**JOINT IMPLEMENTATION PROJECT DESIGN DOCUMENT FORM
FOR SMALL-SCALE PROJECTS
Version 01.1 - in effect as of: 27 October 2006**

CONTENTS

SECTION A. General description of the small-scale project

A.1. Title of the small-scale project:

Griezpelkiu wind power park project
The sectoral scope - (1) Energy industries (renewable/non-renewable sources)
PDD version 04
23 July 2010

A.2. Description of the small-scale project:

Situation existing prior to the starting date of the Project

The renewable electricity produced by the wind power plants would displace carbon intensive electricity produced from fossil fuel sources in the Lithuanian power network. Lithuanian electric power network is being operated by national grid operator - Lietuvos Energija. Foremost, they purchase power quotas (on basis of the prior signed contracts) from electric power producers. The producers may also supply electric power, exceeding the quotas, at a few time lower prices. The difference in national demand for the electric power and total production thereof (quotas and over-quotas) is being covered by Lietuvos Elektrine. Thus, if the implementation of this JI Project fails, the estimated electric power would be produced by Lietuvos Elektrine using fossil fuels – natural gas, heavy fuel oil and orimulsion.

Currently only three wind energy parks with total capacity 66MW and several individual wind turbines with total capacity 9,15 MW are under operation in Lithuania. The total installed capacity is 75,15 MW[1].

The proposed JI Project supports Lithuania's objective to increase the share of renewable electricity from current ca. 3,8% to 7% by year 2010.

Baseline scenario

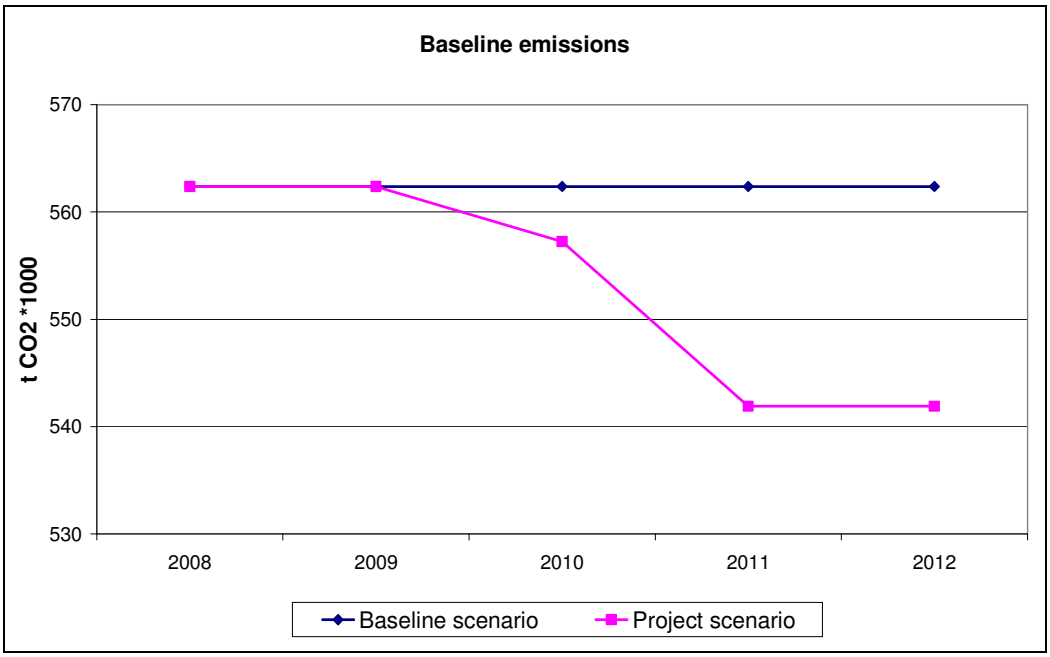
It was calculated thatLietuvos Elektrine, by generating 1 MWh of electric power, contributes to the pollution of atmosphere with 0,626 tones of CO2 (See chapter B.1.). In accordance to the baseline scenario, electric power is produced only by Lietuvos Elektrine with its average annual emission 562354 tCO2.

Project scenario

Griezpelkiu wind power park project would displace carbon intensive electricity produced from fossil fuel sources in the Lietuvos Elektrine. It is foreseen to install 5 wind power plants with the total capacity of 10,0MW (2MW x 5). Wind turbines Power Park will be manufactured, installed, adjusted and set into action by Enercon GmbH staff. After Wind Park's commissioning it is planed to sign additional agreement on turbines maintenance between companies.

The Wind power park, in a conservative approach, will generate about 31,7 GWh of electric power per year. Such wind park's generation will lead 19855 tCO2/year emission reductions on Lietuvos Elektrine side (1 figure).

[1] Data of Lithuanian transmission system operator www.litgrid.eu 11 01 2010



1 Figure. Baseline and Project scenario comparison

History of the Project

Current Project stage – technical designing.

Company Vejo gusis, UAB launched of Project activities on 11.09.2008 from shareholder's decision on preparation business plan for Project development including with JI project development. During business plan preparation it was explored suitable for wind energy sites, analyzed different types of wind turbines technology use possibilities, visited few turbine manufacturers, analyzed project financing prospective and sources, introduced with JI scheme, solved other related questions. After preparation of business plan it was decided to develop wind energy project nearby Griezpelkiu village (Taurages district).

Following actions were related with detailed planning, technical designing, and project financing procurement. It was agreed on project financing (local banks) and signed contracts on turbine delivery (with Enercon Gmbh)s. Currently the detailed planning is on the final stage, technical design is under preparation and selection of contractors for different constructional works is in process.

The timing on all project stages is indicated into Table 3 and Table 4.

A.3. Project participants:

The Griezpelkiu wind power park project's Host party is Lithuania. Investor party will be selected later (Table 1).

Table 1. Project participants

Party involved	Legal entity project participant (as applicable)	Please indicate if the Party involved wishes to be considered as project participant (Yes/No)
Lithuania (Host party)	Vejo gūsis, UAB	No

The Host party company Vejo gūsis, UAB was established particularly for implementation of this wind power park project development in Lithuania as pilot project.

A.4. Technical description of the small-scale project:

A.4.1. Location of the small-scale project:

A.4.1.1. Host Party(ies):

Republic of Lithuania

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

Taurages district

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

Griezpelkiu village

A.4.1.4. Detail of physical location, including information allowing the unique identification of the small-scale project:

Griezpelkiu wind power park project is located in western part of Lithuania, Taurages district near of villages Griezpelkiai II, Kamsciai and Kreivenai (Figure 2.). Wind turbines coordinates are:

WEC 1 X= 6119125.05 , Y=377172.00;
WEC 2 X= 6118802.06 , Y= 376785.78;
WEC 3 X= 6118611.54 , Y= 377284.55
WEC 4 X= 6118546.24, Y=376925.28
WEC 5 X= 6118258.23 , Y= 377202.37

The wind park territory (78 ha) belongs exclusively for Vejo gusis, UAB. Wind power park's connection point will be existing 110/20 kV transformer substation (belongs for Energogrupe, UAB).

The project site is situated in the rolling territory on above 70m over see level. The territory is on open space from all sides without near obstacles. The nearest forest is over 5 km from the wind park location place. This place may be characterized as high wind speed and windy.

Figure 2. Location of Griezpelkiu wind power park project

A.4.2. Small-scale project type(s) and category(ies):

Type I JI SSC project: Renewable energy project with a maximum output capacity of less than 15 MW(e).

A.4.3. Technology(ies) to be employed, or measures, operations or actions to be implemented by the small-scale project:

Characteristics of wind take a significant role in installation of wind power park, especially in selection of the location. Referring to long term meteorological data and measurements of wind speed and strength, chosen location is well suited for project implementation.

Detailed layout of wind power plants is based on Riso laboratory date on area wind speed *(Baltic wind atlas)*. Starting from July of 2007, on site wind parameters is under measurements by German company Enercon GmbH (wind turbine producer). Now wind parameters are under measurement at heights of 85, 66 and 42 meters. During wind power park place selection long term wind speed date from Taurage meteorological station was used as well. The calculations on wind speed parameters were done by German company Enercon GmbH (wind turbine producer)

It is planned to install 5 units of Enercon E-82 type wind turbines manufactured by German company Enercon GmbH. According to turbines manufacturer data the turbines operation regime is on 2,5-28 m/s wind speed. The other technical data of Enercon E-82 turbines is presented in Table 2.

Table 2. Technical parameters of the wind turbines

Type of wind turbine	E-82
Capacity, kW	2000
Rotor diameter, m	82
Rotor‘s rotation direction	Clockwise
Blade number	3
Total power plant height, m	149
Wight of power plant, t	1120
Tower diameter at ground, m	8,8
Hub height, m	108
Cut-in wind speed	2,5 m/s

According to Enercon calculations Griezpelkiu wind power park project should generate about 31,7 GWh electric power per year. Wind power park's connection point will be existing 110/20 kV transformer substation (belongs for Energogrupe, UAB). Wind turbines will be manufactured, installed, adjusted and set into action by Enercon GmbH staff. After Wind Park's commissioning it is planed to sign additional agreement on turbines maintenance between companies.

A project implementation schedule is presented in Table 3.

Table 3. Project implementation schedule.

Project stage	Works period, day	Deadline
Start of Project activities (Agreement on land purchase)	Done	17 09 2008
Business plan preparation	Done	31 12 2008
Technical design	Done	01 2010
Building of roads	90	06 2010
Reconstruction of substation	90	07 2010
Laying down the power cables	60	07 2010
Transportation of wind turbines	150	07 2010
Constructional works	150	08 2010
Installation of wind turbines	90	09 2010
Start-up works	60	10 2010

The obtained permits on wind power park erection are presented in table 4.

Table 4. The obtained permits on wind power park erection

No.	Permit/license	Date of issuance:	Valid before:
1.	Permit to enhance the energy generation capacity No. LP-0181	20 11 2008	31 12 2010 (may be extended for 6 month)
2.	Detailed plan on wind park	22 10 2009	term less
3.	Constructional permit on wind turbines erection	15 03 2010	Valid 10 years from issuance date

Based on wind measurement results Project‘s power production forecast was performed by staff of company Enercon – 32699 MWh/year. Considering declared technical availability of 97% (the

Enercon's Operation and Maintenance contract) the reasonable annual power production forecast was reduced by 3% (Table 5). Similar practice is used in other Lithuanian wind power projects[2].

Table 5. Enercon's forecast on Griezpelkiu wind power park project power production

Project	Energy output, MWh/year
Griezpelkiu wind power park project	31718

The 31718 MWh/year power production will be used in Griezpelkiu wind power park project further calculations as conservative approach.

A.4.4. Brief explanation of how the anthropogenic emissions of greenhouse gases by sources are to be reduced by the proposed small-scale project, including why the emission reductions would not occur in the absence of the proposed small-scale project, taking into account national and/or sectoral policies and circumstances:

The renewable electricity produced by the wind power plants would displace carbon intensive electricity produced from fossil fuel sources in the Lithuanian power network. Lithuanian electric power network is being operated by Lietuvos Energija. Foremost, they purchase power quotas (on basis of the prior signed contracts) from electric power producers. The producers may also supply electric power, exceeding the quotas, at a lower price. The difference in national demand for the electric power and total production thereof (quotas and over-quotas) is being covered by Lietuvos Elektrine. Thus, if the implementation of this JI Project fails, the estimated electric power would be produced by Lietuvos Elektrine using fossil fuels – natural gas, heavy fuel oil and orimulsion. It was calculated that Lietuvos Elektrine, by generating 1 MWh of electric power, contributes to the pollution of atmosphere with 0,626 tones of CO2.

The chapter B.1. describe baseline calculation details. The chapter B.2. includes estimation of the GHG emission reductions of the JI Project which have been calculated conservatively on basis of the above carbon emission factor of 0,626 tCO2e/MWh and the expected power production.

The proposed JI Project supports Lithuania's objective to increase the share of renewable electricity from current ca. 3,8%[3] to 7% by end of year 2010[4]. To comply with this undertaking Lithuania would need to achieve 450 GWh electricity production from renewable energy sources and mainly from wind energy. This would amount to ca. 200 MW of installed wind power capacity.

The Law of the Republic of Lithuania on Energy points out promotion of consumption of renewable energy resources as one of the principal objectives of regulation of state energy sector activities. The law provides that the state encourages the producers to generate electricity from renewable energy sources by imposing the "must carry" obligations. The Rules for Imposing the Public Interest Service Obligations provide that supply license holders are under the obligation to buy up electricity generated by producers (connected to the transmission system) by using renewable and spare energy resources, and to sell it to their customers.

In order to provide incentives for wind power development the government has issued legislation regulating obligatory purchase of wind power at a price of 0,30 LTL per kWh (0,087 EUR). Such a feed-in tariff is expected to remain until year 2020. In order to obtain the mentioned feed-in tariff

[2] Benaiciai wind power project, April 2008, PDD version 06
http://ji.unfccc.int/UserManagement/FileStorage/ODX2FG966C3OSL4P1RCAODBJVX20TP

[3] Official edition "Lietuvos energetika" year 2007

[4] COM 2001/77/EC: Directive on Electricity Production from Renewable Energy Sources

the wind power plant must be built in one of the six zones for which tenders for grid connection are organized by AB Lietuvos Energija - the electricity transmission system operator in Lithuania.

The above feed-in tariff for wind power is unfortunately not sufficient for commercial development of the wind power sector. Thus all recent wind power parks development (e.g. Rudaiciai wind power plant of Veju Spektras, UAB) are being carried out under the JI scheme.

After the introduction of power spot market in Lithuania, the difference of power spot price and the feed-in tariff will be compensated for green power producers. The regulation envisages that the feed-in-tariff scheme will be replaced by green certificate scheme in 2021, hence the feed-in-tariffs are valid until 2021.

A.4.4.1. Estimated amount of emission reductions over the crediting period:

Table 6. Estimated emission reductions

	Years
Length of crediting period	**2 years and 3 months**
Year	**Estimate of annual emission reductions in tones of CO2 equivalent**
2010	4964
2011	19855
2012	19855
Total estimated emission reductions over the crediting period (tones of CO2 equivalent)	**44675**
Annual average of estimated emission reductions over the crediting period (tones of CO2 equivalent)	19855

After year 2012 by following year estimated annual emission reduction – 19855 tones of CO2 equivalent.

A.4.5. Confirmation that the proposed small-scale project is not a debundled component of a larger project:

The Griezpelkiu wind power park project with a combined capacity of 10,0 MW(e) is not a debundled component of a larger project due to the following reasons:
- The project boundaries of all existing wind power parks in Lithuania are different (including the nearest wind power park project developed by Energogrupe, UAB);
- All existing large scale wind parks in Lithuania are covered under JI scheme already;
- The project owners of large wind power parks that are under operation in Lithuania are different.

A.5. Project approval by the Parties involved:

The project idea (project idea note) was approved by Lithuanian DFP (Ministry of Environment of the Republic of Lithuania) and the Letter of Endorsement (LoE) No.(10-7)-D8-1416 was issued on 19.02.2009.

Host country's Letter of Approval (LoA) was issued on 19.06.2010 (letter of Ministry of Environment of the Republic of Lithuania No.(10-2)-D8-6065)

SECTION B. Baseline

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

Baseline - the amount of GHG that would be emitted to the atmosphere during the crediting period of the project, i.e. in 2010-2012, in case the Project was not implemented.

Project baseline was chosen in accordance with appendix B of the JI guidelines and the Guidance on criteria for baseline setting and monitoring., using the following stepwise approach:

Step 1. Indication and description of the approach chosen regarding baseline setting

Paragraphs 1.3 of appendix B of the JI guidelines define criteria for baseline setting A baseline shall be established:

i. On a project-specific basis and/or using a multi-project emissions factor;
ii. In a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors;
iii. Taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector;
iv. In such a way that ERUs cannot be earned for decreases in activity levels outside the project or due to force majeure; and
v. Taking account of uncertainties and using conservative assumptions.

Taking into consideration the specifics of the Lithuanian power market, the methodology based on historical data is most suitable for country's baseline estimation. Furthermore, the usage of described methodology allows to have united country's baseline scenario and baseline emissions (tonne CO2 per MWh of electricity). Based on this fact it was chosen to use JI specific approach by using a multi-project emissions factor adopted by Lithuanian Ministry of Environment of the Republic of Lithuania.

Step 2. Application of the approach chosen

The country's baseline scenario and baseline emissions factor have been described by Ministry of Environment of the Republic of Lithuania during National Allocation Plan (NAP) preparation for First commitment period (2008-2012). The European Commission during supervision of NAP didn't rejected country's baseline methodology. The NAP indicates that Lithuanian baseline emissions factor is 0,626 tCO2/MWhe[5].

The Baseline methodology that is indicated in the NAP is based on historic data of Lietuvos Elektrine and this method is best suited for Lithuanian power market. Approved CDM ACM0002 methodology is not used for the baseline calculation due to the following reasons:

- Lietuvos Elektrine, power plant with the second largest installed capacity in Lithuania (after Ignalina nuclear power plant –INPP) is operating on the power gird as a marginal plant. It covers all power demand which is remaining after all other power producers have supplied their quota power to the grid. Hence, by simply including all these power plants operating on the grid (excl. INPP) would bias the Operating Margin emissions factor.

[5] Lithuanian National allocation plan 2008-2012 (18.04.2007 version), section 6.3. http://www.am.lt/VI/files/0.127744001228738706.pdf

- There is an overcapacity of installed power in Lithuania, so only very few new power plants are built. Because of that, it is impossible to calculate properly the Build Margin emissions factor.

Hence, the current emissions factor – **0,626 tCO2/MWhe** is considered to be conservative and will be used to calculate CO2 reductions from Griezpelkiu wind power park project.

Key information and data used to establish the baseline scenario:

Data/Parameter	CO_2 emission factor for electricity
Data unit	tCO_2/MWh
Description	Emissions from fossil fuel burning
Time of determination/monitoring	Period 2002-2005
Source of data (to be) used	Lithuanian National allocation plan 2008-2012 (18.04.2007 version)
Value of data applied (for ex ante calculations/determinations)	0,626 tCO2/MWh
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Average annual CO2 emissions
QA/QC procedures (to be) applied	Used official public available data
Any comment	Presented emission factor is used for all known Lithuanian JI projects

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 small-scale project:

JI project's additionally indicates the GHG reduction after implementation of JI project in comparison to the baseline. Usually financial efficiency of JI projects is low, thus income from ERU's sale help to promote their development and implementation. This economic promotion also reduces project's payback time.

Additionality of the Griezpelkiu wind power park project was proven using the following stepwise approach:

Step 1. Indication and description of the approach applied

Paragraph 2 of Annex I of JI guidelines define criteria for baseline setting indicates that additionality can be demonstrated, inter alia, by using following approach:

(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.

Therefore the most recent - the version 05.2 of the Tool for the Demonstration and Assessment of Additionality was used for the Griezpelkiu wind power park project.

Step 2. Application of the approach chosen

Griezpelkiu wind power park project additionality will be proven using a step-wise approach and following steps:

• Identification of alternatives to the project activity;
• Investment analysis to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible;
• Barriers analysis; and
• Common practice analysis

Step 3. Provision of additionality proofs

Step 1. Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a. Define alternatives to the project activity:

- Alternative A - the proposed project activity not undertaken as JI project activity;
- Alternative B - the electric power in the Lithuanian network will be produced by new modern cogeneration power plants.

Sub-step 1b. Consistency with mandatory laws and regulations:

The both alternatives are in compliance with mandatory legislation and regulations.

The alternative's A development might be considered due to promotion of renewable energy sources use according national legislation. The Lithuania has obligation against EU to increase the share of renewable electricity from current 3,8% to 7% by year 2010[6]. To comply with this undertaking Lithuania would need to achieve ca. 450 GWh electricity production only from renewable energy sources and the wind is first priority. In order to give incentives for business of wind energy parks, the government has issued legislation regulating the obligatory purchase of wind power electricity for fixed feed-in tariff 0,30 LTL per kWh i.e. 8,69 EUR cents per kWh (1 EUR = 3,4528 LTL). Unfortunately the set feed-in tariff is not sufficient to realize the proposed project on a commercial basis. Additional income from the sale of ERUs under the Kyoto Joint Implementation scheme is thus required to turn the project attractive for the investors. It means that Alternative's A development is fully eligible but project payback time without carbon credit revenues become longer (the IRR of the project without ERUs revenues is lower).

The alternative's B development might be considered based on the fact that wind energy projects still are low financial attractive and with long payback period. Usually the power from the wind energy is more expensive comparison with other renewable energy sources (biomass, geothermal, hydro), and it means that expansion of wind energy generation will take negative impact for end users power price (increase of tariff for inhabitants and industry consumers). Furthermore the wind energy power generation is not stable and other generation capacity reserve is necessary always. Such facts influence small support from state side. The state's obligation on 7% "green energy" generation before 2010 might be achieved by supporting usage of biomass and small and medium scale cogeneration (expansion of CHP). The current legislation supports biomass and cogeneration usage. Moreover EU structural funds are available for new cogeneration plants but not for wind power projects in Lithuania. The practice shows that biomass or cogeneration projects has higher IRR and are more financial attractive. It means that Alternative's B development is fully eligible as well.

Result: Pass

[6] Communication from the Commission to the Council and the European Parliament. Green Paper follow-up action. Report on progress in renewable electricity. Brussels, 10.1.2007, p.8

Step 2. Investment analysis

Sub-step 2a. Determine appropriate analysis method

Simple cost analysis (option I) is not applicable for the project as the income from sale of 'carbon credits' is not the only source of revenues for the project.

Investment comparison analysis (option II) is not applicable for the project as the alternative "A" is the project itself but without an JI incentive and on the other hand the alternative "B" is based on investment that is out of control of the Project developer, i.e. project could be developed by a different entity (as described in paragraph 15 in the Annex to the Tool for the demonstration and assessment of additionality Ver.5.02).

Benchmark analysis (option III) will be used for this project as it is the only applicable method.

Because there is no specific investment benchmarks for the Lithuanian power sector that currently exists the needed benchmark value for that analysis will be derived from the financial and economic indicators that is standard for the country and are public available. The benchmark analysis has been adopted wherein the Internal Rate of Return (IRR) of the project activity serves as a benchmark to assess the financial attractiveness of the project activity. Option III assesses if the project's returns are sufficient for investors to make the initial investment and further bear the associated costs of successfully operating the project activity over the crediting period of the project.

Sub-step 2b. – Option II. Apply Benchmark analysis

In order to apply a benchmark comparable to the project IRR the project participant selected to use average value of the interest rate (AVIR) on loans for non-financial corporations published by the central Bank of Lithuania (LB). The AVIR is the benchmark interest rate at which Lithuanian commercial banks and other financial institutions (unions, funds and etc.) lend money to their customers.

Typically, projects in Lithuania would be borrowing debt at a rate equal to or higher than the AVIR. Hence, for any project to be financially attractive, the IRR of the project must be higher than the rate of borrowing on debt (i.e. higher than the AVIR). Accordingly, if any project's IRR does not exceed the AVIR, it could be considered a financially unattractive project.

The use of the AVIR is consistent with the *Tool for the demonstration and assessment of additionality Ver.5.02* which suggests that "*…benchmarks for IRR, NPV, etc. can be derived from.…Estimates of the cost of financing and required return on capital (e.g.* ***commercial lending rates*** *and guarantees required for the country and the type of project activity concerned), based on bankers views and private equity investors/funds' required return on comparable projects*".

The AVIR that was taken for consideration in the PDD (8,03%) is based on the official last year's (2009) data[7] (Figure 3). For comparison the VILIBOR (Vilnius Interbank Offered Rate) value (for 1 year period) was added[8]. VILIBOR is based on the quotes of not less than 5 local commercial banks, designated by the Bank of Lithuania, which are most active in Lithuanian money market. Banks by lending money for its clients takes VILIBOR value as basis. Moreover banks always add its fixed margin (%).

[7] Statistic, the Bank of Lithuania, 11 01 2010 http://www.lb.lt/eng/statistic/index.html

[8] Statistic, the Bank of Lithuania, 11 01 2010 http://www.lb.lt/eng/statistic/index.html

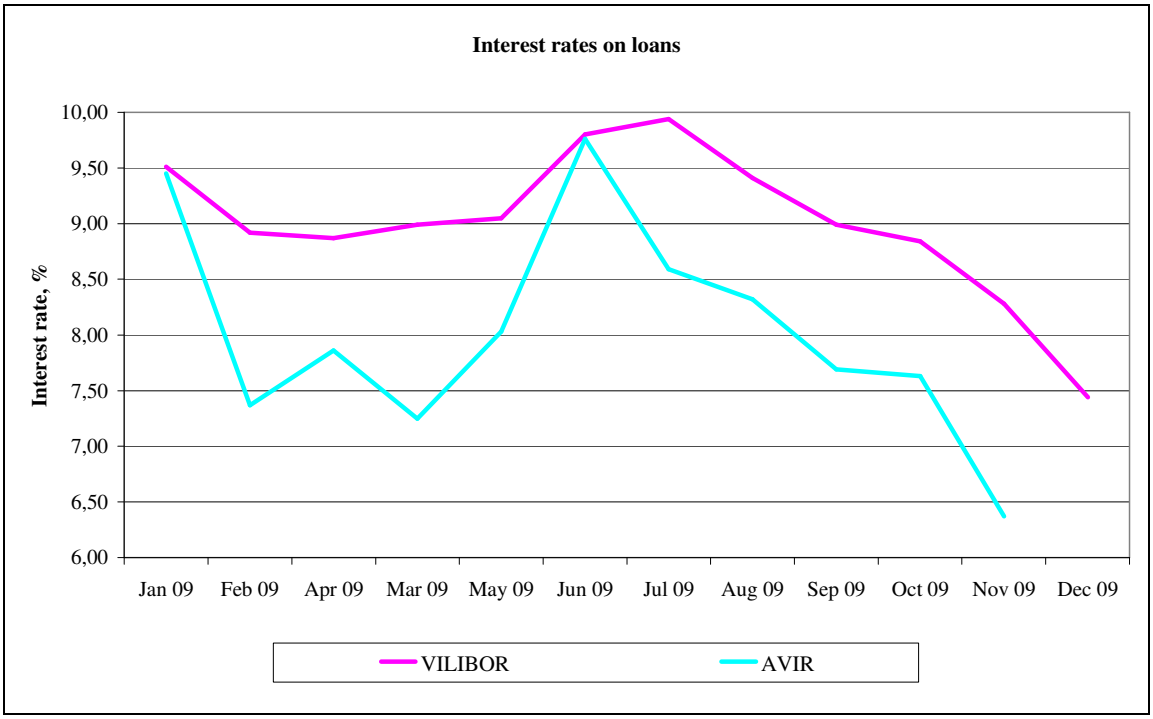


Figure 3. Loans interest rate in Lithuania

In order to keep this benchmark conservative no risk premium associated with the project type or the project developer was added to it. Further, AVIR's is in itself a conservative benchmark as it does not take into account the commercial lending rates of individual private sector banks which are typically higher than AVIR (because VILIBOR+bank margin).

Sub-step 2c. Calculation and comparison of financial indicators

1) Parameters needed for calculation of key financial indicators:

Table 7. Parameters for calculation of key financial indicators

Parameter	Value	Unit
Total investment costs	72 877 000	LTL
Annual operation and maintenance costs	770 615	LTL
Annual electricity production	31718	MWh/year
Feed-in tariff	300,0	LTL/MWh
Project life time	20	Year
ERU crediting period	2,3 (01.10.2010-31.12.2012)	Year
ERU price	12,00	Euro

2) Comparison of IRR for the Project and the benchmark

In accordance with benchmark analysis (Option III), if the financial indicators of the proposed project, such as the project IRR, are lower than the benchmark, the proposed project is not considered to be financially attractive.

Table 8 shows the project IRR with and without the sales of ERUs with comparison with benchmark value. In both cases the project IRR is lower than the benchmark value. It means that project is

financially unattractive on present market conditions. Additional revenues from ERUs sale increasing project IRR from 5,30% (Alternative A) to 5,46%. Therefore the JI revenues enable the Project to overcome the investment barrier and demonstrate the addtionality of the Project.

Table 8. Project IRR in two scenarios

	Project IRR
Without ERUs	5,30%
With ERUs	5,46%
Benchmark value	8,03%

For comparison – the average IRR of new natural gas based cogeneration power plants is about 8-10%. However, EU structural funds are available for new cogeneration plants (up to 50% from all investments) but not for wind power projects in Lithuania. With the EU structural support IRR of new cogeneration plants jumps up to around 15%. This fact makes cogeneration option more attractive for the investors compared to the wind power. As concrete example may be used the new erected CHP plant example (Panevezys CHP) where the project IRR is 16,2%[9] (Alternative B).

Sub-step 2d. Sensitivity analysis

The sensitivity analysis shall show whether the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions.
According to the Tool for the Demonstration and Assessment of Additionality, Ver.5.02, minimal variation range should be in ±10% level.
For the Project, three parameters were selected as sensitive factors to assess the financial attractiveness:

1) Total Investment
2) Annual Electricity Output
3) ERUs sale price

Table 9. Project sensitivity analysis

	-10%	**-5%**	**0%**	**+5%**	**+10%**
Total investment	6,39	5,91	5,46	5,04	4,65
Annual electricity output	4,45	4,96	5,46	5,94	6,39
ERUs sale price	5,44	5,45	5,46	5,47	5,48

[9] UNFCCC webpage, JI Project - Rudaiciai wind power park, PDDs supporting documentation Enclosure3 – IRR for cogeneration plant Panevezys

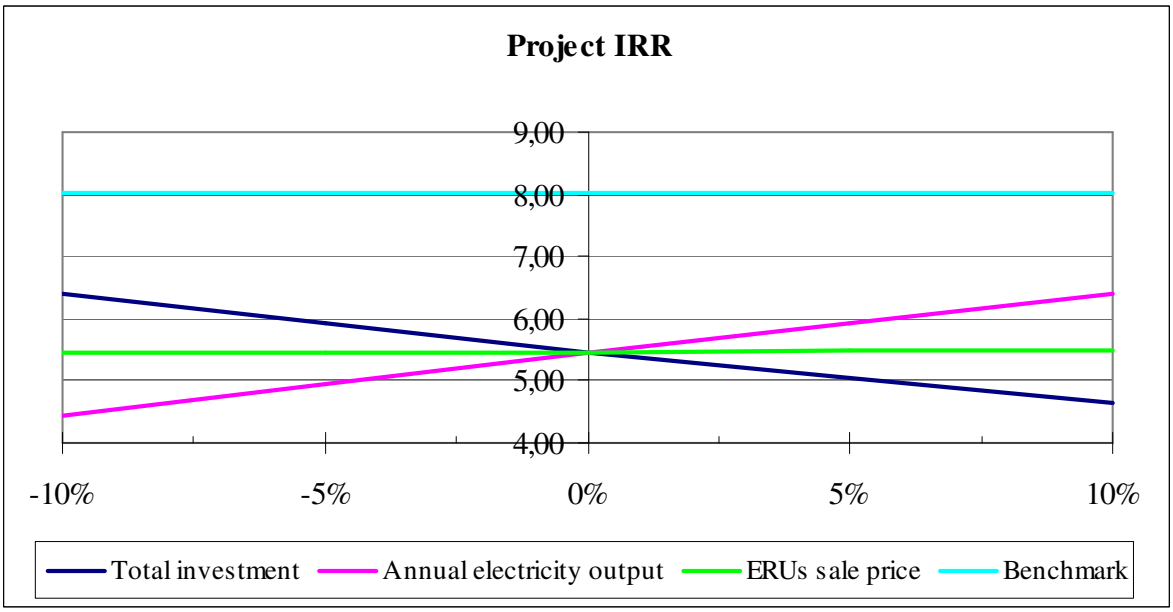


Figure 4. Project IRR sensitivity

It could be seen that the Project IRR is not below the benchmark IRR even when the total investment drops by 10 percent, or annual electricity output and ERUs sale price increases by 10 percent.

The sensitivity analysis shows that the annual power production and total investment size is crucial factors for project economic. The power production is variable and depends from on site wind conditions and wind turbines technical characteristics. The used power generation approach gives for project the capacity factor – 36,2%, that is average result in practice (25-40%)[10]. It means that probability that project financial figures may vary into negative side is higher then into positive side and it shall make Project less financially attractive than is assumed.

Total investment cost depends on the labour and material market price. The real project investments will be known only after project implementation.

The additional revenue from ERUs sale gives more attractiveness and gives positive impact for Project additionallity. The ERUs sale price was estimated based on "carbon credits" market overview.

The sensitivity analysis confirms the fact that the project is not enough financially attractive and revenues from ERUs sale gives the chance to improve its financial figures.

Result: Pass

Step 3. Barrier analysis

According to Tool for the Demonstration and Assessment of Additionality methodology *"If after the sensitivity analysis it is concluded that: (1) the proposed CDM project activity is unlikely to be the most financially/economically attractive (as per step 2c para 11a) or is unlikely to be financially/economically attractive (as per step 2c para 11b), then proceed to Step 4 (Common practice analysis)".*

[10] The capacity factor calculation http://www.awea.org/faq/wwt_basics.html

Step 4. Common practice analysis

Sub-step 4a. Analyze other activities similar to the proposed project activity:

Currently only three wind energy parks with total capacity 66MW and several individual wind turbines with total capacity 9,15 MW are under operation in Lithuania. All three wind energy parks are covered under JI scheme already. There are no information about other wind energy parks which are under operation without JI scheme in the country.

The Griezpelkiu wind energy park project is not related with existing wind parks and will be developed individually.

Sub-step 4b. Discuss any similar options that are occurring:

The practice shows that there are several main obstacles which have negative impact on widen project development in wind energy sector in Lithuania:

- Long wind energy projects pay back period. Due to big investments demand and constantly raising of prices of wind turbines (for ex. the Enercon turbines prices up approx. by 30% during last two years), raw materials (steel), civil works wages) the wind energy projects still are financially unattractive.
- Based on above mentioned reason the debt funding is complicated (the annual rate is increasing due to instable world economic situation).
- No financial support for wind electricity generation is foreseen under the EU structural funds or any other multilateral or bilateral sources.
- Tender rules for grid connection in dedicated zones require a significant initial down-payment.
- Approval of dedicated zones means that only limited land areas might be used for wind energy projects. Such reason influenced the strong rising of prices and scarcity of land for availability of such projects development;
- The know-how related to wind power technology and such kind of project implementation is still limited;
- There is insecurity regarding purchase of wind power when trading on hourly basis comes into effect after the establishment of the spot market. Lietuvos energija has the right to disconnect the wind power-plant park from the power network in case of the system overload.

Based on above mentioned reasons the JI revenue has been considered since the early stages of development of Griezpelkiu wind power park project and is an integral part of financing the Project. As explained in Step 2, the fixed price offered for wind power is not high enough to make the Project activity financial viable. If the project developer will be able to sell the ERUs from the project activity, then the additional revenue from these sales would improve the financial viability and shall make the project more attractive.

The fact that during last two years no more wind parks were erected proves the fact that wind energy Projects aren‘t financially attractive and face with different barriers.

Result: Pass

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

The BASREC JI Project Guidelines describes project boundaries as theoretical boundaries, determining the scope of project’s impact on GHG emissions. The sources of GHG involved in project boundaries represent the sources involved in baseline calculations.

The project boundary is drawn around the physical boundary of the wind power plants (i.e. the wind turbines and generators) and the power plants of Lietuvos Elektrine, the power generation of which the wind power plants would replace. Other producers as well as consumers of electric power are not included into project boundary due to the structure of Lithuanian power grid (see section B1).

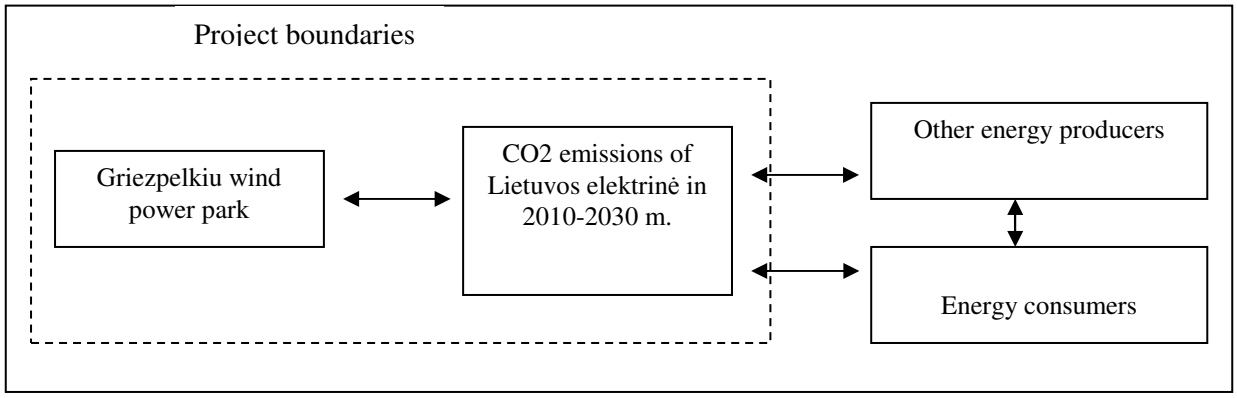


Figure 5. Project boundaries

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

Date of Baseline setting 12/01/2010
Prepared by: Vejo gusis, UAB (Project participant), represented by CEO Egidijus Simutis Tel. +37061601005 Fax. +37046341586 E-mail. es@nemo.lt

SECTION C. Duration of the small-scale project / crediting period

C.1. Starting date of the small-scale project:

Start of the Griezpelkiu wind power park's project activities (Agreement on land purchase)– 17/09/2008.

Energy generation is planed from October 2010.

C.2. Expected operational lifetime of the small-scale project:

Planned operational lifetime of wind power park is 20 years (10/2010-09/2030).

C.3. Length of the crediting period:

The starting date of the crediting period is set to 1st October, 2010. First crediting period consist 2 years and 3 months (2010–2012).

In case of additional international treaties between the parties of Kyoto protocol are signed, the crediting period may be extended for additional internationally agreed period.

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

The main requirements, being imposed on the monitoring plan, are pointed out in the Annex B of Chapter 6 of the Kyoto protocol (Decision 9/CMP.1, "Decisions adopted by the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol"). The following points have to be considered in the monitoring plan:

- All the data necessary to the evaluation or the collection and storage of the data from all the sources of anthropogenic emissions and/or leakage. These data are being collected and stored during all the crediting period;
- The collection and storage of all the data necessary for the calculation of the baseline from all the anthropogenic sources and leakage during all the crediting period;
- The determination of all the potential sources, the collection of information about them and storage of it in case of increasing GHG emissions from the anthropogenic sources as well as leakage that have intense and significant impact on the project during its crediting period and that are outside the project boundaries. The project boundaries must involve all the sources and leakage of anthropogenic pollution under the maintenance of the participants of the project;
- The storage of the information about the state of environmental protection according to the requirements of the hosting country;
- The assurance of the quality of the monitoring and the procedures of control;
- The periodic calculation of the saved GHG, according to all the sources and leakage, if such are present.

The monitoring plan is attached as the Annex 3.

It was calculated that generating 1 MWh of electric power, contributes to the pollution of atmosphere with 0,626 tones of CO2 (see chapter B.1.). In accordance to the baseline scenario Griezpelkiu wind power park project would displace carbon intensive electricity produced from fossil fuel sources. Baseline emissions will be monitored using the following formulae.

$ER = E_{Griez(+/-)} \times EF_{LE}$ [1]

Where:
ER - emission reductions, tCO2
$E_{Griez(+/-)}$ – net power dispatched to the grid from Griezpelkiu wind power park project (difference between supplied into grid power and consumed from the grid power), kWh
EF_{LE} – emission factor for power production in Lithuania, 0,626 tCO2/MWh

Due to reason that Kreivenai wind power park (20MW) and Griezpelkiai wind power park project (10MW) are connected to the same substation with one commercial power meter it is necessary to separate each park energy generation/consumption. Net power dispatched from Griezpelkiai wind power park project will be separated by [2] formulae:

$E_{Griez\ (+/-)} = E_{CM} - E_{Kreiv(+/-)}$ [2]

Where:
E_{CM} – the data of commercial power meter, i.e. net power dispatched to the grid from Kreivenai wind power park and Griezpelkiai wind power park project, kWh
$E_{Kreiv(+/-)}$ – net power dispatched to the grid from Kreivenai wind power park, kWh

According to the power sale-purchase agreement between project owner with AB Lietuvos energija net power dispatched to the grid from each park will be recorded by 3 control meters installed on substation parallel to commercial meter.

$P = P1_{(+/-)}+P2_{(+/-)}+P3_{(+/-)}$ [3]

Where:
P – the sum of net power dispatched to the grid measured by all control meters, kWh
$P1_{(+/-)}$, $P2_{(+/-)}$, $P3_{(+/-)}$ - the data of separate control meter on net power dispatched to the grid, kWh

Based on data of all meters AB Lietuvos energija will separate Griezpelkiai wind power park project park's generation/consumption proportion from net power dispatched to the grid calculated by [4] formulae:

$P3_{\%} = P3_{(+/-)} / P$ [4]

Where:
$P3_{\%}$ – Griezpelkiai wind power park energy generation proportion from total net power amount, %
$P3_{(+/-)}$ - the data of Griezpelkiai wind power park control meter, kWh

The factual net power dispatched to the grid from Griezpelkiai wind power park will be calculated by [5] formulae:

$E_{Griez\ (+/-)} = P3_{\%} \times E_{CM}$ [5]

See baseline study and methodology for detail on how EF_{LE} is calculated (B.1.)

D.2. Data to be monitored:

Key information and data used for monitoring plan setup:

Data/Parameter	E_{CM}
Data unit	MWhe
Description	The data of commercial power meter, i.e. net power dispatched to the grid from Kreivenai wind power park (20MW) and Griezpelkiai wind power park project (10MW)
Time of determination/monitoring	Per certain period (for ex. per month)
Source of data (to be) used	Deeds of transfer and acceptance from AB Lietuvos energija.
Value of data applied (for ex ante calculations/determinations)	-
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data will be aggregated monthly and double checked with receipt of sales, with the SCADA system as back-up
QA/QC procedures (to be) applied	The data reading from commercial power metering device will be executed remotely by SCADA. The installed current and voltage transformers will be certified and inspected by accredited companies (for ex. Lithuania and Germany Ltd. FESLA which has calibration and testing laboratory). Commercial power meter and 3 units of control power meters will be installed and under operation from AB Lietuvos energija side. This company will carry out its periodical supervision, calibration and maintenance. Lietuvos energija will carry out periodical supervision, calibration and maintenance of all control meters.
Any comment	Historical data will be kept for min. 2 years period.

Data/Parameter	$P3_{(+/-)}$
Data unit	MWhe
Description	The data of one control power meter of Griezpelkiai wind power park project, i.e. net power dispatched to the grid (difference between supplied into grid power and consumed from the grid power)
Time of determination/monitoring	Per certain period (for ex. per month)
Source of data (to be) used	Deeds of transfer and acceptance from AB Lietuvos energija.
Value of data applied (for ex ante calculations/determinations)	-
Justification of the choice of data or description of measurement methods and procedures (to be)	Data will be aggregated monthly and double checked with receipt of sales, with the SCADA system as back-up

applied	
QA/QC procedures (to be) applied	The data reading from control power meter will be executed remotely by SCADA. The installed current and voltage transformers will be certified and inspected by accredited companies (for ex. Lithuania and Germany Ltd. FESLA which has calibration and testing laboratory). Control power meter will be installed and under operation from Lietuvos energija side. This company will carry out its periodical supervision, calibration and maintenance.
Any comment	Data on wind park production will be publicly available at Lietuvos energija website. Historical data will be kept for min. 2 years period.

Data/Parameter	$P1_{(+/-)}$, $P2_{(+/-)}$
Data unit	MWhe
Description	The data of two control power meters of Kreivenai wind power park, i.e. net power dispatched to the grid (difference between supplied into grid power and consumed from the grid power)
Time of determination/monitoring	Per certain period (for ex. per month)
Source of data (to be) used	Deeds of transfer and acceptance from AB Lietuvos energija
Value of data applied (for ex ante calculations/determinations)	-
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Data will be aggregated monthly and double checked with receipt of sales, with the SCADA system as back-up
QA/QC procedures (to be) applied	The data reading from control power meter will be executed remotely by SCADA. The installed current and voltage transformers will be certified and inspected by accredited companies (for ex. Lithuania and Germany Ltd. FESLA which has calibration and testing laboratory). Control power meters will be installed and under operation from Lietuvos energija side. This company will carry out its periodical supervision, calibration and maintenance.
Any comment	Data on wind park production will be publicly available at Lietuvos energija website. Historical data will be kept for min. 2 years period.

Key information and data used for monitoring plan setup:

Data/Parameter	ER
Data unit	tCO2
Description	Emission reduction
Time of determination/monitoring	Per certain period (for ex. per month)
Source of data (to be) used	Deeds of transfer and acceptance from AB Lietuvos energija
Value of data applied (for ex ante calculations/determinations)	0,626 tCO2/MWhe
Justification of the choice of data or description of measurement methods and procedures (to be) applied	Calculations based on baseline emissions (B.1.)
QA/QC procedures (to be) applied	Public data sources
Any comment	Historical data will be kept for min. 2 years period.

Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination regarding the PDD:
EF_{LE} – emission factor for power production in Lithuania, 0,626tCO2/MWh

Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of determination regarding the PDD:
None

Data and parameters that are monitored throughout the crediting period:
$E_{Griez(+/-)}$ – net power dispatched to the grid from Griezpelkiu wind power park project, kWh
E_{CM} – the data of commercial power meter, i.e. net power dispatched to the grid from Kreivenai wind power park and Griezpelkiai wind power park project, kWh
$P1_{(+/-)}$, $P2_{(+/-)}$, $P3_{(+/-)}$ - the data of separate control meter on net power dispatched to the grid, kWh

The monitoring plan is attached as the Annex 3

D.3. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored:

Table 9. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored

Data *(Indicate table and ID number)*	Uncertainty level of data (high/medium/low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
$E_{Griez(+/-)}$	*Low*	Data will be directly measured with control meter installed in the substation. This meter will be sealed, calibrated and checked periodically for accuracy. In addition, all metered data will be double checked by receipts of electricity sales, with SCADA system as back-up. Vejo gusis, UAB will collect and keep copies of calibration and maintenance documents of meter. In the case of commercial meter's failure, net dispatched to the grid energy will be controlled through secondary commercial meter that is connected in parallel to prime commercial meter (usually system has two energy meters). In the case of control meter's failure, net dispatched to the grid energy will be calculated based on difference between commercial meter data and data of rest control meters.

D.4. Brief description of the operational and management structure that will be applied in implementing the monitoring plan:

It is planed that the operation and maintenance (O&M) works of Griezpelkiu wind power park project will be done by company Enercon Gmbh that will have an agreement on such services with Vejo gusis, UAB.

Vejo gusis, UAB has three employees – CEO, director of economy and chief accountant. The company's director shall perform all Project based supervision works.

The monitoring report based on monitoring plan and monthly deeds of transfer and acceptance will be prepared by Vejo gusis, UAB director. Monitoring of net power dispatched to the grid will be measured by the commercial and control power meters. The data from all meters will be transferred to AB Lietuvos energija side by SCADA system (through telemetry way). AB Lietuvos energija will send deeds of transfer and acceptance to each wind power park owner. After data verification of received deeds of transfer and acceptance, the invoices from Vejo gusis, UAB will be issued. Moreover data on net energy output into national grid will be published officially on Lietuvos energija website.

The park's backup feed will be secured from low voltage (0,4kV) network (for own purposes). For this reason it is foreseen to sign power sale-purchase agreement between VST and Vejo gusis, UAB. The park's consumed power will be measured by separate low voltage power meter.

The issued invoices and received deeds of transfer and acceptance will be kept into Vejo gusis, UAB accountancy. CEO and director of economy will be responsible for controlling and signing invoices from the Vejo gusis, UAB side. All invoices will be kept in company's accountancy for 10 year period.

For the quality assurance, an audit company will be contracted to revise company's financial results including the monitoring reports. Revision will include verification of the data sources and calculations. All documents will be archived at Vejo gusis, UAB for later reference to proof of the monitoring results. Lietuvos energija and VST are responsible for the periodical supervision, calibration and maintenance of the all power meters.
Vejo gusis, UAB does not have special requirements from state supervisory institutions on Project's environmental impacts monitoring. Based on hygiene norm requirements (HN33:2007) the wind power park's noise level cannot to be higher than allowable. After installing the wind-power plants the compulsory measurements of the noise level will be undertaken. The measurements will be done by Taurages centre of public health side on its equipment.
All possible questions regarding environmental impact evaluation, including possible claims and prevention measures arrangements will be organised by company's CEO.

D.5. Name of person(s)/entity(ies) establishing the monitoring plan:

Prepared by: Vejo gusis, UAB (Project participant), represented by CEO Egidijus Simutis Tel. +37061601005 Fax. +37046341586 E-mail. es@nemo.lt

SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions and formulae used in the estimation:

Wind power does not create any anthropogenic greenhouse gas emissions in operation, so Project emissions are zero.

E.2. Estimated leakage and formulae used in the estimation, if applicable:

There are no direct or indirect emissions outside the project boundary attributable to the project activity.

E.3. Sum of E.1. and E.2.:

E.1.+ E.2.= 0

E.4. Estimated baseline emissions and formulae used in the estimation:

Baseline emissions (BE) are calculated as following:

$BE = E_{VP} \times EF_{LE}$

Where,
BE = Baseline emissions in year x (tCO2)
E_{VP} = Net Electricity supplied to the grid by the project during period X (MWh)
EF_{LE} = Emission factor of the power plants based on fossil fuel (0,626 tCO2/MWh)

Calculation of EF_{LE} is presented in B1 and monitoring in D.1.1.4.

Total baseline emissions for period 2010-2012 are 44675 tCO2.

Year	2010	2011	2012	Total:
Baseline emissions = Project emission Reductions, tCO2	4964	19855	19855	**44675**

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

Because project emissions are zero, the emissions reductions are the same as the baseline emissions.

Year	2010	2011	2012	Total:
Baseline emissions = Project emission Reductions, tCO2	4964	19855	19855	**44675**

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

Table 19. Project emission reductions

Year	Estimated project emissions (tonnes of CO2 equivalent)	Estimated leakage (tonnes of CO2 equivalent)	Estimated baseline emissions (tonnes of CO2 equivalent)	Estimated emission reductions (tonnes of CO2 equivalent)
2010	0	0	4964	4964
2011	0	0	19855	19855
2012	0	0	19855	19855
Total 2010-2012	**0**	**0**	**44675**	**44675**

After year 2012 by following year estimated annual emission reduction – 19855 tones of CO2 equivalent.

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:

According to the Communications No (9.14.5.)-LV4-7027 of Klaipeda Regional Department of Environment of Lithuanian Ministry of Environment of 18 November 2008, the conclusion, concerning the environmental impact of the planned economic activity, was drawn that the environmental impact assessment of the planned economic activity – installation and maintenance of wind power plants – is not required. The above stated conclusion was drawn because (the extract from the above mentioned documents):

- National Energy Strategy approved by the resolution No.X-1046 of Seimas of the Republic of Lithuania of January 18, 2007 (Official Gazette., 2007, No 11-430) schedules, that aiming to the best use local resources, including wind energy, and at the same time to reduce the import of fuel and to establish new work places as well as to improve the state of environmental protection, the State will promote the implementation of the projects on use of wind, water and sun power and the experience of installation and maintenance will be collected;
- Planned economic activity will not influence any kind of pollution, any waste sources will be generated, dwindling natural energy sources will not be used;
- During planned economic activity different preventative measures which reduce environmental impact were provided:
  - the shadow impact that is caused by turbines blades rotation will be reduced by proper wind turbine position. The following wind turbines also will have possibilities automatically to stop (temporary) its blades rotation when the shadow will droop into nearest living houses areas.
  - The planned wind park will have the special sanitary zone (SAZ) outside which turbines noise level will be lower than existing requirements of national hygiene norm HN 33:2007 as well as electromagnetic field intensity will be lower than max available value (1,0 kV/m) for living areas.

Potential environmental impacts are described below.

Atmosphere

The project is considered to result not only in reduction of GHG but also in reduction of other pollutants such as SO2 and NOx. These pollutants are released to the atmosphere while generating electric power at fossil fuel based power plants. To calculate reductions of SO2 and NOx, the following formulas are used:

$E_{SO2} = P_{MWh} \times EF_{SO2}$

Where:
P_{MWh} - is the electric power dispatched to the national grid annually, MWh;
EF_{SO2} – is the emissions factor, defining how many tones of SO2 is emitted to the atmosphere while producing 1 MWh of electric power.

$E_{NOx} = P_{MWh} \times EF_{NOx}$

Where:
P_{MWh} - is the electric power dispatched to the national grid annually, MWh;
EF_{NOx} - is the emissions factor, defining how many tones of NOx emerge, while producing 1 MWh of electric power.

The results of projected SO2 and NOx reduction during period 2009-2012 are given in Table 10.

Table 10. SO2 and NOx emission reductions

Pollutant	kg of pollutant/MWh	Amount of pollutant saved during the crediting period
SO2	0,45	67,80 t
NOx	0,95	32,11 t

Water

There are no open water pools within the project area. There is no risk to pollute the surface and/or ground water during the maintenance of the wind power park project. Water is not used for technological purposes in the wind power park so the wastewater will not be formed. Surface run-off from the wind power park territory will be drained away. For this purpose, drainage systems are reconstructed within the project area.

Soil

There will not be any significant impact on soil. The project area mainly consists of farmlands. During the construction process, in the power plant fundament areas, road construction areas and cable laying areas the upper layer of the soil which is 0,2-0,3m thick, will be separated and stored apart from other soil layers. After construction works are finalized, the loam will be re-cultivated and planted according to projects plans in order to avoid soil erosion.

Flora / Fauna

Based on data of operating wind power plants, there is no evidence of the impact of wind power plants on biological diversity. Hence, measures to recreate environmental biodiversity are not necessary. There are no envisaged tree cuttings or relocation in the project area. A grass-plot will be set in the area. There are no wild animal accumulation, feeding, mating, wintering of migration points in the project area that should be protected.

Impacts on birds

Griezpelkiu wind power park project is far away from bird migration routes. The probability of birds colliding with the wind power plants is very low. Therefore the impacts on birds are considered negligible. A study from the Danish Ministry of the Environment states that high voltage power lines is much greater danger to birds than the wind turbines themselves[11].
According to results of the studies performed by Danish and German scientists – wind power plants have no impacts on migration routes of birds. The studies in ES show that the risk of bird collisions with wind power plants is much smaller compared to the risks of bird collision with high voltage air power lines, cars, skyscraper, glass facades of buildings. After long term observations, the conclusions were drawn that birds have changed their migration routes according to new obstructions evolved on their way.

Impacts on animals

Noise, shadow and blinking effects and landscape fragmentation effect made by wind power park can disturb natural wildlife. However, Griezpelkiu wind power park project is surrounded by farmlands and rural areas situated away from wild animal habitats. Hence, the impact on wild animals is considered negligible.

Protected areas

There are no protected areas within or nearby the project site. There are no protected species of flora or fauna within or close to the project site. Among other sources, such data was verified at the State Service for protected Areas under the Ministry of Environment[12].
All nearest protected areas are within sufficient range away from the project site:

Pagramančio regional park (about 10 km);
Rambyno regional park (about 7 km);
Vilkyškių geomorfogical reservation (about 7 km)
Viešvilės botanical-zoological reservation (about 20 km);
Tyrelio landscape reservation (about 10 km)
Jūros landscape reservation (about 12 km)
Jūros ichthyologic reservation (about 5 km)
Kaskalnio geomorfogical reservation (about 18 km)

Cultural heritage

No valuable cultural heritages are registered in the Project area.

[11] Birds and wind turbines: http://www.windpower.org/en/tour/env/birds.htm

[12] State cadastre of protected areas http://stk.vstt.lt

Waste

Waste in wind power park is minimal. No oil lubricants are used in Enercon turbines as there are no gear boxes in the construction. Any spare parts that are substituted with new ones during the operation and maintenance period of wind power park will be removed from the project site and recycled by the maintenance service provider.

Physical impact

Electromagnetic field

Electromagnetic field is formed around high voltage air power lines, at the transformer substations and other open power installations. Electromagnetic field is measured by the intensity of electric field (E, V/m) and by the intensity of magnetic field (H, A/m). Permissible intensity of electric field in residential (building) areas is up to 1kV/m without limitations for allowed exposure time and up to 5 kV/m in "green" zones (parks, gardens etc.) without limitation for exposure time (HN 104: 2000).
The potential sources of electromagnetic field in wind power park (generators and transformers) are generating low voltage and up to 100kW power capacity. The intensity of electric and magnetic fields are lower than the permissible level for residential areas (1kV/m). Electro-technical equipment of wind power plants are mounted in 90m height from the surface in the metal, connected to earth baskets, which perform as electromagnetic shields. Zone of electromagnetic impact is not present in wind power park territory or in neighboring areas.

Noise

The sanitary zone with the radius of 80 m, was set around wind power plants according to the requirements. Maximum allowed noise level in the residential areas is 55dB at the night time and 65dB at the daytime (HN 33:2007). Estimations of the Griezpelkiu wind power park project noise level gave the following results depending on the distance from wind power plants: 100m-50dB, 290m-45dB, 440m-40dB, 660m-35dB.
The closest living area (grange) is 280m away from the wind power park area.

Visual impact

Wind power plants make landscape more urbanized. However , if the right planning concept is used – a visual impact can be minimized. The positioning of wind power plants is made optimal to integrate it into the landscape. The towers of wind power plants are painted into bright grey color which will fade them in the sky background.

Shadowing effect

Wind power plants, like all tall buildings cast shadow on the neighboring areas when the sun is visible. It also causes a blinking effect due to rotation of wind turbine wings. The shadowing effect is not relevant for the project. According to the preliminary calculations – shadows will be cast not more than 250m from the wind power plants. Bearing in mind that the closest living area are approx. 280 meters away – the shading effect is not considered as an impact.

Transboundary impact

The Project does not have any transboundary impact because the borderline of Russian Federation is over approx. 15 km from Project location side. Project implementation and operation are fully under regulation of national legal acts.

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

The environmental impacts are nor considered as significant.

SECTION G. Stakeholders' comments

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

While preparing the detailed plans, compulsory public consideration procedures were undertaken where all stakeholders may participate. Compulsory written agreements of residents in surrounding areas were obtained during the process of detailed planning and technical project preparation process. Stakeholders have not expressed any objections.
The following steps were made during the stakeholder process (Table 11):

Table 11. Stakeholder process

Date	Description
2009-04-09	Announcement about beginning of Project detailed plan preparation in the newspaper „Taurages kurjeris".
2009-04-09	Information about detailed plan preparation sent to all neighbours of the site by post.
2009-04-09	Information about detailed plan preparation placed on the billboard near the site.
2009-07-14	Announcement about availability of the Project detailed plan for public review on the Taurage Municipality website www.taurage.lt
2009-07-14	Information about finished detailed plan placed on the billboard near the site.
2009-07-14	Detailed plan placed in Taurage Municipality office for public review.
2009-07-14	Announcement about availability of the detailed plan for public review in the newspaper "Taurages kurjeris"
2009-08-11	End of public procedure of the Project detailed plan. No complaints received.

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

Organisation:	Vejo gūsis, UAB
Street/P.O.Box:	Nemuno / P.O.Box 13
Building:	139
City:	Klaipeda
State/Region:	
Postal code:	LT-93262
Country:	Lithuania
Phone:	+370 616 01005
Fax:	+370 46 341586
E-mail:	es@nemo.lt
URL:	
Represented by:	Egidijus Simutis
Title:	Director general
Salutation:	Mr.
Last name:	Simutis
Middle name:	
First name:	Egidijus
Department:	
Phone (direct):	+370 616 01005
Fax (direct):	+370 46 341586
Mobile:	+370 616 01005
Direct e-mail:	es@nemo.lt

Annex 2

BASELINE INFORMATION

Implementing Joint Implementation projects in Lithuania, where the result is the reduction in the power use or power generation, which would indirectly reduce the amount of generated power in the installations of the EU allowance trading scheme, it is offered to use the pollution factor equal to 0,626 tCO2/MWh of the electricity generated.

Annex 3

MONITORING PLAN

Emission reductions from the project will be calculated by multiplying annual amount of power dispatched to the grid by emissions factor:

$ER = E_{Griez(+/-)} \times EF_{LE}$

Where:
ER – emission reductions, tCO2
$E_{Griez(+/-)}$ – net power dispatched to the grid from Griezpelkiu wind power park project, MWh.
EF_{LE} – emission factor for power production in Lithuania, i.e. 0,626 tCO2/MWhe

ER will be calculated for a past period (for ex. previous month), using annual net power dispatched to the grid data (deeds of transfer and acceptance). The monitoring form is presented in next page. Monitoring procedures are described in D2-D4.

Monitoring form

YEAR:_____

Month	Power dispatch confirmation document No.	Date of issuance of power dispatch confirmation document	Power supplied to the grid (Esup), MWh	Power consumed from the grid (Econ), MWh	Net annual power production ($E_{Griez(+/-)}$), MWh	Amount of Emission Reduction (ER), tCO_2e	Name of the person in charge	Signature
January								
February								
March								
April								
May								
June								
July								
August								
September								
October								
November								
December								
Total:								

$ER = E_{Griez(+/-)} \times 0{,}626$

$E_{Griez(+/-)} = Esup\text{-}Econ$

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