JOINT IMPLEMENTATION PROJECT DESIGN DOCUMENT FORM
Version 01 - in effect as of: 15 June 2006

CONTENTS

Annexes

SECTION A. General description of the project

A.1. Title of the project:

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RWE Renewables Polska Wind Power Project
PDD Version: 03
Date: 15 May 2012

A.2. Description of the project:

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The RWE Renewables Polska Wind Power Project (hereafter referred to as the project) is located in Northern Poland.

The objective of the project is to generate electricity using renewable wind resources and to supply the generated electricity to the Polish Grid. The project will involve construction of the wind turbines and also the accompanying infrastructure e.g. internal access roads and power lines for transmission of the generated electricity to the grid.

The project consists of three sites which belong to RWE Renewables Polska with Special Purpose Vehicles (SPV) for each wind farm. The names of the SPVs are as follows:

- Park Wiatrowy Suwalki Sp. z o.o.
- Piecki Sp. z o.o. (51 % of the shares are owned by RWE Renewables Polska, 49% of the shares are owned by HSE)
- Park Wiatrowy Tychowo Sp. z o.o.

The project specific details can be found below:

Site No	Location	No of Turbines	Capacity of Turbine (MW)	Total Installed Capacity (MW)
1	Suwalki	18	2.3	41.4
2	Piecki	16	2	32
3	Tychowo	15	2.3	34.5
Total		49		107.9

The project concept has been concieved by RWE Renewables Polska, which is a subsidiary of RWE Innogy . It includes a total installed capacity of 107.9 MW from the three wind farms and hence the project is defined as a large scale project. The three windfarms are managed and co-ordinated according to RWE standards under RWE Renewables Polska which is a part of RWE Innogy. For sites 1 and 3 the wind turbines are produced by Siemens Wind Power GmbH and site 2 uses wind turbines produced by Gamesa Wind Poland Sp. z o.o.

The project will contribute to greenhouse gas (GHG) emission reductions by supplying renewable electrictiy to the grid and by replacing this part of electricity generation from a fossil fuel-fired power intensive grid. The estimated annual GHG emission reduction is approximately 191,218tCO_2e/year.

The project will not only supply renewable electricity to the grid but will also contribute to sustainable energy development in Poland by:

- Reducing the emission of GHG resulting from the power generation industry, compared with the business-as-usual-scenarios;
- Promote the development of renewable energy in Poland;
- Creating new employment opportunities;
- Mitigate the dependence of fossil fuel power supply and accelerate local economic development.

A.3. Project participants:

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Name of the Party involved	Private and/or public entity(ies) Project participants	Kindly indicate if the Party involved wishes to be considered as project participants
Poland (Host Party)	RWE Renewables Polska Sp. z o.o.	No
Germany	RWE Power AG	No

RWE Renewables Polska is owned by RWE Innogy which pools the renewable energy expertise and power plants of the RWE Group. The company plans, builds and operates facilities generating power from renewable energies. RWE Innogy aims to vigorously grow renewable energies in Europe. Onshore and offshore wind power projects are a focus of the company's activities.[1] In 2009 it has built the first wind turbines in Poland which have been the Suwalki wind park.

RWE Power AG is the main electricity producer within the RWE Group with its portfolio based primarily on lignite, hard coal, nuclear energy and gas. With an installed capacity of 34,028 MW (2010) and an electricity production of 165.1 bn kWh (2010), RWE is one of the biggest electricity generators in Europe. For the same reasons RWE Power AG is also one of the biggest compliance buyer in the Carbon Market. Curently, RWE Power participates in more than 100 CDM and JI projects worldwide.

A.4. Technical description of the project:

A.4.1. Location of the project:

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A.4.1.1. Host Party(ies):

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Poland (Republic of Poland)

A.4.1.2. Region/State/Province etc.:

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Project Site	Voivodship / County
1	Podlaskie / Suwałki
2	Podlaskie / Suwałki
3	West Pomeranian / Stargard Szczeciński

A.4.1.3. City/Town/Community etc.:

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Project Site	Municipality / Community
1	Suwałki / Biała Woda
2	Filipów / Piecki
3	Stargard Szczeciński / Trzebiatów

[1] Source: http://www.rwe.com/web/cms/en/87202/rwe-innogy/company

A.4.1.4. Detail of physical location, including information allowing the unique identification of the project (maximum one page):

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The project consist of three site which are located in Norther Poland at:

- Site 1 - Park Wiatrowy Suwalki, Biala Woda 25, 16-402 Suwalki, Poland
- Site 2 - Park Wiatrowy Piecki, Stacja GPZ Park Wiatrowy, 16-402 Piecki, Poland
- Site 3 - Park Wiatrowy Tychowo, Trzebiatów 13, 73-131 Pęzino, Poland

The geographical coordinates of the sites are:

- Suwalki: 22° 52'39" E and 54°09'30" N
- Piecki: 22° 46'04" E and 54°11'01" N
- Tychowo: 15° 09'22" E and 53°19'11" N

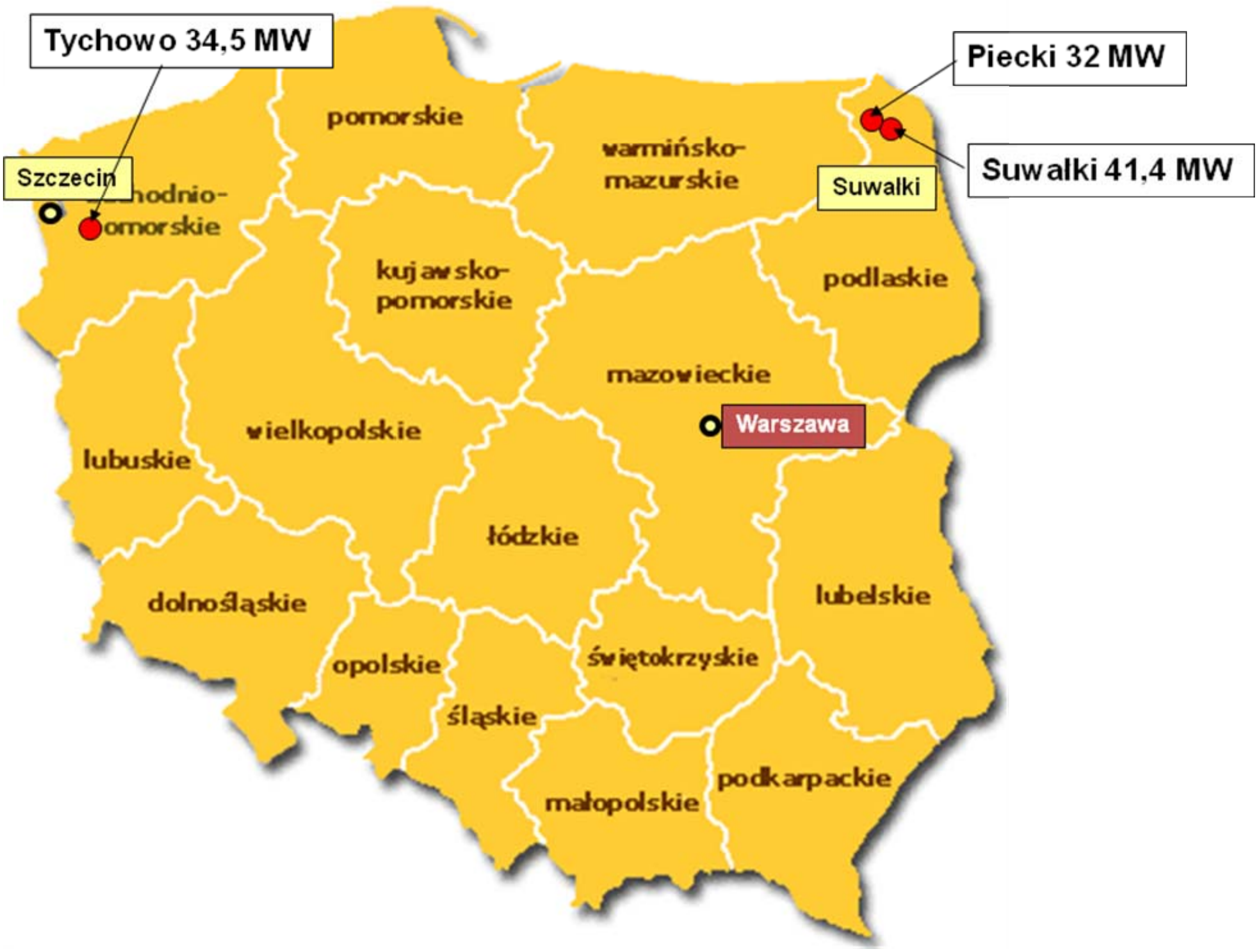

Figure A-4-1 Geographical position of the project sites

A.4.2. Technology(ies) to be employed, or measures, operations or actions to be implemented by the project:

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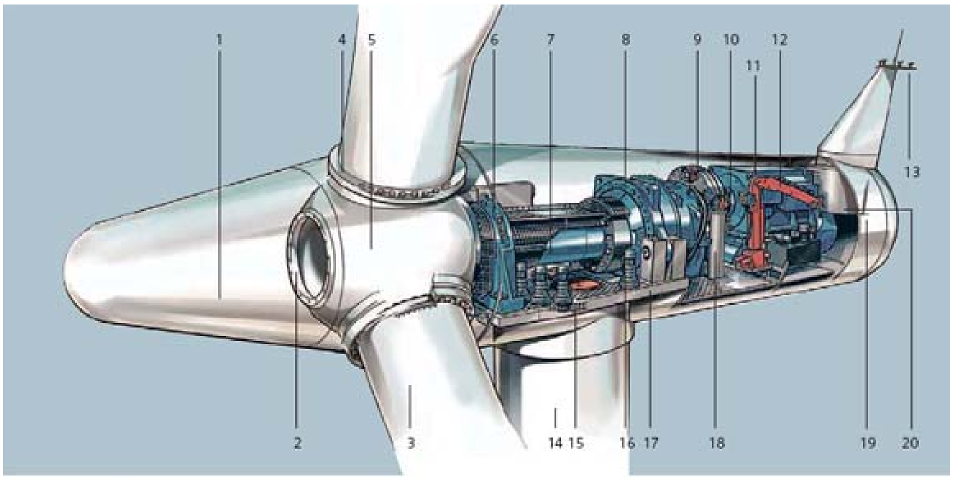
The proposed project will use 18 wind turbine generators manufactured by Siemens at the Suwalki site. The main technical parameters are presented in Table A-4-1:

Table A-4-1 Main technical parameters of Suwalki wind park

Part	Parameter
Turbine	Siemens SWT-2.3
Rated Power	2.3 MW
Rotor diameter	93 m
Height of hub	103 m
Start up speed	4 m/s
Shutdown speed	25 m/s



Nacelle Arrangement

1 Spinner	11 Generator
2 Spinner bracket	12 Service crane
3 Blade	13 Meteorological sensors
4 Pitch bearing	14 Tower
5 Rotor hub	15 Yaw ring
6 Main bearing	16 Yaw gear
7 Main shaft	17 Nacelle bedplate
8 Gearbox	18 Oil filter
9 Brake disc	19 Canopy
10 Coupling	20 Generator fan

Figure A-4-2 Wind Turbine Siemens SWT-2.3-93[2]

[2] Source: http://www.energy.siemens.com/hq/en/power-generation/renewables/wind-power/wind-turbines/swt-2-3-93.htm#content=Design

The proposed project will use 16 wind turbine generators manufactured by Gamesa at the Piecki site. The main technical parameters are presented in Table A-4-3:

Table A-4-2 Main technical parameters of Piecki wind park

Part	Parameter
Turbine	Gamesa G90
Rated Power	2 MW
Rotor diameter	90 m
Height of hub	78 m
Start up speed	3 m/s
Shutdown speed	25 m/s

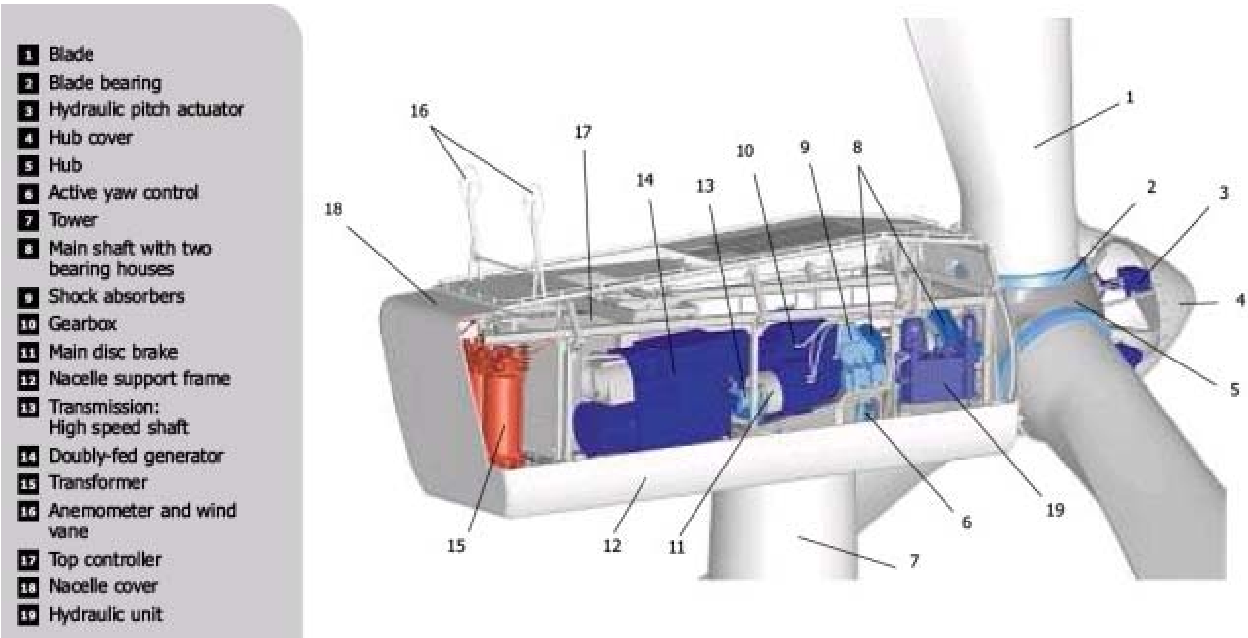


Figure A-4-3 Wind Turbine Gamesa G90[3]

The proposed project will use 15 wind turbine generators manufactured by Siemens at the Tychowo site. The main technical parameters are presented in Table A-4-2:

Table A-4-3 Main technical parameters of Tychowo wind park

Part	Parameter
Turbine	Siemens SWT-2.3
Rated Power	2.3 MW
Rotor diameter	93 m
Height of hub	103 m
Start up speed	4 m/s
Shutdown speed	25 m/s

[3] Source: Gamesa G90-2.0 MW - GAMESA - (Version JPG) - Page n° 5 - PDF Catalogue | Technical Documentation | Brochure

Implementation Schedule

The decision to undertake the projects PW Tychowo and PW Suwałki has been made by the Board of RWE AG in 03.04.2007. and the decision to undertake the projetct PW Piecki has been made by the Board of RWE Innogy in 01.12.2009.

For site 1, in March 2008 the investment stage has been started by signing the Turbine Supply Agreement with Siemens Wind Power GmbH. Construction works began in June 2008 and lasted until August 2009. The official commissioing of the Suwalki wind park has been in October 2009.

For site 2, the construction works began in February 2009 and lasted until September 2010. The official commissioning of the Piecki wind park has been in November 2010. After that RWE Renewables Polska and HSE took over the wind park from Gamesa with RWE Renewables Polska owning 51 % of the shares and HSE owning 49% of the shares.

For site 3, the investment stage has been started in April 2008 by signing the turbine supply agreement with Siemens Wind Power GmbH. Construction works began in February 2010 and lasted one year. The official commissioning of the Tychowo wind park has been in February 2011.

The expected lifetime of the project is 20 years. For all sites, there are O&M agreements with the specific equipment manufacturers (Siemens, Gamesa) for five years. Gamesa undertakes the maintenance works every six months and Siemens undertakes the maintenance works once a year.

A.4.3. Brief explanation of how the anthropogenic emissions of greenhouse gases by sources are to be reduced by the proposed JI project, including why the emission reductions would not occur in the absence of the proposed project, taking into account national and/or sectoral policies and circumstances:

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Anthropogenic emissions of greenhouse gases are to be reduced due to use of renewable power generation. It implies emission reductions due to substitution of electricity from the national grid, which has a high carbon intensity factor of 0.812 tCO2e/MWh[4].

In 2010, almost 90 % of the electricity has been generated by coal-fired and lignite-fired power plants, whereas the electricity generated by wind power plants or other types of renewable energy only amounts to around 3.5 % (including hydroelectric power plants).

[4] Source: http://www.kobize.pl/materialy/jicdm/JI-wskaznik_referencyjny_26sie2011_publik.pdf

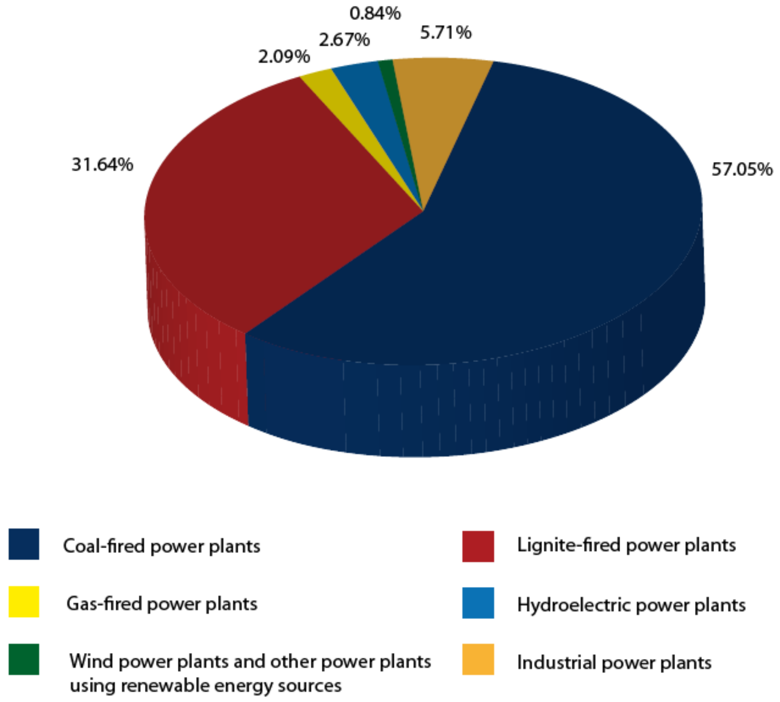

Figure A-4-4 Share in the domestic electricity production in Poland, by fuel type in 2010[5]

The carbon factoring for the project was conceived by RWE under Joint Implementation since 2007. At that time the Polish government did not have enough carbon dioxide emission allowances for distribution within their National Allocation Plan (NAP). As a consequence, the request of RWE to develop the project as a JI project was put on hold. Despite intense efforts RWE was not able to receive a Letter of Endorsement for the project in 2007. This can be confirmed by written communication with the Polish Ministry of Ecology which has been submitted to the determinator.

The decision to undertake the projects PW Tychowo and PW Suwałki has been made by the Board of RWE AG in 03.04.2007. and the decision to undertake the projetct PW Piecki has been made by the Board of RWE Innogy in 01.12.2009.

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For site 3, the investment stage has been started in April 2008 by signing the turbine supply agreement with Siemens Wind Power GmbH. Construction works began in February 2010 and lasted one year. The official commissioning of the Tychowo wind park has been in February 2011

In April 2010, the new NAP which has been submitted by Poland for distributing carbon dioxide emission allowances for the 2008 – 2012 trading period of the EU ETS, has been accepted by the

[5] Source: http://www.pse-operator.pl/uploads/kontener/raport_pse_2010_en.pdf

European Commission. Thereafter the legal act "o systemie handlu uprawnieniami do emisji gazów cieplarnianych" came under force under Polish law number 695 from 28.04.2011 and this act allowed the enabled application of Renewable Energy projects under JI in Poland. In June 2011 the Kobize came out with the document "Referencyjny wskaźnik jednostkowej emisyjności dwutlenku węgla przy produkcji energii elektrycznej do wyznaczania poziomu bazowego dla projektów JI realizowanych w Polsce"[6] that established the valid Grid Emission Factor of 0.812 tCO2e/MWh . Afterwards RWE increased its efforts again to develop the project under the JI scheme and signed an Emission Reduction Purchase Agreement (ERPA) for it at the end of 2011.

RWE's intention to develop alongwith the Carbon revenues were clear from the start and this can be observed in the timeline described above from 2007. The considerable risk (as stated in Section B) undertaken by RWE in the wind sector in Poland with the help of Carbon revenues proves that the project would not have existed in an buisness as usual scenario.

A.4.3.1. Estimated amount of emission reductions over the crediting period:

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Year	Annual estimation of emission reductions (tCO2e)
01/10/2009 – 31/12/2009	19,814
01/01/2010 – 31/12/2010	88,628
01/01/2011 – 31/12/2011	200,876
01/01/2012 – 31/12/2012	206,820
Subtotal 2009 – 2012	**516,139**
01/01/2013 – 31/12/2013	206,820
01/01/2014 – 31/12/2014	206,820
01/01/2015 – 31/12/2015	206,820
01/01/2016 – 31/12/2016	206,820
01/01/2017 – 31/12/2017	206,820
01/01/2018 – 31/12/2018	206,820
01/01/2019 – 30/09/2019	155,115
Total estimated emission reductions (tCO2e)	1,912,177
Total number of crediting years	10
Annual average of the estimated emission reductions over the crediting period (tCO2e)	191,218

The emission reductions from 01.01.2013 until 30.09.2019 are subject to Host Party approval.

A.5. Project approval by the Parties involved:

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The new version of the JI procedures in Poland which has been published by KOBiZE in December 2011 gives a clear indication on the procedures to be followed for the project under Track 1[7].

This project activity requires a Letter of Approval for which the project participants will provide the necessary documentation i.e. Project Design Document, Determination Report, Environmental Impact Assessment Report and a document confirming the intention to purchase the generated ERUs to the Polish Ministry of Environment.

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[6] Source: http://www.kobize.pl/materialy/jicdm/JI-wskaznik_referencyjny_26sie2011_publik.pdf

[7] Source: http://www.kobize.pl/materialy/opracowania/grudzien2011/PROJEKTY_WSPOLNYCH_WDROZEN-mozliwosci_realizacji_w_Polsce_aktualizacja_2011.pdf

The German Letter of Approval is granted once the Project Design Document has been completed and a positive determination report and the Polish Letter of Approval have been received.

SECTION B. Baseline

B.1. Description and justification of the baseline chosen:

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The baseline is the scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases (GHG) that would occur in the absence of the proposed project activity.

In line with the Guidelines on criteria for baseline setting and monitoring (Version 3, JISC 26, September 2011) a methodology for baseline setting and monitoring approved by the Executive Board of the Clean Development Mechanism (CDM) has been chosen: ACM0002, version 12.1.0 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”.

Table B-1-1. Applicability of the baseline methodology ACM0002

ACM0002 Applicability Criteria	Project Characteristics
The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit.	The project is the installation of a wind power plant. Therefore this criteria can be seen as fulfilled.
In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use Option 2: on page 11 to calculate the parameter *EGPJ,y*): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	As the project is a wind power plant this criteria is not applicable.
In case of hydro power plants, one of the following conditions must apply: o The project activity is implemented in an existing reservoir, with no change in the volume of reservoir; or o The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m2; or o The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions	The project is a wind power plant. Therefore this criteria is not applicable.

section, is greater than 4 W/m2.	

Step 1: Identify realistic and credible alternative baseline scenarios for power generation

Alternative 1: The proposed project activity is undertaken without being registered as a JI project.
Alternative 2: Construction of a fuel-fired power plant with equivalent amount of annual electricity output.
Alternative 3: Construction of a power plant using other sources of renewable energy with equivalent amount of annual electricity output.
Alternative 4: Electricity delivered to the Polish 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.

The utilizing hours and stability of wind power are of great difference from that of thermal power. The total installed capacity in the Polish Power System as of 31 December 2007 amounted to 35,096 MW, slightly more than in the previous year (by 232 MW). At the end of 2007, the total maximum capacity of the public thermal power plants amounted to 30,147 MW and represented 86 % of the total maximum capacity of the power system.[8]

Sub-step 1b. Enforcement of mandatory laws and regulations.

Polish government has promulgated laws and regulations to support the renewable energy project which includes the wind power project, thus the *alternative 1* complies with Polish current laws and regulations. However, due to the high investment costs and a number of technological barriers this is not a realistic alternative, which can also be recognized when comparing the domestic electricity production in Poland by fuel type in 2007 and in 2010. It is obvious that the fuel mix did not change remarkably within the last three years.

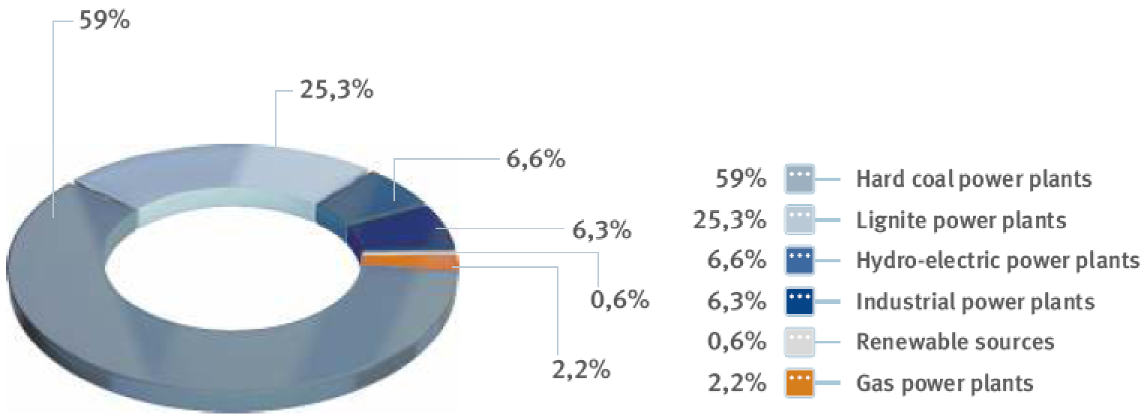

Figure B-1-1 Share in the domestic electricity production in Poland, by fuel type in 2007[9]

The share in the domestic electricity production in Poland by fuel type in 2010 can be seen in Figure A-4-4. By comparing the two figures it is obvious that the share of renewable energy production has only slightly increased by 0.24 %.

According to the new indicative objectives set by Directive 2009/28/EC on the promotion of the use of energy from renewable sources amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC require that by 2020 Poland should reach a 15% share of electric energy from RES in the

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[8] Source: http://www.pse-operator.pl/uploads/kontener/Raport_Roczny_2007_EN.pdf

[9] Source: http://www.pse-operator.pl/uploads/kontener/Raport_Roczny_2007_EN.pdf

gross consumption of electric energy.[10] *Alternative 2* would mean the construction of a fuel-fired power plant with equivalent amount of annual electricity output which would not be consistent with the aims of the Polish energy development. Therefore this alternative is to be considered as not feasible.

Development of renewable energies is one of the priorities listed in the document called "Energy Policy until 2030", adopted by the Polish Government on 10 November 2009. It provides for mechanisms that are intended to encourage the development of renewable energy power plants such as:

- exemption of the green power from excise tax (already in force);
- green certificates and the relevant mechanisms supporting green power producers (already in force);
- tax support tools (some tax relieves have already been introduced);
- support of RES projects from the EU and environment protection funds.[11]

Therefore, the *alternative 3* complies with the Polish laws and regulations. However, due to the technology development status and the high cost for power generation, solar PV, biomass or geothermal power stations of similar installed capacity as the proposed project are not realistic alternatives in Poland. The proposed project is located in areas which lack hydropower resources, thus the alternative 3 is not feasible.

Alternative 4 is in compliance with all mandatory laws and regulations in Polish and faces with no economical barriers. Furthermore, the annual electricity output of the Polish Grid has been increasing steadily, as can be seen in Figure B-1-2 below:

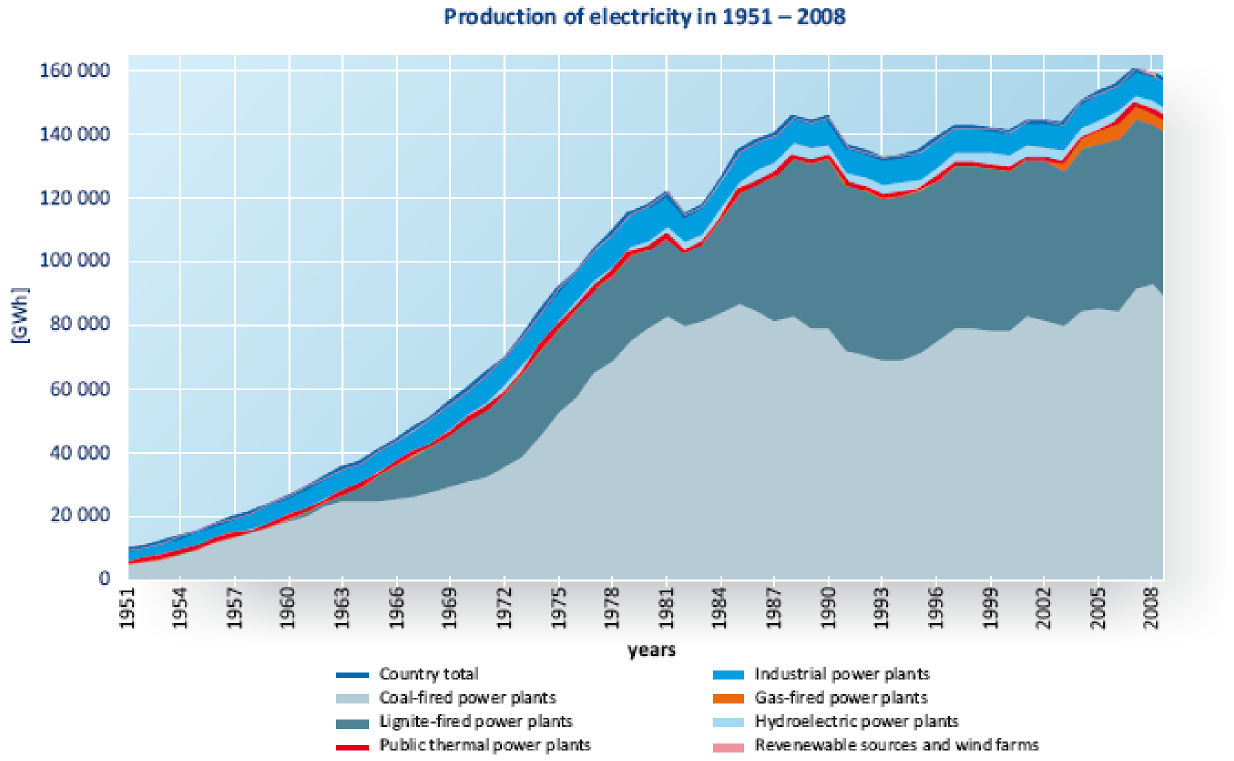

Figure B-1-2 Production of electricity in 1951 – 2008[12]

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[10] Source: http://www.paiz.gov.pl/polish_law/renewable_energy

[11] Source: http://www.paiz.gov.pl/polish_law/renewable_energy

[12] Source: http://www.pse-operator.pl/uploads/kontener/Raport_Roczny_2008_EN.pdf

Hence, the Alternative 4 is a credible and realistic alternative. As a result, providing the same electricity output by the Polish Grid is selected as the baseline scenario for the proposed project.

Step 2: Financial Analysis

A financial analysis has not been undertaken as a barrier analysis will be used to demonstrate the project additionality. The required financial information as per §2 of the Decree of the Minister of Environment of Poland Nr. 1608 (dated 03.12.2010)[13] can be found in Annex 2.

Step 3: Barrier Analysis

As already mentioned in the Figures A-4-2 and B-1-1 wind power is not a prevailing practice in Poland. Hence the fact that existing experience is limited to designing, building and operating wind farms does represent a barrier to implementation of such a project activity. Furthermore, the project faced technological barriers, as well as administrative barriers due to this lack of expertise in dealing with renewable energies.

Technical Barriers:

- grid connection / grid access
- infrastructure of Polish electricity grid
- limited experience with renewable energy technologies

Among the technical barriers, the most severe ones are the barriers linked to grid connection and access, not in terms of the physical connection but in terms of limited priority access with regard to fossil power production and insufficient transport capacity linked to obsolete infrastructure.

The main problem is that the existing transmission and distribution networks are not able to provide grid access to all renewable energy sources, as there are more applications for connection than the grid is able to accept. The infrastructure of the Polish electricity grid has not been modernised properly during the last two decades and therefore the grid is heavily overloaded. As a consequence, a significant number of applications for a connection to the grid are rejected.
In order to expand the existing electricity infrastructure new overhead lines have to be constructed but the owners of the land through which these lines are planned to pass are strongly opposed to this construction. They fear that the value of their real estate decreases or ask for high indemnities. Furthermore, the bearing and sharing of the costs for the grid extension is not transparent which prolongs the whole process of grid expansion.

This above analysis is confirmed by a study undertaken in the name of the European Commision regarding the “Assessment of non-cost barriers to renewable energy growth in EU Member States” in May 2010.[14] Furthermore, an assessment especially for Poland has been undertaken[15] which also states this issue within Section 7.2 as the most significant barrier in Poland.

Administrative Barriers:

- insufficient administrative procedures
- lack of transparency and guidelines for applications and decision-making processes
- non-transparent and difficult procedures for obtaining permits

Apart from the technological barriers there are administrative barriers for wind farms in Poland. As the market for wind energy is still relatively new there are a lot of insufficient administrative procedures and a lack of transparency and guidelines. The main administrative barriers are:

[13] Source: http://dokumenty.e-prawnik.pl/akty-prawne/dziennik-ustaw/2010/240/1608/

[14] Source: http://ec.europa.eu/energy/renewables/studies/doc/renewables/2010_non_cost_barriers.pdf

[15] Source: http://ec.europa.eu/energy/renewables/studies/doc/renewables/2010_non_cost_barriers_countries.zip

- a lack of transparency in the application and decision-making process for authorising grid connection
- badly defined requirements for the Environmental Impact Assessment (EIA) process (especially for sites located close to Natura 2000 areas), the spatial planning permission and the grid connection process
- obtaining the building permits e.g. for installation of masts for wind measurements and development of wind farms

These barriers are also recognized by the Polish Wind Energy Association (PWEA)[16] and due to these the development of wind farms in Poland is associated with high risks. As a wind farm developer one has to plan the time schedule and the expected costs for the project. However, this is very difficult in Poland as the application and decision-making processes for the grid connection are not transparent and vary from project application to project application. The unclear definitions for EIAs also form a part of this problem because developers are often required to submit additional, time-consuming information at a later stage which leads to a delay in the whole process. It could also happen that the same document is accepted by one authority and questioned by another. The assessment of the wind farm's impact on protected bird species migration is reported to be a problem. Regarding the spatial planning the main issue is that currently only 20% of the Polish area is covered with local spatial development plans. In case such a plan is not in place the investor is obliged to obtain a "conditions on the site's development" decision which defines what facility can be implemented under which conditions. This means a prolongation of the initiation phase of the project.
Obtaining a building permit often takes a long time in Poland due to public consultation and the time lag in decisions of local authorities which might be caused due to a lack of knowledge and benefits of renewable energies. In the worst case, all this time delays can lead to the failure of a project.

Barriers after Implementation
- no priority evacuation for renewable energy
- huge dependance on grid operator
- lack of certification bodies and trainings

Once the project is installed there are more barriers one has to face. Firstly, there is no priority evacuation for renewable energy as it is the case in Germany and therefore the future of the grid supply relies heavily on the grid operator. He gives a production limit to the companies which means they often have to switch off wind turbines although they could generate electricity because they are not allowed to supply this energy to the grid. Secondly, there is a lack of certification bodies and trainings for the education of installers, planners etc. for renewable energies. In Poland there is no implemented system for the certification and accreditation of installers of equipment as defined in the regulation of the European Commission. There is also no certification body for wind power which would secure trainings or the assessment of quality of the system or the equipment.

Step 4: Common Practice Analysis
As already stated above wind energy is not common practice in Poland. Prevailing practice is the electrictiy generation by fossil fuels as hard coal and lignite. Even though in 2005 the Polish Energy Law Act was amended to provide a quota system obligation in the form of a "Green Certificate System"[17] the production of electricity through renewable energies did not increase noticeably. In 2010, almost 90 % of the electricity has still been generated by coal-fired and lignite-fired power plants, whereas the electricity generated by wind power plants or other types of renewable energy only amounts to around 3.5 % (including hydroelectric power plants) as can be seen in Figure A-4-4 above.

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[16] Source: http://www.wind-energy-the-facts.org/en/part-4-industry--markets/chapter-5-administrative-and-grid-access-barriers---an-analysis-of-existing-eu-studies-in-the-field/case-studies

[17] Source: http://www.iea.org/textbase/pm/?mode=pm&id=3675&action=detail

Step 5: Conclusion
Taking into account the number of significant technological barriers, connected with renewable energy, other barriers described in details in Section B1 above and the fact that renewable energy is not a common practice in Poland, it is concluded that emission reductions would not occur in the absence of the proposed project. This is because the barriers place a huge impact on the decision making process and only with the help of carbon credits these barriers are alleviated as the carbon credits improve the project financially. Hence the wind park activity is additional.

B.2. Description of how the anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the JI project:

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Calculation of baseline emissions (BE_y)

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

Where:

BE_y = Baseline emissions in year y

$EG_{PJ, y}$ = 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)

$EF_{grid, CM, y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y

Calculation of $EG_{PJ, y}$

For greenfield renewable energy power plants the quantity of net electricity generation that is produced and fed into the grid is equal to the quantity of net electricity generation supplied by the project plant

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

Calculation of $EF_{grid, CM, y}$

The calculation of the grid emission factor is not necessary as this factor is officially regulated by the Polish government[18]:

$EF_{grid, CM, y} = 0.812\ tCO_2/MWh$

Calculation of Leakage

According to ACM0002, version 12.1.0 no leakage emissions are to be 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 emission sources are neglected.

$LE_y = 0$

Project Emissions

According to ACM0002, version 12.1.0 the project emissions for renewable power generation project activities are to be considered as zero except the project activity uses fossil fuels as a back up technology, the project activity is a geothermal power plant or the project activity is a hydropower plant with a reservoir.

As this project activity is a wind power plant the project emissions can be defined as:

[18] Source: http://www.kobize.pl/materialy/jicdm/JI-wskaznik_referencyjny_26sie2011_publik.pdf

$PE_y = 0$

Emission Reductions
$ER_y = BE_y - PE_y$

Where:
ER_y = Emission Reductions in year y (tCO_2e/yr)
BE_y = Baseline emissions in year y (tCO_2/yr)
PE_y = Project emissions in year y (tCO_2e/yr)

Data and parameters not monitored

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	0.812 tCO_2/MWh
Description:	CO_2 emission factor for grid connected power generation in year *y* regulated by the Polish government and provided by the National Centre for Emission Management (KOBiZE)
Source of data:	http://www.kobize.pl/materialy/jicdm/JI-wskaznik_referencyjny_26sie2011_publik.pdf
Measurement procedures (if any):	-
Monitoring frequency:	The emission factor is fixed ex ante.
QA/QC procedures:	-
Any comment:	

Data and parameters monitored

Data / Parameter:	$EG_{facility,y}$
Data unit:	MWh/yr
Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y*
Source of data:	Project activity sites Suwalki, Piecki and Tychowo
Measurement procedures (if any):	Electricity meters
Monitoring frequency:	Continuous measurement and at least monthly recording
QA/QC procedures:	Each wind turbine is connected to a transformer station which is equipped with two green meters (one main meter and one back up meter) to monitor the amount of electricity produced by the specific turbine. This value is important to determine the amount of Certificates of Origin which can be issued for the production of renewable energy. The transformer station is connected to the substation where two black meters are installed. These monitor the amount of electricity that is actually provided to the grid which is usually a bit less than the green meters due to energy losses from the cables between transformer station and substation. The values that are obtained from the black meters are the ones used to determine the amount of ERUs that are generated by the JI project.
Any comment:	-

B.3. Description of how the definition of the project boundary is applied to the project:

>>

The project boundary is defined as being the Polish electricity grid which is operated by the state-owned Polskie Sieci Elektroenergetyczne (PSE) Operator S.A..

The following three subsystems are distinguished in the Polish Power System (PPS), because of the nature of the technical functions:

- generation of electricity (at power plants, heat and power plants and distributed generation);
- transmission of electricity through the extra-high voltage power network nation-wide and via crossborder lines through the Polish borders (the task is executed by PSE as the transmission system operator);
- distribution of electricity through the high, medium and low voltage distribution networks (the task is executed by 20 different distribution system operators; for this project i.e. PGE Dystrybucja S.A. and ENEA Operator Sp. z o.o.).

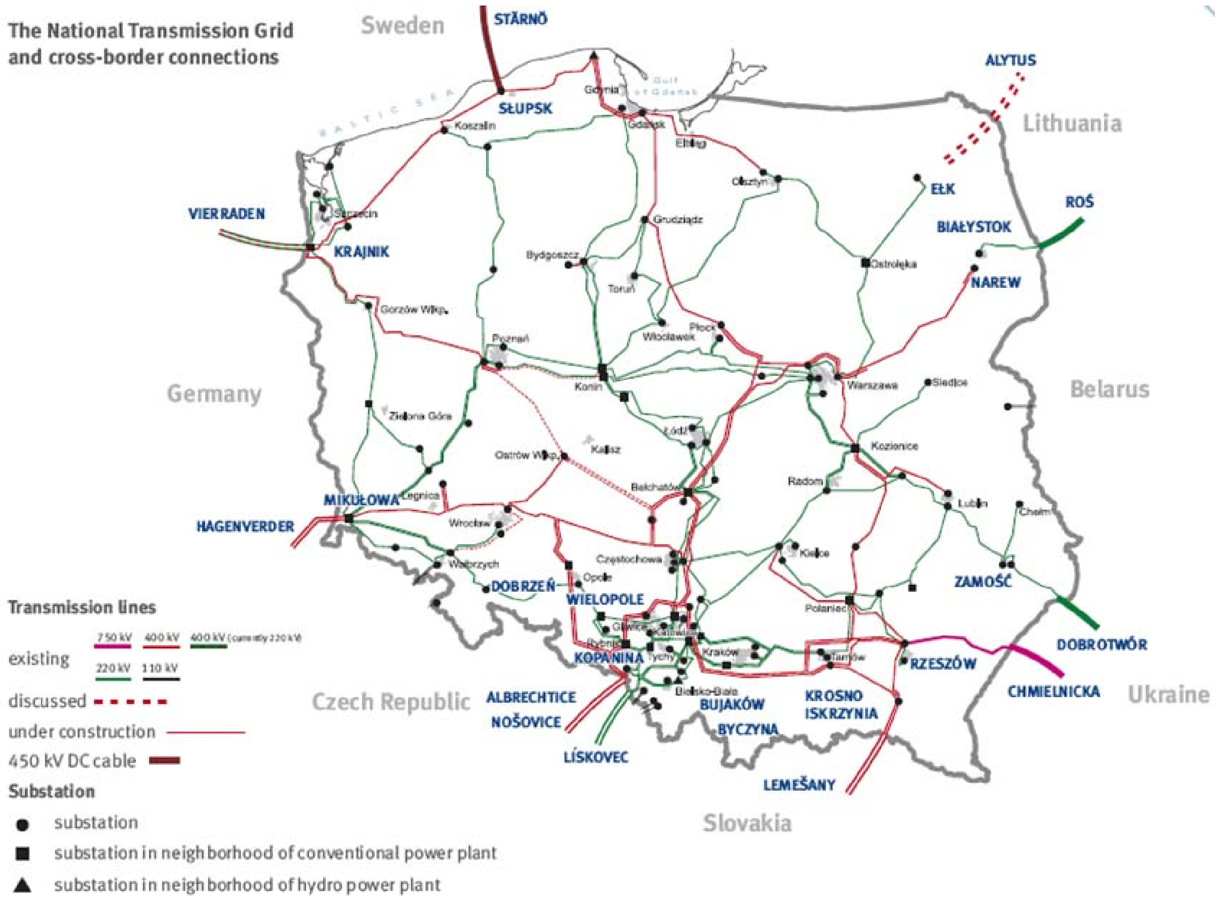

Figure B-3-1 Polish Transmission System[19]

[19] Source: http://www.pse-operator.pl/uploads/kontener/Raport_Roczny_2007_EN.pdf

The project boundary is illustrated in figure B-3-2 below:

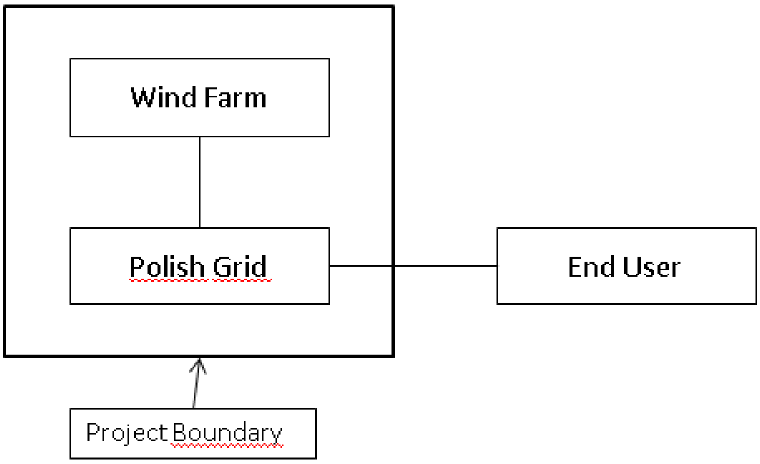

Figure B-3-2 Project boundary for the RWE Innogy Wind Park Project

B.4. Further baseline information, including the date of baseline setting and the name(s) of the person(s)/entity(ies) setting the baseline:

>>

Date of completion of the baseline: 24.02.2012

Contact Details:
Mr Kamesh Iyer
RWE Power AG
Huyssenallee 2
45128 Essen
Germany
Tel: +49 201 12 24141
Mail: kamesh.iyer@rwe.com

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

>>
The starting date of the project activity is 31.03.2008 which is the date of the Turbine Supply Agreement with Siemens Wind Power GmbH for site no 1 (Suwalki).

C.2. Expected operational lifetime of the project:

>>
20 years

C.3. Length of the crediting period:

>>
The start of the crediting period for the proposed project activity is 1st October 2009 which is the date of commissioning of the first project site at Suwalki.
The end of the first commitment period is 31st December 2012.

The end of the crediting period is 30st September 2019.

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

>>

In line with the Guidelines on criteria for baseline setting and monitoring (Version 3, JISC 26, September 2011) ACM0002, version 12.1.0 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” is used for the development of the monitoring plan.

Monitoring subject

Data to be monitored is $EG_{facility}$ where the output from each wind turbine will be monitored and recorded using the metering system described below. The exact amount of energy produced will be quoted in the sales invoices issued for the distribution company.

The grid emission factor $EF_{grid,CM,y}$ has been defined by the Polish government as 0,812 tCO_2/MWh[20] and therefore needs not to be monitored.

Project Integrate Management

As the wind parks are already in operation a monitoring system has already been installed. For sites 1 (Suwalki) and 3 (Tychowo) “Web WPS”, a web based SCADA system developed by Siemens Wind Power A/S, has been installed and for project site 2 (Piecki) “Gamesa SGIPE”, a Gamesa in-house system, using a commercial SCADA motor, has been installed.

Metering System

The Suwalki wind farm uses a metering system of the type Elster A1500 with an accuracy class of 0.5. For the sites at Piecki and Tychowo a metering system of the type Landis+Gyr ZMQ202C.8r4af6 with an accuracy class of 0.5 is used.

[20] Source: http://www.kobize.pl/materialy/jicdm/JI-wskaznik_referencyjny_26sie2011_publik.pdf

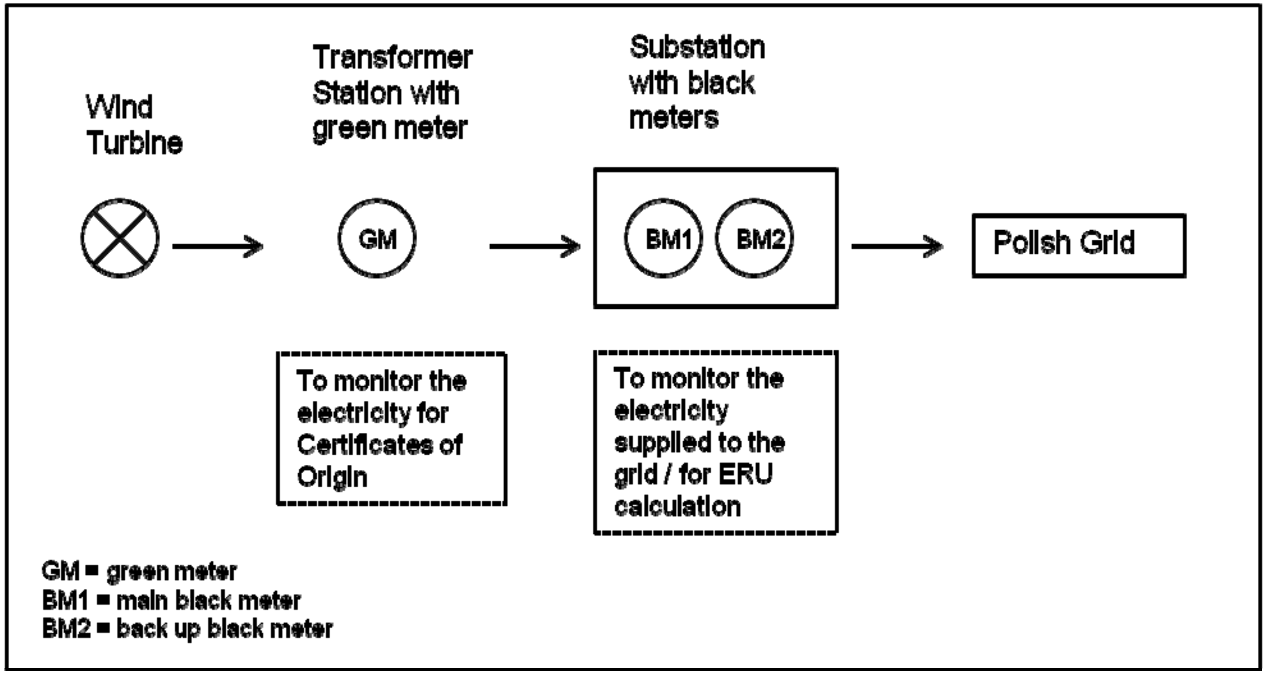

Figure D-1-1 Metering System

Each wind turbine is connected to a transformer station which is equipped with a green meter to monitor the amount of electricity produced by the specific turbine. This value is important to determine the amount of Certificates of Origin which can be issued for the production of renewable energy. The transformer station is connected to the substation where two black meters are installed. These monitor the amount of electricity that is actually provided to the grid which is usually a bit less than the green meters due to energy losses from the cables between transformer station and substation. The values that are obtained from the black meters are the ones used to determine the amount of ERUs that are generated by the JI project.

The serial numbers of the individual black meters are as follows:

Suwalki		Piecki		Tychowo	
Meter	Serial Number	Meter	Serial Number	Meter	Serial Number
Main Meter 1	4030001530	Main Meter	96460283	Main Meter	96779058
Main Meter 2	4030001525	Back Up Meter	96460284	Back Up Meter	96779057
Back Up Meter 1	4030001529				
Back Up Meter 2	4030001532				

The metering system will be calibrated every eight years by the grid operator which is PGE Dystrybucja S.A., the Distribution Company of PGE Capital Group, for Suwalki / Piecki and ENEA Operator Sp. z o.o. for Tychowo. This is according to the Polish energy regulations.

D.1.1. Option 1 – Monitoring of the emissions in the project scenario and the baseline scenario:

D.1.1.2. Description of formulae used to estimate project emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

>>

D.1.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and archived:

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment

$EG_{facility}$	Electricity	Electricity supplied to the grid	MWh	m	Permanent measurement and monthly recording	100%	Electronic	Each wind turbine is connected to a transformer station which is equipped with a green meter to monitor the amount of electricity produced by the specific turbine. This value is important to determine the amount of Certificates of Origin which can be issued for the production of renewable energy. The transformer station is connected to the substation where two black meters are installed. These monitor the amount of electricity that is actually provided to the grid which is usually a bit less than the green meters due to energy losses from the cables between transformer station and substation. The values that are obtained from the black meters are the ones used to determine the amount of ERUs that are generated by the JI project. There are responsible persons for each site who take care of the data collection and control on a monthly basis. These are employed directly by RWE Renewables Polska, the company operating the wind park.

D.1.1.4. Description of formulae used to estimate baseline emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

>>

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

Where:

BE_y = Baseline emissions in year y

$EG_{PJ,y}$ = 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)

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y

Calculation of $EG_{PJ,y}$

For greenfield renewable energy power plants the quantity of net electricity generation that is produced and fed into the grid is equal to the quantity of net electricity generation supplied by the project plant

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

Calculation of $EF_{grid,CM,y}$

The calculation of the grid emission factor is not necessary as this factor is officially regulated by the Polish government[21]:

$EF_{grid,CM,y} = 0.812\ tCO_2/MWh$

D. 1.2. Option 2 – Direct monitoring of emission reductions from the project (values should be consistent with those in section E.):

>>

D.1.2.1. Data to be collected in order to monitor emission reductions from the project, and how these data will be archived:

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
$EF_{grid,CM,y}$	Grid emission factor	GHG emission factor of the Polish grid	tCO_2/MWh	Fixed by the Polish government	-	-	-	The grid emission factor has been defined by the Polish government as 0.812 tCO_2/MWh[22].

D.1.2.2. Description of formulae used to calculate emission reductions from the project (for each gas, source etc.; emissions/emission

[21] Source: http://www.kobize.pl/materialy/jicdm/JI-wskaznik_referencyjny_26sie2011_publik.pdf

[22] http://www.kobize.pl/materialy/jicdm/JI-wskaznik_referencyjny_26sie2011_publik.pdf

reductions in units of CO_2 equivalent):

>>

$ER_y = BE_y - PE_y$

Where:

ER_y = Emission Reductions in year y (tCO_2e/yr)
BE_y = Baseline emissions in year y (tCO_2/yr)
PE_y = Project emissions in year y (tCO_2e/yr)

D.1.3. Treatment of leakage in the monitoring plan:

>>

According to ACM0002, version 12.1.0 no leakage emissions are to be 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 emission sources are neglected.

$LE_y = 0$

D.1.3.2. Description of formulae used to estimate leakage (for each gas, source etc.; emissions in units of CO_2 equivalent):

>>

Please refer to Secion D.1.3.

D.1.4. Description of formulae used to estimate emission reductions for the project (for each gas, source etc.; emissions/emission reductions in units of CO_2 equivalent):

>>

$ER_y = BE_y - PE_y$

Where:

ER_y = Emission Reductions in year y (tCO_2e/yr)
BE_y = Baseline emissions in year y (tCO_2/yr)
PE_y = Project emissions in year y (tCO_2e/yr)

D.1.5. Where applicable, in accordance with procedures as required by the host Party, information on the collection and archiving of information on the environmental impacts of the project:

>>

Please refer to Section F. Environmental Impacts.

D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored:

Data	Uncertainty level of data (high/medium/low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
$EG_{facility}$	Low	Each wind turbine is connected to a transformer station which is equipped with a green meter to monitor the amount of electricity produced by the specific turbine. This value is important to determine the amount of Certificates of Origin which can be issued for the production of renewable energy. The transformer station is connected to the substation where two black meters are installed. These monitor the amount of electricity that is actually provided to the grid which is usually a bit less than the green meters due to energy losses from the cables between transformer station and substation. The values that are obtained from the black meters are the ones used to determine the amount of ERUs that are generated by the JI project. There are responsible persons for each site who take care of the data collection and control on a monthly basis. These are employed directly by RWE Renewables Polska, the company operating the wind park.

D.3. Please describe the operational and management structure that the project operator will apply in implementing the monitoring plan:

>>

An efficient operational and management structure as already been implemented for monitoring the project. On each site there are responsible persons who take care of the data collection and control. They do not only check the data that has been recorded by the Scada System but do also check the data directly at the monitoring meters at the end of the month. These people are employed by RWE Renewables Polska, the operator of the wind farms and are therefore familiar with the technical equipments.

D.4. Name of person(s)/entity(ies) establishing the monitoring plan:

>>

Date: 24.02.2012

Contact Details:

Mr Kamesh Iyer
RWE Power AG
Huyssenallee 2
45128 Essen
Germany
Tel: +49 201 12 24141
Mail: kamesh.iyer@rwe.com

SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions:

>>
According to ACM0002, version 12.1.0 the project emissions for renewable power generation project activities are to be considered as zero except the project activity uses fossil fuels as a back up technology, the project activity is a geothermal power plant or the project activity is a hydropower plant with a reservoir.

As this project activity is a wind power plant the project emissions can be defined as: $PE_y = 0$

E.2. Estimated leakage:

>>
According to ACM0002, version 12.1.0 no leakage emissions are to be 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 emission sources are neglected.

$LE_y = 0$

E.3. The sum of E.1. and E.2.:

>>
As both values are considered as zero, the sum of E.1. and E.2. is also to be considered as zero.

$PE_y + LE_y = 0$

E.4. Estimated baseline emissions:

>>
The estimated baseline emissions have been calculated as following:

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

Where:

BE_y	= Baseline emissions in year y
$EG_{PJ,y}$	= 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)
$EF_{grid,CM,y}$	= Combined margin CO_2 emission factor for grid connected power generation in year y

Calculation of $EG_{PJ,y}$
For greenfield renewable energy power plants the quantity of net electricity generation that is produced and fed into the grid is equal to the quantity of net electricity generation supplied by the project plant

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

Calculation of $EF_{grid,CM,y}$
The calculation of the grid emission factor is not necessary as this factor is officially regulated by the Polish government[23]:

$EF_{grid,CM,y} = 0.812\ tCO_2/MWh$

[23] Source: http://www.kobize.pl/materialy/jicdm/JI-wskaznik_referencyjny_26sie2011_publik.pdf

According to the RWE internal business cases the following quantities of electricity generation have been estimated:

- Suwalki: 97,607 MWh/y
- Piecki: 69,248 MWh/y
- Tychowo: 87,850 MWh/y

These have been calculated according to wind test measurements which have been undertaken by windtest grevenbroich gmbh. From the results of the wind tests a certain loss has been deducted which has been defined internally by RWE and which is different for each site depending on the turbine type, the cable length etc..

Therefore the total estimated annual electricity generation amounts to 235,490 MWh/y, once all the sites have been put into operation. The commissioning dates of the different sites are as followed:

- Suwalki: October 2009
- Piecki: November 2010
- Tychowo: February 2011

As a result the estimated electrity generation only amounts to 2,354,898 MWh for the whole crediting period from 01/10/2009 until 30/09/2019. The baseline emissions for the crediting period are calculated as following:

2,354,898 · 0.812 = 1,912,177 tCO_2e

E.5. Difference between E.4. and E.3. representing the emission reductions of the project:

>>

As the project emissions and the leakage is to be considered as zero, the emission reductions are equal to the baseline emissions i.e. 1,912,177 tCO_2e.

E.6. Table providing values obtained when applying formulae above:

>>

Year	Estimated project emissions (tCO_2e)	Estimated leakage (tCO_2e)	Estimated baseline emissions (tCO_2e)	Estimated emission reductions (tCO_2e)
2009	0	0	19,814	19,814
2010	0	0	88,628	88,628
2011	0	0	200,876	200,876
2012	0	0	206,820	206,820
Subtotal 2009 – 2012 (tCO_2e)	**0**	**0**	**516,139**	**516,139**
2013	0	0	206,820	206,820
2014	0	0	206,820	206,820
2015	0	0	206,820	206,820
2016	0	0	206,820	206,820
2017	0	0	206,820	206,820
2018	0	0	206,820	206,820
2019	0	0	155,115	155,115
Subtotal 2013 – 2019 (tCO_2e)	**0**	**0**	**1,396,038**	**1,396,038**
Total 2009 – 2019	**0**	**0**	**1,912,177**	**1,912,177**

(tCO_2e)				

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party:

>>

For all three sites an Environmental Impact Assessment (EIA) has been undertaken as detailed below:

Site	Issued on	Issuing Authority	Consulted with
1	10.11.2006	Mayor of Municipality Suwalki	Sanitary Inspection and Regional Authority (Starosta Suwalski)
2	08.11.2007	Mayor of Municipality Piecki	Sanitary Inspection and Regional Authority (Starosta Suwalski)
3	10.11.2006	Mayor of Municipality Stargard Szczeciński	Sanitary Inspection and Regional Authority (Starosta Stargardzki and Zachodniopomorski Urząd Wojewódzki w Szczecinie)

There has been a public consultation procedure for 21 days during which the EIAs have been publicly available and there has also been the possibility to raise comments and questions concerning the installation of the wind park.

The EIAs concluded that none of the sites has significant impacts to the environment or any protected areas.

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

>>

Overall environmental impacts of the project activity will be positive in comparism with the baseline scenario.

SECTION G. Stakeholders' comments

G.1. Information on stakeholders' comments on the project, as appropriate:

>>

Stakeholder comments will be collected after the publication of this document on the DOE's web-page during the determination procedure.

However, as a part of the EIA's a detailed public consultation procedure has been undertaken for all 3 sites and no comments were received. So we conclude that these Windparks are in accordance with the expectation of the relevant stakeholders and is deemed appropriate.

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

Organisation:	RWE Renewables Polska Sp. z o.o.
Street/P.O.Box:	ul. Wybrzeże Kościuszkowskie 41
Building:	
City:	Warsaw
State/Region:	
Postal code:	00-347
Country:	Poland
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E-mail:	
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Represented by:	Mark Hol
Title:	
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Personal e-mail:	antonio.aguilera@rwe.com

Annex 2

BASELINE INFORMATION

>>

Calculation of baseline emissions (BE_y)

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

Where:

BE_y	= Baseline emissions in year y
$EG_{PJ,y}$	= 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)
$EF_{grid,CM,y}$	= Combined margin CO_2 emission factor for grid connected power generation in year y

Calculation of $EG_{PJ,y}$

For greenfield renewable energy power plants the quantity of net electricity generation that is produced and fed into the grid is equal to the quantity of net electricity generation supplied by the project plant

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

Calculation of $EF_{grid,CM,y}$

The calculation of the grid emission factor is not necessary as this factor is officially regulated by the Polish government[24]:

$EF_{grid,CM,y} = 0.812\ tCO_2/MWh$

Calculation of Leakage

According to ACM0002, version 12.1.0 no leakage emissions are to be 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 emission sources are neglected.

$LE_y = 0$

Project Emissions

According to ACM0002, version 12.1.0 the project emissions for renewable power generation project activities are to be considered as zero except the project activity uses fossil fuels as a back up technology, the project activity is a geothermal power plant or the project activity is a hydropower plant with a reservoir.

As this project activity is a wind power plant the project emissions can be defined as:

$PE_y = 0$

---

[24] Source: http://www.kobize.pl/materialy/jicdm/JI-wskaznik_referencyjny_26sie2011_publik.pdf

Emission Reductions

$ER_y = BE_y - PE_y$

Where:

ER_y	= Emission Reductions in year y (tCO_2e/yr)
BE_y	= Baseline emissions in year y (tCO_2/yr)
PE_y	= Project emissions in year y (tCO_2e/yr)

Data and parameters not monitored

Data / Parameter:	$EF_{grid,CM,y}$
Data unit:	0.812 tCO_2/MWh
Description:	CO_2 emission factor for grid connected power generation in year *y* regulated by the Polish government and provided by the National Centre for Emission Management (KOBiZE)
Source of data:	http://www.kobize.pl/materialy/jicdm/JI-wskaznik_referencyjny_26sie2011_publik.pdf
Measurement procedures (if any):	-
Monitoring frequency:	The emission factor is fixed ex ante.
QA/QC procedures:	-
Any comment:	

Data and parameters monitored

Data / Parameter:	$EG_{facility,y}$
Data unit:	MWh/yr
Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y*
Source of data:	Project activity sites Suwalki, Piecki and Tychowo
Measurement procedures (if any):	Electricity meters
Monitoring frequency:	Continuous measurement and at least monthly recording
QA/QC procedures:	Each wind turbine is connected to a transformer station which is equipped with two green meters (one main meter and one back up meter) to monitor the amount of electricity produced by the specific turbine. This value is important to determine the amount of Certificates of Origin which can be issued for the production of renewable energy. The transformer station is connected to the substation where two black meters are installed. These monitor the amount of electricity that is actually provided to the grid which is usually a bit less than the green meters due to energy losses from the cables between transformer station and substation. The values that are obtained from the black meters are the ones used to determine the amount of ERUs that are generated by the JI project.
Any comment:	-

Annex 3

MONITORING PLAN

>>
Please refer to Section D. Monitoring Plan.

Annex 4

FINANCIAL INFORMATION

>>

Suwalki

Parameter	Unit	Value
CAPEX	Euro	72,899,000
OPEX (from 2007 – 2029)	Euro	38,101,000
Average ERU price 2007*	Euro	8.90
Revenue from ERUs until 2019	Euro	7,054,000
IRR without JI	%	7.79
IRR with JI	%	8.72

Piecki

Parameter	Unit	Value
CAPEX	PLN	218,360,000
OPEX (from 2009 – 2030)	PLN	215,785,000
Average ERU price 2007*	PLN	38.15
Revenue from ERUs until 2019	PLN	19,128,000
IRR without JI	%	5.13
IRR with JI	%	6.10

Tychowo

Parameter	Unit	Value
CAPEX	Euro	65,107,000
OPEX (from 2007 – 2029)	Euro	36,799,000
Average ERU price 2007*	Euro	8.90
Revenue from ERUs until 2019	Euro	5,502,000
IRR without JI	%	6.09
IRR with JI	%	6.78

*As source to determine the average ERU price from 2007 the following article published by Ecosystem Marketplace has been used:

http://www.ecosystemmarketplace.com/pages/dynamic/web.page.php?section=carbon_market&page_name=kyoto_market