many industry experts, only wind farms can significantly contribute to the realization of the assumptions of EU pro environmental policy. Experiences of other countries (e.g. Germany) clearly show that the leading position among different types of RES technology, in countries that have similar geographic conditions, is being taken by wind energy and wind farms. Also **in Poland wind energy is currently the most dynamically growing branch of renewable energy.**

D. Name and address of the developer and owner of the project

Name of the entities authorised by eligible countries to implement the project:

POLAND:

Goldap 2007 Management GmbH
EW Gołdap sp.k.
Malczewskiego 26 street
71-612 Szczecin

Court register No.	0000328017
Tax reg No.	847-154-88-88
National Official Register of Business Entities:	280085249

Representation: proxy Adam Pantkowski

Project developer:

Vortex Polska Management sp. z o.o.
Vortex Polska sp. k.
Malczewskiego 26 street
71-612 Szczecin

Court register No.	0000335246
Tax reg No.	559-195-86-99
National Official Register of Business Entities:	340211771

Representation: Adam Pantkowski and dr Till Jeske

Project owner:

Goldap 2007 Management GmbH
EW Gołdap sp.k.
Malczewskiego 26 street
71-612 Szczecin

Court register No.	0000328017
Tax reg No.	847-154-88-88
National Official Register of Business Entities:	280085249

Representation: proxy Adam Pantkowski

E. Project developer's and project owner's experience in projects realization, including projects that are being developed and not operating yet and description of authors and co-authors of technologies and solutions applied in the project

Company structure

Wind farm Korsze was developed by the special-purpose vehicle **Goldap 2007 Management GmbH EW Gołdap sp.k.** The ownership structure in 100% based on resources of Vortex capital group. The scheme of the ownership structure:

A. **Goldap 2007 Management GmbH EW Gołdap Sp.k.**
    a. Goldap 2007 Management GmbH
        i. Windpark Goldap GmbH & CO KG
    b. Windpark Goldap GmbH & CO KG
        i. Goldap 2007 Management GmbH
        ii. Vortex Polska Management Sp. z o.o. Vortex Polska Sp. k.

Experience

Vortex Energy Company GmbH & Co. KG. KG was established in 2004 by two partners: Till Jeske and Claudio Papa as a civil partnership Vortex GB. In early 2008 it was transformed into the current company Vortex Energy GmbH & Co. KG. Beyond the two founders there were also Heinrich Jeske and Holger Fritsche, who brought their long-term experiences related to wind energy.

After early successes in the field of project planning and after obtaining the appropriate administrative permits for the **construction of wind farms in the village Zodel and Siersleben** in Germany, **Vortex Anlagenbau GmbH** z o.o. was established which has specialized quickly proved itself in carrying out projects.

After the decision to expand the business into international markets, by adopting new partners: Adam Pantkowski

and August Abing, in 2006 limited liability company - **Vortex Poland was founded (in 2009 transformed into a limited partnership). In a short time the company has prepared an excellent portfolio of ready to execute projects of a total capacity of 146 MW. Vortex Company Anlagenbau GmbHch took up implementation.**

In 2009 **Czysta Energia spółka z o.o. was established. The scope of the its duties shall comprise services consisting of technical and commercial management of wind turbines for operating companies.** For emerging wind farms special purpose vehicles are established whose ownership structure and capital are identical. They are engaged in the operation of completed projects. The group independently and comprehensively plans and prepares projects in the field of wind energy, including legal and ownership issues. In addition, it implements and supervises the construction of the installation. Additionally operating companies engage in the management of economic projects and provide their services outside as outsourcing.

Completed projects:

In Germany:

- Zodel II - 6,9 MW
- Sierleben -10 MW
- Einsenach I - 4 MW
- Wundersleben - 6 MW
- Burbach - 6 MW
- Eisenach II -12 MW

In Poland:

- WF in Śniatów - 32 MW
- WF in Gołdap / Wronki - 48 MW
- WF in Dobrzyń - 34 MW
- WF in Mogiln - 34 MW
- WF in Inowrocław - 32 MW

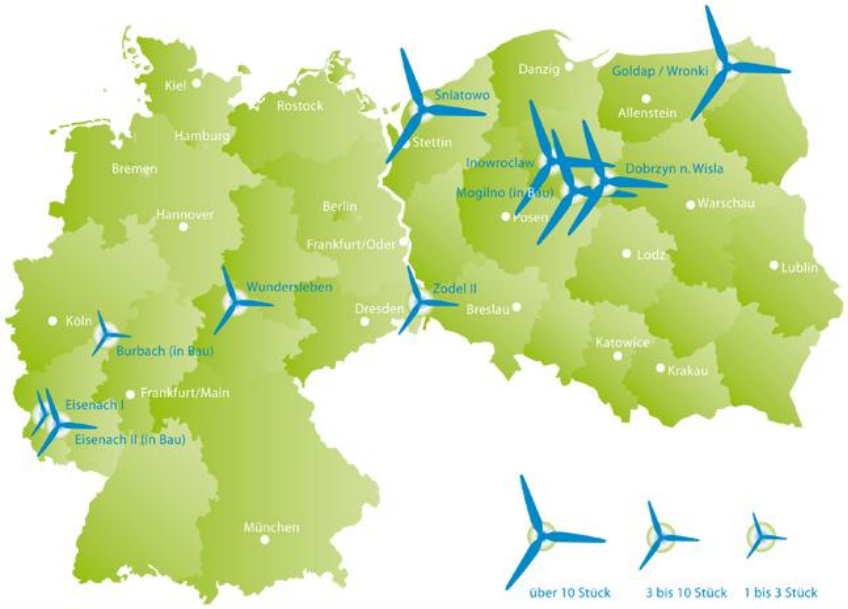

Figure 4 Localizations of the Project developer's projects

Authors of technologies applied in the project

Technology applied in the project – converting wind energy into electricity by the use of wind turbines – is very common and it is also one of the best available techniques (BAT) and is being applied successfully in many countries worldwide. Wind farms are zero-emission, their development and operation contributes to GHG emission reduction.

The scope of investment covers the following technological components:

- **The total installed nominal power is 48MWel.** It consists of 16 Vestas V90 wind turbines with a capacity of 3MWel each; main turbine parameters are: rotor diameter - 90m, sweeping surface - 6.362 m2, rotation range - 8,6-18,4 rev / min.
- The cut-off wind speed equals v = 25 m / s. Towers are made of prefabricated tubular steel technology, with a height of up to 105 m.
- Each generator is equipped with the lightning protection. Generator's gondola automatically follows the wind direction.
- Electricity generated in the wind turbines is transferred through 20kV line (medium voltage) to 20/110kV substation. The transformer station is located within the municipality Goldap and it is shared by all wind turbines. The total cable length is 12 809m.

V90 wind turbines are first class devices and are characterized by low noise emission, high efficiency and high availability, which was achieved based on many years of manufacturer's expertise. The V90 turbines are optimal for inland placement and can adapt even to modest wind conditions. Vestas turbines pass very detailed performance tests before entering into operation, assuring that high requirements are met for energy production, availability ratio, power quality and sound levels.

F. Project development phase – at the date of application

The project, that is being a subject of the application for issuance of the Letter of Approval, was finished and at the date of application is under fully operation.

In 2008, after securing all the rights to the project, in autumn Vortex started to build the wind farm. The construction of wind turbines was completed in late 2010. Since that time, all the turbines started to work and have been tested by the Danish technical advisers belonging to the association Vindmoelleforening.

License for electricity production has been issued by the ERO on 17.02.2011 for a period up to 31.12.2030, for the total installed capacity of 48MW. **Installation has been operating without any failures since its start-up in the fourth quarter of 2010** (except for 4 days in the period from 11 to 15.12.2010 - farm did not work due to the modernization of the 110kV line, to which it is attached), **generating RES energy and distributing it to the national grid.**

Wind turbine failures occur very rarely, due to the constant monitoring carried out remotely. Goldap 2007 Management GmbH EW Gołdap sp.k. has signed full maintenance and servicing contract (O&M) with Vestas Poland sp. z o.o. (70-812 Szczecin, Pomorska 61/65 street).

Stages of preparation and implementation of the project:

The table below shows the process of obtaining key administrative decisions issued during the preparation and realization of investment.

Type of document	Issuance no.	Date of issuance
Application for the issuance of conditions for grid connection	----------	14.11.2006
Issuance of the grid connection conditions	----------	04.02.2008
Environmental Impact Assessment - Wind farm in the vicinity of Goldap at the stage of setting development conditions with the addition of 11.02.2008.	----------	July 2004
Environmental Impact Assessment - construction of 23 wind power plants (capacity of 3 MW each) in Gołdap municypality, in plots of land of the following registration numbers: 145/11, 122/70, 122/71, 134/3, 16/1 and 122/73 in the survey area of Jabłońskie, 40/13 and 48/3 in the survey area of Osowo, 24/37, 24/38, 24/39, 1/5, 1/6, 1/9, 24/41 and 24/34 in the survey area of Suczki, 162/1 in the survey area of Kośmidry and 155/20, 155/18,134/52, 48/9, 277/23 and 146/10 in the survey area of Marcinowo	----------	March 2008
Report on the inventory of birds in the Wind Park Gołdap	----------	December 2009
The report on the environmental noise, derived from plant or equipment, made by sampling method.	----------	April 2011
Environmental decision – Wind Farm Gołdap	GPO.7624 W.5 /49/ 2007	25.04.2008
Decision - location of a public investment	GPO.7331.cp-8/04	10.06.2005
Decision - amending the decision on the location of a public investment	GPO.7331.cp-8/04/07	04.07.2007
Decision - amending the decision on the location of a public investment	GPO.7331.cp-8/04/08	16.01.2008
Decision - location of a public investment (final)	GPO.7331.cp-29/08	07.10.2008
Construction permit for wind farm	BiOS.7351-gG-87/08	30.05.2008
Construction permit transferred on the target company	BiOS.7351-gG-254/09	03.02.2010
Construction permit for terminal (2x110kV)	BiOS.7351-gG-14/09	09.02.2009

Construction permit for GPZ station	BiOS.7351-gG-195/08	19.12.2008
Station construction permit transferred on the target company.	BiOS.7351-gG-157/2010	15.09.2010
Construction permit for cable route	BiOS.7351-gG-158/08	07.11.2008
Cable route construction permit transferred on the target company.	BiOS.7351-gG-100/10	04.08.2010
Replacement decision for construction permit for cable route.	BiOS.7351-gG187/2010	19.11.2010
Wind farm Gołdap – operational permit	PINB.7353-89/G/10	15.11.2010
Wind farm Gołdap GPZ station operational permit	PINB.7353-65/G/10	16.09.2010
Issuance of the promise of licence for electricity production	WEE/1099/13976/P/3/2008/MOS	2008-03-14
Amendment to the promise of licence.	WEE/1099A/13976/P/3/2010/MOS	2010-01-18
Issuance of licence for electricity production	WEE/1733/13976/W/3/2011/MP	2011-02-17

Table 2 History of the process of obtaining the administrative decisions during the preparation and realization of the project

G. Technical description of the project, including technology or solutions used in the project, indicating the innovation of technology, the best available techniques, the use results of research and development applied in the project

Technology and solutions applied in the project

Wind farm Gołdap uses 16 wind turbines, which at the time of installation were in the global lead of technological solutions in the field of wind energy.

Vestas turbines, thanks to its innovative design, allow to change the nominal rotor speed ratio. Furthermore, Vestas turbine rotor's blades have a so-called "Pitch-control", which allows optimal adjustment of blades to the current wind speed. These solutions allow a significant increase in the degree of efficiency of power plants and possibly optimal use of wind energy for electricity production.

Wind Turbines V90 manufactured by Vestas feature the following solutions:

Main parameters of the installation

- Number of turbines: 16
- Individual installed capacity of the turbines: 3MW
- Height of the turbine tower: 105 m

- Diameter of the rotor blades: 44 m
- Rotation range: 8,6-18,4 rot/min
- Max. cut off threshold (threshold wind speed): 25 m/s

The mechanical energy of the rotor is transmitted by gear through the drive shaft to the induction generator. Developed by Vestas 'Vestas Convert System' (VCS, also known as OptiSpeed ®) enables to work with variable gear ratio in the range of approximately + / - 60% of the nominal ratio. This means that with OptiSpeed ® rotor speed can be up to 30% faster or slower than the synchronous speed. Thus, the degree of effective operation of the plant and the technical availability are significantly improved.

A wind power plant is in addition equipped with a brake disc, which, however, should be used in case of emergency braking or in the case of network failure. Braking systems function as a "fail-safe". In this case, the power plant switches immediately to a safe state, if only one component in the braking system is defective or not working.

Number of functions in the wind turbine is controlled in real time by operating by remote controlled computer. The use of telecommunications systems achieved good speed data transfer, while optimizing the protection against electromagnetic interfering fields. Also in case of a failure of the hosting computer the power plant could be placed in a safe condition by the stored-up energy.

Metering system

Electricity generation measurement system is located in GPZ station in Wronki, near Gołdap.

The energy is measured in two transformer fields 20/110kV (site 110kV) and in two linear fields 110kV, according to the rules of PGE Dystrybucja Białystok sp. z o.o.

In the transformations'' fields combined transformers have been installed (type EJOF 123 produced by PFIFFNER). The electrical element of transformers class 0,2FS5 capacity 15VA, switch gear 200/1/1/1/1A. Voltage part of the transformers class 0,2 capacity 50VA with switch gear 110kV:√3/100:√3/100:√3/100:3V. Transformers are equipped with two secondary measuring windings.

In the 110kV fields there have been installed combined transformers type EJOF 123 manufactured by PFIFFNER. The electrical element of transformers class 0,5FS5, capacity 15VA with switch gear 600/5/5/5/5A. Voltage part of transformers, class 0,5, capacity 50V, with switch gear 110kV:√3/100:√3/100:√3/100:3V. Transformers are equipped with two secondary measuring windings.

Installed transformers meet the requirements of IRiESD instruction specified by PGE Dystrybucja Białystok Sp. z o.o. The metering and controlling systems are installed in three metering boards ET1+WQ, ET2+WQ i EL1+EL2+WQ. Metering boards are located in the control room, next to the 20kV switch gear room.

Measuring and billing system energy consists of two basic counters and two reserve counters. There are four counters ZMD402CT 44.0459 1A, class 0.2 3x58/100V and class 0.5 with built-in modules CU-B4 + produced by Landis & Gyr. These counters allow to communicate via RS232 and RS485 interfaces.

Balance and control system consists of two basic counters. There are two counters ZMD402CT 44.0459 5A, 3x58/100V class 0,2 and class 0,5 with built-in modules CU-B4 + produced by Landis & Gyr.

All units of measuring and billing and balance and control systems were placed in three measuring tables in the room next to the 20kV switchgear room.

Data transmission:

Two independent remote transmissions were established. The first remote transmission is possible because of adapter CU-ADP1 with communication module CU-P31 transmitting in the GPRS / GSM system. The module is equipped with a GSM antenna. Adapter is connected to the converter ICF 1150-M-SC (RS485/RS232) produced by Moxa through RS232 interface. The converter is connected with all meters and ZMD counters and PQI-D recorders through RS-485 interface. The second transmission is performed remotely by connecting to the converter ICF 1150-M-SC fibre optic link providing the data for the PGE Dystrybucja Białystok Sp. z o.o.

Additionally, Nport5410 4xRS232/Ethernet converter is used. It allows to communicate using the LAN. Converter is connected to four counters of measuring and billing system via RS232 interface. The converter is supplied by 24V terminal which is connected to DR-45 AC-24 supplier produced by Moxa. Converter and hubs are connected via Ethernet to an industrial switch. Measuring and billing system is connected to a central system PRINS.

Energy parameters registration:

To record the parameters of electricity two PQI-D recorders are used. They are supplied by combined transformers located in fields of 110kV lines. Recorders are connected via RS485 interface to ICF 1150-M-SC converter. Recorders are synchronized by synchronizer US-162/GPS located in the measuring table EL1 + EL2 + WQ.

According to Decree of Minister of Economy of Poland of 7 January 2008 on metrological control of measurement equipment (Law Gazette from 14 January 2008 r.) electricity meters of more than 30kW rated power have initial legalization term of 8 years and 8 years of validity for subsequential legalisations. The proof for their legalization is a seal on the equipment (category “c” of the legalization proof acc. to the decree).

The figure below shows a general scheme of the turbine V90 Vestas32 MW - used in this project:

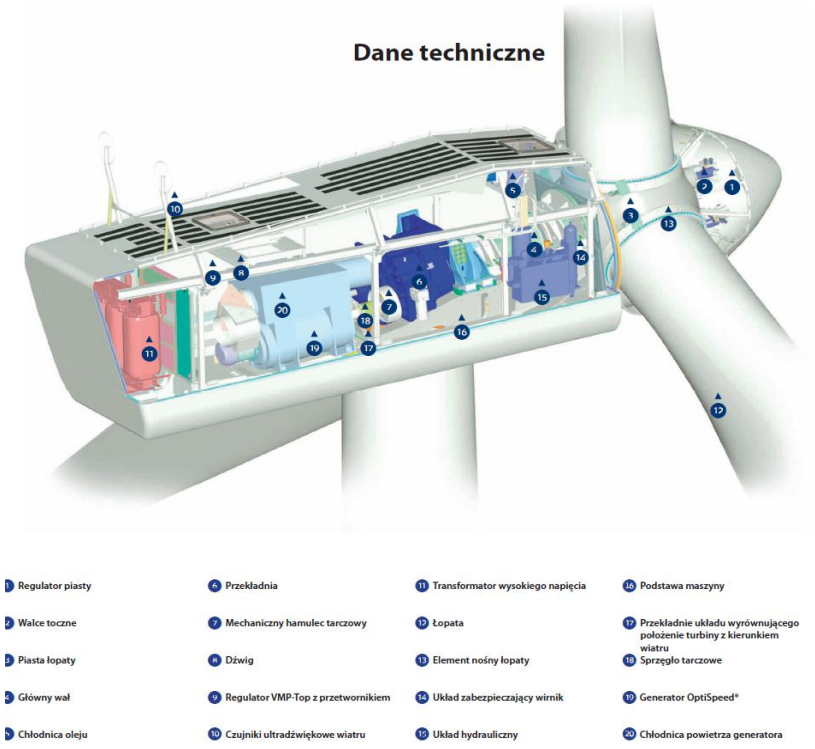

Figure 5 General scheme of Vestas V90 3MW

H. Description of the method of achievement of the greenhouse gas emissions avoidance below a set baseline

The result of the implementation of this project is the electricity generated from renewable sources, what results in a reduction of GHG emissions (CO2eq) through the replacement of electricity produced from non-renewable sources, that build the energy sector in Poland. The scenario of the project involves the construction of wind farm using the Vestas V-90 3MW turbines.

Assuming that the emission baseline is higher than the emissions from the project (that equal zero), the project has features of additionality and contributes to the reduction of anthropogenic GHG emissions below levels that would have occurred in case the implementation of the project had been abandoned.

Detailed information and data reduction were included in the calculations, below, in the project documentation (point 4).

I. Description of the project's impact on the environment

Wind is a renewable energy source. Its use to produce electricity does not cause pollution, does not contribute to GHG emissions, it does not involve the exploitation of natural resources.

Construction and operation of wind turbines does not impact the environment and public health. The nearest surroundings includes agricultural areas with minimal coverage of forest and water bodies. The required distance from the existing buildings located on adjacent parcels has been maintained as well as a minimum distance of buildings line from roads, power lines, telecommunication lines, oil and gas pipelines. Other requirements of spatial order, based on on the outlines of the local development plan and other special provisions have also been fulfilled.

The area in which the wind farms are located is not subject to environmental protection. There was no provision obliging the investor to provide architectural supervision during the earthwork operations.

The investment meets the requirements for protection against noise, vibrations, protection of fauna and flora , doesn't cause the exceeding of the limit values for the emitted electromagnetic field, power plants operation, thanks to the technical means employed in the project, doesn't introduce interference to users of radio, television and other receivers and electronic devices, as well as it complies with the safety regulations of transport and communications, that result from the provisions of the Environmental Protection and Management Act.

Power plants have been built and are operated using the best technologies available on the market. It ensures the safety and meeting all the obligations and legal standards related to the operation of power plants. Wind farms, being air traffic obstacles, are fully equipped with obstacle signs (i.e. appropriate marking of rotor blades and obstacle lighting), which are located on the highest point of the gondola.

According to the classification in the Polish regulations applicable at the date of obtaining the environmental administrative decisions (repealed Regulation of the Ministry of the Environment on the types of projects that may significantly affect the environment and on the detailed conditions for qualifying projects for the preparation of a report on the environmental impact), the planned investment was classified as having possibly significant effects on the environment.

At the stage of environmental procedures it was necessary to prepare a report on the impact of the planned project - the construction of wind power park Gołdap - on the environment. Therefore, the project was taken up in the environmental impact assessment, which resulted in the following documents were developed and issued the following administrative decisions:

1. Environmental Impact Assessment - Wind farm in the vicinity of Goldap at the stage of setting development conditions
2. Additional information to Environmental Impact Assessment - Wind farm in the vicinity of Goldap at the stage of setting development conditions
3. Environmental Impact Assessment - construction of 23 wind power plants (capacity of 3 MW each) in Gołdap municipality, in plots of land of the following registration numbers: 145/11, 122/70, 122/71, 134/3, 16/1 and 122/73 in the district of Jabłońskie, 40/13 and 48/3 in the district of Osowo, 24/37, 24/38, 24/39, 1/5, 1/6, 1/9, 24/41 and 24/34 in the survey area of Suczki, 162/1 in the district of Kośmidry and 155/20, 155/18,134/52, 48/9, 277/23 and 146/10 in the district of Marcinowo.
4. Report on the inventory of birds in the Wind Park Gołdap/Wronki.
5. The report on the environmental noise, derived from plant or equipment, made by sampling method.

The Environmental Impact Assessment - construction of 23 wind power plants (capacity of 3 MW each) in Gołdap municipality, in plots of land of the following registration numbers: 145/11, 122/70, 122/71, 134/3, 16/1 and 122/73 in the district of Jabłońskie, 40/13 and 48/3 in the district of Osowo, 24/37, 24/38, 24/39, 1/5, 1/6, 1/9, 24/41 and 24/34 in the district of Suczki, 162/1 in the district of Kośmidry and 155/20, 155/18,134/52, 48/9, 277/23 and 146/10 in the district of Marcinowo **indicated the following recommendations suggested for inclusion in the environmental impact assessment FW Gołdap:**

1. Mass of land which are necessary to move are to be used in the way specified in the decision on building for the project - manage as far as possible within the borders of the parcels or another location agreed with local authorities,
2. Within the wind farm turbines are to be installed with the same colour and having the same direction of rotation of rotor blades,
3. To monitor the avifauna - before and after the implementation,
4. To apply flashing lights on the gondolas and an appropriate blade tip painting,
5. In case of finding objects of archaeological values during the earthworks works should be stopped and the Voivodeship Office of Monuments Protection - Elk Branch should be informed immediately in order to establish an appropriate supervision.

Consent for the project - construction of WF Gołdap - has been issued under the following conditions regarding the exploitation phase of investment:

1. Hazardous wastes generated during the operation should be provided in whole for utilization, without the possibility of storage on the investment area.
2. Surface of public roads exploited as a result of operation of equipment during the life of the investment should remain in an unloosened state.
3. It is necessary to carry out periodic reviews of the technical condition of plant construction.
4. It is required to ensure sufficient retention of the soil and reduce its leaching by seeding mix of grasses in the area of earthworks.

5. Operation of the wind turbine must not exceed emission standards and environmental quality including areas to which the operator has no the legal title.
6. Minimum distance from residential buildings to power plants cannot be less than 400m.
7. Construction of the windmill should be painted white or white-gray, preventing the development of light reflection. Transformer rooms on the outside shall be painted in white, white-gray or olive.
8. Wind towers should be illuminate at night and in conditions of reduced transparency of the air in order to reduce threats to migrating birds. Most modern technology available to eliminate the threat of collisions of birds with turbines (e.g. audio signals) should be implemented.
9. A wind power plant closed for a period of 1 year or in case of exceeding emission standards and environmental quality must be removed.

All of the above requirements have been met by the investor of the project.

Environmental impact monitoring

In the Environmental decision regarding to the approval for the project appropriate authorities have imposed on the investor of WF Gołdap an obligation of monitoring in relation to impacts on avifauna, and installation associated with the operation of noise pollution. Measurement of these factors were taken and are available for inspection.

According to the Environmental Decision wind park in Gołdap not exceed the limit values of noise emitted into the environment, as defined in the Regulation of the Minister of Environment of 19 July 2004 on acceptable levels of environmental noise (Polish Journal of Laws no. 178, item1841). These limits are:

- for single-family residential areas - 50 dB in the daytime (from 6.00 to 22.00) and 40 dB at night (from 22.00 to 6.00),
- for multi-family residential areas and land farm building - 55 dB in the daytime (from 6.00 to 22.00) and 45 dB at night (from 22.00 to 6.00).

Therefore, the owner of the installation was obliged to execute and submit post-investment analysis within three months from start of the operation of the investment and after every change of technical parameters, taking into account the actual measurements of noise in the vicinity of wind turbines and the nearest building. This analysis was done by properly certified laboratory and presented to District Office and City Council of Gołdap. There was no exceedance of noise levels.

The Environmental Decision has also imposed on the investor of WF Gołdap an obligation of monitoring in relation to impacts on avifauna. This monitoring was conducted in December 2009.

The project's boundary is defined by the Polish power system. No other location of energy produced is expected to be set.

J. Scope of the project's impact on the environment, regarding avoidance of the greenhouse gases emission

At the stage of environmental procedures it was necessary to prepare a report on the impact of the planned project - the construction of wind power park Gołdap - on the environment. Therefore, the project was taken up in the environmental impact assessment.

Based on a report prepared on the environmental impact the project has been approved by the municipal environmental authorities. The project does not cause transboundary environmental impact. It reduces GHG emissions , as well as the emission of pollutants such as: NOx, SO_2, dust.

The project's boundary is defined by the Polish power grid. No other location of energy produced is expected to be set.

K. Name of the entity developing the project documentation

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28/12 Szlak Str.
31-153 Krakow
office: +48 12 376 82 43
fax: +48 12 378 93 23
www.carbonengineering.pl
KRS (National Court Registry Number): 0000351847
NIP (Tax Identification Number): 676-241-61-56
REGON (Statistic ID Number): 12118233

L. Calculation of the planned costs and revenue related to the project

A detailed information on the project financing in the years 2008-2030, taking into account the costs of O&M and revenues from the project are presented in Annex 1 The detailed scheme of the financial structure of the project.

M. Stakeholder's comments

A Polish construction permitting of the allowance procedure requires stakeholder consultation element – stakeholder consultations have been made and no remarks were received (which is confirmed in construction permits).

2. DESCRIPTION OF THE PROJECT FINANCING

A. Method of the project's financing

The project - construction of WF Gołdap - was financed entirely with public funds, granted by the German Development Bank (KfW) and the funds derived from loans granted by private banks.

The next table presents the summary of support provided by public and by privet sectors (the sources of project funding).**Total sum of credits and loans is equal to the total amount of capital investment of the Project - 103 604 193 EUR.**

B. Project's financing sources

The table below presents a diagram of of the project funding sources, including external funding of the project - bank credits and public funds.

Position	Scheme and detailed terms of repayment	
Tranche A1 (funds from the credit granted by HSH Nordbank AG)	initial amount - EUR	27 571 875,00 EUR
	initial amount – PLN	94 899 636,56 PLN
	repayment amount	1 621 875,00 €
	repayment cycle	semi-annual
	interest rate	7,97%
Tranche A2 (funds from the credit granted by HSH Nordbank AG)	initial amount - EUR	14 328 125,00 EUR
	repayment amount to 2019r.	123 958,00 PLN
	repayment amount to 2020r.	1 621 875,00 EUR
	repayment cycle	semi-annual

	interest rate	6,18%
Tranche A3 (KfW - public funds)	initial amount - EUR	10 000 000,00 EUR
	repayment amount	400 000,00 EUR
	repayment cycle	semi-annual
	interest rate	4,80%
Tranche B (line of credit at the HSH Nordbank AG)	credit line	20 100 000,00 €
	interest rate	8,50%
Tranche C (line of credit at HSH Nordbank AG for the purpose of payment of VAT)	credit line	10 604 193,00 €
	interest rate	4,00%
Tranche D (line of credit at the HSH Nordbank AG)	credit line	21 000 000,00 €
	interest rate	8,50%

Table 3 Project's financing scheme I

Item	Currency	Value
	EUR	percentage share
Public funds	10 000 000	9,65 %
Bank credits	93 604 193	90,35 %
TOTAL	**103 604 193**	**100%**

Table 4 Project's financing scheme II

3. DESCRIPTION OF THE PROJECT'S BASELINE, THE DESIGN AND THE METHOD FOR ITS DETERMINING

A. Method of baseline determination, including the methodology applied in the project, with a justification

Baseline scenario

CDM Methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" Version 12.2.0 has been used, with two variations:

1. where ACM0002 refers to the "Tool to calculate the emission factor for an electricity system", a JI specific approach has been used, as the emission factor for the Polish national grid electricity system is provided by the the National Centre for Emissions Management (KOBiZE). The emission factor is fixed ex ante for the whole 2008-2012 period and is 0.812MgCO2/MWh;

2. second variation from the CDM Methodology ACM0002 is the project scenario demonstration of additionality, where Annex I to the Guidance on criteria for baseline setting and monitoring (JISC 18, Annex 2) using option (b): Provision of traceable and transparent information that an accredited independent entity has already positively determined that a comparable project (to be) implemented under comparable circumstances (same GHG mitigation measure, same country, similar technology, similar scale) would result in a reduction of anthropogenic emissions by sources or an enhancement of net anthropogenic removals by sinks that is additional to any that would otherwise occur and a justification why this determination is relevant for the project at hand.

Applicability

This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).

As the project activity is the installation of a power plant/unit of a wind power plant/unit and is not the following:

- Project activitiy that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;
- Biomass fired power plant;
- A hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the power plant is less than 4 W/m^2;

An applicability condition of the methodology are met.

Identification of the baseline scenario

The project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

Baseline methodology is chosen to present best scenario that would occur in the case of no previous project. Baseline scenario implies that in the event of withdrawal of a project the electricity would be produced by operating, connected to the network, power plants and by adding a new source of production.

Electricity generation in Poland is based on fossil fuels, mainly coal and lignite. Polish energy system is dominated by conventional energy sources and it is expected that the current fuel mix will remain the same throughout the project's crediting period.

Main reasons for that are:

- very high (and rising) market prices of oil and gas which means that their use for energy production is neither competitive nor profitable,
- limited water resources, which make it impossible to increase the participation of hydro power in the RES market,
- distant prospect of opening the first nuclear power plant (years 2021- 22) according to the national energy policy,
- large national deposits of coal, along with the relatively stable and low price,
- rather limited area with very good wind conditions suitable for efficient production of electricity (mostly along the coast and in the mountains).

Project scenario

Since the proposed project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected by the baseline emission factor published by KOBIZE.

In accordance with the provision laid down in article 41 paragraph 3 of the Act on the system of managing emissions of greenhouse gases and other substances of 17th of July 20091 (Polish Journal of Laws no. 130, item 1070, with subsequent amendments), the Minister of the Environment can determine, in a way of a decree, criteria for baseline setting, including emission factors or sectoral baselines and their monitoring methodologies.

KOBiZE has determined an emission factor, specifically for projects involving reduction of electricity production from non-renewable resources or reduction of energy consumption in installations covered by the EU ETS. This factor, which was approved by the Minister of the Environment, is the basis to determine the baseline and calculate the emissions avoided or reduced by the project. The factor was calculated in relation to monitored, verified and reported CO2 emissions. It does not take into account CO2 emissions from small energy sources, which are not covered by the EU ETS (due to the negligibly small scale of production and emissions from these installations as compared to CO2 emissions in the production of electricity from installations covered by the EU ETS). http://www.kobize.pl/materialy/jicdm/JI-wskaznik_referencyjny_26sie2011_publik.pdf

The scenario of the project involves the construction of a wind power plant with total installed capacity of 48 MW el. Renewable energy produced by wind farm replaces energy based on non-renewable sources , that is generated by conventional power plants and delivered to the Polish national energy grid.

Emission reduction will be calculated based on the total amount of CO2 emissions avoided by the operation of this project. Baseline implies a higher rate than the scenario of the project, for which the emission rate is zero. This implies that emissions from the project also equal zero.

Project boundary

The boundaries of the project are determined by the Polish Power Grid.

Baseline emission factor

The reference rate per unit of carbon dioxide emission from electricity production for JI projects implemented in Poland, given by National Centre for Emission Balancing and Management was used to set the baseline and amounts to 0.812MgCO2/MWh.

Emission ratio is the basis for determining the baseline and for calculation of emissions avoided or reduced.

B. Source data used for the calculation of baseline

The following data have been assumed for the baseline calculation:

- the amount of electricity, supplied to the grid in particular years of operation of wind farm [MWh]. Data on the amount of electricity, supplied in each year to the grid were acquired from the Operator, on the basis of invoices regarding the sale of electricity;
- carbon dioxide emission ratio for electricity production [Mg CO_2 / MWh].

Emission ratio provides a basis for determining the baseline and calculating the emission reduction resulting from implementation of this project.

Determined reference value of emission ratio should be used for setting the baseline for projects that reduce electricity production from non-renewable resources (ratio related to the production ratio), or reduce electricity consumption, derived by the operator of the national power grid.

As recommended by the National Centre for Emission Balancing and Management (KOBIZE) reference ratio of carbon dioxide emission for electricity production at the level of 0.812 MgCO_2 / MWh has been applied.

Data was obtained from the website of KOBiZE. Detailed information can be found in the study "The reference ratio per unit emission of carbon dioxide for electricity generation for the determination of baseline for JI projects implemented in Poland", available at www.kobize.pl.

C. Determination of the applied baseline with justification

Baseline

BE baseline [Mg CO2] has been calculated as the product of:

- amount of electricity, which was supplied to the network each year or the amount of electricity that will be supplied (based on real values and forecasts of electricity production) E [MWh],
- reference carbon dioxide emission ratio for electricity production WE = 0.812 [Mg CO2/MWh];

Emissions

Baseline emissions include only CO2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are calculated as follows:

$$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$$

Where:

BEy	=	Baseline emissions in year y (tCO2/yr)
EGPJ,y	=	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the JI project activity in year y (MWh/yr)
EFgrid,CM,y	=	reference carbon dioxide emission ratio for electricity production 0.812 [Mg CO2/MWh]

Calculation of EGPJ,y

(a) Greenfield renewable energy power plants

The project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity:

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

EGPJ,y	=	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)
EGfacility,y	=	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)

Leakage

No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport). These emissions sources are neglected.

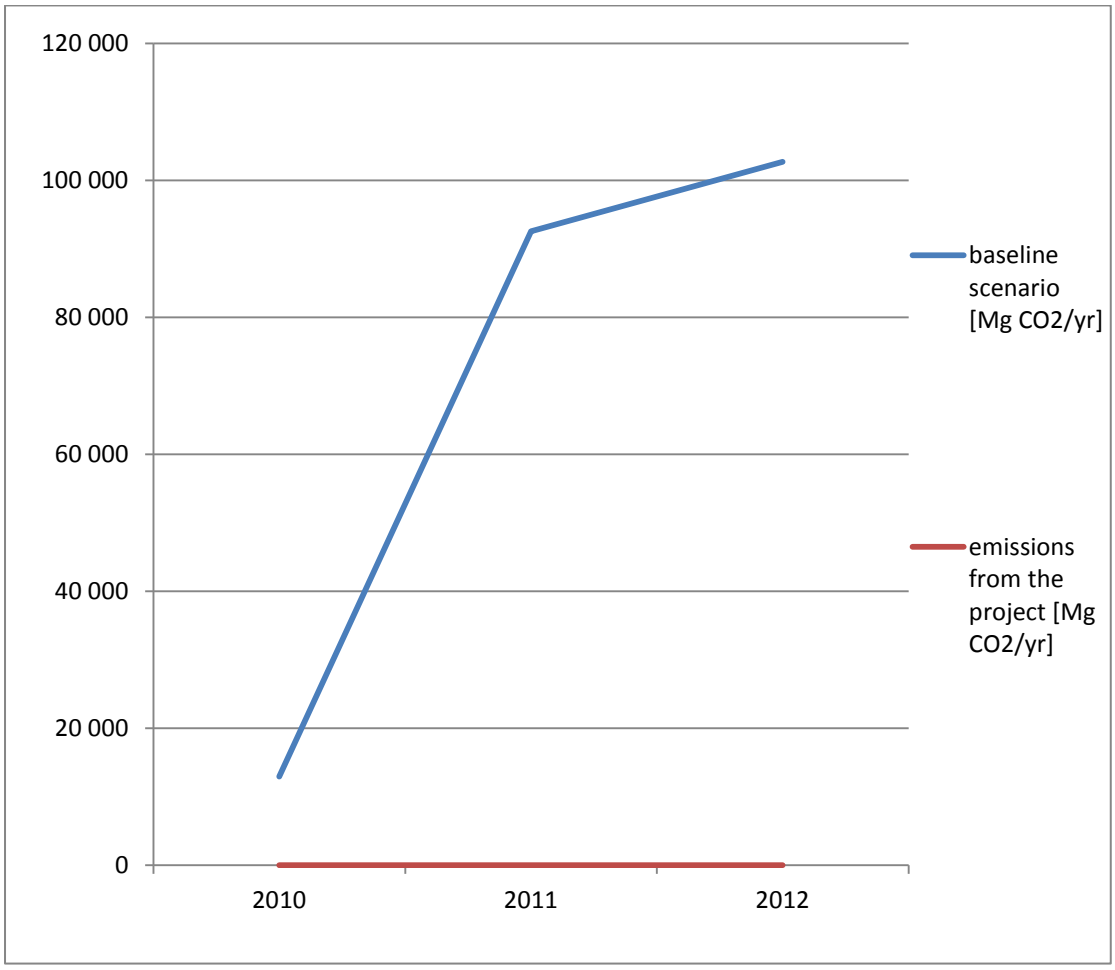

Figure 6 Baseline vs project's emission ratio

D. Date of baseline setting

The date of the setting of the base level is **22.12.2011**.

E. Name of the entity setting the baseline

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28/12 Szlak Str.
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office: +48 12 376 82 43
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KRS (National Court Registry Number): 0000351847
NIP (Tax Identification Number): 676-241-61-56
REGON (Statistic ID Number): 12118233

4. ESTIMATION OF THE GREENHOUSE GAS EMISSIONS AVOIDANCE AND DESCRIPTION OF THE APPLIED EVALUATION METHODOLOGY

A. Determination of annual amounts

Emission reductions

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y = Emission reductions in year *y* (t CO_2e/yr)

BE_y = Baseline emissions in year *y* (t CO_2/yr)

PE_y = Project emissions in year *y* (t CO_2e/yr)

The amount of the annual GHG emissions avoidance has been calculated as the product of the amount of electricity

[MWh], which will be supplied into the grid each year, calculated on the basis of supplier invoices for sales of electricity and the reference ratio of emission of carbon dioxide for the production of electricity, amounting to 0.812 [Mg CO2/MWh].

The total amount of electricity supplied into the grid:

year	The actual amount of electricity, supplied into the grid E_{prod} [MWh]	Estimated amount of electricity E_{for} [MWh]	Total amount of electricity supplied into the grid E [MWh]	Commentary
2010	15 980,58		15 980,58	
2011	54 451,62	59565,00	114 016,62	*forecast applies to the second half of 2011; the total amount on the date of the application consists of the electricity delivered to the grid in the first half of 2011 and planned production for the second half of 2011.*
2012	----------	126 465,00	126 465,00	*Planned amount based on wind measurements and estimates of the investor.*

Table 5 Total amount of energy supplied annually to the grid

Annual GHG emission avoidance:

year	Total amount of electricity supplied into the grid E [MWh]	Reference ratio of emission of carbon dioxide for the production of electricity WE [Mg CO_2/MWh]	Annual GHG emission avoidance BE [Mg CO_2]
2010	15 980,58	0,812	12 976
2011	114 016,62	0,812	92 581
2012	126 465,00	0,812	102 690

Table 6 Annual GHG emission avoidance

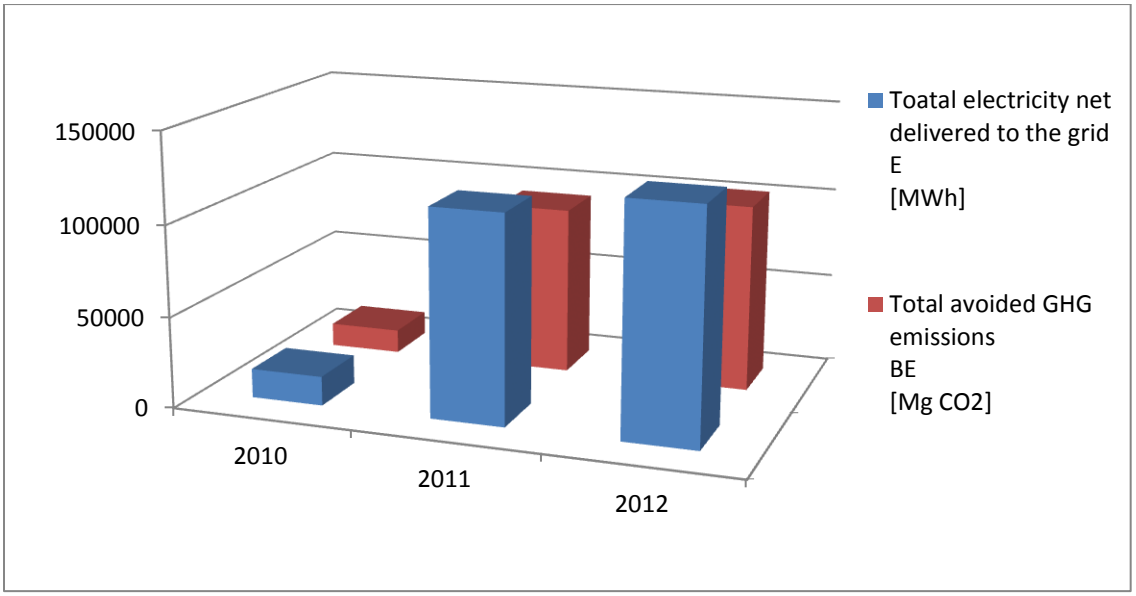

Figure 7 Total amount of electricity supplied to the grid vs annual GHG emission avoidance

B. Determining the total amount for the crediting period 2008-2012

The size of the total electricity production in the reference period 2008-2012 is estimated at 256 462 MWh. The emission avoided in the reference period 2008-2012 will amount to 208 257 Mg of CO2, **which is equivalent to 208 257 emission reduction units (ERUs).**

C. Determining the total amount during the project's operation

In order to estimate the total emissions avoided during the operation of the project, a forecast of electricity production of 126 465 MWh has been assumed.

$$E_{for\ av} = 126\ 465\ [MWh]$$

Forecasted electricity production in 2008-2012 equals to: 256 462 MWh

$$E_{for\ tot} = 18 \times 126\ 465 = 2\ 276\ 370\ [MWh]$$

The table below presents the total amount of emissions avoided during the project's operation, ie in the years 2008-2030:

year	Total amount of electricity supplied into the grid E [MWh]	Reference ratio of emission of carbon dioxide for the production of electricity WE [Mg CO2/MWh]	Annual GHG emission avoidance BE [Mg CO2]
2008	**-**	0,812	**-**
2009	-	0,812	-
2010	15 980,58	0,812	12 976
2011	114 016,62	0,812	92 581
2012	126 465,00	0,812	102 690
2013-2030	2 276 370,00	0,812	1 848 412

Table 7 Total amount of GHG emission avoided during the project's operation

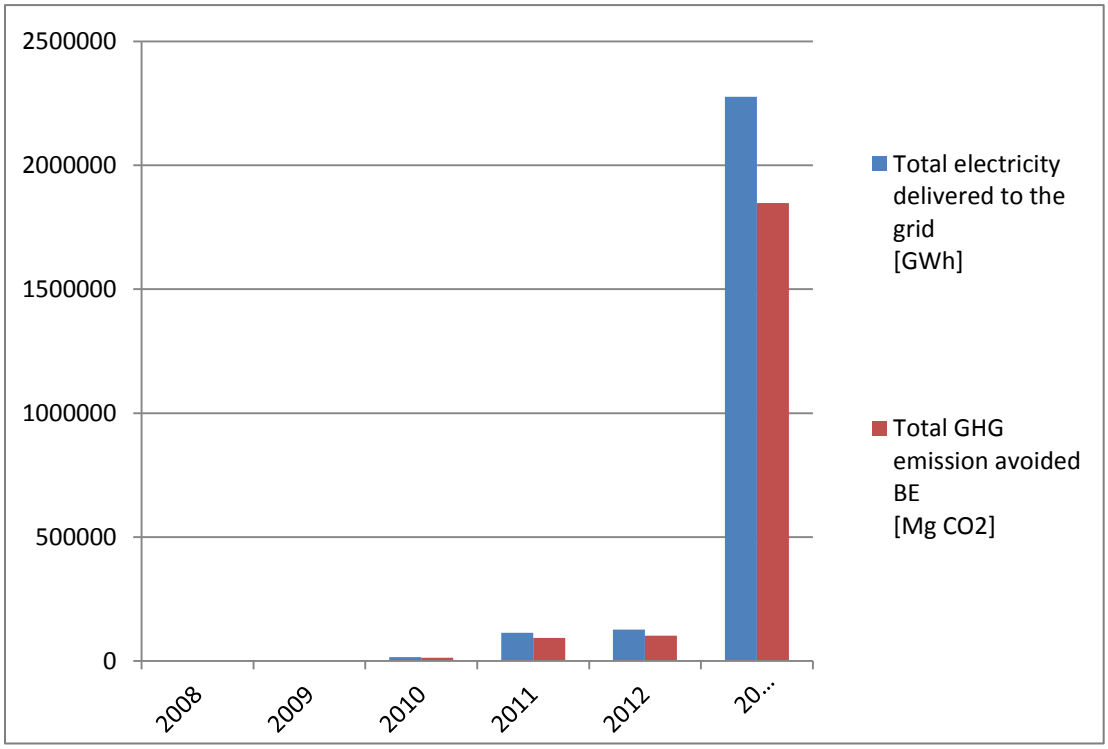

Figure 8 Total amount of electricity supplied into the grid vs total amount of GHG emission avoidance during the operation of the Project

The amount of the total electricity production during the project's operation is estimated at 2 532 832 [MWh]. The amount of emissions avoided during the project's operation will amount to 2 056 669 [Mg CO2], which equals to 2 056 669 emission reduction units.

D. Starting date for greenhouse gas emissions avoidance

Starting date for greenhouse gas emissions avoidance is **23.10.2010.**

E. Emission reductions generation period

It was assumed that the generation of ERUs from project covers the period **from 23.10.2010 to 31.12.2012**, which is in line with international and national provisions governing the JI reduction projects, which are defined as a flexible mechanism for meeting the objectives of the Kyoto Protocol.

F. Estimation of the amount of greenhouse gas emissions generated by the project's operation

According to ACM0002 Version 12.2.0 for most renewable power generation project activities, PEy = 0. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

Gdzie:

PE_y	=	Project emissions in year *y* (tCO_2e/yr)
$PE_{FF,y}$	=	Project emissions from fossil fuel consumption in year *y* (tCO_2/yr)
$PE_{GP,y}$	=	Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year *y* (tCO_2e/yr)
$PE_{HP,y}$	=	Project emissions from water reservoirs of hydro power plants in year *y* (tCO_2e/yr)

The proposed project activity does not consume any fossil fuels, is not a geothermal power plant and no hydro.
The project does not result in GHG emissions, nor create a risk of additional emissions.

5. ASSESSMENT OF THE ADDITIONALITY CONNECTED WITH THE REALIZATION OF AN EMISSION AVOIDANCE PROJECT

A. National and sectoral policies

Analysis of the wind energy sector in Poland

Against the background of European countries, especially in view of these with a high utilization rate of renewable energy sources such as Germany, Spain and Denmark, Poland is a country that is definitely just in the phase of wind energy development. This source of renewable energy had practically not been used in Poland before 2000. Large areas of the country with favourable wind velocity (5.5-7.0 m / s at a height of 50 meters), make Poland one of the most attractive locations of wind farms in Europe. Interest of domestic and foreign companies in the acquisition of projects related to wind energy has been growing significantly as well.

According to the estimates presented by Polish Wind Energy Association (PWEA), more than 100 entities, which are developing projects or obtaining wind project investment areas - sub-contractors involved in the development of wind farms and experts engaged in environmental and energy development, designers and service companies, are currently operating in the domestic market.

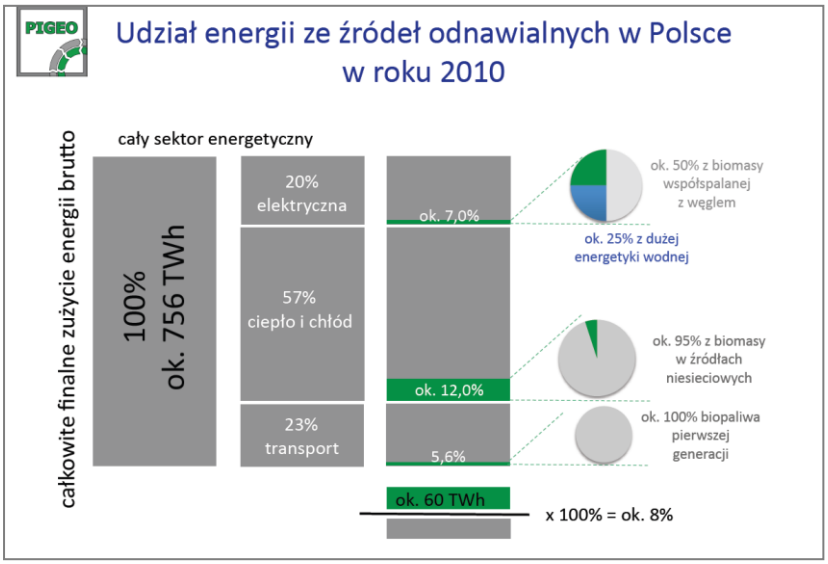

Figure 9 RES energy in Poland 2010, (source: PIGEO)

In recent years, there has been a significant increase in installed capacity of wind farms in Poland, between 2000 and September 2009 it has increased by more than 166 times. The dynamic development is also proved by

installation of facilities with a total capacity of 206 MW between 2007 and 2008.

However, according to PWEA analysis, saturation of wind power in Poland is among the lowest in Europe. The installed capacity in wind energy per capita is 0.012 kW, and per km2 of land area equals to 1.44 kW.

Electricity production in Poland – wind farms					
2004	2005	2006	2007	2008	I-V 2009
142,3	*135,3*	*388,4*	*494,2*	*790,2*	*233,3*

Table 8 Electricity production in Poland - wind farms (source: Energy Regulatory Office)

According to the report "Wind power development in Poland - 2020 perspective" developed by PWEA, in 2020 wind farms will be the cheapest renewable source of electricity - a technology where the electricity production costs will be comparable with the costs of electricity production in existing nuclear power plants. Participation of wind power in electricity production will increase rapidly to 17% in 2020 and almost 29% in 2030.

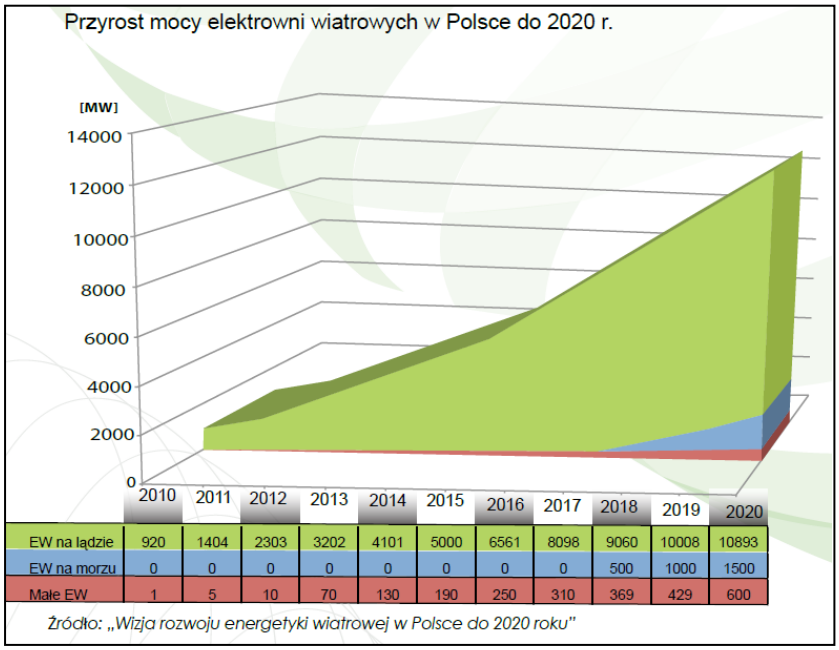

Figure 10 Forecast of wind farm installed capacity growth in Poland – 2020 (Source: "Wind power development in Poland - 2020 perspective")

Wind energy is one of the cheapest technological options to avoid the emission of CO_2. According to the scenario, avoidance of the emission of CO_2 using wind energy will reach 33 million tons in 2020, with further potential for growth up to 65 million tonnes in 2030.

The development of wind energy sector will influence local business activity. Income from municipal property tax in 2020 is likely to equal to even 212 million PLN / year (about 2% of all rural municipalities' own revenues, and in case of municipalities with favourable wind conditions up to 17%). Tenants' revenues from wind farm sites in 2020 may account for over 100 million PLN / year. Wind energy will make a significant contribute to the implementation of Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC in the perspective of 2020.

National and sectoral RES policies

No.	Title of the document	Main assumptions
1	**STATE ENVIRONMENTAL POLICY FOR THE PERIOD 2009-2012 with the prospect of 2016** (adopted the Resolution of the Parliament of 22 May 2009)	adoption of of the new Polish energy policy until 2030, which will incorporate mechanisms to stimulate both energy savings and promote development of renewable energy
2	**CLIMATE POLICY - Strategies to reduce greenhouse gas emissions in Poland by 2020** (adopted by the Council of Ministers on 4 November 2003)	after 2010 there will be need to build new capacity in power plants, construction of new coal plants means maintaining the relatively high CO_2 emissions from burning coal throughout many years; use of renewable energy resources (RES) is one of the most important actions that allow to effectively reduce GHG emissions, most prospective technologies in Poland are: biomass power plants, wind farms, hydropower plants;
3	**POLAND'S ENERGY POLICY - 2025** (adopted by the Council of Ministers on 4 January 2005)	action plan for the wind energy boils down to just three tasks: to prepare maps of areas intended for start-up projects related to wind energy, the development of the concept of combination pumped storage power plants with wind turbines and a comparison of schemes to support renewable energy sources used in different countries; in the long term one should not expect significant changes in the Polish power sector, which will remain strongly focused on the coal;
4	**RENEWABLE ENERGY DEVELOPMENT STRATEGY** (adopted by the Council of Ministers on 5 September 2000)	strategic objective for participation of renewable energy in the fuel and energy balance in 2010 for Poland is almost half the size of the EU objective; however, forecasts regarding share of renewable energy in the fuel and energy balance of the country do not indicate that this participation by 2010 could be higher than 7.5%; it is necessary to iniciate development programs for various types of renewable energy sources that contribute to achieving strategic goals; these actions should allow for doubling the share of renewable energy in the fuel and energy balance in the perspective of 2020. compared to 2010 and obtaining the value of 14%;
5	**SUSTAINABLE DEVELOPMENT STRATEGY FOR POLAND 2025** (adopted by the Council of Ministers on 26 July 2000)	pro-ecologic activities, including the use of renewable energy resources and recycling materials will become competitive in the market through appropriate financial and fiscal policies, introducing the internalisation of external costs of health and environment

		protection products to the market prices;
6	**NATIONAL DEVELOPMENT PLAN 2007-2013** (adopted by the Council of Ministers on 11 January 2005)	increase in the participation of energy from renewable energy sources as one of the priorities of national development and as a key component of national energy security growth, through diversifying sources of energy production; it is also planned to modernize electricity grids and the RES energy infrastructure;

1. According to the **Environmental Policy** it is necessary to adoption as soon as possible a new Polish energy policy until 2030, which will incorporate mechanisms to stimulate both energy savings and promote development of renewable energy sources; these two methods, in the most radical way, reduce the emission of any pollutant into the environment, as well as they are cost effective and socially acceptable**. Poland committed itself to the participation of renewable energy sources in 2010 amounted to no less than 7.5% and in 2020 - 14% (according to the European Commission participation shall be not less than 15%). Only through extensive promotion of the use of these sources, along with economic and organizational incentives Poland can meet the objectives set by the EU**.

2. **Analysis of the potential of GHG emission reductions** undertaken within the **Polish Climate Policy** indicates that at a moderate rate of growth of electricity demand and a significant surplus of generation capacity in Poland after 2010, there is a need to build new capacity in power plants. **Among the energy technologies available in Polish conditions it is best chance of use have coal technologies (coal or lignite) or gas.** From the viewpoint of optimal allocation of fuel coal of the Polish mines to different consumers it would be beneficial to concentrate its exploitation in large energy facilities. In such facilities there are suitable technical and economic conditions for the use of effective technologies of the protection of the atmosphere from pollution from coal combustion.

On the other hand, construction of new coal power plants means maintaining relatively high CO_2 emissions from burning coal for many years. From the perspective of GHG emission reduction strategies it would be better to use high-efficiency natural gas-burning technology, working in the gas - steam cycle.

Moreover, the use of renewable energy resources (RES) - the use of technologies using renewable energy sources and projects in the field of energy saving are the most important activities allowing effective reduction of GHG emissions. Rational use of energy from renewable sources of energy such as rivers, wind, solar radiation geothermal energy or biomass, is one of the essential components of sustainable development, bringing measurable benefits and energy effects. **Most promising technologies in Poland are: biomass power plants, wind farms, hydroelectric power plants**

In this document, different variants of realization of climate policy were presented in three scenarios of GHG emission reductions:

- **Reduction reference scenario**: reduction of GHG emissions in accordance with current policy of the state (the most important is the assumption of the coal sector to maintain its activity at the level set on the basis of government reform program of coal mining. assumed 100-65 million tonnes of extraction and maintenance of electricity production based on lignite at the current level by 2020)but without forcing the share of RES in the energy balance by 2020., which is set by the renewable energy strategy at the level of 14%;
- **Reduction market scenario**: a policy implemented in the released energy market - the release of structural limitations, including lack of forcing a 14% share of RES in the energy balance by 2020.,
- **Reduction ecological scenario:** a policy implemented in conditions of release of structural limitations, but forcing 14% share of RES in the energy balance by 2020, set by the renewable energy strategy;

3. **Polish Energy Policy until 2025 includes long-term forecasts of energy and action plans for the Polish government.** Key objectives include: increased the increase of (including the diversification of energy sources), increase of competitiveness for Polish energy sources in domestic and foreign markets, environmental protection, energy efficiency and reduction of carbon emissions associated with energy production.

The strategy takes into account the need to meet the obligations of the Treaty of Accession and EU directives (especially Directive 2001/77/EC, 2001/80/EC and 2001/81/EC), as well as it assumes certain transitional periods. However, an **action plan for the wind energy sector reduced only to three tasks: to prepare maps of areas intended for launching of projects related to wind energy, the development of the concept of connections of pumped-storage hydro plants with wind farms and a comparison of schemes to support renewable energy sources used in different countries.** In addition, "Polish Energy Policy" confirms that the Polish authorities are serious about building the first nuclear power plant in the years 2018-2020.

There are four different scenarios for long-term development of the Polish energy sector presented in the document - Treaty Variant, Coal Variant, Gas Variant, and Performance Variant. Forecasts for the use of various energy sources in different scenarios are based on the current structure the fuel consumption in the Polish energy sector, hence the assumption of continued domination of coal, particularly in the Treaty and Coal Variant, where the increase of coal consumption is expected. All scenarios assume the construction of nuclear power plant and use of nuclear energy around 2020.

Detailed investment plans of particular power plants are not publicly known. However, **based on consolidated data of the PSE it can be expected that after 2008 there will be an increased activity in the construction of new installations**. However, alongside with the modernization and construction of

new power units, the old units will be switched off, which in turn can cause a drop in the total installed capacity.

In the long term one should not expect significant changes in the Polish power sector, which will remain firmly oriented towards coal. Polish International commitments will force the government to revise the policy in order to change the structure of electricity sources in Poland. However, the effects of these changes will not affect the emissivity of energy production before year 2012, which is the end of the crediting period.

4. The conclusions of the **Renewable Energy Development Strategy** indicate that the next few years, renewable energy will constitute a significant component of the energy balance of the European Union. The strategic goal for the share of renewable energy in the fuel and energy balance in 2010 for Poland is almost half the size of the EU. However, forecasts regarding the share of renewable energy in the fuel and energy balance of the country do not indicate that this share could be higher than 7.5% by 2010. During this time, the mechanisms proposed in this strategy and new solutions developed, will be checked and verified. At the same time we should proceed to development programs for various types of renewable energy sources that contribute to achieving strategic goals. These actions should allow for doubling the share of renewable energy in the national fuel and energy balance in the perspective of 2020. compared to 2010. and achieving the value of 14%.

The development of renewable energy sources offers an opportunity, especially for local communities, to maintain energy independence, regional development and new workplaces, as well as eco-friendly modernization, diversification and decentralization of the national energy sector. It is estimated that implementation of the objectives contained in the Strategy will allow the reduction of GHG emissions by approximately 18 million tons and to create additional 30-40 thousand. of workplaces. The sooner Poland engages in the development of renewable energy, the faster the domestic renewable energy industry, especially small and medium-sized enterprises will become an equal participant in the global market for renewable energy technologies. The existing technical potential of renewable energy sources requires the implementation of the tasks aimed at its best use, and without support from the state, the rapid development of renewable energy is not possible.

5. **Sustainable Development Strategy** confirms the previously discussed assumptions. The strategy underlines **the postulate that the pro-ecological activity, including the use of renewable energy resources and recycling materials will become competitive in the market through appropriate financial and fiscal policies, introducing the internalisation of external costs of health and the environment protection with market prices.** It is also necessary to support the development of science and environment-friendly technologies and intellectual property rights protection for these technologies , the free transfer of technology and environmental investments and support for the export of Polish technical ideas in this regard.

Polish Strategy for Sustainable Development must be supported by properly designed sectoral policies,

including the state environmental policy, the policy of economic development, the policy of the development of the fuel and energy sector, resources policy, agricultural development policy, transport policy, planning policy and the regions of the country, politics development of science, education and higher education, health care policy, foreign affairs and home affairs, policy of the development of law and justice, labour and payroll policies, and finally, financial,, fiscal, customs and public procurement policy. In addition, the environmental components should be included in privatization programs, investment programs, educational programs and propaganda. Responsibility for their implementation must rest on environmental departments and the Treasury.

6. **The National Development Plan - Preliminary Draft for 2007-2013 - mentions the increase in the share of energy produced from renewable energy sources as one of the priorities of national development and growth and as a key component of national energy security by diversification of sources of energy production. The modernization of energy networks and energy infrastructure using RES is also planned.** These postulates were included in the new programming period of European funds, and the Operational Programme Infrastructure and Environment and Innovative Economy Operational Programme have been equipped with mechanisms and measures aimed at increasing the share of result in the production of "green" energy in overall energy balance of the country.

All the above mentioned strategies, relating in their thematic scope to the development of the RES and their main objectives and priorities clearly indicate that from the viewpoint of both the national economy, energy security and sustainable development, taking into account the interests of future generations, the support for the renewable energy sector is a very important goal for Poland in the next decades. This suggestion is based both on the Polish Government's commitments included in the international agreements such as the Kyoto Protocol and the Community rules, plans and strategies, in particular, the regulations included in the so-called. Climate-energy package 3x20.

Unfortunately, **the realization of these objectives and targets is not fully reflected in national legislation nor does it translate into real, tangible help in the investment process for the investors who are planning and implementing projects such as wind farms in Poland. The length of the entire investment process, which can take up to 8 years, and all kinds of barriers and difficulties, especially technical and organizational,** faced by investors are a major disincentive to renewable energy projects. On the one hand there are real commitments regarding the achievement of the share of energy production from renewable sources in the national balance sheet at 15%. Officially there is also a public aid for projects (mainly within EU structural funds, regional programs, Green Investment Scheme).

In reality, however, application for the support for investment is limited by various kinds of criteria, which are often difficult to meet and also by the size of the allocation alone. Number of entities that can benefit from such support is, therefore, in effect, very limited. Investors can be assured only of revenues from the sale of "green" energy and the revenues from the sale of certificates of origin. This does not always allow the full coverage of costs of investment and ongoing operation of the project. Therefore, **the possibility of obtaining revenue from the sale of emission reduction units (ERUs), granted for a certain level of CO_2 avoidance, is an additional, strong incentive for investors. This may be in many cases a very important condition that enables the decision to implement**

renewable energy investments in Poland, despite the not entirely favourable technical, organizational and legal conditions. This was also the case with the investor.

B. The estimated internal rate of return with and without revenue from the sale of emission reduction units

- Estimated internal rate of return without revenue from the sale of emission reduction units:: 6,36%
- Estimated internal rate of return including revenue from the sale of emission reduction units: 6,45%

C. Description of the difficulties that may occur during the implementation of the project and an indication of the way they are removed

List of formal, legal, economic, technical and social barriers identified by the investor during the preparation and implementation of investment

Legal barrier - One of the major barriers is the still unpredictable, inconsistent and ambiguous law. Concepts and principles of operation of renewable energy projects have changed several times in the past few years. In recent years there have been changes in a number of legal acts such as: Construction Law, Energy Law, Environmental Protection Law, The Nature Conservation Act, Public Procurement Law and the implementing regulations for these laws. The changes were very as far as legal conditions of the investment in wind energy are considered.

The difficulties indicated by the investor are largely coherent with the description of general and sectoral barriers for the investments in renewable energy sector, which are presented in a recent report of PKPP Lewiatan: *„The list of barriers in the energy sector",* developed in May 2011, and also in the conclusions described in the report.: *„Wind energy in Poland",* developed in November 2009 by the TPA Horwath and Domanski Zakrzewski Palinka.

In order to equalize the conditions of the operation of renewable energy installations in the energy market, there are instruments of support: legal (e.g., quantitative liabilities), financial (e.g. subsidies from environmental funds and EU funds) and tax (e.g. the excise duty relief). They serve not only the renewable energy sector and obtaining its full competitiveness, but also the implementation of important general social objectives related to environmental protection, job creation, improving energy security, development of innovation and de-monopolisation. These also serve directly the implementation of Poland's international obligations relating to i.e. environmental protection and in the current situation – the implementation of climate-energy package. However, they are difficult to access, application process is long and complicated, not always clear are the criteria upon which proposals are being rejected. It should be noted also that the funds are depleted long before the end of the programming period and the intensity of support is determined arbitrarily, in an uncoordinated manner and without a broader analysis of costs and technological learning curves.

Determination of the connection conditions by the investor of the project is one of the major

ratios complicating and extending the investment process. Each case it requires difficult arrangements with the grid operator and the electricity company, before the final version of the document is accepted. In addition, each of of these evaluations must take into account other wind energy projects who have already received the connection conditions. However, most of these projects will not be implemented due to lack financial resources, and they simply block access to the network. Conditions remain valid for 2 years and during that period these projects keep exclusive rights for the connection in a particular location. This is why many new projects have difficulties obtaining the technical conditions of connection to the grid, especially if we consider the weak transmission system in certain regions of Poland.

The current state of transmission and distribution infrastructure does not allow for the transfer of such quantity of renewable energy to the grid, which in future years would enable the realization of a mandatory share of renewable energy in total energy sold. It should be emphasized that none of the existing regulations does oblige operators to modernize and develop the transmission infrastructure. This issue remains therefore a matter for the respective boards of corporations, but it is no secret that the primary investment objectives of all major energy groups are within the area of reconstruction and construction of new capacity, rather than modernization of or construction of the transmission / distribution infrastructure. In practice, the source of wind mainly depends on the capacity of local distribution systems and to a lesser extent on the condition of national high voltage transmission system.

The result of the above described barriers to the development of wind energy sector is the fact that **duration of the investment process in Poland is still very long and equals to an average of 4 to 7 years, while the project preparation duration until the start construction works can take range from one year to 5 years, and the lower limit of this range applies to projects of small capacity. Not all investors, despite the start of preparatory actions, finalize the scheduled projects.**

D. Justification of the project's additionality

During the implementation of the wind power project in the region of Gołdap, company Goldap 2007 Management GmbH EW Gołdap sp.k. (Vortex Polska Management sp. z o.o.) was forced to overcome the above mentioned barriers and difficulties, which were for her a financial, organizational and time ballast.

Thanks to the experience of persons involved in the project preparation and determination of the project owners (specialized in projects related to wind energy) it was possible to overcome such sectoral and individual barriers and to complete the project successfully. **The above conclusions drawn from the history of the investment and difficulties encountered in connection with its realization, together with the analysis of RES industry sector presented in Section 5 A. of this project documentation implicate, according to the investor, the fullfillment of the condition of additionality of the project, within the meaning of Article 6.1 (b) of the Kyoto Protocol.**

Project participants may demonstrate additionality in one of a number of ways, which are set out in Annex I to the Guidance on criteria for baseline setting and monitoring (JISC 18, Annex 2).

(a) Provision of traceable and transparent information showing that the baseline was identified on the basis of conservative assumptions, that the project scenario is not part of the identified baseline scenario and that the project will lead to reductions of anthropogenic emissions by sources or enhancements of net anthropogenic removals by sinks of GHGs;

(b) Provision of traceable and transparent information that an accredited independent entity has already positively determined that a comparable project (to be) implemented under comparable circumstances (same GHG mitigation measure, same country, similar technology, similar scale) would result in a reduction of anthropogenic emissions by sources or an enhancement of net anthropogenic removals by sinks that is additional to any that would otherwise occur and a justification why this determination is relevant for the project at hand.

(c) Application of the most recent version of the *Tool for the demonstration and assessment of additionality* approved by the CDM Executive Board (allowing for a grace period of two months when the PDD is submitted for publication on the UNFCCC JI website), or any other method for proving additionality approved by the CDM Executive Board.

Option (b) is selected to demonstrate additionality.

Based on the regulations drawn up by JISC, in particular Annex I to the Guidance on criteria for baseline setting and monitoring (JISC 18, Annex 2), it is possible to rely on the so-called exceptional case, namely the existence of similar reduction projects whose additionality has been proven by the investor and approved by the AIE, in order to demonstrate the additionality of the project, which is the subject of application procedure for the issuance of the letter of approval.
In recent years a number of ongoing JI projects in Poland, involving the production of renewable energy in a wind farm, including:

- projects Lake Ostrowo
  http://ji.unfccc.int/JIITLProject/DB/S4IZCRCSRZ9K8LO1W7SF42J9EY24KK/details
  (LoA 31.01.2007)
  ITL Project ID: PL1000063
  http://www.dnv.com/focus/climate_change/upload/pdd%20and%20monitoring%20plan%20-%20lake%20ostrowo.pdf
- WF Zagórze
  http://ji.unfccc.int/JIITLProject/DB/34F3QUAKGOUUEKOBGFVQPUREG06603/details
  (LoA 10.01.2010)
  ITL Project ID PL1000065
  http://www.dnv.com/focus/climate_change/upload/zagorzewindpddpoland.pdf

Lake Ostrowo is located nearby Wolin, a small city located in Zachodniopomorskie Province in Poland. The total installed nominal generating capacity is 30.6 MWel, resulting from erecting 17 wind turbines of 1.8 MWel installed capacity each.

Zagorze wind farm is located on Wolin peninsula, a region in the north western part of Poland and utilizes 15 2MW Vestas wind turbines.

Named projects are also large scale projects, utilize same technology, same type of turbine and are connected to the same national grid, therefore reference to can be made directly and therefore are applicable to this project in the light of aforementioned project additionality demonstration option of JISC 18, Annex 2 decision.

6. MONITORING PLAN

A. Identification of the data and information that should be collected to monitor the project and the method of data collection, analysis and storage

In order to monitor the project there must be a systematic and precise **collection of data on production amounts of electricity delivered into the national grid**. Direct measurements are performed by the use of counters and software supporting the wind farm management, provided by the manufacturer of turbines - Vestas.

Reading of electricity is performed remotely via software SKADEN. Production data are collected continuously in counters memory. Readings are made once a month at the beginning of each calendar month, by a competent and independent Electricity Board and the owner of a wind farm. Data from the readings are archived by the software SKADEN.

Data on production which are the basis for the development of the monitoring reports are checked with monthy commercial invoices (WF issues to the distribution company the commercial invoice on the basis of a power purchase agreement). There is also possibility of using the certificates of origin as a secondary proof of the production of electricity.

The acquired data are stored in the office of the company managing the project - Windpark Gołdap 2007 Management GMBH EW Gołdap sp. k**. Calculations and internal reports on the number of emission reduction units generated within the project are stored in both paper and electronic (CD) for ten years after the billing period in the seat of Windpark Gołdap 2007 Management GMBH EW Gołdap sp. k. and as a "backup" at the administrator of the computer system.**

The independently verified reports concerning the previous year shall be sent to DNA no later than before 1 March of a particular year with the application for issuance of ERUs for energy production in the monitoring period.

B. Description of formulas used to calculate the emissions generated by the project, along with their description

The project contributes to the reduction of carbon dioxide emissions by transferring to the power grid the renewable electricity, which replaces the energy that would otherwise have been produced by conventional power plants using fossil fuels.

Emission reduction ERy by the Project during the year y is the difference between baseline emission (Bey), emission of the project (Pey) and emission caused by the leakage (Ly):

$$ERy = BEy - Pey - Ly$$

Baseline emission equals BEy:

$$BEy = Ey \times WE$$

where:

Ey – amount of electricity delivered to the grid [MWh]
WE – reference carbon dioxide emission rate for electricity production
WE = 0,812 [Mg CO_2/MWh]

The project does not result in GHG emissions, nor create a risk of of additional emissions due to leakage, therefore:

Pey = 0
Ly = 0

Therefore, the project's emission reduction equals to:

$$ERy = BEy = Ey \times WE$$

C. Determination of procedure for monitoring the reliability of data and information gathered in order to monitor the project

Monitoring Plan
The procedure for reviewing the accuracy of data and information collected to monitor the project
Wind Park Gołdap for the purpose of granting of the emission reduction units (ERUs)

	Name and surname	Position	Date	Signature
Developed by:				
Accepted by:				

A . Duration of the monitoring and the methodology applied:

1. The aim of the Monitoring Plan (MP) is to present the procedures for acquisition and recording data required for annual verification of number of Emission Reduction Units (ERUs) generated by the Project WF Gołdap during the 2008 – 2012 period.
2. The MP is to be used for verification of Emission Reduction Units which will be due to commissioning and operation of the WF Gołdap.
3. Verification of the number of acquired emission reduction units will take place every year, i.e. 2010-2012. A monitored variable will be the electrical energy delivered to the grid by the wind farm in the course of particular years 2010-2012.

B.: The allocation of responsibilities, rules for obtaining data, running the calculations and internal control:

1. The person designated by Windpark Gołdap 2007 Management GMBH EW Gołdap sp. k. for project management will be responsible for obtaining the source data necessary to calculate the baseline emissions and, consequently, eventually for calculating the number of emission reduction units and proper storage.
2. As a substitute, in exceptional cases (eg longer absence of the person responsible due to various reasons), the obligations relating to the monitoring will be taken over by a designated person.
3. Collection of data for the previous year and calculation of monitored indices shall be performed by 31 January of a particular calendar year.
4. Asset Manager will be responsible for verification of correctness of used source data, control of their proper recording, verification of correctness of calculation of ERUs and overall control. Asset Manager will be responsible for the whole monitoring process management.
5. In case of the Asset Manager performing the calculation of ERUs (while substituting the person responsible in his or her absence), the internal control and approval shall be temporarily performed by Head of Project and Asset Management.
6. The internal verification of correctness of the input data, calculations and recording method for the previous year (of the content of an annual monitoring report prepared by the person responsible) shall be concluded by 10 February of a particular calendar year.
7. As a result of the verification should therefore be done an internal acceptance of the report by the Country Manager.
8. In case that data contained in the report are proved to be incomplete, based on improper assumptions,

bad calculations algorithm or in case of any other irregularities, the Country Manager shall recommend that the person responsible for the preparation of the monitoring report will implement appropriate corrections or provide supplementary information, in the course of 10 consecutive days from the conclusion of internal verification of the annual report, i.e. until 20 February of a particular year.

9. The independently verified reports concerning the previous year shall be sent to DNA no later than before 1 March of a particular year.

10. Calculations and internal reports on the number of emission reduction units generated within the project should be stored in both paper and electronic (CD) for two years after the end of the crediting period in the seat of Windpark Gołdap 2007 Management GMBH EW Gołdap sp. k. and as a "backup" on the computer of system administrator

11. CD-ROMs and paper files shall be stored separately, in a room together with other basic, key documents of the Windpark Gołdap 2007 Management GMBH EW Gołdap sp. k. The access to documentation stored in this way shall be restricted only to Country Manager, Head of Project and Asset Management, Office Manager.

12. The following indices and quantities will be monitored:

- The amount of energy supplied by the Project to the grid,
- The number of ERUs generated by the Project during particular calendar year.

13. Measurements of the energy supplied to the grid by the project will be conducted by the meters which were presented at the drawings attached to the project documentation. Monitoring of wind farms production is carried out using the SCADA software - Vestas Online Business for WF VORTEX Gołdap. This software allows the online viewing of all parameters of wind farms operation including the production of individual turbines and the total electricity generation of the wind park.

14. Reading of electricity is performed remotely via software SKADEN. Production data are collected continuously in counters memory. Readings are made once a month at the beginning of each calendar month, by a competent and independent Electricity Board and the owner of a wind farm. Data from the readings are archived by the software SKADEN.

15. The person responsible for reporting should every year at a given time send for the verification together with a report on the volume of GHG reduction also copies of source materials used to calculate the parameters.

16. The data for each passed calendar year, together with the calculations of the number of ERUs, shall be recorded in a separate spreadsheet and stored in paper and electronic form. There should be a year written on each spreadsheet (verification year).

17. Correctness of formulas used in the spreadsheets shall be verified by Asset Manager and protected from data modification. In case of electronic versions, an eight-characters password shall be used; in case of paper documents two copies bearing the signatures of Asset Manager shall be made. One copy shall be stored in a limited access storage spaces.

18. The calculation formulas will comply with above mentioned methodology. Number of ERUs will correspond to the amount of electricity delivered to the grid by the project multiplied by a baseline emissions ratio set in the project, which equals to 0,812 tCO_2/MWh.

19. The data on the amount of electricity generated will be acquired from the electricity sale invoices.

20. Data for invoices (kWh number) come from the primary measurement system, legalized in accordance with the appropriate standards.

21. In case of malfunction of the primary measurement device, the readouts from the second, backup meter, registering generated energy in parallel in case of malfunction of the primary system, will be used.

22. The primary source which allows the verification of information on the amount of energy supplied to the

grid by the project is the invoiced electricity sales volume.

23. In order to verify the amount of energy generated by a wind farm, there is a possibility of additional use of invoices issued by the WF Gołdap to recipients of the certificates of origin of green electricity.

24. The form and layout of the monitoring report are determined in the decree of the Minister of the Environment of 10th November 2010 on the statement from monitoring and verification report on number of ERUs achieved by the JI project (Polish Journal of Laws no. 225, item 1472) – any possible change to the required layout and content of required information shall be verified against any changes by the Asset Manager before preparing of the monitoring report.

25. Report relates to a period of no longer than 1 year and determines the amount of emission reductions and a corresponding amount of ERUs.

26. Should additional emission of GHG occur due to the project realisation this also should be noted and the amount should be calculated and recorded in monitoring report.

C. Corrective actions procedure for the Monitoring Plan

1. Aim of the procedure

The aim of the procedure is to ensure that in case of non-conformance or threat to the quality of actions resulting from the Monitoring Plan, an adequate corrective or preventive measures are undertaken to eliminate the cause of the non-conformance and threats, depending on the degree of the problem's importance and the occurring threats.

2. Subject of the procedure

The Procedure incorporates the course of conduct to be followed during implementation of the corrective (preventive) measures from the time of the non-conformance (threats to quality) ascertainment to the time of the documented confirmation of the effectiveness of the measures and implementation of possible changes to the quality system documentation.

3. Responsibility

Below there are listed responsibilities of the employees of Windpark Gołdap 2007 Management GMBH EW Gołdap sp. k. in connection with the procedure of corrective actions undertaken in the case of a breach of the Monitoring Plan:

3.1. Country Manager is responsible for:

- for managing of the whole monitoring process;
- supervision over the procedure of corrective actions;
- direct supervision over actions carried out by Asset Manager;
- review of notes in the Non-Conformance Report.

3.2. Asset Manager is responsible for:

- direct supervision over actions carried out by the person designated by Windpark Gołdap 2007 Management GMBH EW Gołdap sp. k. for managing the Project;

- supervision of correctness of the implementation actions encompassed by the corrective procedure within the scope of the Monitoring Plan;
- review of notes made within the scope of the Monitoring Plan in order to detect and eliminate non-conformance/threats to the effective performance of the Monitoring Plan.
- making notes in the Non-Conformance Report.

3.3. The person designated by Windpark Gołdap 2007 Management GMBH EW Gołdap sp. k. in order to manage the Project is obliged to carry out actions resulting from the Monitoring Plan and to report to the Asset Manager on established non-conformance or potential threat to the quality in the Monitoring Plan.

4. Course of action

4.1. Detection of a non-conformance or potential threat to the quality takes place usually via direct observations and perceptiveness and review of notes resulting from the Monitoring Plan:

- records of readings,
- reports from yearly reviews;
- verification reports,

Reporting of a non-conformance or threats to the quality is performed by the employee that detected it, by means of a verbal reporting on the cause to the direct supervisor.

4.2. Non-Conformance Analysis/ Threat to Quality:
Asset Manager performs analysis of a non-conformance or threat and determines the cause of their arising. If consultation is required regarding the requirements, such consultation is carried out with the Country Manager and/or the Independent Verifier prior to drawing up the corrective actions..

4.3. Drawing up corrective/preventive actions program:
Asset Manager draws up corrective/preventive actions by making an adequate note in the Non-Conformance Report.

4.4. Implementation of corrective/preventive actions:
The person designated by Windpark Gołdap 2007 Management GMBH EW Gołdap sp. k. Ltd for managing the Project or the Asset Manager (depending on the corrective action) implements the corrective/preventive actions according to the Program. The designated person informs the Country Manager on the completion of the actions.

4.5. Examination of effectiveness of corrective/preventive actions:
Upon implementation of the corrective/preventive actions, the Asset Manager shall examine the effectiveness of the undertaken action and makes an adequate note in the Non-Compliance Report.

D. Justification of the selected method of monitoring

In case of the wind farm project in Gołdap an approved methodology for monitoring - ACM0002 **"Consolidated monitoring methodology for zero-Emissions Grid-connected Electricity Generation from renewable sources"** has been selected as a basis and some elements of the data quality management systems.

This methodology is applied to:

- projects aiming at increase of the electricity generation capacity from flow-through water power plants, hydropower plants with existing reservoirs where the capacity of the reservoir does not increase; sources of wind, geothermal springs, solar sources, wave and tidal sources;
- if the geographical boundaries of the analyzed electricity grid can be clearly defined, and information about the characteristics of the grid is available.

Project WF Gołdap meets the above mentioned criteria, and therefore it is appropriate to apply the above described method of monitoring.

ACM0002 monitoring methodology has been applied also because of its simplicity. This methodology does not require monitoring of complex variables. Only the output of electricity to the grid in this project must be monitored throughout the crediting period. The whole monitoring of the project will be just corroborating data from electricity sale invoices from the period of 12 months and multiplying the sum by the baseline emission factor of 0.812MgCO2/MWh to produce resultant number of ERU achieved by the project.

Competences of the monitoring personnel are assured by the company's procedure. It says, that every person assigned to calculation of avoided should have a MS Excel and monitoring instruction training. O&M competences and needs are assured in O&M contracts with Vestas Poland.

Except of manual transposition errors, which are minimised through double check practice described in monitoring plan, and use of electricity sale invoices, which are under legal fiscal supervision in terms of consistency, as well as proper class and maintenance of the measuring equipment (legalization routine) the whole project monitoring risk profile should be estimated as very low.