**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:

>>
Wind Power Projects of Stefanov and Svodin in Slovak Republic
Version number of the document: 1.1
Date of the document: 05/03/2008

### A.2. Description of the project:

>>
This whole project does the wind power generation of total 90.75MW in the west of The Slovak Republic. The wind parks of the project are located at two local spots as TRNAVA province, Senica district, Stefanov village, and NITRA province, NoveZamky district, Svodin village. Each site has a name as “Stefanov Project” and “Svodin Project” respectively from names of those two villages.

### A.3. Project participants:

>>

| Party involved | Legal entity project participant | Please indicate if the Party involved wishes to be considered as project participant (Yes/No) |
|---|---|---|
| Slovakia | VENTUREAL s.r.o. | No |

### A.4. Technical description of the project:

#### A.4.1. Location of the project:

>>
TRNAVA province, Senica district, Stefanov village and,
NITRA province, NoveZamky district, Svodin village

##### A.4.1.1. Host Party(ies):

>>
The Slovak Republic

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

>>
TRNAVA and NITRA

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

>>
Stefanov and Svodin

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

>>


Figure 1. Site locations for 2 wind power projects.

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

>>

V100 series 2.75MW, a new product from Vestas company, will be introduced to this project. The V100-2.75MW is capable to generate electricity with every wind direction . The rated speed of rotor can be changed within the range of 60% based on the OptiSpeed technology that Vestas Co. has developed. As a result, it can even harness the force of wind gust, then the potential of annual power generation has been improved comparing to Vestas' previous products. Moreover, a low peak load contributes to reduce mechanical wear and cracks on the gear, the wings, and the tower. In addition, its lower rotational speed leads noise-reduction respectably.

**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:**

>>

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

>>

| | **Years** |
|---|---|
| **Length of the crediting period** | 4 |
| **Year** | Estimated of annual emission reductions in tonnes of CO2 equivalent |
| 2009 | 77,436 |
| 2010 | 134,152 |
| 2011 | 135,168 |

| | |
|---|---|
| 2012 | 133,064 |
| **Total estimated emission reductions over the crediting period (tonnes of CO2 equivalent)** | 479,820 |
| **Annual average of estimated emission reductions over the crediting period (tonnes of CO2 equivalent)** | 119,955 |

**A.5. Project approval by the Parties involved:**

>>

## SECTION B. Baseline

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

>>
This project is a wind power generation project, and brings out neither immediate GHG emissions nor the reductions from the project itself. On the other hand, the electric power generated by the project will be connected and transmitted through the power grid, thereafter; it comes to reduce certain emissions from other fossil fuel power plants over the grid in the country.

In the methodology of the carbon intensity calculation is used the build margin (BM) and operating margin (OM) approach as specified in "Tool to calculate the emission factor for an electricity system" (Version 01).

***STEP 1. Identify the relevant electric power system.***

The electricity grid of Slovakia is chosen as a relevant electric power system.

***STEP 2. Select an operating margin (OM) method.***

Calculation of the Operating Margin emission factor ($EF_{grid,OM,y}$) should be based on one of the four following methods:

- Simple OM, or
- Simple adjusted OM, or
- Dispatch Data Analysis OM, or
- Average OM.

Dispatch data analysis should be the first methodological choice, but in this case data are not available in full for Slovakia. Thus, and on the ground of fact that low-cost/must-run resources constitute more than 50% of total grid generation, calculation of the operating margin emission factor based on the method, "Simple adjusted OM" was used.

***STEP 3. Calculate the operating margin emission factor according to the selected method.***

The simple adjusted OM emission factor ($EF_{grid,OM-adj,y}$) is a variation of the simple OM, where the power plants / units (including imports) are separated in low-cost/must-run power sources (*k*) and other power sources (*j*). As with the simple OM, it can be calculated:
Based on data on net electricity generation, the average efficiency of each power unit and the fuel type(s) used in each power unit (Option B), as follows:

$$EF_{grid,OM\text{-}adj,y} = (1-\lambda_y) \times \frac{\sum_j EG_{j,y} \times EF_{EL,j,y}}{\sum_j EG_{j,y}} + \lambda_y \times \frac{\sum_k EG_{k,y} \times EF_{EL,k,y}}{\sum_k EG_{k,y}}$$

Where $FC_{i,j,y}$, $FC_{i,k,y}$, NCVi,y, EFCO2,i,y, EGj,y and EGk,y are analogous to the variables described for the simple OM method above and where EFEL,j,y and EFEL,k,y should be determined as for the simple OM method above. The indices j and k are subsets of all power sources m supplying electricity to the grid in year y, where k refers to power plants / units which are either low-cost or are must-run and j refers to the remaining power plants / units.
There is no electricity imports in Slovakia.

$$\lambda_y (\%) = \frac{\text{Number of hours low - cost / must - run sources are on the margin in year y}}{\text{8760 hours per year}}$$

The low-cost/must-run sources' share of total power production is shown in Table 1. Approximately 83% of electricity is generated by low-cost/must-run power sources which include nuclear and hydro power plants, regional heating plants where power generation is forced and industrial power platns. Remaining portion of electricity is produced in regulated thermal power plants.

**Table 1 Low-cost/must-run resources' share of total power production until 2012.**

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|
| Total low-cost/must-run | 83.1% | 83.4% | 83.1% | 82.7% | 80.6% | 73.9% | 75.7% | 75.2% |

Fig. 1 shows the estimation of the number of hours for which low-cost/must-run sources are on the margin in 2006.

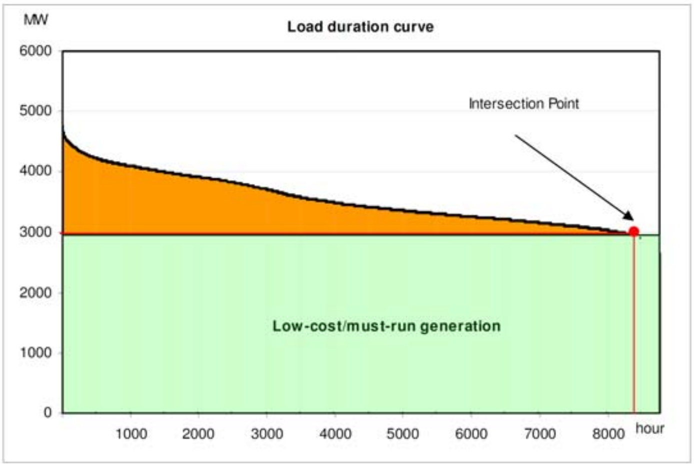


**Fig. 1 The estimation of the number of hours for which low-cost/must-run sources are on the margin.**

**Table 2 Values of lambda within 2003-2012.**

| | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|
| Lambda $\lambda$ | 0.116 | 0.009 | 0.046 | 0.044 | 0.054 | 0.054 | 0.054 | 0.054 | 0.054 | 0.054 |

**Table 3 Emission factors for low-cost/must-run sources – industrial generators and regional heating.**

| Industrial generators and Regional heating plants | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|
| Total CO2 emissions (tCO2) | 2,935,443 | 2,774,729 | 2,727,638 | 2,706,672 | 2,628,518 |
| Total electricity (MWh) | 4,032,394 | 3,838,110 | 3,763,026 | 3,662,697 | 3,575,420 |
| Must-run EF (tCO2/MWh) | 0.7280 | 0.7229 | 0.7249 | 0.7390 | 0.7352 |

**Table 4 Operating Margin emission factors.**

| | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|
| Lambda | 0.116 | 0.116 | 0.046 | 0.044 | 0.054 |
| Emission factor - regulated PP | 0.9357 | 0.9467 | 0.9499 | 0.9485 | 0.9446 |
| Emission factor - low-cost/must-run | 0.7280 | 0.7228 | 0.7249 | 0.7390 | 0.7352 |
| OM emission factor | 0.9116 | 0.9207 | 0.9396 | 0.9393 | 0.9333 |

***STEP 4. Identify the cohort of power units to be included in the build margin (BM).***

The Build Margin emission factor is calculated as weighted average of emission factors for group of five power sources put in operation most recently.

**Table 5 Build margin emission factor.**

| Plant (MWe) | Putting in Operation | Electricity (MWh) | Emissions (t-CO2) | Emission Factor (t-CO2/MWh) |
|---|---|---|---|---|
| Fluid boiler 110 MWe | 2001 | 491,474 | 514,190 | 1.0462 |
| Fluid boiler 110 MWe | 2001 | 491,474 | 514,190 | 1.0462 |
| CC 215 MWe | 1998 | 978,224 | 424,820 | 0.4343 |
| CC 88 MWe | 1997 | 259,600 | 119,592 | 0.4607 |
| Cogeneration unit | 2002 | 36,191 | 16,719 | 0.4620 |
| Total | | 2,256,963 | 1,589,513 | 0.7043 |

***STEP 5. Calculate the build margin emission factor.***

As shown in Table 5, Build Margin emission factor for Slovakia is 0.7043 t-CO2/MWh.

***STEP 6. Calculate the combined margin (CM) emissions factor.***

The baseline emission factor, the Combined Margin emission factor, is calculated as weighted average of the OM emission factor and the BM emission factor.
The calculation results are shown in Table 6.

**Table 6 Combined Margin emission factors**

| | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|
| OM EF (tCO2/MWh) | 0.9116 | 0.9207 | 0.9480 | 0.9388 | 0.9354 |
| BM EF (tCO2/MWh) | 0.7043 | 0.7043 | 0.7043 | 0.7043 | 0.7043 |
| CM EF (tCO2/MWh) | 0.8079 | 0.8125 | 0.8261 | 0.8215 | 0.8198 |

**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:**

>>
The electric power generated by the project will be connected and transmitted through the power grid, thereafter; it comes to reduce certain emissions from other fossil fuel power plants over the grid in the country.

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

>>
The project boundary of this project is shown in the following figure.

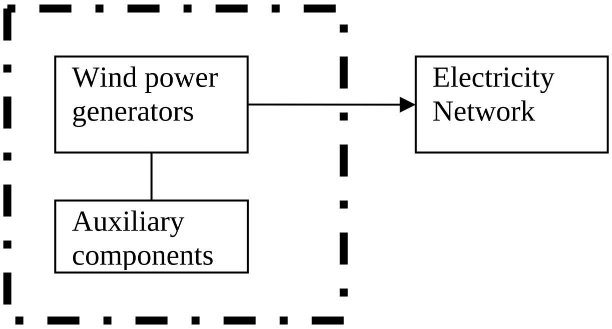


Figure 2. The project boundary.

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

>>

## SECTION C. Duration of the project / crediting period

**C.1. Starting date of the project:**

>>

01/01/2009

**C.2. Expected operational lifetime of the project:**

>>

20 years and 0 months.

**C.3. Length of the crediting period:**

>>

4 years and 0 months.

## SECTION D. Monitoring plan

### D.1. Description of monitoring plan chosen:

>>

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

| D.1.1.1. Data to be collected in order to monitor emissions from the project, and how these data will be archived: | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ID number *(Please use numbers to ease cross-referencing to D.2.)* | 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 |
| | | | | | | | | |
| | | | | | | | | |

This table is not applicable.

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

>>

This is not applicable.

| 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 *(Please use numbers to ease cross-referencing to D.2.)* | 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 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| *1. EGy* | *Electricity quantity* | *Electricity supplied to the grid by the project* | *GWh* | *m* | *Hourly measurement.* | *100%* | *Electronic* | *Double check by receipt of sales* |
| | | | | | | | | |

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

>>

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

This sub-section is not applicable.

**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 *(Please use numbers to ease cross-referencing to D.2.)* | 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 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |

**D.1.2.2. Description of formulae used to calculate emission reductions from the project (for each gas, source etc.; emissions/emission reductions in units of $CO_2$ equivalent):**

>>

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

This sub-section is not applicable.

| D.1.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project: | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ID number *(Please use numbers to ease cross-referencing to D.2.)* | 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 |
| | | | | | | | | |
| | | | | | | | | |

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

>>

**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):**

>>

Detailed in section B of the PDD.

**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:**

>>

| D.2. 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. |
| *1.* | *low* | *Sales records to the grid are used to ensure the consistency with official statistics* |
| | | |

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

>>

See Annex 3.

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

>>

VENTUREAL s.r.o. Project developer, contact information is shown in Annex 1.

## SECTION E. Estimation of greenhouse gas emission reductions

### E.1. Estimated project emissions:

>>

There is no GHG emissions within the project boundary.

### E.2. Estimated leakage:

>>

There is no leakage within the project boundary.

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

>>

The sum of E.1. and E.2. is zero.

### E.4. Estimated baseline emissions:

>>

Key elements for calculation are show in Annex 2.

Baseline emissions for Stefanov project is the following:

**Table 7 Baseline emissions for Stefanov project.**

| | | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|
| CM Emission Factor | (tCO2/MWh) | 0.8663 | 0.8685 | 0.7523 | 0.7580 | 0.7462 |
| Electricity | (MWh) | 0 | 44,982 | 89,964 | 89,964 | 89,964 |
| Emission Reductions | (tCO2) | 0 | 39,067 | 67,680 | 68,193 | 67,131 |

On the other hands, baseline emissions for Svodin project is the following:

**Table 8 Baseline emissions for Svodin project.**

| | | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|
| CM Emission Factor | (tCO2/MWh) | 0.8663 | 0.8685 | 0.7523 | 0.7580 | 0.7462 |
| Electricity | (MWh) | 0 | 44,179 | 88,358 | 88,358 | 88,358 |
| Emission Reductions | (tCO2) | 0 | 38,369 | 66,472 | 66,975 | 65,933 |

Total baseline emissions:

**Table 9 Total baseline emissions for both Stefanov and Svodin projects.**

| | | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|
| CM Emission Factor | (tCO2/MWh) | 0.8663 | 0.8685 | 0.7523 | 0.7580 | 0.7462 |
| Electricity | (MWh) | 0 | 89,161 | 178,322 | 178,322 | 178,322 |
| Emission Reductions | (tCO2) | 0 | 77,436 | 134,152 | 135,168 | 133,064 |

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

>>

Emissions reductions = E4 – E3 as follows:

**Table 10 Total emission reductions for both Stefanov and Svodin projects.**

| | | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|
| Baseline Emissions | (tCO2) | 0 | 77,436 | 134,152 | 135,168 | 133,064 |
| Project Emissions | (tCO2) | 0 | 0 | 0 | 0 | 0 |
| Emission Reductions | (tCO2) | 0 | 77,436 | 134,152 | 135,168 | 133,064 |

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

>>

| 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) |
|---|---|---|---|---|
| 2008 | 0 | 0 | 0 | 0 |
| 2009 | 0 | 0 | 77,436 | 77,436 |
| 2010 | 0 | 0 | 134,152 | 134,152 |
| 2011 | 0 | 0 | 135,168 | 135,168 |
| 2012 | 0 | 0 | 133,064 | 133,064 |
| Total (tonnes of CO2 equivalent) | 0 | 0 | 479,820 | 479,820 |

## 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:**

>>

**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:**

>>

Environmental assessment has been performed by the VENTUREAL Slovakia Co. since the beginning of 2006, and as soon as completed as a report, a next process will be undertaken for final approval by the signature of the director of a bureau which specializes in environmental assessment in Ministry of the Environment. "Noise", "Impact on scenery", and "Impact on birds" are the three important issues in the environmental assessment which requires the approval regarding wind power generation business. In the present circumstances, it is understood that it has gone extremely well the explanation to the public meetings, local governments, etc. General reactions are positive due to the potential increase of job opportunities of the power generation sites.

The current progress on the mentioned important issues is described as following;

(1) Noise

Practically noise does not cause any problems because of enough distance between private residences in each village and each planned power generation site under the current situation.

(2)Impact on landscape

It is not simple to assess the impact on scenery because how to feel about the scenery depends on the individual. The tower of the wind turbine is 90 meters high, and it must be accepted and understood as to unboundedly blend with the surroundings. To develop such a mutual understanding for scenery, following procedures are taken through town meetings;

- The business operator explains their business description to the Heads of the local governments, councils, etc.
- Then, the operator also explains it to the land owners.

(3) Impact on birds

To check the impact on birds, the specialists for bird observation have been already occupied, and they are now in the operation of one-year research started at January, 2006. This type of research takes a full year in general, and this case should complete within 2006. Impact on birds is considered as the biggest environmental issue, and the result of the research may cause rescheduling of the project. For this reason, the issue has to be addressed with the sensitive manner. The bird observation research itself has been proceeded well by this point, however, the business operator made a comment that Svodin site located in the middle of duck’s path and this might be moderately questionable. This point must be confirmed upon the final result of the research.

## SECTION G. Stakeholders’ comments

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

>>

VENTUREAL Slovakia s.r.o. the business operator is making a collection of stakeholders' opinions and responding to them regarding to its wind power generation business itself. At this stage, mostly favorable opinions are received from each stakeholder.

(1) Local distribution company
The local distribution company, ZSE, provided comments as listed below during the field study. The person in charge in ZSE expresses that they recognizes wind power generation as an important and necessary way. It is also described that buying system has been already established, no need for individually specific negotiation for transferring electricity to them.

(2) Ministry of Economy of the Slovak Republic
Remarks from the interview with the person in charge in Ministry of Economy of the Slovak Republic under the field study are listed below. Based on these comments, the power generation expected to increase to the most is the wind power generation, in the renewable energy strategy currently in process by Ministry of Economy. Because of this background, Ministry of Economy has expressed that they will support the introduction of wind power generation in policy matters.

(3) Financial institutions
At an interview with the person in charge of development in VENTUREAL Slovakia s.r.o. under the field study, there are some sorts of problems with the perspective of financial institutions to wind power generation. The price to local distribution companies; means buying price at these distribution companies, is treated as a preferential price, and however changed by year (7.5skk/kW at present). For this reason, financial institutions tend to worry about the price risk at Off-Taker's side. As mentioned before, for the government also questions the annual price-update for purchasing electricity comes from wind power, and Slovakia needs to introduce renewable energies rapidly to achieve the EU target, it is thought that this problem at financial institutions will be solved in the near future.

Annex 1

**CONTACT INFORMATION ON PROJECT PARTICIPANTS**

| | |
|---|---|
| Organisation: | |
| Street/P.O.Box: | |
| Building: | |
| City: | |
| State/Region: | |
| Postal code: | |
| Country: | |
| Phone: | |
| Fax: | |
| E-mail: | |
| URL: | |
| Represented by: | |
| Title: | |
| Salutation: | |
| Last name: | |
| Middle name: | |
| First name: | |
| Department: | |
| Phone (direct): | |
| Fax (direct): | |
| Mobile: | |
| Personal e-mail: | |

Annex 2

## BASELINE INFORMATION

**Table 1. Electricity generation projection 2007-2012.**

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|
| Hydro Power Plants | 4,610 | 4,610 | 4,610 | 4,736 | 4,736 | 5,638 |
| Nuclear Power Plants | 15,164 | 16,232 | 13,578 | 13,885 | 14,883 | 14,813 |
| Regulated+Indep. PP | 4,837 | 5,276 | 5,504 | 8,347 | 7,897 | 8,181 |
| *EVO I K1,2* | *1,200* | *1,291* | *1,443* | *1,456* | *1,501* | *1,497* |
| *EVO I K3,4* | *0* | *0* | *0* | *0* | *0* | *0* |
| *EVO I FK5,6* | *924* | *905* | *1,056* | *1,141* | *1,142* | *1,116* |
| *EVO II K21-26* | *0* | *0* | *0* | *0* | *0* | *0* |
| *ENO A K1,2* | *114* | *131* | *0* | *0* | *0* | *0* |
| *ENO A FK1* | *96* | *79* | *210* | *201* | *210* | *210* |
| *ENO B K1,2* | *731* | *1,352* | *1,196* | *1,213* | *1,229* | *1,204* |
| *ENO B K3,4* | *698* | *444* | *525* | *516* | *341* | *334* |
| *Fluid/CC/EVO I+II** | *0* | *0* | *0* | *2,746* | *2,400* | *2,746* |
| *CC 215* | *1,074* | *1,074* | *1,074* | *1,074* | *1,074* | *1,074* |
| Regional Heatings | 754 | 754 | 763 | 763 | 763 | 771 |
| *BAT* | *151* | *151* | *153* | *153* | *153* | *154* |
| *ZvT* | *94* | *94* | *95* | *95* | *95* | *96* |
| *MT* | *65* | *65* | *66* | *66* | *66* | *67* |
| *ZiT* | *92* | *92* | *93* | *93* | *93* | *94* |
| *TEKO* | *352* | *352* | *356* | *356* | *356* | *360* |
| Industrial Generators | 2,917 | 2,917 | 2,917 | 2,917 | 2,917 | 2,917 |
| Biomass | 342 | 657 | 981 | 1,306 | 1,300 | 728 |
| Total Generation | 28,624 | 30,446 | 28,353 | 31,954 | 32,496 | 33,048 |

**Table 2. CO2 emissions from electricity generation 2007-2012.**

| | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|
| Hydro Power Plants | 0 | 0 | 0 | 0 | 0 | 0 |
| Nuclear Power Plants | 0 | 0 | 0 | 0 | 0 | 0 |
| Regulated+Indep. PP | 4,498,361 | 4,910,764 | 5,139,073 | 8,083,458 | 7,592,539 | 7,885,106 |
| *EVO I K1,2* | *1,209,868* | *1,301,712* | *1,454,491* | *1,467,738* | *1,513,660* | *1,509,244* |
| *EVO I K3,4* | *0* | *0* | *0* | *0* | *0* | *0* |
| *EVO I FK5,6* | *957,984* | *938,007* | *1,094,190* | *1,182,270* | *1,184,086* | *1,156,845* |
| *EVO II K21-26* | *0* | *0* | *0* | *0* | *0* | *0* |
| *ENO A K1,2* | *160,564* | *185,267* | *0* | *0* | *0* | *0* |
| *ENO A FK1* | *124,426* | *101,803* | *271,474* | *260,162* | *271,474* | *271,474* |
| *ENO B K1,2* | *752,088* | *1,391,453* | *1,230,935* | *1,248,971* | *1,265,203* | *1,239,051* |
| *ENO B K3,4* | *826,980* | *526,071* | *621,532* | *611,156* | *403,632* | *395,331* |
| *Fluid/CC/EVO I+II** | *0* | *0* | *0* | *2,846,710* | *2,488,033* | *2,846,710* |
| *CC 215* | *466,451* | *466,451* | *466,451* | *466,451* | *466,451* | *466,451* |
| Regional Heatings | 404,428 | 404,428 | 409,129 | 409,129 | 409,129 | 412,079 |
| *BAT* | *35,468* | *35,468* | *35,880* | *35,880* | *35,880* | *35,880* |
| *ZvT* | *115,360* | *115,360* | *116,701* | *116,701* | *116,701* | *116,701* |
| *MT* | *63,591* | *63,591* | *64,330* | *64,330* | *64,330* | *65,070* |
| *ZiT* | *43,286* | *43,286* | *43,789* | *43,789* | *43,789* | *44,293* |
| *TEKO* | *146,723* | *146,723* | *148,429* | *148,429* | *148,429* | *150,135* |
| Industrial Generators | 2,296,457 | 2,296,457 | 2,296,457 | 2,296,457 | 2,296,457 | 2,296,457 |
| Biomass | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Generation | 7,199,246 | 7,611,649 | 7,844,659 | 10,789,044 | 10,298,125 | 10,593,642 |

Annex 3

## MONITORING PLAN

In this project, power generation by wind turbines and the necessary data for calculation of emission factor on the grid will be monitored.

(1)Monitoring the amount of power generation

To prove the accuracy of calculated power generation, monitoring process should be conducted by the responsible person of the project. In practice of selling some generated power to a local distribution company, the amount of electricity transmission for concerned period is determined after when two meters, placed by each of the project operator and the distribution company at a grid connection point (a substation), are verified with the same metered records.

For the monitoring of this project, as same, a meter at a substation will be used. The meter is readable with a remote operation through telecommunication lines. Monthly data from meter is processed to be documentations and stored ensuring verifier's convenient access, and all metered records have to be maintained for further demands of an inspection organization.

(2) Monitoring necessary data for calculation of emission factor on the power grid

Data for calculation of baseline emission factor on the power grid in Slovakia will be monitoring. As described in "Baseline scenario", power generation and fossil fuel consumption on the entire grid is calculated referring IEA statistics of ENERGY BALANCES OF OECD COUNTRIES and ENERGY STATISTICS OF OECD COUNTRIES. For this reason, above two statistical resources are positioned as the basic data for monitoring.

(3) Data management system

The data management system provides information for continuous data collecting and recording during the monitoring period. The relevant and successive data recording is the most fundamental among all monitoring works. If the successive data cannot be archived in the precise and effective ways, there will be no appropriate validation for emission reductions by implementing a project. Hereafter describes the way of data management for records related to the project.

VENTUREAL Slovakia s.r.o. has complete responsibility for monitoring GHG emission reductions. Procedures of tracing the information from primary data sources towards the calculation of final data should be explained in the written documents.

To realize enough accessibility for verifier(s) to any data related this wind power generation projects, project-related documents and monitoring results are formatted as indexes, all hardcopies are stored by engineering division at the responsible body of the project (the operating company of wind power generation) and their copies are also stored as backup.

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