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

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**Annexes**

## SECTION A. General description of the project

### A.1. Title of the project:

***Renewable Energy Production Facilities in Babadag, Tulcea***
The project fits sectoral scope (1) Energy industries (renewable/non-renewable sources), as per "List of Sectoral Scopes (Version 2)"

Document version Number: 04
22 November 2010

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

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The *Renewable Energy Production Facilities in Babadag* (BWPP) consists in the construction and operation of one medium size wind park located in two sites in the proximity of Babadag city, Tulcea County, Romania. With a total of 20 wind turbines, the planned total capacity of BWPP is 42 MW, with full operation expected by April 1st, 2011. Partial commissioning is possible during end of 2010. The project activity will produce renewable electricity, with the purpose of exporting it to the National Power Grid of Romania.

The project construction start date was estimated to be 01.06.2010, but due to favourable conditions, road and even foundations construction has started at end of April, 2010. The planned construction phase involves the installation of 20 x 2.1 MW new wind turbine generators and all necessary interconnection cables. The wind park contains two locations: Babadag I (16 turbines) and Babadag II (four turbines). The Grid connection will be made on two voltage levels: 110 kV, for Babadag I and 20kV for Babadag II. SC EVIVA NALBANT SRL (the project owner and developer) signed the connection contracts with ENEL Dobrogea for the power evacuation into the Grid. In order to install the park, road infrastructure upgrade and development works will be performed, to allow access to the project location during construction, operation and maintenance.

The proposed project fits JI sectoral scope (1), Energy industries (renewable/non-renewable sources), as per "List of Sectoral Scopes (Version 2)". It seeks to reduce greenhouse gas emissions by supplying clean renewable wind power to the Romanian National Power Grid (RNPG), thus replacing an equivalent amount of electricity otherwise generated largely by fossil fuel-fired power plants connected to the RNPG. Electricity production of BWPP is expected to reach about 87323 MWh/yr. During the crediting period (2011 -2012), the total electricity production of the wind park is expected to reach 155415 MWh, replacing electricity produced in the Romanian NPG. This power displaces an equivalent amount that, in the absence of the project, would have been supplied to the grid by fossil fuel based power plants; as a result, the project leads to emissions reductions of CO2 gas from displaced fuel combustion. Estimated annual emission reductions from this proposed project activity amount to 71427 tCO2eq, thus resulting in total emission reductions of 129461 tCO2eq over the crediting period, i.e., from January 1st 2011 to December 31st 2012—the end point of the current Kyoto commitment period.

The proposed project activity brings significant novelty to the Romanian power sector; based on publicly available information the largest wind park installed and in operation as of January 01, 2010 is 2.65 MW. Therefore, although the technology of its single component turbines can be considered mature, a number of new technological solutions (advanced command and control equipment, power compensators, Grid coupling/decoupling systems etc. ) are required as it will operate in Dobrogea region (this being recognized as an area where the power consumption is low, compared to the production requiring electricity transportation and reliable electricity quality equipment on the producers side).

The contributions of the proposed project activity to the sustainable development of the region are significant. The proposed project activity will generate new employment opportunities in relation to project construction and operations, including several long-term jobs in technical positions. In addition, improvements to road infrastructure will benefit the region by facilitating transport. Hotels and shops will also benefit as during construction of the project, some of the foreign experts will live in the local community. Opportunities and employment prospects in the region will get improved. A short history of the project is presented below:

| **Aproximate date** | **Event** |
|---|---|
| 2005 | Martifer Renewables SA started its activity in Romania in 2005 with the set-up of its Romanian branch S.C. Eviva Energy S.R.L |
| April 2006 | SC EVIVA ENERGY S.R.L. installs windmast in Agighiol (15 km from Babadag) |
| December 2006 | EVIVA NALBANT was set-up as an SPV to develop a project in Nalbant (the project was cancelled and the SPV used later on for Babadag project) |
| June 2007 | A preliminary wind resource assessment was elaborated by the wind consultant (MEGAJOULE) |
| August 2007 | Prefeasibility assessment & decision to move further on |
| September 2007 | Concession Contract is signed, following a tender organized by Babadag Municipality |
| November 2007 | A urbanism certificate was asked for in order to better evaluate the legal requirements/risks regarding the development of a wind power project in the area |
| December 2007 | JI consultancy agreement with eco2ro for Babadag project |
| January 2008 | Suzlon approval for the Babadag wind power park location |
| March 2008 | Onsite wind measurement mast was installed |
| April 2008 | Turbine supply contract is signed |
| July 2008 | EIA sent for analysis by the EPA Tulcea |
| August 2008 | Technical Permit of Connection for Babadag II |
| February 2009 | The Environmental permit was issued |
| February 2009 | Technical Permit of Connection for Babadag I |
| April 2009 | Project revision and wind park layout optimization *based one year data measured onsite* |
| June 2009 | PIN submitted for the DFP approval and LoE issuance |
| October 2009 | Seting up Authorization issued by ANRE for Babadag I and Babadag II |
| December 2009 | A Construction Permit was issued for five turbines in Babadag I location |
| March 2010 | Construction permit submitted to the DFP |
| April 2010 | Start of construction works |
| June 2010 | LoE obtained |
| July 2010 | Revised Environmental Permit |
| August 2010 | AIE contract signed for the determination of the PDD |
| August 2010 | Construction Permit for the rest of 15 turbines |

**A.3. Project participants:**

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| Party Involved | Legal entity project participant (as applicable) | Please indicate if the Party involved wishes to be considered as project participant (Yes/No) |
|---|---|---|

| | | |
|---|---|---|
| Romania (Host Country) | S.C. EVIVA NALBANT S.R.L. | No |
| To be decided | | |

S.C. EVIVA NALBANT S.R.L. is a private company, held by EVIVA ENERGY, the local reprezentative of MARTIFER GROUP, Portugal.

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

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

>>
The project will be located near Babadag City (about 10,000 inhabitants), in the county of Tulcea, Romania (south-eastern part of Romania). The county is the fourth biggest in Romania, with a total surface of 8,499 km². As per the most recent census (2002) in the population of Tulcea County is 265,349; over 90,000 people live in the capital city, Tulcea.


[1]

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

>>
The Host Party of the project is Romania.

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

>>
The project will be built in Tulcea County.

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

[1] Source : Wikipedia: Constanta County _ http://ro.wikipedia.org/wiki/Județul_Tulcea#Ora.C5.9Fe

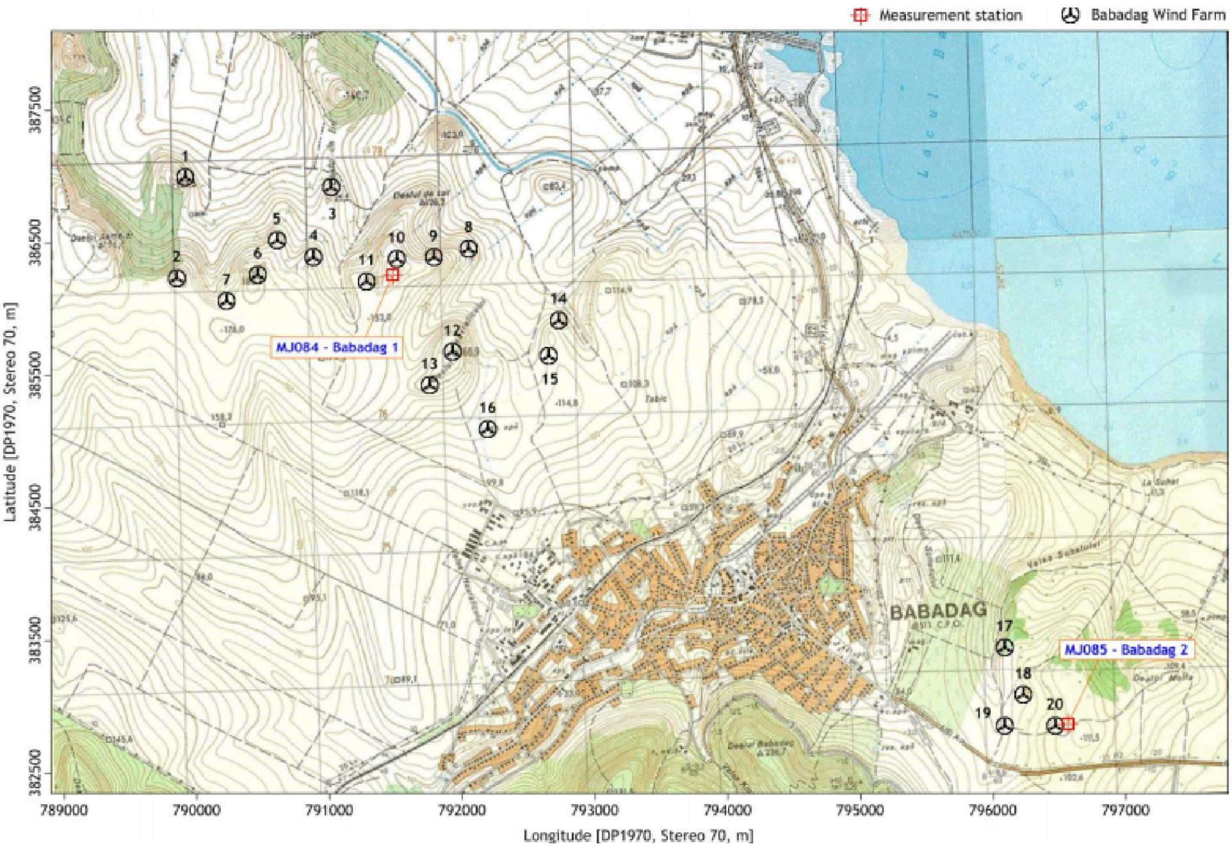
>>
The project is located on two sites in the proximity of Babadag City, towards the center of Tulcea County, on the road that links Tulcea (in the north ) with Constanta (in the south).

[2]

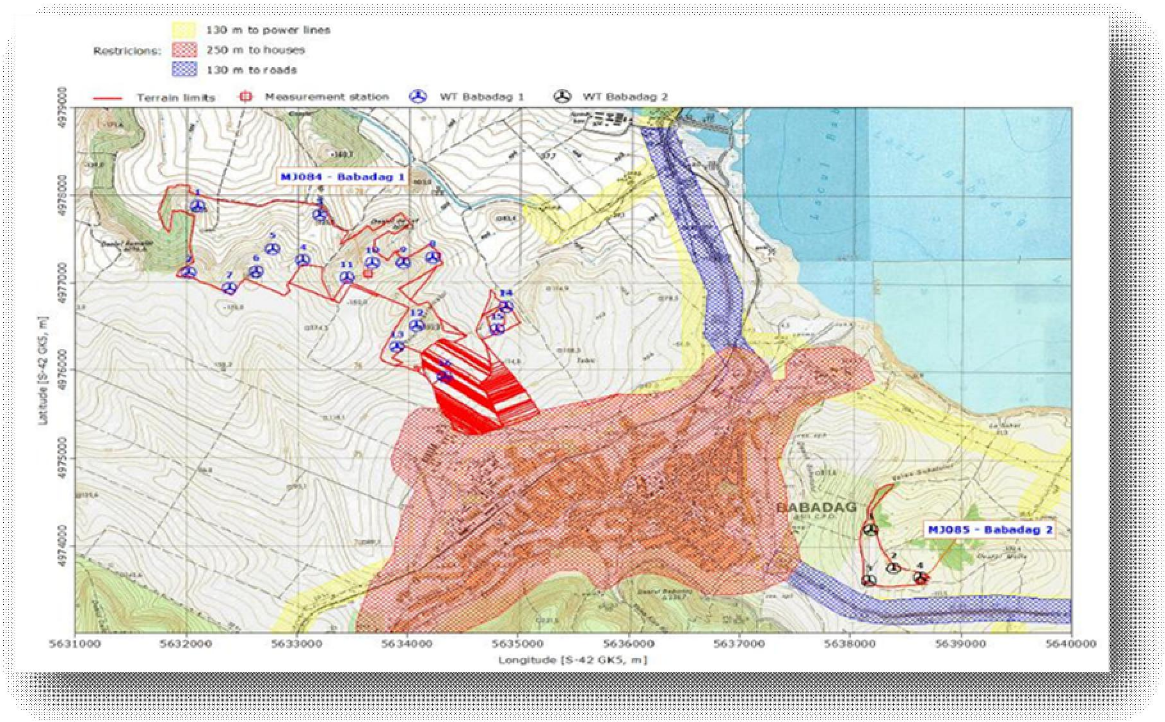
| A.4.1.4. Detail of physical location, including information allowing the unique identification of the project (maximum one page): |
|---|

>>
The project sites are located on the north-eastern and south-western side of Babadag City, in hilly areas, with altitudes ranging between 70 m and 180 m. The sites are located on softly rounded hills, used predominantly for pasture.

[2] http://www.pescarul.com/judete/tulcea.jpg




The coordinates of the project are shown in the image above _ Stereo 70:



Stereo 70 coordinates are:

| Turbine | Coordinates | |
|---|---|---|
| | X | Y |
| **Babadag 1** | | |
| 1 | 789913 | 386995 |
| 2 | 789848 | 386236 |
| 3 | 791013 | 386919 |
| 4 | 790879 | 386397 |
| 5 | 790602 | 386263 |
| 6 | 790459 | 386263 |
| 7 | 790224 | 386062 |
| 8 | 792049 | 386460 |
| 9 | 791783 | 386392 |
| 10 | 791504 | 386381 |
| 11 | 791279 | 386212 |
| 12 | 791924 | 385680 |
| 13 | 791753 | 385428 |
| 14 | 792724 | 385920 |
| 15 | 792652 | 385653 |
| 16 | 792191 | 385097 |
| **Babadag 2** | | |
| 17 | 796085 | 383451 |
| 18 | 796228 | 383093 |
| 19 | 796086 | 382862 |
| 20 | 796467 | 382861 |

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

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The micro-siting of the Babadag Wind park was performed after preliminary assessments based on wind data measured and after performing necessary geological assessments for foundations. Wind measurement equipment is installed onsite since March 2008. Another wind assessment equipment is installed at a distance of about 17 km, in Agighiol.

The project consists in the installation of 20 x 2.1 MW wind turbines for electricity production, based on favourable wind conditions available in the area.

The project is based on new, high efficiency 2.1 MW wind turbines; the characteristics of the wind turbine are: 79 m hub-height[3], 88 m rotor diameter[4].

The type of turbine used is Suzlon S88 – 2.1 MW. Some of the characteristics of the wind turbine are presented below:

- rated capacity: 2.1 MW
- Cut-in wind speed: 4.0 m/s
- Cut-off wind speed: 25.0 m/s
- Restart wind speed: 23.0 m/s

[3] Supply and installation agreement between Martifer Energia and Eviva Nalbant, April 15, 2008

[4] GENERAL DESCRIPTION S88-2.1 MW STV, document WD 00122-06-00 General Description - STV

- Wind class: iia
- Life expectancy: 20 yrs
- Apparent power: 2,283 kVA
- Voltage stator: 0.69 kV

The Suzlon S88 – 2.1 MW Grid Standard turbine is capable of remaining connected to the grid during temporary grid disturbances. For this purpose the turbine is equipped with advanced turbine control, adding UPS (battery backup panel) and new protection settings. The UPS system will supply the turbine's internal components such as the turbine controller and other components such as turbine controller and other components during "network" disturbance. The Suzlon S88, 2.1 MWGrid Standard basic version of LVRT capability which has no extrareactive power support features during the default period. In the event of a fault the Suzlon Flexislip System (SFS) will use a "crowbar" to shortcircuit the generator variable rotor system. The generator overrides the fault acting as a traditional induction generator with improved control strategy.

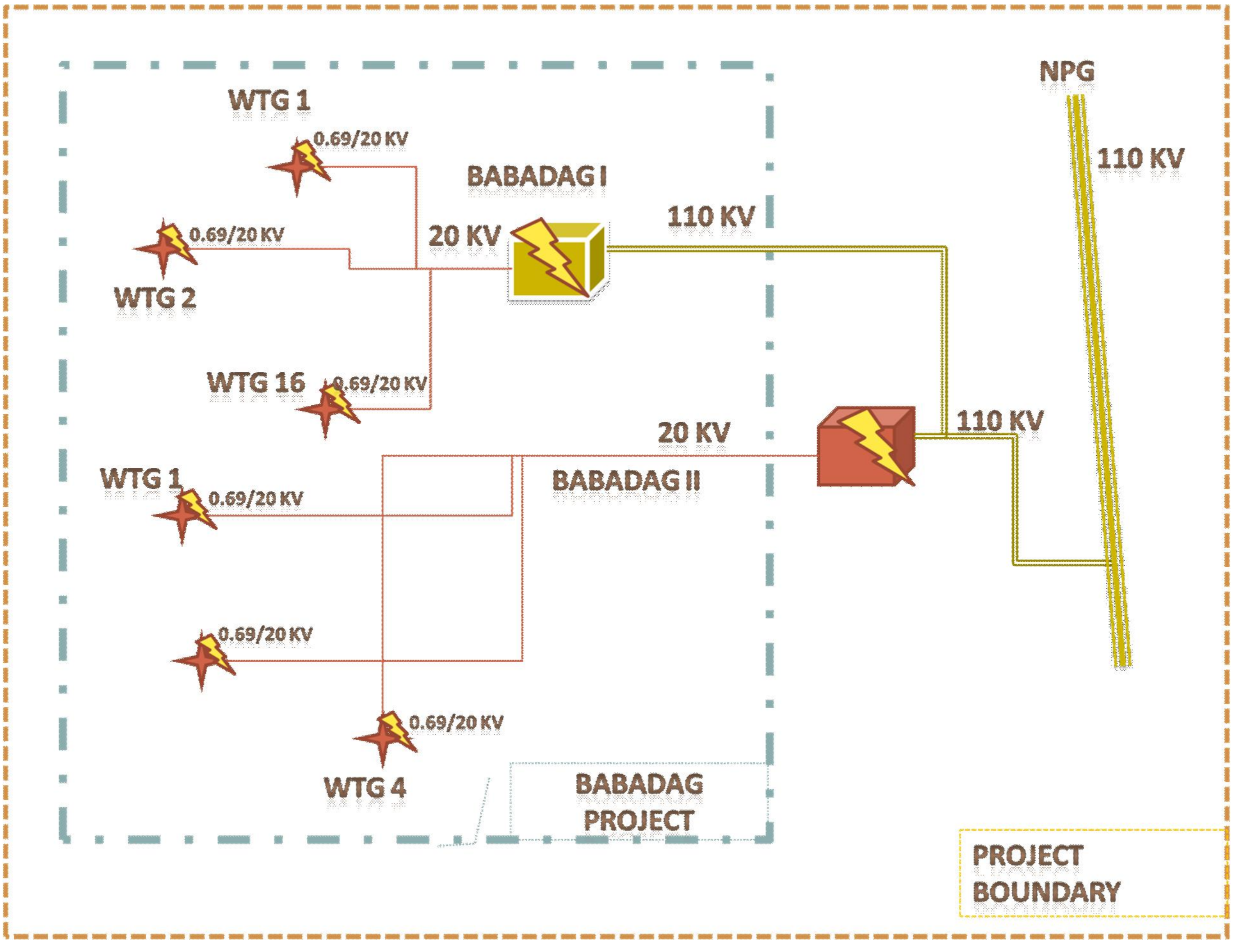
By means of a 14 stage capacitor bank the reactive power compensation system ensures uniform output at turbine cut in as it is parameterised. The Suzlon controller continuously measures the actual reactive compensation needed. The turbine controller maintains the specified power factor by switching on or off a number of capacitor steps adjusting the required reactive power. To avoid frequent switching on and off of the capacitor bank, a delay has been defined both for switching on and off to enhance the life and performance of capacitors.

Installing the wind turbines for BWPP requires significant upgrade of existing, as well as construction of new, access roads in the project area. The project developer will perform upgrade works and will build the necessary new roads in order for the project to be built. All necessary environmental impacts will be kept at a minimum, and in any case within approved national guidelines.

The wind turbines are generating the electricity at 0.69 kV. A 20 kV / 0.69 kV Group Transformer is placed outside each wind turbine with a nominal apparent power of 2,500 kVA. These Group Transformers are of Oil Hermetic type.

The Medium Voltage (MV) electrical connection between turbines is made at the 20 kV voltage level.
In Babadag I, an electrical substation will be built including a 110 kV / 20 kV Power Transformer with a nominal apparent power of 40 MVA. The interconnection with the grid 110 kV / 20 kV substation will be assured by a 110 kV underground interconnection line of approximately 4 km.

In Babadag II, no electrical substation will be built given that the Interconnection with the grid 110 kV / 20 kV substation will be made on the MV side (20 kV), through an underground and aerial 20 kV interconnection line with roughly 8 km. One switching station will be installed to assure the Grid Connection Requirements.




As per the project implementation schedule, construction works were estimated to start on June 01, 2010 (e.g., building the wind park foundations); all turbines are expected to get online by April 01, 2011. Partialy the operation is possible, some of the turbines entering in operation during the third quarter of year 2010.

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

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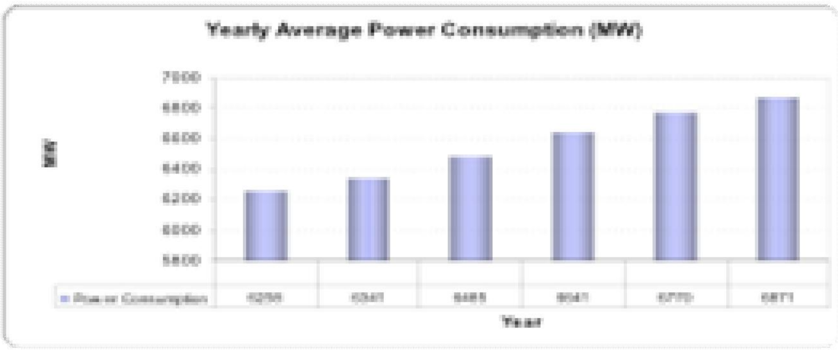
The proposed JI project will reduce anthropogenic GHG emissions by increasing the supply of electricity from renewable energy sources to the National Power Grid, thereby displacing fossil fuel generation. The wind park commissioned under this project will operate integrated in the National Power Grid, replacing electricity at the margin of production curve, which is largely based on fossil fuels (mainly natural gas, fuel oil, coal).

Emissions reduction will be related to CO2 gas emissions resulting from the displaced fuel combustion. An estimated amount of 71,427 tCO2eq will be reduced yearly, after the proposed project becomes operational, counting in total **129,461** tCO2eq over the crediting period.

As discussed more in detail in following sections of this document, the baseline for this project activity is “continuation of current activity” that is, fossil fuel based production of an equivalent amount of electricity in the Romania National Power grid (or business as usual). By contrast, the project scenario is demonstrated to be additional by virtue of a number of barriers to its implementation, as per JI Guidelines and use of the prescribed CDM "Tool for the demonstration and assessment of additionality" vs. 05.2. These include technical barriers, linked to the difficulty to implement the project under the conditions of an obvious lack of expertise and incertitude on the Romanian market. The project is among the first to be built at dozens of MW; and investment barriers, linked to lack of investment opportunities in this sector, aggravated by the recent financial crisis. In addition, common practice in the Romanian power sector is such that marginal power production is dominated by fossil fuel generation; at the same time the build margin too small compared to the operational margin to be considered in computations of emission reductions--as we demonstrate in later sections.

*Country context*

Power consumption in Romania is continuing to grow as the country develops. From 2003 to 2008, there was an increase in average power consumption of 9.8%. This is highlighted in the chart below[5].

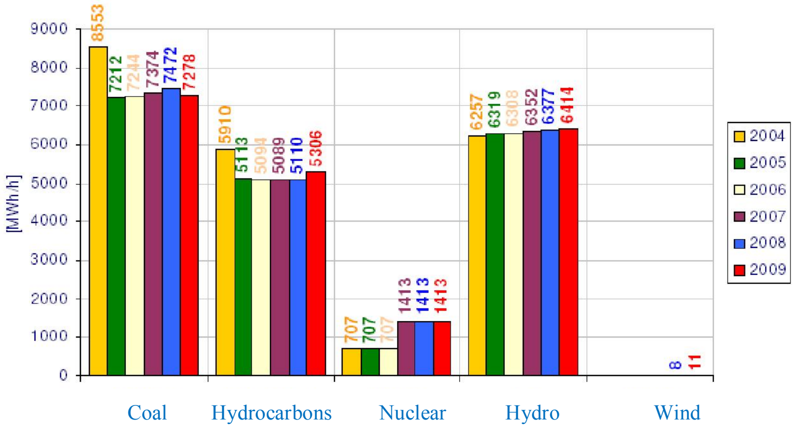



Currently, the Romanian Power grid has excess installed capacity. Indeed, by comparing the maximum average consumption rates in the graph above, to installed power amounts (following graph), it follows that maximum power consumption is about one-third than the currently installed capacity. This is due to the downturn in economic activity after the collapse of the communist production system in the year 1990. Considering the decrease in consumption registered in 2009 (9% against 2008) and the decline of electricity prices on the competitive market (day ahead: - 23%) incertitude is increasing.

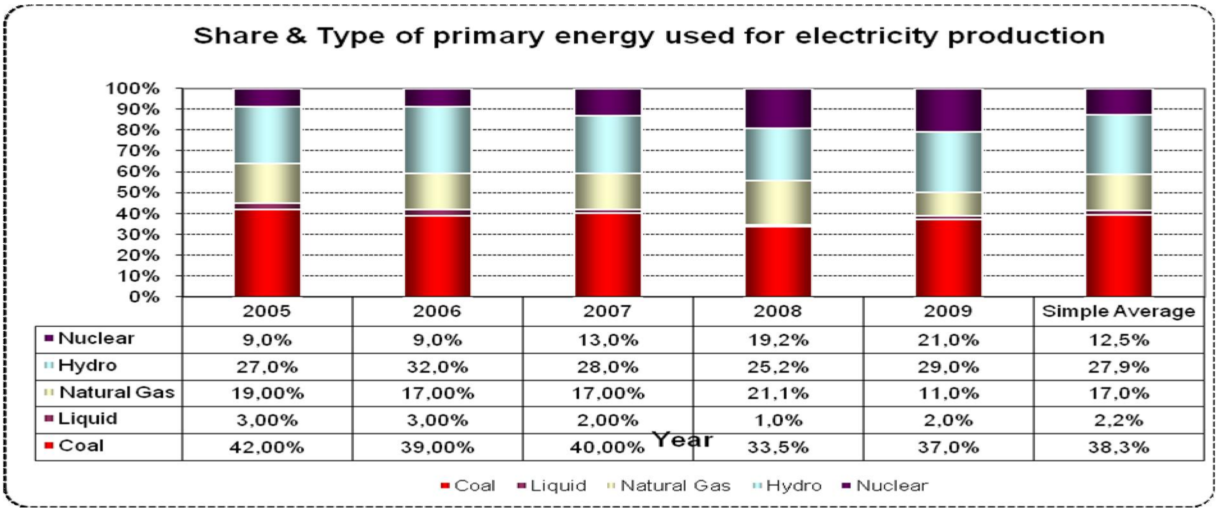
***Structure of installed power in Romanian National Power Grid in years 2004 - 2009[6]***

[5] http://www.transelectrica.ro/ - Technical results of the National Power Grid in year (Rezultate tehnice ale SEN in anul) 2008, page 3

[6] http://www.transelectrica.ro/ - Technical results of the National Power Grid in year (Rezultate tehnice ale SEN in anul) 2008, page 11




The electricity generation sector in Romania is based on a wide range of primary sources, with the main resource being fossil fuels (largely coal). This is illustrated in the official data released by the National Energy Regulatory Authority (ANRE)[7] and illustrated below:




| | 2005 | 2006 | 2007 | 2008 | 2009 | Simple Average |
|---|---|---|---|---|---|---|
| Nuclear | 9,0% | 9,0% | 13,0% | 19,2% | 21,0% | 12,5% |
| Hydro | 27,0% | 32,0% | 28,0% | 25,2% | 29,0% | 27,9% |
| Natural Gas | 19,00% | 17,00% | 17,00% | 21,1% | 11,0% | 17,0% |
| Liquid | 3,00% | 3,00% | 2,00% | 1,0% | 2,0% | 2,2% |
| Coal | 42,00% | 39,00% | 40,00% | 33,5% | 37,0% | 38,3% |

The data in the chart above show that marginal power plants in Romania operate on fossil fuels. Indeed, in the period from 2007 to 2008, electricity generated by the second nuclear unit in Cernavoda NPP – commissioned in October 2007— resulted in replaced thermal power in the country primary mix, while hydroelectric power decreased by about 3% in the same period, due to lack of water.

With respect to specific fuel mix, data in the second chart above for the year 2008 indicate an increase in use of nuclear in the electricity production sector, due to the commissioning of Cernavoda NPP unit II.

In the year 2008, the producers have asked for guarantees of origin for about 6500 MW (installed power); the share of hydro in the total is 99.8% (from which, 93% are facilities larger than 10 MW), while wind power represents only 0.2%.[8] Situation did not change significantly in 2009 and also there are not big chances in the near future due to the economic and financial crisis.

[7] http://www.anre.ro/activitati.php?id=319

[8] Romanian Energy Regulatory Authority, Report on Guarantees of Origin for year 2008, page 6 (http://www.anre.ro/documente.php?id=395)

In 2008, the average capacity factor of the existing wind power plants was 11.43%. [9]
In the years from current till 2012 (i.e, coinciding with the Kyoto first commitment period), a limited number of wind parks is expected to be commissioned; however, investors' plans are being delayed due to the current economic situation in Romania and due to the negative evolution of the electricity consumption (i.e. 9% decrease in the final electricity consumption in 2009 against 2008, with 17 % decrease in the non-home users consumption).

*Baseline scenario*
As a JI project activity, the project type of the Babadag Wind Park is classified as "Grid connected electricity production." The project boundary is the National Power Grid (NPG), since the Romanian Grid is of national scale.

As there is no immediate need for new electricity production facilities in Romania—given the discussed overcapacity—the most likely baseline is a business as usual (BaU) scenario at least throughout the first Kyoto Protocol commitment period. Indeed, no major changes in energy mix are likely to take place during this period, especially under the current economic conditions, even considering those renewable energy projects that are scheduled to be commissioned. In addition, similar baseline assumptions have been used in other JI projects in Romania, which were positively determined and approved by the National DFP for the first commitment period[10].
The transparency of the baseline scenario chosen is further insured by choosing an **ex-post approach** to calculating the grid emission factor based on EU ETS-verified GHG emissions data.

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

>>
During the project crediting period of 2011-2012, a total of 155,415 MWh of electricity will be fed into the Romanian National Power Grid by the BWPP.
One of the main challenges on using ex-post grid emissions factors is ex-ante estimating the baseline emissions. The ex-ante grid emission factor used herein to estimate baseline emissions and emission reductions is 833gCO2/kWh. This emissions factor was also used in other JI projects approved in Romania. Therefore its utilization in this document is allowed under specific provisions of the «GUIDANCE ON CRITERIA FOR BASELINE SETTING AND MONITORING» v 02, Section 5, para 28. The project will have zero greenhouse gas emissions; therefore it will result in emission reductions of **129461** tCO2eq during the crediting period.

| **Length of the crediting period** | **Years**<br>**2 (24 month)** |
|---|---|
| **Year** | **Estimate of annual emission reductions in tonnes of CO2 equivalent** |
| 2011 | 58,034 |
| 2012 | 71,427 |
| Total estimated emission reductions over the crediting period (tonnes of CO2 equivalent) | 129,461 |
| Annual average of estimated emission reductions over the crediting period (tonnes of CO2 equivalent) | 64,730 |

[9] Romanian Energy Regulatory Authority, Report on Guarantees of Origin for year 2008, page 7 (http://www.anre.ro/documente.php?id=395)

[10] "Modernization of CET Timisoara Centru"

Pending on the DFP decision (and international agreements), the project owner is willing to apply for an extended crediting period (likely 10 years fixed, including 2011 and 2012). The estimated amount of emissions reduction to be generated starting January 01, 2013 and ending December 31, 2020 is 571416 (71,427 ER/year * 8 years).

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

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The project has received preliminary approval from the Romanian Authorities (Host Country), through Letter of Endorsement no. 5514 dated 30.06.2010 (Romanian Ministry of Environment and Forests). Approval from the Investor Country will be obtained after PDD determination, a procedure that is allowed under National procedures for approving JI track 1 projects in Romania.

## SECTION B. Baseline

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

>>

**Baseline Methodology**

The baseline methodology of the BWPP project activity is developed specifically for renewable energy projects under Romanian conditions, in line with JISC guidelines: "GUIDANCE ON CRITERIA FOR BASELINE SETTING AND MONITORING, (vs. 02, JISC 18) and consistently with previously registered JI projects in Romania.
Specifically, this project follows a JI-specific approach, applying section B. 10 (a) of the JISC guidelines.

This means we use a project-specific baseline and monitoring methodology, in practice based largely on the CDM approved methodology ACM0002 vs.10, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources." In fact, there are only three instances where our JI-specific approach does not follow such CDM methodology in full. First, we are using vs.10 instead of vs. 11. Apart from the fact that current CDM project can be submitted for registration using vs. 10 up to October 25, 2010, JI Guidelines do not require us to use the most recent version of a CDM methodology, if the latter is used within a JI-Specific approach. Second, we apply a different method to compute the grid emission factor, based on computations that are more suitable to the Romanian situation, and which indeed have been already positively determined in registered track 1 JI project in Romania. Thirdly, while we use the latest CDM "Additionality tool," vs. 05.2, our JI-specific approach does not require using the tool "Tool to calculate the emission factor for an electricity system." This is because we are using instead a computation approach and a value for the ex-ante emission factor more appropriate to the Romanian situation—where build margin is virtually insignificant—and which have been already positively determined for another JI project approved in Romania. In any case, as we demonstrated in following sections, the value of the ex-ante emission factor used herein is conservative.
This methodology is applicable to grid-connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s). The BWPP belongs to category (a) above. It delivers electricity to the power grid, which would otherwise have been generated by operation of existing and new grid-connected power plants. The project is a *greenfield* project which creates new capacity on sites where formerly no power production took place.

**Applicability**

The proposed project can meet the following applicability criteria of the baseline and monitoring methodology:

- The proposed project is a grid-connected zero-emission renewable power generation activity from wind sources;
- The proposed project is not an activity that involves switching from fossil fuels to renewable energy at the proposed project site;
- The proposed project is to be connected to the Romanian National Power grid, which is clearly identified and information on the characteristics of this grid is publicly available;
- The proposed project is not a biomass fired power plant.

Therefore, the methodology ACM0002 is applicable to the proposed project and is used herein as the starting point for describing the Baseline Methodology of BWPP, including the modifications that characterize this JI-Specific approach and that we have previously discussed.

**Description of Baseline Chosen**

The proposed project involves the installation of 20 wind turbines with a nominal capacity of 2.1 MW per unit, to generate zero-emissions wind power and supply it to the Romanian National Power Grid. As per the methodology ACM0002 vs.10, the baseline scenario of the project activity is as follows:

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

The description in B.2 below will further support the selection of above baseline scenario.

**Modifications applicable to JI Projects in Romania**

The National Power grid in Romania has certain specific characteristics that make it different to power grids typical of developing countries where CDM projects are implemented, and for which CDM methodologies are specifically developed. In particular, the Romanian National Power Grid differs from more typical CDM grids, in that its operational margin is much larger than its build margin, so much so that the latter can be ignored in relation to the former. To this end, ACM0002 has been used in a modified manner with specific reference to computations of the grid emission factor, EF. Similar modifications have been proposed and accepted through positive determination and approval[11] of existing JI projects in Romania, i.e.: "Timisoara combined heat and power rehabilitation for CET Centru location", "Hidroelectrica Hydropower Development Portfolio Track 1 JI Project"[12]

We next include a detailed technical analysis supporting the particular computation of the EF for the Romanian National grid in Appendix 1. Here it is sufficient to note that the approach chosen herein can be seen as a special case of ACM0002 vs.10 and its associated tool, rather than a deviation from it. In fact, according to ACM0002, the grid emission factor, EF, is defined as a combination of an operational margin, OM, and a built margin, BM, such as:

$EF = \alpha\ OM + \beta\ BM$,
(with $\alpha + \beta = 1$)

The same can be re-written as:

$EF = \alpha\ OM * (1 + \beta / \alpha * BM/OM)$

But according to previous JI determinations for Romania, as well as further analysis offered in Appendix 1 to this document, in Romania the term $BM/OM << 1$, while the term $\alpha/\beta$ is finite, so that in the limit:

$$EF = OM \quad (1)$$

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[11] National procedure for using Joint Implementation (JI) mechanism under Track I (National JI Track I Procedure) / CHAPTER III – Endorsement, determination and approval of projects / The following activities are required under the third step of the process: / (i) LoA issuance ensures the automatic registration of the project as a JI Track I project in Romania.(page 10)

[12] Joint Implementation Quarterly, vol. 15, no. 3, October 2009 (http://www.jiqweb.org/index.php/jiq-magazine/jiq-pat-issues)

Therefore, for application of ACM0002 towards computation of grid EF in Romania, it will be sufficient to compute the OM ($\alpha$ =1 by definition).
Furthermore, we will use an ex-post approach to determine EF for the purpose of computing project emission reductions, as described in detail below. This is possible in a transparent manner because, as part of its EU requirements, Romania is mandated to publish such data for the purpose of its participation to the EU ETS.

**Baseline emissions**

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

The project's baseline emissions will therefore be calculated as follows:

$$BE_y = (GEN_y - IMP_y) x EF_{grid,y} \qquad (2)$$

Where,

| | | |
|---|---|---|
| $BE_y$ | = | Baseline emissions in year y in tonnes $CO_2$ per year. |
| $GEN_y$ | = | Electricity supplied to the grid (MWh) |
| $IMP_y$ | = | Imported electricity from the grid (MWh) |
| $EF_{grid}$ | = | $CO_2$ emission factor of the Romania grid in year y; it is expressed in g/kWh (see the methodology description in Section B.1; equation 1). |

**Calculating the baseline $CO_2$ emission factor**

The following two steps are applied to calculate the baseline emission factor (CM emission factor):

STEP 1: Identify the relevant electric power system.
STEP 2: Calculation of a modified grid emission factor for Romania

***Step1: Identify the relevant electric power system.***

The project electricity system is the Romanian National Power Grid. The spatial extent is limited to the national electricity system, since the electricity imports from across national borders account for a very small percentage, and recent or likely future additions to transmission capacity will not enable significant increases in imported electricity.

***Step 2: Calculation of a grid emission factor for Romania***

For the calculation of a grid-connected $CO_2$ baseline emission factor for Romania the following data is needed:

- **The verified $CO_2$ emissions data of Romanian power sector installations in the ETS that operate at the margin.** These data is published on the published on the Internet site of MESD and CITL website (between 1 May and 30 June of the following year) and are freely accessible.[13]

[13] CITL Internet site of the European Commission: http://ec.europa.eu/environment/climat/emission/citl_en.htm

– **Electricity supply to the grid by each of the ETS installations operating at the margin.** These data will be provided by the *Autoritatea Nationala De Reglementare in Domeniul Energiei* (National Energy Regulatory Authority, ANRE)**.** These two data sources will be combined as follows in order to acquire a $CO_2$ baseline emission factor for the Romanian grid:

$$EF_{grid,y} = \frac{(\sum_{i=1}^{x} CO_{2,i,y} + \sum_{j=1}^{z} CO_{2,j,y})}{(\sum_{i=1}^{x} Gen_{i,y} + \sum_{j=1}^{z} ENER_{j,y})} \qquad (3)$$

Where,

| | | |
|---|---|---|
| $EF_{grid,y}$ | = | $CO_2$ emission factor of the Romanian grid (non-must-run thermal power plants) in year y; it is expressed in g/kWh (=tonne/MWh). |
| $CO_{2,i,y}$ | = | $CO_2$ emissions in year *y* of installation *i* expressed tonnes. |
| $GEN_{i,y}$ | = | The electricity (MWh) delivered to the Romanian grid by installation *i* in year *y*. These figures are based on the total electricity production of installation *i* minus the electricity used onsite by *i*. |
| i = 1..x | = | All thermal non-must-run electricity producing, non-CHP installations under the EU ETS in the entire Romanian electricity grid. |
| $ENER_{j,y}$ | = | The total of electricity production of marginal CHP installation *j* minus the electricity used onsite by *j* and the heat output of *j* in year *y* expressed in MWh. |
| $CO_{2,j,y}$ | = | $CO_2$ emissions in year *y* of installation *j* expressed in tonnes. |
| j = 1...z | = | Installations selected as marginal CHP plants in Romania within the EU ETS. |

For the calculation of the grid-based $CO_2$ emission factor, an Excel worksheet has been developed with the following purposes:

1. Calculation of aggregate $CO_2$ emissions of marginal Romanian ETS-covered electricity producing installations during the baseline year y (= $\Sigma\ CO_{2,i,y} + \Sigma\ CO_{2,j,y}$).
2. Calculation of aggregate electricity output for the Romanian marginal power producing installations, and electricity and heat output for Romanian marginal CHP installations covered by the EU ETS during the baseline year y (= $\Sigma\ GEN_{i,y} + \Sigma\ ENER_{j,y}$).

Dividing the aggregate figures of 1) and 2) above results in the Romanian electricity-grid baseline $CO_2$ emission factor: $EF_{grid,y}$.

**Computation of emission reductions**

***Ex-post* EF Approach: EU ETS data set for Romania**

For the BWPP project activity, the $CO_2$ baseline emissions factor will be calculated on an *ex-post* basis, using data verified for Romanian electricity generation installations covered by the EU ETS as inputs into (3).

In fact, this approach was developed under a bilateral agreement between the Netherlands and Romania and it is meant to allow the Romanian Authorities to calculate a realistic Grid emissions factor, to be used by the JI projects developed in the energy field (energy generation). The project is currently under development and several project meetings took place between the different parties and stakeholders (including the National Energy Regulatory Authority, National Environmental Protection Agency, Ministry of Environment, NGOs, and Experts).

The verified data set offers a solid and transparent representation of the composition of the Romanian grid-connected power production capacity as it contains both installations that have been operational for a long time and those that have been installed and/or refurbished during recent years (and even the ones

to be commissioned in each year of the baseline). A strong advantage of using these data is that they are verified within the ETS context (therefore by third parties) on an annual basis and published on the Internet site of the Ministry of Environment and Forests or on the European ETS website.[14] Another advantage is that of considering all fossil fuel power generating capacities (excluding the must run and the CHP) and that no advantage to one or other fuel type in granted (inside the fossil mix).
The EU ETS has been operational since 2005. It allocates (through National Allocation Plans determined by Member States) allowances in the form of $CO_2$ emissions to a broad range of installations within the EU (presently around 12,000 installations). Installations can trade these allowances with other installations so that an EU market has emerged for trading of $CO_2$ emission allowances. The first phase of the ETS ended in 2007 and the present second phase coincide with the commitment period of the Kyoto Protocol (from 2008 through 2012). Romanian installations have been part of the ETS since Romania's accession to the EU on 1 January 2007.
Each Member State has to report on the $CO_2$ emissions of its ETS installations during a particular year by April 30 of the following year at the latest. This implies that as of 30 April of each year the verified emission data for all ETS installations must be available. Given that almost all Romanian grid-connected electricity production capacities are covered by the ETS and that the non-ETS grid connected capacity is based on hydro and nuclear energy, which are unlikely to appear at the margin of being disconnected when new capacity comes online (for reasons explained below) and since the ETS verified data can be considered the best available data set for grid-connected $CO_2$ emissions in Romania, this approach delivers the most reasonable estimate of a baseline $CO_2$emission factor (expressed as grams of $CO_2$-eq per kWh).
However, as a consequence, since data on emissions for a particular year will only become available in the following year, using this data will imply an *ex-post* determination of the baseline emissions scenario for this project. For instance, the project's baseline for the year 2009 will be based on verified ETS data for grid-connected power plants in Romania for the year 2009, which is available since first half of 2010. This would be fully in line with the provision in the methodological "Tool to calculate the emission factor for an electricity system", adopted by the CDM Executive Board at its 35th meeting (Annex 12 of the meeting report), which recommends that for *ex-post* baseline calculations for grid-connected CDM power production projects data required to calculate the emission factor for year *y* would need to be available within six months after the end of year *y*; otherwise, data from year *y-1* may be used.
This would also imply that the baseline emission factors could differ across the years of the project's crediting lifetime.

As explained in Section B.1, the project will use *ex-post* emission factor to compute emission reductions, $EF_{grid,y}$, for each year y of the project lifetime. The project's baseline emissions will then be calculated by using equations (2) and (3) above.

The first year for which the Romanian grid ex-post $EF_{grid,y}$ will be calculated is y=2009, based on data available in the first six months of 2010. The first year for which the baseline will be calculated for the BWPP project activity is, more specifically, 2011 –based on data that will become available during the first six months of 2012. Similarly, in 2012 baseline emissions will be calculated based on data that will become available in the first six months of 2013.

### *Ex-ante* EF approach

While the BWPP project will use an *ex-post* approach to compute its emission reductions as specified above, estimation of project emission reductions are nonetheless necessary at this stage of project implementation, requiring the use of a *ex-ante* emission factor for the Romanian grid, EF,$_{grid,fixed}$, defined as in equation (1). Rather than using equation (3) above to compute the *ex-ante* EF, we chose instead to

[14] CITL Internet site of the European Commission: http://ec.europa.eu/environment/climat/emission/citl_en.htm

use value that has been approved (registered)[15] under the Romanian JI track 1. This approach is allowed by the JI Guidelines, as previously discussed. Specifically, we use the *ex-ante* EF computed in the PDD "Modernizarea CET Timisoara Centru," developed in the year 2006 ("Lista scrisori sustinere/aprobare"[16]): $EF_{,grid,fixed}$ = 833 $g_{CO2}$/kWh. This approach is clearly transparent, because the value used herein has been already positively determined by a third party validator. It is furthermore conservative, by comparing ex-ante EF calculations obtained using more recent ANRE emissions data (2005-2008), as shown below.

Indeed, $CO_2$ emissions per kilowatt-hour can be obtained from the Annual Reports prepared by ANRE, which contain for each year the overall $CO_2$ emission factor for the Romanian electricity grid. An overview of these factors is presented in Table B.2-1 (column A). These factors need to be corrected to eliminate zero-emission sources, such as hydropower and nuclear energy—because hydro and nuclear power production do not appear at the margin of disconnection when new capacity becomes operational (Section A2). Such a correction was performed by scaling down the overall grid factor, i.e., by dividing the values in column A of Tab. B.2-1 by the % share of fossil fuel-based electricity production in Romania. The resulting EFs are shown in the table below for the period 2005-2008, and range between 910-931 $gCO_2$/kWh.

**Table B.2-1: Development Romanian $CO_2$ emission factor based on annual ANRE reports**

| Year | Overall $CO_2$ emission factor for the grid (g/kWh) determined by ANRE | Hydropower share in electricity supplied to grid | Nuclear power share in electricity supplied to grid | Fossil fuel share in electricity supplied to grid (100% = 1) | EF without hydro and nuclear capacity ($gCO_2$/kWh) |
|---|---|---|---|---|---|
| | A | B | C | D | E (A / D) |
| 2005 | 485 | 37.11 | 9.59 | 0.53 | **910** |
| 2006 | 547 | 32.02 | 9.20 | 0.59 | **931** |
| 2007 | 566 | 25.80 | 13.10 | 0.61 | **926** |
| 2008 | 496 | 28.40 | 17.50 | 0.54 | **919** |
| | | | | **Average for 2005-2008** | **921.5** |

*Source:* ANRE Annual report _Statistical data on electricity (*Date Statistice Aferente Energiei Electrice), 2004-2008*

Furthermore, the EF values reported in column E are likely to be underestimates of the Romanian grid ex-ante EF for the peiod 2005-2008, because they include emissions from co-generatoin for heat and power (CHP) plants for district heating and electricity production. These power plants, as discussed in Section B.1, operating under guaranteed rights to deliver electricity to the grid, do not appear at the margin of technologies to be disconnected when new JI-based capacity comes on line. Excluding the CHPs from the pool of fossil fuel operated power plants, the grid EF would likely further rise compared to values in column E; the reason being that production of heat in cogeneration facilities has high efficiency (90%[17]).

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[15] National procedure for using Joint Implementation (JI) mechanism under Track I (National JI Track I Procedure) / CHAPTER III – Endorsement, determination and approval of projects / The following activities are required under the third step of the process: / (i) LoA issuance ensures the automatic registration of the project as a JI Track I project in Romania.(page 10)

[16] http://www.mmediu.ro/departament_mediu/schimbari_climatice/schimbari_climatice.htm

("Lista scrisori sustinere/aprobare"[16] _ project "**Modernizarea CET Timisoara Centru**")

[17] Ministry of Economic Affairs of the Netherlands, June 2003, "Operational Guidelines for Project Design Documents of Joint Implementation Projects", vol. 1, page 37

Therefore, using the *ex-ante* emissions factor, $EF_{grid,y}$ = 833 $g_{CO2}$/kWh is a choice that is both transparent, as well as conservative—compared to computing the ex-ante EF from the last available three years of ANRE data.

**Table B.2-2.Estimated annual emissions according to the baseline scenario**

| Year in crediting lifetime | Estimated aggregate annual electricity production of project units (GWh) | Estimated annual baseline emission factor ($g_{CO2}$/kWh) | Annual baseline emissions (tCO2eq) |
|---|---|---|---|
| 2011 | 69,7 | 833 | 58,034 |
| 2012 | 85,7 | 833 | 71,427 |
| **Total** | **155,4** | | **129,461** |

**Project emissions**
No emissions are associated with the wind turbines operation.

**Leakage**
As per ACM0002 vs. 10, zero leakage is assumed due to the project activity.

**Emission reductions**

Finally, emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y \qquad (4)$$

Where:
$RE_y$: Emission reductions in year y (t CO2e/yr).
$BE_y$: Baseline emissions in year y (t CO2e/yr).
$PE_y$: Project emissions in year y (t CO2/yr).
$LE_y$ : Leakage emissions in year y (t CO/yr).

Estimated emission reductions of the BWPP project activity are given in Table B-2-2, using the previously justified ex-ante grid EF.

**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 additionality of the proposed project activity is demonstrated as per the most recent JISC guidelines, in particular with reference to Annex I.2 (c) of the guidelines. For full consistency with the baseline methodology developed, we refer to the "Tool for the demonstration and assessment of additionality" (version 05.2) used by CDM projects that apply baseline methodology ACM0002.

We therefore apply the following steps to demonstrating project additionality:

**Step1. Identification of alternatives to the project activity consistent with current laws and regulations**

The objective of this step is to identify realistic and credible alternatives to the proposed project that can be the baseline scenario through the following sub-steps:

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

The following alternatives have been identified that provide the same output or services comparable with the proposed JI project activity:

a) No construction of the proposed project; Romanian National Power Grid providing the same annual power generation;

b) The proposed project not undertaken as a JI project activity;

The CDM Additionality tool vs. 05.2—used herein— specifies that, for projects using ACM0002, showing that there is at least one alternative to the project scenario that is more attractive than the proposed project activity is sufficient to demonstrate additionality.

***Sub-step1b. Consistency with mandatory laws and regulations applicable laws and regulations***

The alternatives a) and b) are both in compliance with all applicable Romanian laws and regulations. Connection to the Grid is granted in both alternatives, according to Law 13/2007 (the electricity law). Regarding the environmental constraints, other than GHG emissions reduction, no legal provision can jeopardize the operation of Grid power plants, at least during the Kyoto commitment period.

Power plants in the NPG are licensed to operate, according to law 13/2007 and all secondary legislation.

The project in Babadag is following the rules in order to obtain the operation license.

On the other hand, there is no requirement in Romania demanding for the project in Babadag to be implemented. Likewise, GHG emissions reduction obligations of Romania under international regulations do not include the CWP project. In fact, according to the most recent submission of the National Inventory Report, and as illustrated in the following graph, “there is a great probability for Romania to meet its Kyoto Protocol commitments under the current baseline scenario.” [18]

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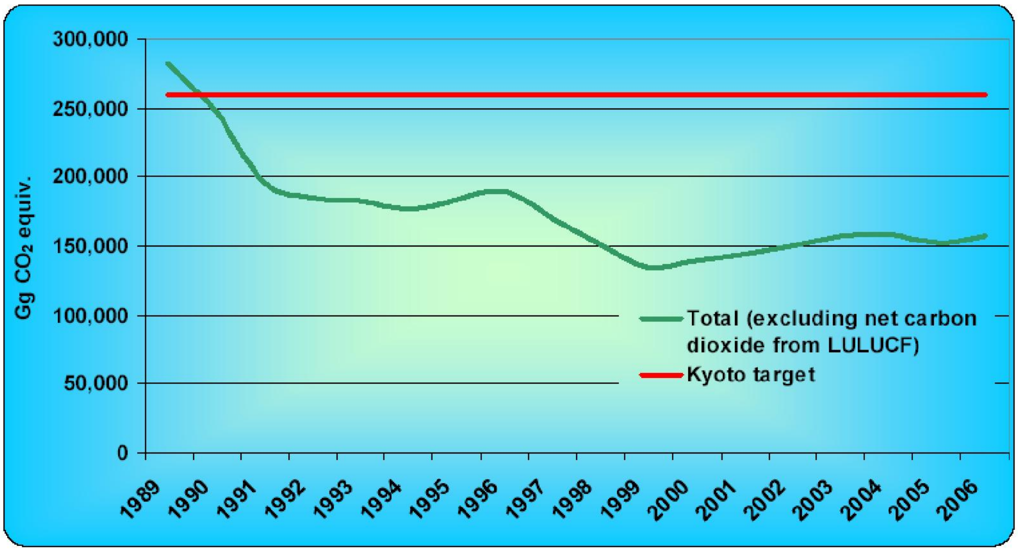
[18] http://www.mmediu.ro/departament_mediu/schimbari_climatice/schimbari_climatice.htm. National Inventory Report, submission 2008 , pg. 21

*Figure ES 1 The total GHG emissions in $CO_2$ equivalent in the period 1989-2006*



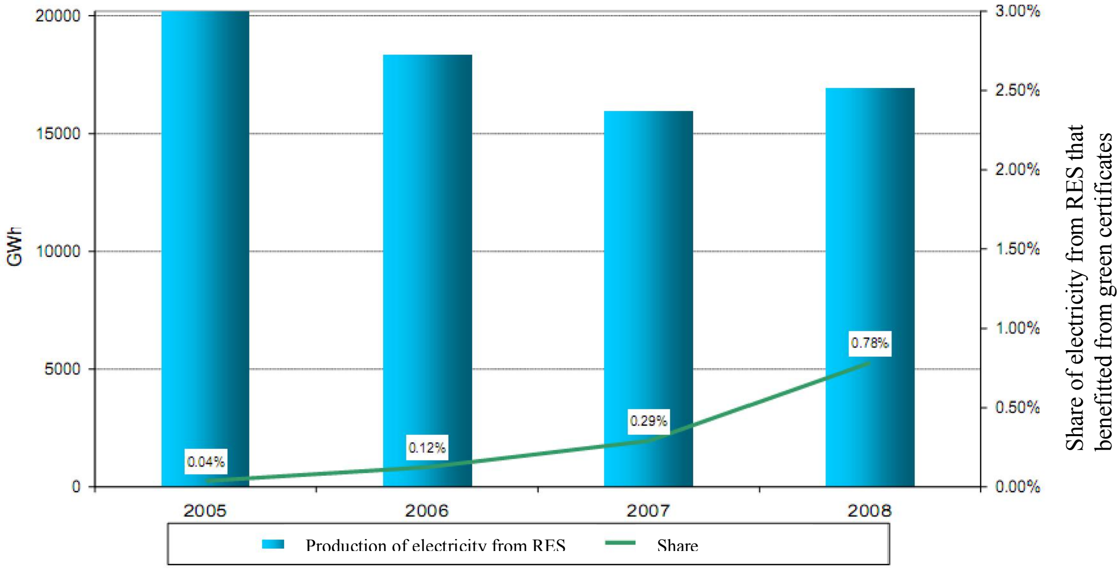

A series of "E-policies" has been introduced in the electricity production sector. They promote the production of electricity through the use of renewable energy resources[19]. The effect of introducing this type of legislation is slightly visible and, actually, the total amount of electricity produced from this type of resources is rather depending on the meteorological conditions[20] than on the promoting system proposed by the Romanian Energy Regulatory Authority (see graph below and EC "The Renewable Energy Progress Report"[21]). Despite the "E-policies" in place, the development of the sector and the increase in electricity production are rather small, the chart below illustrating the small share of RES electricity (which is receiving the benefits of the E- policies as green certificates) compared to the electricity produced in large hydro (of more 10MW, installed capacity).

[19] Governmental Decision (GD) 443/2003 for promoting electricity generation from renewable energy (HG 443 /2003 - pentru promovarea productiei de energie electrica din surse regenerabile de energie), modified through Law 220/2008, and Law 139/2010http://www.anre.ro/documente.php?id=393

[20] Annual Report 2008 – for the guarantees of origin (Raportul anual - 2008- pentru emiterea de garantii de origine), http://www.anre.ro/documente.php?id=395

[21] http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/639&type=HTML

Production of electricity from renewable and share of this type of electricity that benefitted from green certificates




Furthermore guidance received from the CDM Executive Board highlights the fact that **E-** policies may not be considered as baseline if they came in place after November 11, 2001[22]. That is definitely the case with the Romanian energy production field policies; furthermore, none of the existing legal provisions require this particular project to be implemented.

Governmental Decision 443/2004 and Law 220/2008, amended by Law 139/2010, and Governmental Decision 29/2010 propose a system for eliminating some of the disadvantages of RES electricity generation compared to the standard sources electricity generation ("promoting RES electricity generation"); the system consists in a mix of Green Certificates and Mandatory quotas. As demonstrated above, the efficiency of the promotion system is doubtful and though the system exists, the quotas may be modified retroactively by ANRE, for the preceding year (Law 220/2008, art 4, para 7; GD 1538/2008); eg: the quota for year 2009 was established at 6.28% by Law 220/2008; through Order 97/2009, ANRE modified the quota to 0.589% (or about 10 times lower). The Authority proposed that the revenue sources of the electricity producers from RES to be electricity (on one hand) and green certificates (on the other hand). While green certificates are traded on the dedicated market between a minimum and maximum price limit established by law, electricity is to be sold on the competitive market, not being excepted from the payment of imbalances and bringing an important amount of risk to the investor.

Law 220/2008 was modified through Law 139/2010. Some of the most important adjustments were made with respect to the promoting system, allowing for more green certificates to be granted (per MWh, depending on the technology) or for granting them for a longer period. This was received positively by the market but it seems that even for the Law 220/2008, the Romanian Authorities did not take all the necessary steps in order for the Law to be functional[23], which keeps a shadow over if and when, the Law

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[22] CDM EB 16, Annex 3, paragraph 3

[23] The support system must be notified to the European Commission so that the Romanian Authorities receive the approval for using it (competition regulation). As of beginning of July 2010 the Law 220/2008 entered into force as

is to be applied. The document from the Competition Council demonstrate that the interest of the Romanian Authorities towards the renewable energy sources is limited (this statement is also supported by the provision of the legal framework –Law 139, art 15, (9) – allowing ANRE to *retroactively modify the mandatory quota* for green certificates).

To summarize, the baseline scenario is concluded to be only alternative a), "No construction of the proposed project, Romanian National Power Grid providing the same annual power generation". This statement is to be supported in the following assertions.

By Romanian law[24] and the requirements of the international regulation in the field, in order for the project to be approved as JI, its additionality must be demonstrated. The approach followed is referring to the barriers faced by the project activity.

By the provisions of the CDM Tool for demonstration and assessment of additionality (v.05.2), project activities that apply the tool need to identify that there is at least one credible and feasible alternative that would be more attractive than the proposed project activity. Substep 3.b fully demonstrates the same as per the considerations regarding the installed power in Romania and the average and/or pick electricity consumption.

**Step 3. Identification of barriers to the implementation of the project scenario**

The role of this step is to demonstrate that on the Romanian market there are barriers that prevent or postpone the project activity, while they do not prevent the alternative scenario.

*Sub-step 3a: Identify barriers that would prevent the implementation of the proposed project activity:*

a) Investment barriers

The BWPP intends to operate 42 MW in Babadag City, Romania. The project developer has started collecting wind data onsite in March 2008.

The fact that Romania offers the possibility of using the Kyoto Protocol and due to the fact that renewable energy market was and is profoundly underdeveloped, the project developer thought of applying the JI Mechanism in order to have more credibility in front of the bank that was supposed to finance the project; at the beginning, inhouse calculations were performed, based on the abilities of the company's employees. By the end of 2007, the company decided to contract a consultant and in the first half of 2009 the first version of the Project Idea Note was produced and submitted to the Ministry of Environment for early approval (Letter of Endorsement).

In 2007 - 2008, the manufacturers of wind turbines were having long waiting lists and high prices (it was a sellers' market); therefore, the company decided very fast (even without having measured wind data onsite) to enter negotiations with wind turbine manufacturers. Suzlon promised to be able to deliver the necessary turbines by the end of 2008/early 2009, even if the available wind data was by far insufficient and the project status was: *early development*, basically permitting was just started; the wind turbine supply agreement was signed and turbines started to arrive at the end of 2008.

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of November 8, 2008, was not notified yet (answer **4630** received by Terra Mileniul III from the Romanian Competition Council on July 09, 2010 ).

[24] « Guide for the use of the Joint Implementation mechanism track II» ("Ghidul pentru utilizarea mecanismului IMPLEMENTARE IN COMUN (JI) pe baza Modului II (art. 6 al Protocolului de la Kyoto)" ) (http://www.mmediu.ro/departament_mediu/schimbari_climatice/schimbari_climatice.htm)

In order to secure a smooth development of the project and having in mind to apply for a bank loan/partners in order to finance the project, temporary financing was granted to EVIVA Nalbant by the mother company on the idea that the project will be developed fast enough. From the end of 2008, things have changed, both for EVIVA Nalbant and for the mother company; changes took place on the wind turbine markets and on the financing markets as well and EVIVA did not have all the permits so that they can start building the wind park.

EVIVA received the environmental permit during February 2009 , a first building permit for the first 5 turbines (on Babadag I location) in December 2009 and the building permit of the rest of 15 turbines, in August 2010.

Other type of renewable energy projects (e.g. hydro), are also promoted through the JI mechanism[25] while smaller sized projects (< 10 MW), usually apply for EU State aid systems (Structural funds, Economic Competitivity, pile 4)[26] or for national financing programs (National Environmental Fund)[27].

The funding situation is highly variable from year to year and we provide an overview of funds available as of 2010.

As explained above, among the **EU Structural Funds**, the most important is the Sectoral Program regarding Increasing Economic Competitiveness. This program holds a financing line dedicated to projects in the renewable energy field (line 4.2.1). Available funding was of about 420 million RON (roughly 100 million Euro), while the demand reached 8.3 billion RON (roughly 2 billion Euro), for 419 (< 10 MW) proposed projects ( http://www.fonduri-structurale.ro/detaliu.aspx?t=Stiri&eID=6980 ).
Eligible conditions were:

- Public administration
- SME
- Large Entreprise
- Total project value: 0.4 mil RON – 50 mil Euro
- Maximum value financed per project: 80 mil RON
- Financed share; 40 – 70 % (larger amounts financed for SMEs)
- **Projects less then 10 MW**

**The Environmental Fund** opened a financing line for projects in the renewable energy field as well. The available funding was 440 million RON (about 100 mil Euro). For this second fund, both large enterprises and SMEs were eligible, but the amount accessible was limited to 30 million RON (about 7 million Euro) per project. The share to be financed varied between 40% and 50% ( http://www.fonduri-structurale.ro/detaliu.aspx?eID=5806&t=altefinantari ). The projects financed were all small size.

The two mentioned funds are the main possibilities of use of public money for investors in the renewable energy in Romania.

Regarding the selection process and communication of the results, the process is not transparent, and as a result publicly available information is rather scarce.

The situation is illustrated by the study prepared by the **NGOs Coalition for Structural Funds: "Emergency call for structural funds" (** http://www.ce-re.ro/ENG/new/report-on-structural-fun **).**

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[25] First Romanian JI Track I Project Operational: The emergence of an ex-post EU ETS-based CEF ; JIQ Magazine, 2009Oct, page 12

[26] http://amposcce.minind.ro/

[27] http://www.afm.ro/proiecte02_in_curs_de_finantare.php

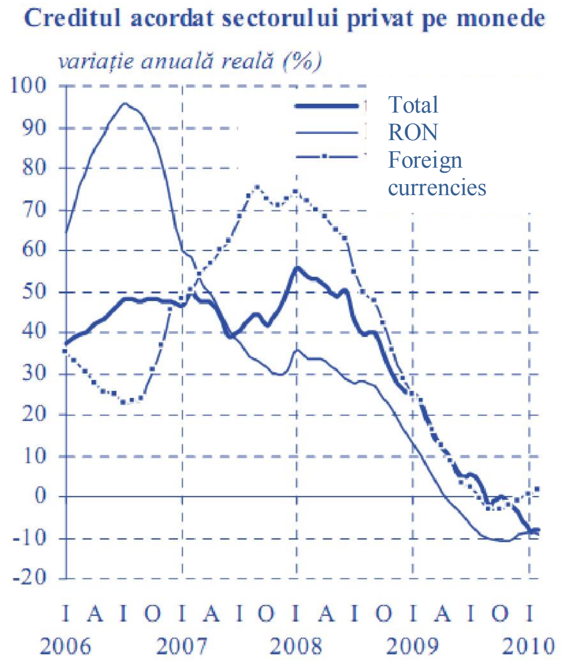
No public funding is foreseen to be used for the development or for the implementation of the project activity.

EVIVA Nalbant is currently looking for partners/banks in order to participate to the financing of the project. In the current energy and financing market conditions and due to the fact PP already has the turbines which, most probably were bought at a higher price than a developer may obtain today, it is highly improbable that a partner can be found easily (especially when the Romanian RES market does not offer PPAs option and feed-in tariff, which on this market is equal to "non-predictability of the income generated"). In the worst case scenario, the mother company will lend capital to EVIVA NALBANT so that the project may be finalized, hoping that this way banks may be more interested in offering financing for it. In the perspective of negotiations with banks and other possible investors, using the JI mechanism may certainly represent a supplementary warranty for the Bank/partner regarding the commitment of the project developer.

The lack of financing and strong contraction of the credit market is also illustrated by the National Bank of Romania through its Inflation Report – Mai 2010[28]; the report mentions that the credit has reached the record minimum of the last seven (7) years in January 2010. Real variation of the credit for the private sector:

**Lending to the private sector (on currencies)**
***Yearly variation %***

[28] http://www.bnro.ro/PublicationDocuments.aspx?icid=3922 , Reports on inflation, may 2010 (Rapoarte asupra inflatiei – mai 2010), page 41




Source: NS, BNR

Financial barriers are strong enough to hamper the development of BWPP, at least on medium term. Postponing the project until available financial resources may be identified may be dangerous, given that the investment priorities may change and that the turbines are already on site (following the normal process of aging – physically and morally).

During the period 2005 – 2010, six out of 15 projects (40%) that received the DFP support (through LoE and/or LoA) are wind power projects, expressing the need for the JI support for this type of projects.

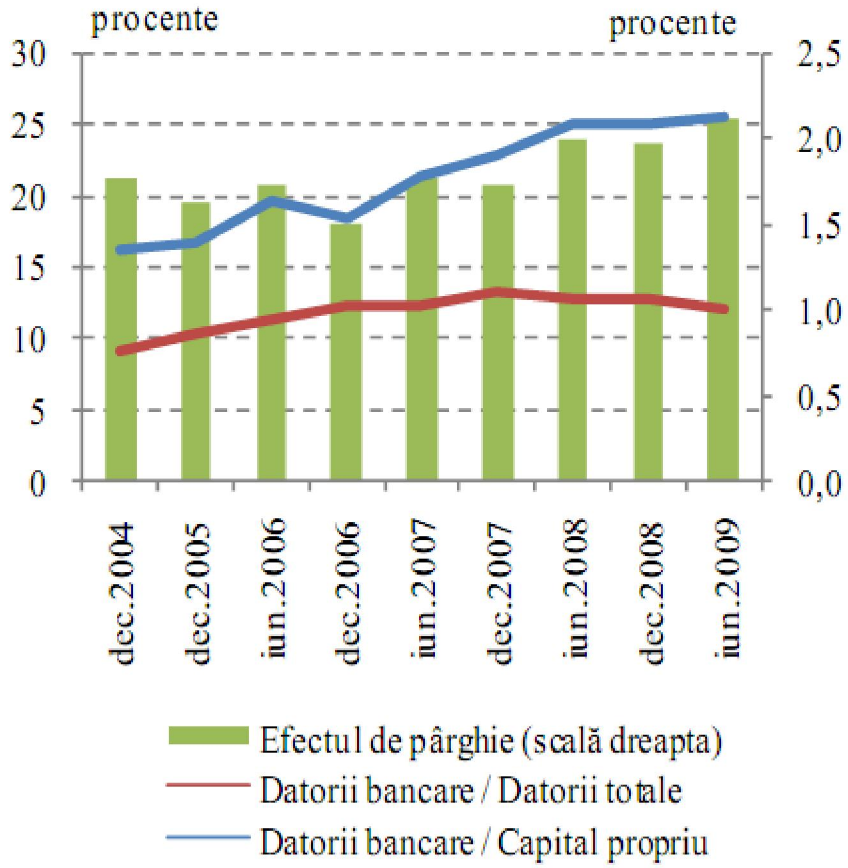
14. Proiectul de energie eoliana la Pestera si Valea Dacilor
21. Construirea a patru (4) parcuri eoliene de 10 MW in regiunea Constanta
22. Mireasa Wind Park
23. Cogealac – Construire si exploatare parc eolian
25. Centrala electrica eoliana cu o putere instalata de 9 MW, Oravita
28. Parcul Eolian Casimcea - Alpha

The JI status may boost Banks interest for financing respective projects, as a JI Project inspire more confidence, due to the multiple verification stages performed by different entities.

On the other hand, **lack of private capital** on the market due to the perceived risks, legal instability and general economic environment is also illustrated by the reports of the National Bank of Romania[29] in chapter 5.1.1 Impact of crisis on the economic and financial performance of companies (Impactul crizei asupra performantelei economice si financiare a companiilor). A summary of the conlusions is presented below:

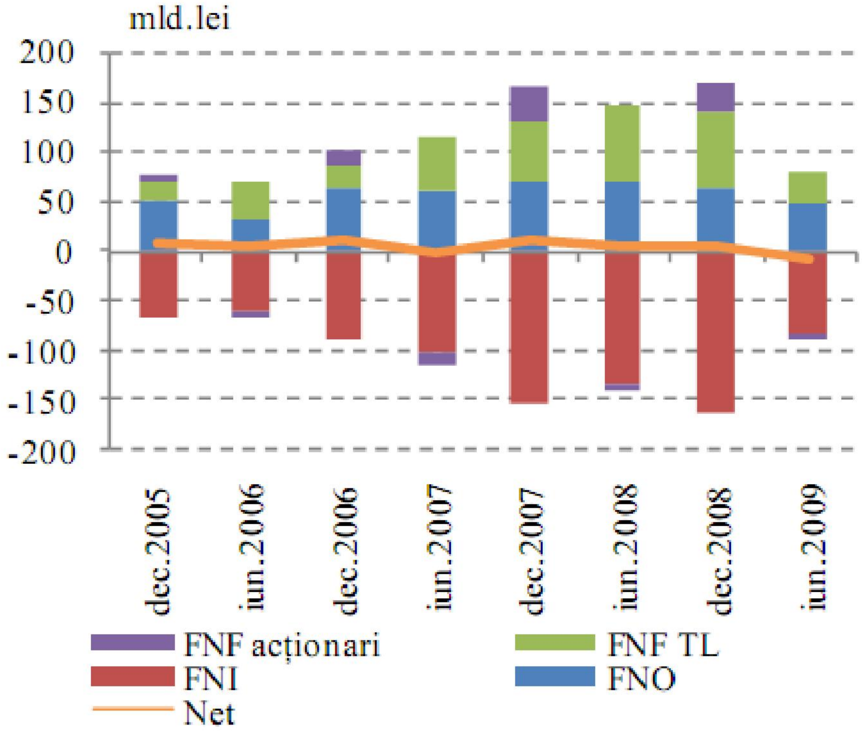
A. Capacity of companies to cover interest costs has been reduced from 3.96 in June 2008 to 1.07 in june 2009; the causes of this situation is:
    a. The decrease of profits (64% decrease in June 2009 compared to June 2008)
    b. Increase of interest costs (31%, in the same period)
B. Total debt of companies (DEBT/EQUITY) increased significantly (*in blue in the chart below, %*)

[29] "Report on the financial stability" (Rapoarte asupra stabilităţii financiare) 2010, http://www.bnr.ro/PublicationDocuments.aspx?icid=6711



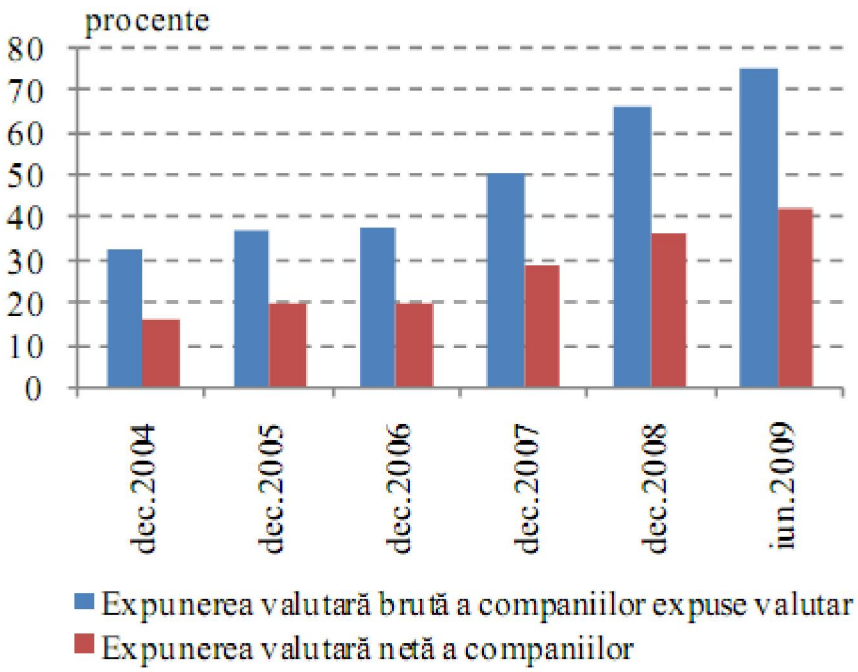

C. The capacity of companies to maintain the cash flow reduced significantly; the main causes are:
   a. Decrease of profitability
   b. Decrease of crediting

   It is considered to impact:
   a. Rate of credit reimbursement
   b. Rate of delay in payments
   **c. Investments (investment plans being postponed or cancelled)**




*Evolution of cashflows of the companies*

D. Rate of Return of capital decreased dramatically (from 20 % to 6% in June 2008 compared to June 2009)
E. Exposure of companies to the exchange rate risks (especially or companies that borrowed money in foreign currency)



F. Number of companies going bankrupt (about 18000 in 2008 and 2009, but increased with about 38% in the first half of 2010 compared to the same period of 2009)

b) Technological barriers

Romanian experience in developing wind power projects consist in installing and operating 14.18 MW at country level[30] (end 2009 figures). The same source states on page 63 that 10.6 MW (out of 13.1 MW) installed during 2005 – 2009 (more than 80%) are second hand turbines. The 14.18 MW are owned by more than 12 companies, as it is shown in ANRE reports. This is translated in unavailability of local skilled and properly trained construction companies/personnel and skilled and properly trained operation personnel.

Furthermore, regarding the attractiveness of Babadag city, this is a 10,000 inhabitants town, having extremely high unemployment rates and lack of industry, meaning lack of technical skills.

The BWPP project activity consists in a medium sized wind park (42 MW) that is expected to export to the Grid a net amount of more than 155 GWh of electricity by the end of 2012. A few permanent jobs will be created for the local people. Some of them may require special skills and, if found, people may be trained for them.

The turbine used comes from a big international player, which is present mostly in Asia and by far less in (Eastern) Europe. This situation represents a risk during the operation of the wind park even if EVIVA plans measures to safeguard this risk through insurance contracts. Equipment failure and potentially long waiting before intervention may jeopardize the forecasted income from operation.

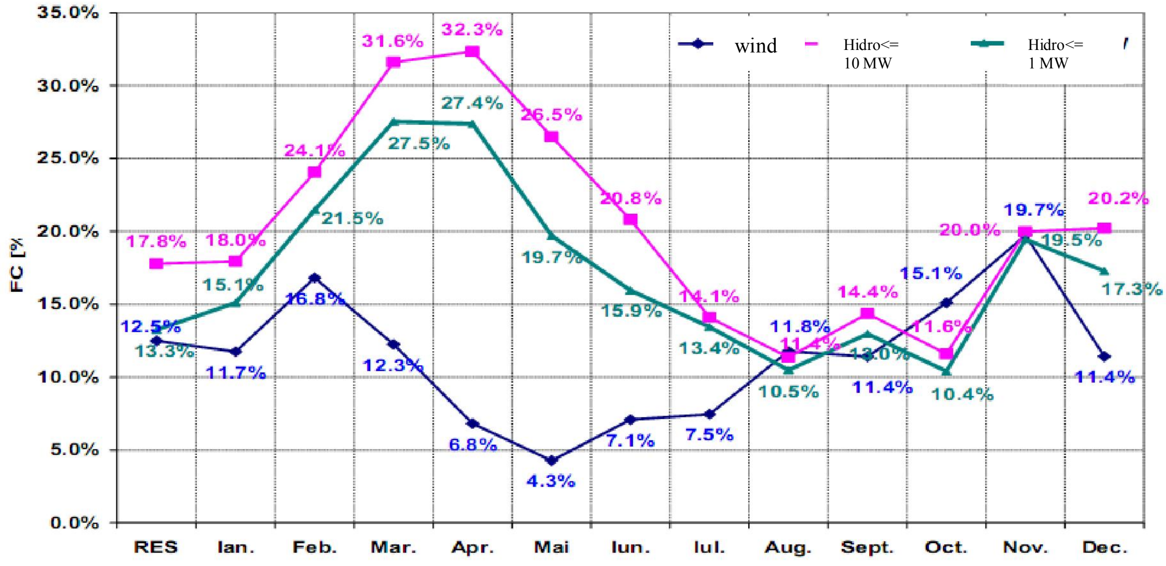
Furthermore, the novelty nature of the proposed project activity requires assessment of the grid operation in the area but contracts for electricity supply (which are more or less standard) do not cover situations where, due to the Grid instability, the producer gets disconnected and may encounter technical problems and financial losses (even due to payment of imbalances). Overestimation of expected income and underestimation of the payback period of the project may easily happen; especially if, as mandatory by law, the project developer will sell electricity on the competitive (day ahead) market, where all inbalances must be paid.

These are partly linked to significant risk of (over)estimation of the capacity factor: indeed, project participants estimated an average capacity factor of 24%, while monitored data from existing wind turbines during 2008 show that the capacity factor did not exceed 20%, while the yearly mean value was lower than 15%. [31]

[30] www.anre.ro: "2009 Annual Report", page 65(please see the chart explaining that in 2009 the installed power in wind represented 3.58%, out of 396.16 MW)

[31] Annual Report 2008 – for the guarantees of origin (Raportul anual - 2008- pentru emiterea de garantii de origine), http://www.anre.ro/documente.php?id=395

**Monthly evolution of the Capacity Factor (FC) in 2008 (%)**



c) Barriers due to prevailing practice

As discussed, in Romania there is no prevailing practice in the field of medium - large wind power plants even if there are some under construction; one large wind park is under construction at present but is not commissioned yet. By contrast, prevailing practice in Romania is the operation of very small wind power stations. Hence the fact that existing experience is limited to designing, building and operating small wind power systems does represent a barrier to implementation of the BWPP project activity.

The present operators (as of the end of 2009) are the following[32]:

- S.C. ECOPROD ENERGY SRL (Topolog 1) (0.66 MW)
- S.C. ILEXIMP SRL (Fântânele) (0.25 MW)
- S.C. HOLROM Renewable Energy SRL (Baia) (2.65 MW))
- S.C. ELECTROGRUP ENERGY SRL (Valea Nucarilor 2) (2.24 MW)
- S.C. ELECTRO MARGO LINE SRL (Sânicoară 2) (0.29 MW)
- S.C. BLUE LINE ENERGY SRL (Sânicoară 1) (0.29 MW)
- S.C. ELECTRIC PROD S.A. (Măcin 1) (0.6 MW)
- S.C. GREEN ENERGY GRUP S.A. (Dealul Nucarilor) (1.95 MW)
- S.C. HYDRO-WIND POWER SRL (Valea Nucarilor 1) (1.35 MW)
- S.C. E MARKET SRL (Tureni) (0.30 MW)
- S.C. SERVOPLANT ECO ENERGY SRL (Corbu 1) (0.09 MW)
- S.C. PIROTEHNIC OSB SRL (Muntenii de Jos) (0.25 MW)
- S.C.TELESATELIT S.R.L. (CEE) (0.25 MW)

[32] http://www.anre.ro/documente.php?id=395, ANRE, Report on RES in 2009 ("RAPORT privind monitorizarea sistemului de promovare a E-SRE în anul 2009"), Annex 2

- S.C. TOPLET ENERGY S.R.L. (Topleţ 1) (1.8 MW)
- S.C. ENERGYCUM W S.R.L. (Rugineşti) (1.2 MW)

As shown above, the larges WPP operational is 2.65 MW, therefore the prevailing practice for operating wind parks larger than 2.65 MW is absent (the total installed power, as of the end of year 2009, is 14.1 MW).

d) Other barriers

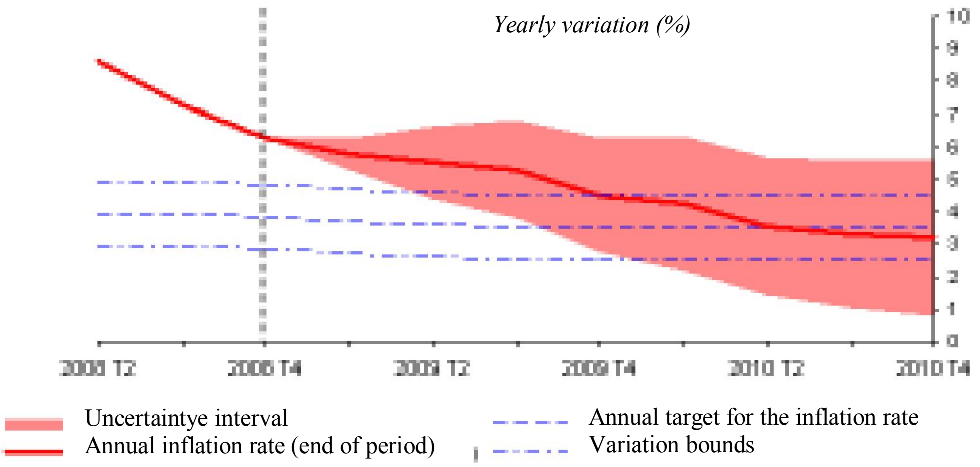
**A. related to the general investment climate in Romania**

- *Inflation*

Incertitude regarding the inflation rate is increasing and it is getting difficult for an investor to make realistic projections for its investment cash flow. As it can be noticed from the following chart, the incertitude interval is increasing from ± 1.1% in the second trimester of year 2009 (at a projected level of 5.5%) to ± 2.4 % in the fourth trimester of year 2010[33] (at a projected level of 3.2%).

[33] http://www.bnro.ro/Proiectia-curenta-3169.aspx, Projections of the National Bank of Romania - BNR (Banca Nationala a Romaniei)

**Uncertainty interval associated to projected inflation of the consumption price index**




| Period | T2 2008 | T3 2008 | T4 2008 | T1 2009 | T2 2009 | T3 2009 | T4 2009 | T1 2010 | T2 2010 | T3 2010 | T4 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Target | | | 3,8 | | | | 3,5 | | | | 3,5* |
| Actual/Forecast %, end of period | 8,6 | 7,3 | 6,3 | 5,8 | 5,5 | 5,3 | 4,5 | 4,3 | 3,6 | 3,3 | 3,2 |
| Uncertainty interval of projection (% points) | | | | +/- 0,5 | +/-1,1 | +/-1,5 | +/-1,8 | +/-2,1 | +/-2,1 | +/-2,3 | +/-2,4 |

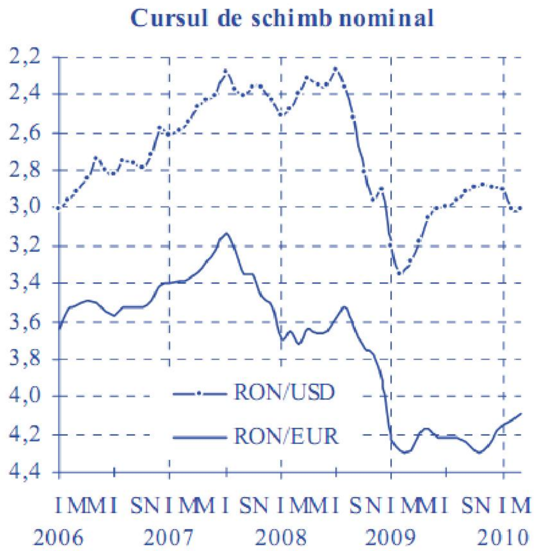
*Technical hypothesis
Source: INS, calculation BNR

- *Exchange rate risks*

Nominal exchange rate[34] has suffered important changes during year 2008, passing from about 3.2 RON/EUR to more than 4 RON/EUR highlighting an increased volatility of the exchange rate and reducing the general interest of foreign investors for the Romanian market.

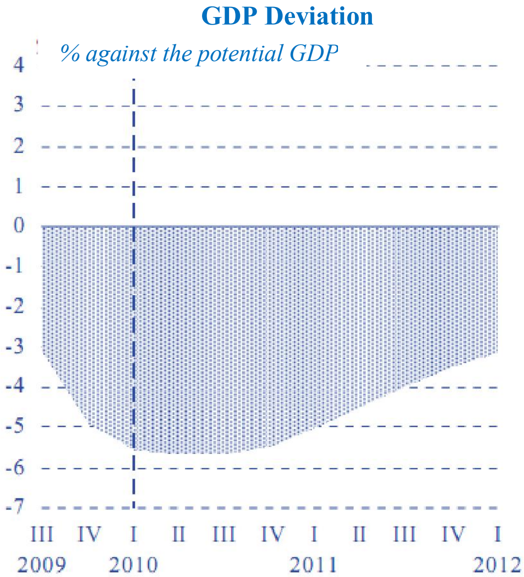
**Nominal Exchange Rate**

[34] http://www.bnro.ro/PublicationDocuments.aspx?icid=3922 , Reports on Inflation (Rapoarte asupra inflatiei) – may 2010




- *economic recovery*

GDP growth (by the National Bank of Romania) is estimated to reach its theoretical potential only after 2012[35], general economic status do not offer enough confidence that the estimation of the payback period of investment projects may be done within a reasonable confidence level.




*Source: INS, calculation BNR*

**B. strategic risks**

- *governmental decisions*

[35] http://www.bnro.ro/PublicationDocuments.aspx?icid=3922 , Reports on Inflation (Rapoarte asupra inflatiei) – May 2010, page 51

Having in view the current economic situation, it is not excluded that on the short term the Government changes the tax policies, in order to improve the income flow to the State Budget. This may affect as well investments.

- *implementation of the strategic plan*

Although experienced people are working in the project company, the economic crisis is not a situation that they have faced during their professional experience; therefore errors during the decision process may happen. They can cost in terms of capital investment and time.

**C. operational risks**

- *electricity prices*

Electricity prices show an increasing tendency. The Romanian electricity market is a 100% open market; therefore, electricity produced from renewable sources has to face the competition of electricity produced from fossil fuels and nuclear energy (as per the provisions of Law 220/2008). Conditions of very low oil prices may drive inefficient the investments in renewable electricity, especially in a power grid where there is an important excess in the installed production capacity (by more than 50%).

- *slowdown of economic activity*

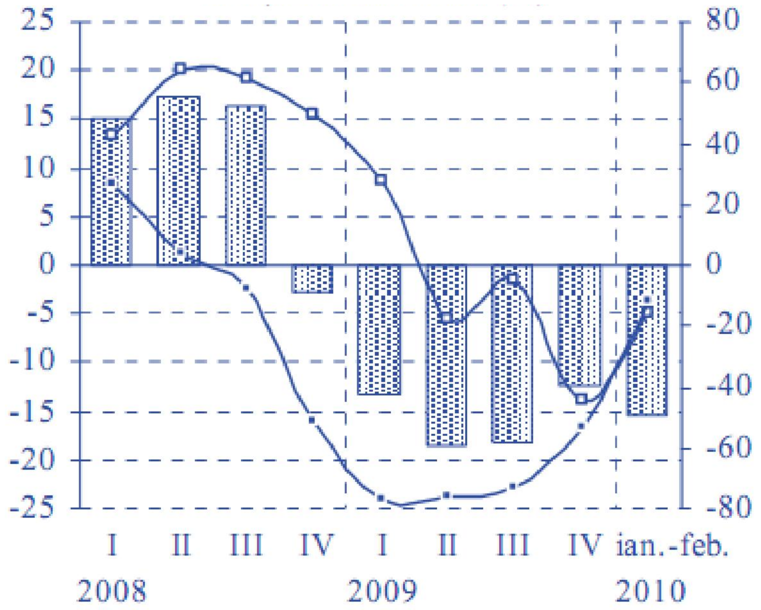
A consequence of the financial crises is that of decrease in demand of consumer goods (see chart below[36]). High energy intensive industries (like steel production, aluminum smelters, car manufacturing facilities etc.) have significantly decreased their activity (if not stopped); it results in a decrease of electricity consumption/need for electricity production. The situation may be easily interpreted by investors as a reason for postponing investment decisions.

[36] http://www.bnro.ro/PublicationDocuments.aspx?icid=3922 , Reports on Inflation (Rapoarte asupra inflatiei) – May 2010, page 18

**Population consumption and main financing sources**

*Annual variation (%) – real terms*

*Annual variation (%) – real terms*




April - May

Expenses for goods and services *
Available income
Consumption credit newly awarded (right scale)

*) for April – May 2009, the volume of turnover in commerce and services on the market is used

*Source: INS, calculations BNR*

**Sub-step 3 b**

Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity):

None of the barriers identified above would prevent the alternative scenario:“No construction of the proposed project; Romanian National Power Grid providing the same annual power generation.”On the one hand, continuation of the current situation obviously would not face any technological barrier. In addition, despite the current financial crisis, the current scenario is not prevented by the identified financial barriers. Indeed, the RNPG is and will remain in operation., given that all national regulation in the field is built to insure the operation of the RNPG. In particular, Law 13/2007, provides for the rights and obligations of a user of the National Power Grid (electricity producer and/or electricity consumer) (art. 16 & 17). By law, all license holders are obliged to offer the entire available capacity at any moment.

Power consumption in Romania was continuing to grow as the country developed. From 2003 to 2008, there was an increase in average power consumption of 9.8%. This is highlighted in the chart below[37].

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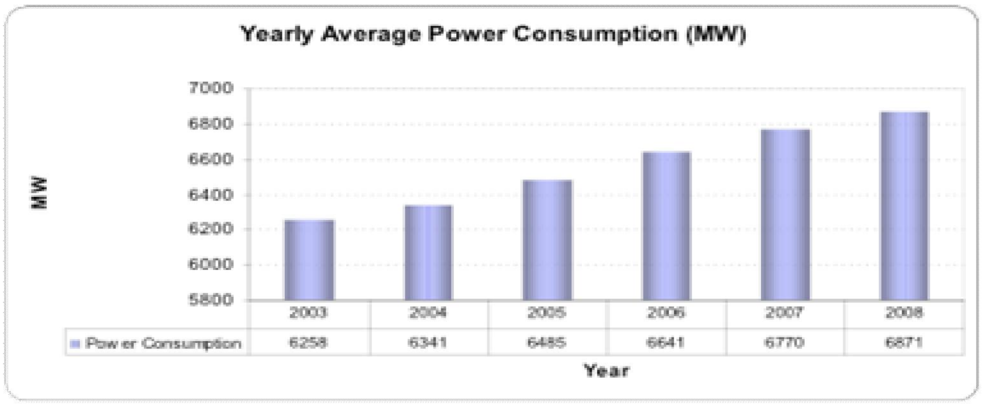
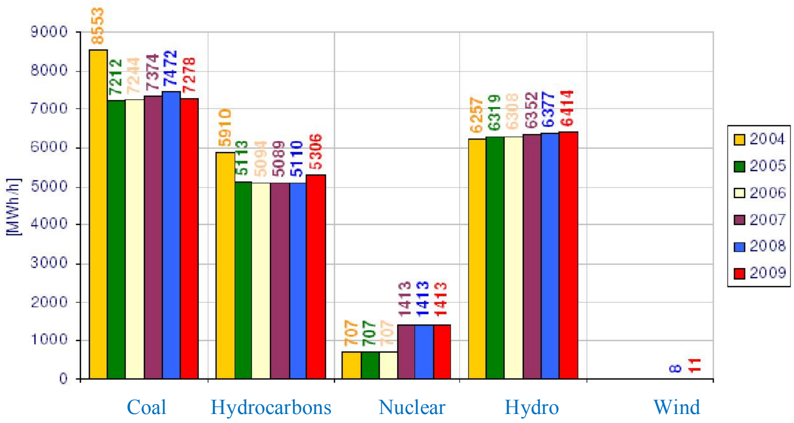
[37] http://www.transelectrica.ro/ - Technical results of the NPG in year 2008 (Rezultate tehnice ale SEN in anul 2008), page 3




In 2009, the power consumption decreased significantly (about 9% against 2008), while electricity prices on the day ahead market decreased with about 23% (making it difficult for the project developer to assume a price for its production).

Currently, the Romanian Power grid has excess installed capacity. Indeed, by comparing the maximum average consumption rates in the graph above, to installed power amounts (following graph), it follows that maximum power consumption is about three times lower than the currently installed capacity. This is due to the downturn in centrally planned economic activity (especially heavy industry) after the collapse of the communist system in 1990.

***Structure of installed power in Romanian National Power Grid in years 2004 - 2009***[38]



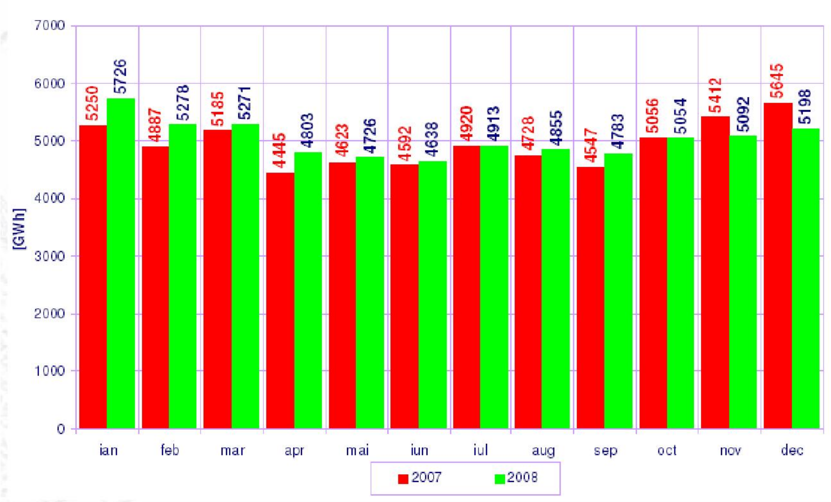

The project to be commissioned represents by far less that 1% of the total installed capacity of the Grid. Therefore, in contrast to the alternative scenario identified above, it can be concluded that installation of over 42 MW in Babadag is not mandatory in terms of operation requirements of the RNPG.

Finally, the recent world-wide financial crisis resulted in a slow down of electricity consumption in the Romanian economy, as shown in the chart below, documenting slower growth during the last three month of 2008 and into 2009, and further arguing for the additionality of the Babadag project.

---

38 http://www.transelectrica.ro/ - Technical results of the NPG in year 2008 (Rezultate tehnice ale SEN in anul 2008), page 11

*Monthly evolution of electricity consumption in Romania in year 2008, against year 2007*[39]




As a conclusion, the analysis of the mentioned barriers and status of the RNPG show that the project is not part of business-as-usual development in Romania, and therefore cannot be considered a baseline scenario, as opposed to the alternative scenario. Thus BWPP is additional, and continuation of current situation, i.e., power supply from the RNPG, is the baseline.

**Step 4. Common practice analysis**

As already shown in sub-step 3a above, Romanian experience in developing and operating wind power projects consist in installing and operating 14.1 MW in several locations at country level (end 2009 figures). The 14.1 MW are owned by more than 12 companies, as it is shown in ANRE reports.

By contrast, the BWPP project activity consists in development and operation of a wind park of more than 40 MW. Although this is smaller than a wind power project currently under construction by a competitor, in Fantanele, the latter is not operational--being in implementation and not yet connected to the grid -- thus by definition cannot be considered within common practice analysis.

Larger projects are being built (i.e. Fantanele), but, as mentioned, they are not operational yet. on the other hand we can argue larger parks benefit (usually) from some favourable condtions: i.e. economies of scale.

That economies of scale due to the different size of turbines come from the fact that larger machines are usually able to deliver electricity at a lower cost than smaller machines. It is the case of Fantanele: 2.5 MW, Casimcea: 2.3 MW compared to Babadag: 2.1 MW. This is due to the fact that the cost of foundations, road building, electrical grid connection, plus a number of components in the turbine (the electronic controlling system etc.) are somewhat independent of the size of the machine.

On the other hand, negotiation position with technology and civil works suppliers is different in the case of a large WPP than in the case of a medium size park; certainly the larger the park is, the better are the conditions offered by the suppliers.

[39] http://www.transelectrica.ro/ - Technical results of the NPG in year 2008 (Rezultate tehnice ale SEN in anul 2008), page 4

Other than the economies of scale which vary with the size of the turbine, there may be economies of scale in the operation of larger wind parks. These economies are related to the maintenance visits, surveillance and administration, etc. Babadag is a two locations project; situation that is certainly generating higher costs.

Finally, we need to mention that Babadag WTGs were contracted at higher prices, on a producers market, as at the contracting moment (April 2008), the WTG producers still had long waiting lists.
Considering the time needed for all steps undertaken in order to promote the project: the preliminary feasibility analysis, land concessions, wind measurement, contracts, the developer demonstrated good skils on a very new market. Being among the pioneers on the market and due to the results of the preliminary feasibility analysis, the PP decided that the project must be promoted with the JI revenues (document provided during site visit *"Project Babadag Recommendation of Investment - Aug 2007"*). Babadag wind power park is the first project of EVIVA ENERGY (through EVIVA NALBANT) on the Romanian market.

Fantanele project was excluded from the common practice analysis due to the following considerations:

**a.** The mentioned project is not fully operational at present and the project has applied for JI (meaning that it needed the JI revenues). The owner of Fantanele Wind Farm Project, SC Tomis Team SRL, prepared the PIN in 2008 and submitted it to the DFP in 2009. It was analysed and as it was expected to come online in the first quarter of 2010 the NCCC considered that its impact of the approval over the JI reserve (as per the National Allocation Plan) could not allow granting the ERUs to the projects already approved; therefore, the application was rejected.

**b.** The size of the project (347.5 MW) exceeds almost 9 times the size of Babadag project; therefore the two cannot be compared especially from the perspective of the specific investment costs (both equipment and civil works can be cheaper per MW, due to the effect of economy of scale) and the negotiation power with the different contractors (including the electricity transporter and distributor)

c. Being a private investment, not much public information on Fantanele is available / Considering that the project was not online on December 31, 2009, data regarding the project is not included in the official publications (ANRE, Transelectrica)

d. According to the available information (http://www.finmedia.ro/conferences/conferintele/energy_forum/ed1/prezentation.php _ Adrian Borotea), Fantanele WPP was supposed to be commissioned in the first half of year 2010 (attached presentation_ slide17). As of the present day, it is not yet fully operational. Knowing a part of the history of the project (especially the JI side) and considering the fact that the Renewable Energy Law (220/2008) is not applied yet, bringing important misbalancing to the forecasted cash flow (only one green certificate, instead of two is offered), we can assume that the financial structure is not closed yet. On the other hand, according to CEZ website (http://www.cez.ro/index.php?id=2&b=96&l=1), in 2009 the group obtained from a group of German banks and companies the financing of an export credit of more than 262 mil Euro with a maturity of 15 years (very favorable to the project) for the equipment to be installed in the Fantanele wind farm; also, in the last quarter of 2009, the European Investment Bank approved a 200 mil Euro for the project in Fantanele (http://www.eib.org/projects/pipeline/2007/20070524.htm ). In both cases, the loans were granted to CEZ (company active in the energy field and active in Romania since 2005) - a considerable advantage for Fantanele project. According to the publicly available information regarding the investment value (about 650 mil Euro), the sum of the two loans obtained account for more that 70% of the investment. In this respect and compared to other projects on the market, the situation of Fantanele project is considerably better than that of others and it might have been able to overcome the financial barriers mainly due to the credibility, experience and strength of the mother company in its relationship with the banks. Nonetheless, not all companies may benefit from loans from EIB and those loans are recognized for carrying over good financing conditions

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

>>
According to the definition in the Marrakech accords, the project boundary shall encompass all anthropogenic emissions by sources of greenhouse gases under the control of the project participants that are significant and reasonably attributable to the project.

The project boundary refers to the limits of the Romanian National Power Grid. Specifically, the project boundary comprises all thermal non-must-run power producing installations under the EU ETS in the Romanian electricity grid.

The GHG emissions resulted from the construction activities will not be included as they are not under the direct control of the project participants.

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

>>
The baseline was established by eco2ro environmentally friendly solutions s.r.l. (eco2ro), in line with JISC guidelines: "GUIDANCE ON CRITERIA FOR BASELINE SETTING AND MONITORING, (vs. 02, JISC 18) and consistently with previously registered JI projects in Romania.

| | |
|---|---|
| Organisation: | eco2ro environmentally friendly solutions s.r.l. |
| Street/P.O.Box: | 15, Baraolt Str. |
| Building: | Bld 48, A, 1 |
| City: | Ploiesti |
| State/Region: | Prahova |
| Postal code: | 100233 |
| Country: | Romania |
| Phone/Fax | +40344104918 |
| E-mail: | office@eco2ro.ro |
| URL: | www.eco2ro.ro |

eco2ro is not a project participant.

The date of the baseline setting is **June 15, 2010.**

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

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

April 26, 2010 (start date of construction works)

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

20 years

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

The crediting period of the project is 2 yrs (or 24 month)

Pending on the decision of the Host Party, the crediting period may be extended post 2012.

## SECTION D. Monitoring plan

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

>>

ACM0002 "*Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources*" can be considered the best available, approved methodology for this type of projects.

The monitoring shall consist of metering the electricity generated and imported for own consumption by BWPP. Data will be stored electronically. All data collected as part of monitoring will be archived electronically and be kept at least 2 years after the issuance of the last ERUs (after the last crediting period).

Data monitored according to the current MP will enable the calculation of baseline emissions on an *ex post* basis using the grid CEF communicated by the Ministry of Environment and calculated as described in sections B1 & B2, based on EU ETS verified data for Romania. As explained in Section B.1, the aggregated data and other information required are available and can be assessed and reviewed whilst individual fossil fuel fired power plant data is accessible from the Romanian Energy Authority (ANRE) and the Romanian Environmental Protection Agency (NEPA/ANPM); therefore, the Project participants will finally use only the CEF calculated by the Romanian Authorities.

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

Not applicable

#### 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 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |

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

>>

The project is a zero emissions project. There is one grid connection point for each location (Babadag I & Babadag II), as they will be connected on different voltage levels of the DSO's electrical station in Babadag (110 kV and 20 kV, respectively). No back-up line will be installed between the wind farm and DSO station.
The meters are estimating energy losses between the wind farm station and DSO station. Having one commercial meter and one witness meter is a usual practice for dispatcher able power plants, which is reducing the problems related with possible failures of the meters. All the meters involved are predicted with GSM modem and RS 232/485 adapter for integration into remote management of DSO(Enel), in Tulcea district. The measurements for active and reactive power are performed in both ways and transmitted hourly, in a first stage, after that every 15 minutes. Electricity consumed from the grid by the Project.
Considering the possible failures of the data acquisition system, EVIVA NALBANT wishes is to create a central point for data acquisition at its level, the Producer level, assuring in this way a back up data acquisition system. It will be created a data base that is able to register the measurements for minimum 400 days.

**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. GENy* | *Electricity supplied to the grid by the Project* | *Bidirectional meters at park-grid connection point Ownership – ENEL* | *MWh* | *m* | *Monthly* | *100%* | *Electronic* | *Electricity supplied to the grid by the Project.* |
| *2. $IMP_y$* | *Imported electricity from the grid* | *Bidirectional meters at park-grid connection point Ownership – ENEL* | *MWh* | *m* | *Monthly* | *100%* | *Electronic* | *Electricity consumed from the grid by the Project.* |
| *3. EF grid,y* | *CO2 emission factor of the grid* | *Published by MESD (ANPM; ANRE based)* | *tCO2/MWh* | *c* | *Yearly* | *100%* | *Electronic* | *Determined using the EU ETS verified data based protocol by ANRE/ANPM/MESD* |

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

>>
The project's baseline emissions will therefore be calculated as follows:

$$BE_y = (GEN_y - IMP_y) x\, EF_{grid,y} \qquad (2)$$

Where:

$BE_y$ = Baseline emissions in year y in tonnes $CO_2$ per year.
$GEN_y$ = Electricity supplied to the grid (MWh)
$IMP_y$ = Imported electricity from the grid (MWh)
$EF_{grid,\ y}$ = A modified $CO_2$ emission factor of the Romania grid in year y; it is expressed in g/kWh (see the methodology description in Section B.1; equation 1).

The first year for which the baseline will be prepared is 2010 based on data that will become available during the first six months of 2011. Subsequently, in 2012 and 2013 baseline emissions will be calculated for 2011, and 2012, respectively and the CEF published on MEF web-site.

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

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):**

>>

Not applicable.

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

Emissions likely to happen as leakage of the project are those resulted from the transport of the equipment and construction works. As they are not under the control of the project participants and in order to respect the provisions of the ACM0002, these emissions are neglected.

No leakage is to be registered.

**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):**

>>

Not aplicable

**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):**

>>

Since the Project is a windpower project and does not give rise to direct GHG emissions, the emission reductions (ER) are equal to the baseline emissions.

$$ER_y = (BE_y - PE_y - L_y);$$

Where:

$BE_y$ = Baseline emissions in year y in tonnes $CO_2$ per year.
$PE_y$ = 0 (as has been explained in Section D.1.1), and
$L_y$ = 0 [leakage, see Section D.1.3.2]

**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:**

>>

The environmental monitoring programmes are developed in accordance with the Romanian legislation, as the permitting procedure requires working close with the Local & Regional Environmental Protection Agencies.

**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. GENy* | *Low* | *The parameter is subject to commercial contracts and transactions. QA/QC procedures shall be adopted for monitoring the energy production. Meters will be subject to regular maintenance and testing to ensure accuracy (as required by the Romanian specific regulation). Sales records to the Grid are to be used to ensure the consistency.* |
| *2.* $IMP_y$ | *Low* | *The parameter is subject to commercial contracts and transactions. QA/QC procedures shall be adopted for monitoring the energy production. Meters will be subject to regular maintenance and testing to ensure accuracy (as required by the Romanian specific regulation). Sales records to/from the Grid are to be used to ensure the consistency.* |
| *6. EF grid,y* | *Low* | *QA/QC procedures shall be adopted to ensure following up the annual revision of carbon emission factor calculated using the EU ETS installation level verified CO2 emissions and ANRE sustained electricity production data* |

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

>>

Data collecting & handling will be conducted in a transparent way to secure high quality of recording and storing of data. Data collected and monitored shall be stored electronically for a period (crediting period + two years from the last date of issuance of ERUs) that respects all relevant provisions of the UNFCCC regarding this type of projects (at least two years from the last crediting period).
The MP can be updated and adjusted to meet operational requirements, provided such modifications are approved by the verifier during the process of initial or periodic verification.

The baseline grid emission factor will be determined using the document "*Protocol for the annual establishment of carbon emission factor for grid-connected JI project on the basis of EU ETS verified emissions"* and performed annually by ANRE and NEPA/APNM under co-ordination of MESD. The emission factors will be calculated *ex-post* from actual power generation and fuel consumption data of selected EU ETS installations.
Eviva Nalbant intends to outsource the Technical Operation of the Babadag wind farm to a specialized company.
The **Scope of the Technical Operation** of the wind farm comprises:

- Operation Supervision
- Electrical Installations Operation Management
- Maintenance Works Supervision

The intended **key components** of the Technical Operation are the following:

- A Command & Control System installed in Babadag I and Babadag II
- A team comprising a Local Operator (located at a 15 min range from the wind farm site) and a Supervisor (located in the headquarters of the technical operation company)

**Command & Control System is intended to comprise:**

- All the relevant data from the wind turbines, electrical installations and met masts of the wind farm to be collected via an internal optical fiber network and directed to the Command Room of the Babadag I and II wind farm
- The hardware of the Command & Control System will be located in the Control Room. The main component of this system is a PLC (Programmable Logic Controller)
- The data that to be collected and acted upon by the PLC should enable:
    - A real time monitoring and controlling of the operation of the wind farm
        - Whenever there is a fault, an alarm is sent to the Local Operator and a quick reaction is assured (<15min)
        - The Local Operator then assesses the issue on site and finds a solution together with his Supervisor
    - Optimization of the Wind Farm Operation
        - An active management of the electrical installations set points is made in the Command & Control System to maximize the production of the wind farm and the quality of the produced electrical energy

- Also, an active management of the turbines will be performed by the wind turbine manufacturer, Suzlon, by monitoring the functioning of the turbines and assuring assistance in case of failure.

Both Babadag I and II wind farms need to communicate with several entities:

- **National Dispatcher (DEC – Dispecerul Energetic Central)**
  - Babadag I wind farm will be integrated in the Emergency Management System of the National Dispatcher (DEC), trough an independent fiber optical network.
  - The connection between Babadag I wind farm and DEC's network will be assured by Eviva Nalbant via optical fiber
  - Additionally, a dedicated phone line will be available on site for DEC

- **Distribution Dispatcher (DED – Dispecerul Energetic din Distributie)**
  - Babadag II wind farm will be integrated in the Distribution Management System the Distribution Dispatcher (DED), trough an independent optical fiber network.
  - The connection between Babadag II wind farm and DED's network will be assured by Eviva Nalbant via optical fiber
  - Additionally, a dedicated phone line will be available on site for DEC

- **Metering Department of ENEL (UTR Tulcea - Unitate Teritorială Reţea Tulcea)**
  - The information collected in ENEL's meters is sent via GSM to the Metering Department of ENEL (UTR Tulcea)

In terms of MP, the technical staff will register, the Supervisor /responsible of the BWPP will check crosscheck the net electricity produced. All operational data will be recorded while the delivery and sales documentation copies will be stored for documentation. The metering system comprises bidirectional meters. Both locations (Babadag I & Babadag II have two meters: commercial meter and witness meter). In case of meter failure, electricity sales data, in the form of ENEL's Metering Department approved invoices, shall be used for monitoring.

In order to be on the safe side, the local operator will manually read the meters (both, commercial and witness) once per month. Values for the four meters will be stored in a back-up archive. Data electronically collected will be crosschecked for consistency against the data in the manually created excel sheet.

All operational staff will have annual training scheme that include training on JI monitoring issues.

MP will be constituted by a workbook (in excel format), fully consistent with the baseline scenario identified.

| **Table D.1: MP management and operating system** | | |
|---|---|---|
| **Activities** | **CWP Operator and Management** | **Responsible** |
| Monitoring system | Review MP and suggest adjustments if necessary | Supervisor |
| Data Collection | Establish and maintain data measurement and collection systems for all MP indicators<br>Check data quality and collection procedures regularly | Technical operator |
| Data computation | Enter date in MP workbook | Technical operator |
| Data storage systems | Implement record maintenance system<br>Store and maintain records<br>Forward monthly and annual worksheet outputs | Technical operator |
| Performance monitoring and reporting | Analyse data and compare project performance with project targets<br>Analyse system problems and recommend improvements (performance management)<br>Prepare and forward periodic reports | Supervisor |
| MP Training and Capacity Building | Develop and establish MP training, skills review and feedback system<br>Ensure operational staff trained and enabled to meet needs of MP<br>Consider providing support to national authorities and other JI projects | Project team Supervisor |
| Quality assurance, audit and verification | Establish and maintain quality assurance system with a view to ensuring transparency and allowing for audits and verification<br>Facilitate audits and verification process | Project team EVIVA QA & QC Responsible |

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

>>

| | |
|---|---|
| Organisation: | eco2ro environmentally friendly solutions s.r.l. |
| Street/P.O.Box: | 15, Baraolt Str. |
| Building: | Bld 48, A, 1 |
| City: | Ploiesti |

| | |
|---|---|
| State/Region: | Prahova |
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| E-mail: | office@eco2ro.ro |
| URL: | www.eco2ro.ro |

## SECTION E. Estimation of greenhouse gas emission reductions

### E.1. Estimated project emissions:

>>

| Table E.1.1 Project emissions during 2008-2012 | | | |
|---|---|---|---|
| | 2011 | 2012 | 2011-2012 |
| Project emissions (t $CO_2$) | 0 | 0 | 0 |

The project is a zero emissions project

$$PEy = 0$$

Wind power does not create anthropogenic greenhouse gas emissions during operation, therefore project emissions are zero.

### E.2. Estimated leakage:

>>

No sources of leakages were identified, therefore:

$$Ly = 0$$

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

>>

$$PEy + Ly = 0$$

| Table E.3.1. Project emissions during 2008-2012 | | | |
|---|---|---|---|
| | 2011 | 2012 | 2011-2012 |
| Project emissions (t $CO_2$) | 0 | 0 | 0 |
| Leakage | 0 | 0 | 0 |
| Sum E.1 and E.2 | 0 | 0 | 0 |

### E.4. Estimated baseline emissions:

>>

Based on the calculation method explained in Section B.2., the grid emissions factor will be determined ex-post. In order to be able to drive the JI project through the JI project cycle, ex-ante estimation is used. The value of the ex-ante CEF is 833 $g_{CO2}$/kWh.

| Table E.4.1. Baseline emissions during 2008-2012 | | | |
|---|---|---|---|
| | 2011 | 2012 | 2011-2012 |
| Baseline emissions (t $CO_2$) | 58,034 | 71,427 | 129,461 |

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

>>

The emission reductions are those calculated in Section E.4:

$$ERy = BEy - PEy - Ly = BEy\,;$$

Therefore the expected emissions reductions are: 129461 $t_{CO2}$ in the period 2011-2012 (see Table E.5.1).

| Table E.5.1. Emission reductions during 2008-2012 | | | |
|---|---|---|---|
| | 2011 | 2012 | 2011-2012 |
| Emission reductions (t $CO_2$) | 58034 | 71427 | 129461 |

Data based on the Excel calculation sheet ("Babadag I + II + lucru _ v1.4_PDD")

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

>>

| Table E.6.1. Emission during 2008-2012 | | | | |
|---|---|---|---|---|
| Year | Estimated project emissions (tonnes of CO2 equivalent) | Estimated leakage (tonnes of CO2 equivalent) | Estimated baseline emissions (tonnes of CO2 equivalent) | Estimated emissions reductions (tonnes of CO2 equivalent) |
| 2011 | 0 | 0 | 58,034 | 58,034 |
| 2012 | 0 | 0 | 71,427 | 71,427 |
| Total (tonnes of $CO_2$ equivalent) | 0 | 0 | 129,461 | 129,461 |

## 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:**

>>

The Romanian Permitting procedure requires a thorough environmental analysis before the Construction permit is granted. Two permits are issued before construction works can start and multiple (public consultation) meetings are necessary, in order for the Environmental Permit to be issued.

In the last step in the Environmental permitting, an environmental authorization is issued and it grants its holder the right to operate an installation under conditions which ensure that the installation corresponds to the requirements for prevention and integrated control of pollution. The environmental authorization is obtained after the investment is made, but before starting its operation.

At all stages, documentations (different reports) must be prepared by an authorized environmental company/person.

As per the conclusions of the Environmental Impact Assessment performed for Babadag project, it is situated outside of natural protected areas and it has no transboundary impacts. as Romania does not have the experience of building and operating such type of projects, monitoring of environmental indicators during construction and (at least one year of) operation of the wind farm is required.

Tulcea Environmental Protection Agency issued the Environmental Permit no 2371/04.02.2009 and its first revision in 21.07.2010. A series of appropriate monitoring measures during the first year of operation of the park, especially regarding birds have been established. Data included in the monitoring are to be offered to the Environmental Protection Agency in order to be analysed.

In terms of JI, the National Commission on Climate Change issued an LoE considering that the project meets the legal requirements, including environmental ones.

**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:**

>>

According to the permitting procedure, the conclusions of the environmental impact assessment highlighted that impacts are not significant.

## SECTION G. Stakeholders' comments

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

>>

According to the Romanian Environmental permitting procedure, all investment projects pass a public consultation phase.

The EIA was submitted to the EPA for evaluation at the beginning of July 2008 (and the Permit was obtained in February 2009).

During 2008, the public opinion was asked through the process organized by Tulcea Environmental Protection Agency. No major comments were raised, except for one neighbor which owned agricultural land and wanted the Authorities to approve EVIVA project but under the condition that at a (future) moment he will decide to change the use of his land, EVIVA project has now influence over the approval of his projects. This requirement does not have legal basis.

Anyhow, the Romanian National procedure for using Joint Implementation (JI) mechanism under Track I (Romanian JI Track I Procedure) provides that the approval process consists of the following three steps:

1. Consultation of Ministry of Environment and Forest by the AIE and project participants during the PDD determination and project approval process;
2. Public consultation;
3. Formal appraisal of the PDD and the draft determination report for the LoA issuance

The PDD will be published on the Ministry of Environment and Sustainable Development website, and at international level, for a period of 30 days.

All comments received from the public during this period will be communicated to the project participants and the PDD will be updated accordingly.

Annex 1

## CONTACT INFORMATION ON PROJECT PARTICIPANTS

| | |
|---|---|
| Organisation: | SC EVIVA NALBANT SRL |
| Street/P.O. Box: | 12, Stelea Spataru str., sector 3 |
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| City: | Bucharest |
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| Represented by: | Manuel Silva |
| Title: | Country Manager |
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Annex 2

**BASELINE INFORMATION**

**How to compute the grid emission factor in Romania**

Since it is generally very complex to accurately identify beforehand the grid-connected capacity that will be replaced by the additional capacity of a greenfield project (after all, the capacity replaced will depend on such factors as grid capacity usage, load factor, weather conditions throughout the year, *etc.*), the baseline methodology will have to enable a reasonable estimate of the electricity production capacity that will appear at the margin of being disconnected when new electricity production capacity becomes online. The ACM0002 methodology allows for both calculating a weighted average of $CO_2$-eq. emissions of existing and operational plants, and estimating the $CO_2$-eq. emissions of plants that are planned and/or expected to be built and connected to the grid. The resulting emission factor is a so-called combined margin factor.

**Approach: EU ETS data set for Romania**
An average $CO_2$ emission factor (expressed in $gCO_2/kWh$) for the power grid of Romania will be calculated in order to determine a baseline emissions scenario. However, contrary to the ACM0002 (version 10) methodology, which has been developed for *ex ante* baseline calculation, for this project the $CO_2$ baseline emissions factor will be calculated on an *ex post* basis using data verified for Romanian electricity generation installations covered by the EU ETS.

This approach is a wider one, developed under a bilateral agreement between the Netherlands and Romania and it is meant to allow the Romanian Authorities to calculate a realistic Grid emissions factor, to be used by the JI projects developed in the energy field (energy generation). The project is currently undergoing and several project meetings took place between the different parties and stakeholders (including the National Energy Regulatory Authority, National Environmental Protection Agency, Ministry of Environment, NGOs, and Experts).

As will be explained below, the verified data set can be considered a solid representation of the composition of the Romanian grid-connected power production capacity as it contains both installations that have been operational for a long time and those that have been installed/refurbished during recent years (and even the ones to be commissioned in each year of the baseline).

The criteria formulated for selecting, from this data set, those installations that are likely to appear at the margin of being disconnected when new capacity comes on-line are presented subsequently.

A strong advantage of using these data is that they are verified within the ETS context (therefore by third parties) on an annual basis and published on the Internet site of the Ministry of Environment and Sustainable Development (MESD) or on the European ETS website.[40] Another advantage is that of considering all fossil fuel power generating capacities (excluding the must run and the CHP) and that no advantage to one or other fuel type in granted (inside the fossil mix).

The EU ETS has been operational since 2005. It allocates (through National Allocation Plans determined by Member States) allowances in the form of $CO_2$-eq emissions to a broad range of installations within the EU (presently around 12,000 installations). Installations can trade these allowances with other installations so that an EU market has emerged for trading of $CO_2$-eq emission allowances. The first phase of the ETS ended in 2007 and the present second phase coincide with the commitment period of

[40] CITL Internet site of the European Commission: http://ec.europa.eu/environment/climat/emission/citl_en.htm

the Kyoto Protocol (from 2008 through 2012). Romanian installations have been part of the ETS since Romania's accession to the EU on 1 January 2007.

Each Member State has to report on the $CO_2$-eq. emissions of its ETS installations during a particular year by April 30 of the following year at the latest. This implies that as of 30 April of each year the verified emission data for all ETS installations must be available. Given that almost all Romanian grid-connected electricity production capacities are covered by the ETS and that the non-ETS grid connected capacity is based on hydro and nuclear energy, which are unlikely to appear at the margin of being disconnected when new capacity comes online (for reasons explained below) and since the ETS verified data can be considered the best available data set for grid-connected $CO_2$ emissions in Romania, this approach delivers the most reasonable estimate of a baseline $CO_2$-eq. emission factor (expressed as grams of $CO_2$-eq per kWh).

However, as a consequence, since data on emissions for a particular year will only become available in the following year, using this data will imply an *ex-post* determination of the baseline emissions scenario for this project. For instance, the project's baseline for the year 2009 will be based on verified ETS data for grid-connected power plants in Romania for the year 2009, which will become available during the first half of 2010. This would be fully in line with the provision in the methodological "Tool to calculate the emission factor for an electricity system", adopted by the CDM Executive Board at its 35th meeting (Annex 12 of the meeting report), which recommends that for *ex-post* baseline calculations for grid-connected CDM power production projects data required to calculate the emission factor for year *y* would need to be available within six months after the end of year *y*; otherwise, data from year *y-1* may be used.

This would also imply that the baseline emission factors could differ across the years of the project's crediting lifetime.

**Approach: Defining the marginal capacity**
Another justification of using the Romanian ETS installations' data for the baseline calculations is that these installations produce power mainly with fossil fuel combustion (that is the reason why they have been included in the ETS in the first place). Usually, a country's power production capacity is as big as the highest annual peak in electricity demand, so that throughout the year there is excess capacity. Power plants are operated in different modes with nuclear energy and run-of-river hydropower plants normally being operational as many hours as possible because of their relatively low operational costs. According to the *Operational Guidelines for Baseline Studies, Validation, Monitoring and Verification of Joint Implementation Projects* (Vol.1, version 2.0; published by the Ministry of Economic Affairs of the Netherlands, October 2001), fossil fuel based plants, instead, are usually modulated depending on electricity demand developments while securing electricity supply. For the latter plants, it could generally be assumed that the higher the fuel costs and the lower the energy efficiency, the higher will be their variable costs and, therefore, it will be more attractive to reduce their operation when new capacity becomes available.

It is therefore reasonable to assume that grid-connected hydropower and nuclear power plant capacity (which are not included in the ETS) will not appear at the margin of being modulated when new capacity becomes available or when electricity demand increases (section A2). Consequently, hydropower and nuclear power plants will not be included in the baseline emission factor for Romania. However, as stated by the "Tool to calculate the emission factor for an electricity system" (adopted by the CDM Executive Board at its 35th Session), if 'coal' is obviously used as must-run, it should also be included in the list of must-run technology plants which are dispatched independently of the daily or seasonal load of the grid.[41] Tn the mentioned framework, for each year for which the baseline will be established, the

[41] CDM EB, "Tool to calculate the emission factor for an electricity system", Annex 12 of EB 35 report, footnote 3, p.4.

Romanian Energy Market Authority ANRE will be asked for its expert judgement about which of the coal-based grid-connected ETS plants in Romania can be considered low-cost, must run plants and therefore be excluded from the baseline calculations.

In addition, the baseline calculations will incorporate the issue that some power production technologies have, according to Romanian legislation, a preferential status in the dispatch order (*e.g.* co-generation for district heating, see also below). Capacity with a preferential dispatch treatment is unlikely to be replaced when new power production capacity becomes available, such as through a JI project. Therefore, similar to must-run and/or low operational cost power production technologies, power production capacity with a preferential dispatch status will not be included in the baseline $CO_2$ emission factor.

When an installation contains a heat-only boiler, then the emissions related to this heat production will be left out of installation's total annual $CO_2$ emissions.

**Approach: Combined Heat and Power connected to the electricity grid**

One further specific aspect that needs to be considered in this baseline methodology is how to deal with $CO_2$ emissions that originate from Combined Heat and Power (CHP or co-generation) plants. Within the context of Romania, most CHP plants are used for district heating.[42] Before 2002, heat was mainly produced for district heating by CHP plants owned by Termoelectrica (company resulted from the reorganization of the State owned RENEL, during late '90s). As part of the restructuring of the Romanian energy market, most part of Termoelectrica district heating and CHP plants have become independent and owned by the municipalities they used to supply with heat.[43]

An important general problem for district heating and CHP plants during the process of energy market transformation was that many households decided to disconnect from the centralised heating systems, because of increasing prices of the services, poor status of the heat distribution systems and lack of metering for individual measurement of heat consumption and lack of possibilities to adjust comfort. For CHP-based district heating this rate of disconnection could range from 3 % of total apartments to a share that drove towards shutting down of the system (Baia Mare).[44] Nowadays, the situation seems to have stabilised with a number of 5.5 million inhabitants connected to residential district heating systems.

CHP plants produce electricity and heat in a combined manner, which is much more efficient than producing heat and power in separate processes. CHPs could reach an efficiency level of over 90%, thereby increasing efficiency by 15-40% compared to separate processes. According to the OECD database,[45] about a quarter of Romania's electricity output in 2005 was produced by CHP plants. CHP plants in Romania operate on fossil fuel.

The complexity with CHP plants in Romania is that they are head demand driven and most of them over dimensioned, being built rather for meeting industrial heat demand. Should a CHP plant's delivery of electricity to the grid be reduced and in combination with that the heat production reduced, then extra heat needs to be produced elsewhere in order to be able to meet the municipality's baseload heat demand, which would still cause emissions of $CO_2$.[46] Therefore, calculating $CO_2$ emissions in terms of kWh of

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[42] SAVE II PROCHP, 2003. Promoting CHP in the Liberalised Energy Markets - Outline and Recommendations, with a case-study on: Romania – CHP in the Liberalised Market, http://www.kape.gov.pl/PL/Programy/Programy_UniiEuropejskiej/SAVE/aP_PROCHP/Promoting_CHP_in_Liberalised_Energy_Markets.pdf

[43] COGEN Romania: http://www.cogen.ro/

[44] http://www.anrsc.ro/main.php?mn=6&cont=date_stare_energetica

[45] http://oecd-stats.ingenta.com/OECD/TableViewer/tableView.aspx

[46] Although the efficiency of heat production in a heat-only boiler is generally higher, around 80%, then in a CHP, around 55%, so that $CO_2$ per kWh heat produced would become lower, see WADE, 2003, *Guide to Decentralised Energy Technologies*, December 2003.

electricity produced and including this emission factor in the baseline would not be a conservative approach.

In principle, there would not be a large difference between CHP plants that are driven by heat demand with electricity as a 'residual' product and CHP plants driven by electricity demand with residual heat production. In both cases, the heat demand will have to be met with an alternative technology. Generally, it is considered inefficient to disconnect CHP-based electricity from the grid as this would reduce the efficiency of CHPs and it is therefore reasonable to give these plants a preferential treatment in the dispatch procedure.

With a view to the above, and in order to follow a conservative approach, CHP plants will be treated as follows in this baseline methodology. When CHP plants have, according to Romanian legislation, a preferential status in the dispatch order, then these plants will be left out of the baseline as they are unlikely to become marginal plants due to a JI project.[47]

All other CHPs which deliver electricity to the grid and which are included in the EU ETS, but which are not serving district heating purposes (but, instead, *e.g.* CHPs delivering industrial heat/steam), will be treated as follows. For these plants, the total energy output will be taken (heat and power) and expressed in GWh (by converting heat output from PetaJoule to GWh by a conversion rate of 1000/3.6). Subsequently, a CHP plant's annual $CO_2$ energy output will be divided by its total annual energy output (instead of electricity alone). Therefore, for these plants the $CO_2$ emission factor that is included in the overall electricity grid factor will become lower. Applying this rule has the advantage that no site-specific analysis is required of the efficiency rate at which the heat demand will be met if not in a CHP plant.

**Approach: Nuclear electricity**
*Ex post* baseline determination will also enable a careful incorporation of the impact on the Romanian power production of the commissioning of the second unit of the Cernavoda nuclear power plants in late 2007. This second unit (700 MW capacity) is increasing the share of nuclear power-based electricity production in Romania from 13.1% in 2007 to about 20% (please see statistics for year 2008 in Section A2).

**Approach: Electricity imports**
A final issue that has been considered in this project design document is the possible incorporation of electricity imported to the grid from abroad. Generally, within the CDM context, electricity imports are referred to as electricity transported from one grid to another grid within the same host country. Such situations may occur in countries which have layered dispatch systems (*e.g.* provincial/ regional/ national). When a project boundary chosen is a regional grid, then also electricity acquired from other regional grids will need to be incorporated as this electricity import could also appear at the margin when new capacity becomes available through a JI or CDM project. However, such layered dispatch systems are usually bound by the borders of a host country, which is why the above-mentioned CDM-based tool ("for calculating a baseline emission factor for an electricity system") states that electricity imports must be determined as far as they are from a connected electricity system within the same host country. Following this reasoning, electricity imports in Romania will be left out of the modified grid-factor

[47] By Energy Efficiency law – no. 199 / 2000, CHP plants delivering heat to the residential sector have guaranteed access to the electricity grid. However, there could be reasons in actual practice for a reduced delivery, such as unfavourable electricity and energy source price developments and difficulties with concluding longer-term purchasing power agreements. Nonetheless, such reduced delivery would unlikely be caused by the extra JI project electricity capacity, so that these CHP plants for district heating could be left out of the baseline for ex-ante baseline emission factor purposes. In the *ex-post* analysis, however, a situation may occur that the non-delivery of power by CHP plants to the grid could result in a reduction of electricity supply, so that it could become unnecessary to disconnect non-CHP power producing plants. That judgement will be part of the ex-post baseline determination model described below.

baseline calculations. Moreover, given that Romania's electricity import in 2008 (0.92 TWh) was only 1.5 % of all electricity supplied to the grid (*Raport Privind Rezultatele monitorizării Pieţei De Energie Electrică, În Luna Decembrie 2008*, ANRE)[48], including electricity import would, for the time of the crediting period, make a small difference only in the $CO_2$ baseline emission factor.

The subsequent table represents the basis for choosing the marginal plants as per the Protocol and according to the bilateral project under development. The result of the project will be the calculation and publication of the Romanian Grid CEF which will be used by the project participants to calculate the baseline emissions/emissions reduction of the CWP project. The power plants mentioned in the column represent the Romanian energy producers included in the EU – ETS. From this list, the Romanian Authorities have exclude the must run capacities, following up the steps below:

1. From the list of Romanian EU ETS installations annually published on the Internet (http://ec.europa.eu/environment/climat/emission/citl_en.htm) those installations will be selected which generate electricity for the Romanian electricity grid.
2. The National Energy Regulatory Authority (ANRE) will, based on its professional judgement, remove from this EU ETS list those power producing installations which have had a preferential status in the dispatch procedure (*e.g.* CHP for district heating) and coal-based power plants that are "unlikely to appear at the margin" must-run installations and which have low variable costs (*e.g.* Turceni and Rovinari).
3. This final worksheet list with marginal, **baseline** installations will be copied: one copy stays with ANRE and one copy is provided to the Romanian Environmental Protection Agency NEPA/ANPM.
4. ANRE will complete its copy of the worksheet with the power output data for the selected ETS installations in Romania for the baseline year. It is important to note that these output data are confidential and will not be disclosed to the project participants (otherwise, the entire procedure is safeguarding the confidentiality principle). The ANRE copy of the worksheet will only be made available for verification purposes. ANRE will provide the total electricity production figure for grid-based marginal capacity ETS installations to MEF and/or to NEPA/ANPM.
5. In the NEPA/ANPM copy of the worksheet, $CO_2$ emission data for each installation will be collected by NEPA/ANPM from the MEF EU ETS database or the Community Independent Transaction Log (http://ec.europa.eu/environment/climat/emission/citl_en.htm) and filled in the worksheet. This results in a total $CO_2$ emission figure for the selected marginal ETS installations.
6. NEPA/ANPM will deduct the $CO_2$ emissions from heat-only boilers (HOB) in case an installation includes one or more HOBs;
7. NEPA/ANPM will provide MEF with the total annual $CO_2$ emissions related to electricity production by marginal ETS installations, excluding the emissions from HOBs.
8. The final phase of the CEF Data Collection Protocol consists of dividing the total $CO_2$ emissions figure (under 7) by the total electricity output (under 4) in order to obtain a $CO_2$ emission factor for baseline determination purposes (expressed in $gCO_2/kWh$). ***MEF will calculate this factor and publish it on its website from where JI project participants will obtain it for the purpose of calculating JI project emission reductions***. Therefore, individual installation data will not be disclosed to any project participants.

Table Annex 2.1

| ETS power producing installations, Romania | Annual $CO_2$ emissions (excl. heat-only boilers) for each | Total electricity output (only aggregate figure provided to |
|---|---|---|

[48] http://www.anre.ro/documente.php?id=654

| | | installation - by *NEPA/ANPM* | MESD and/or NEPA/ANPM) - by *ANRE* |
|---|---|---|---|
| 1 | 1 SC Termoelectrica SA - SE Borzesti | | |
| 2 | 2 SC Termoelectrica SA - SE Braila | | |
| 3 | SC Termoelectrica SA - SE Doicesti | | |
| 4 | SC Complex Energetic Craiova SA - SE Isalnita | | |
| 5 | SC Complex Energetic Rovinari SA | | |
| 6 | SC Complex Energetic Turceni SA | | |
| 7 | SC Electr.centrt.Bucuresti-CET Iernut | | |
| 8 | SC CET ARAD SA - CET Lignit | | |
| 9 | SC CET ARAD SA - CET Hidrocarburi | | |
| 10 | SC TERMOFICARE 2000 SA - Pitesti Sud | | |
| 11 | SC TERMOFICARE 2000 SA - Gavana | | |
| 12 | SC TERMON SRL | | |
| 13 | SC CET SA Bacau - Inst nr 1 | | |
| 14 | SC Electrocentrale Oradea SA | | |
| 15 | SC CET Brasov SA - CET Brasov | | |
| 16 | SC CET SA Braila | | |
| 17 | SC Electr.centrt.Bucuresti-CET Progresu | | |
| 18 | SC Electr.centrt.Bucuresti-CET Bucuresti Vest | | |
| 19 | SC Electr.centrt.Bucuresti-CET Titan | | |
| 20 | SC Electr.centrt.Bucuresti-CET Grozavesti | | |
| 21 | SC Electr.centrt.Bucuresti-CET Bucuresti Sud | | |
| 22 | SC Vest Energo SA | | |
| 23 | SC Electr.centrt.Bucuresti-SE Const.-CET Palas | | |
| 24 | CCNE CT ZONA SOMES NORD | | |
| 25 | SC CET ENERGOTERM RESITA SA | | |
| 26 | SC Termica SA Targoviste | | |
| 27 | SC Compl.Energ.Craiova SA-SE Craiova II | | |
| 28 | SC ELECTROCENTRALE GALATI SA | | |
| 29 | SC Uzina Termoelectrica Giurgiu SA | | |
| 30 | SC Termoelectrica SA - SE Paroseni | | |
| 31 | SC Electrocentrale Deva SA | | |
| 32 | SC CET IASI SA CET Iasi I | | |
| 33 | SC CET IASI SA CET Iasi II | | |
| 34 | R.A.A.N. Sucursala ROMAG TERMO | | |
| 35 | SC DALKIA TERMO PRAHOVA SRL Punct de lucru Brazi | | |
| 36 | SC UZINA ELECTRICA ZALAU SA | | |
| 37 | SC CET Govora SA | | |
| 38 | SC TERMICA SA Suceava - CET pe huila | | |
| 39 | CET TIMISOARA Centru | | |
| 40 | SC ENET SA Focsani | | |
| 41 | SC CET GRIVITA SRL | | |
| 42 | Societ. National "Nucl.electr." SA-Dir.CNE Cern.v. | | |
| 43 | SC Enercompa SRL | | |
| 44 | SC NUONSIB SRL | | |
| | **Total** | | |

Annex 3

## MONITORING PLAN

The monitored data will be obtained from the meters installed as per the provisions of the "Grid Connection Technical Accord" (based on the detailed design) and the Measurement Code issued by ANRE[49].

The meters will measure both electricity exported and electricity consumed and are to be based at the point where invoicing happens.

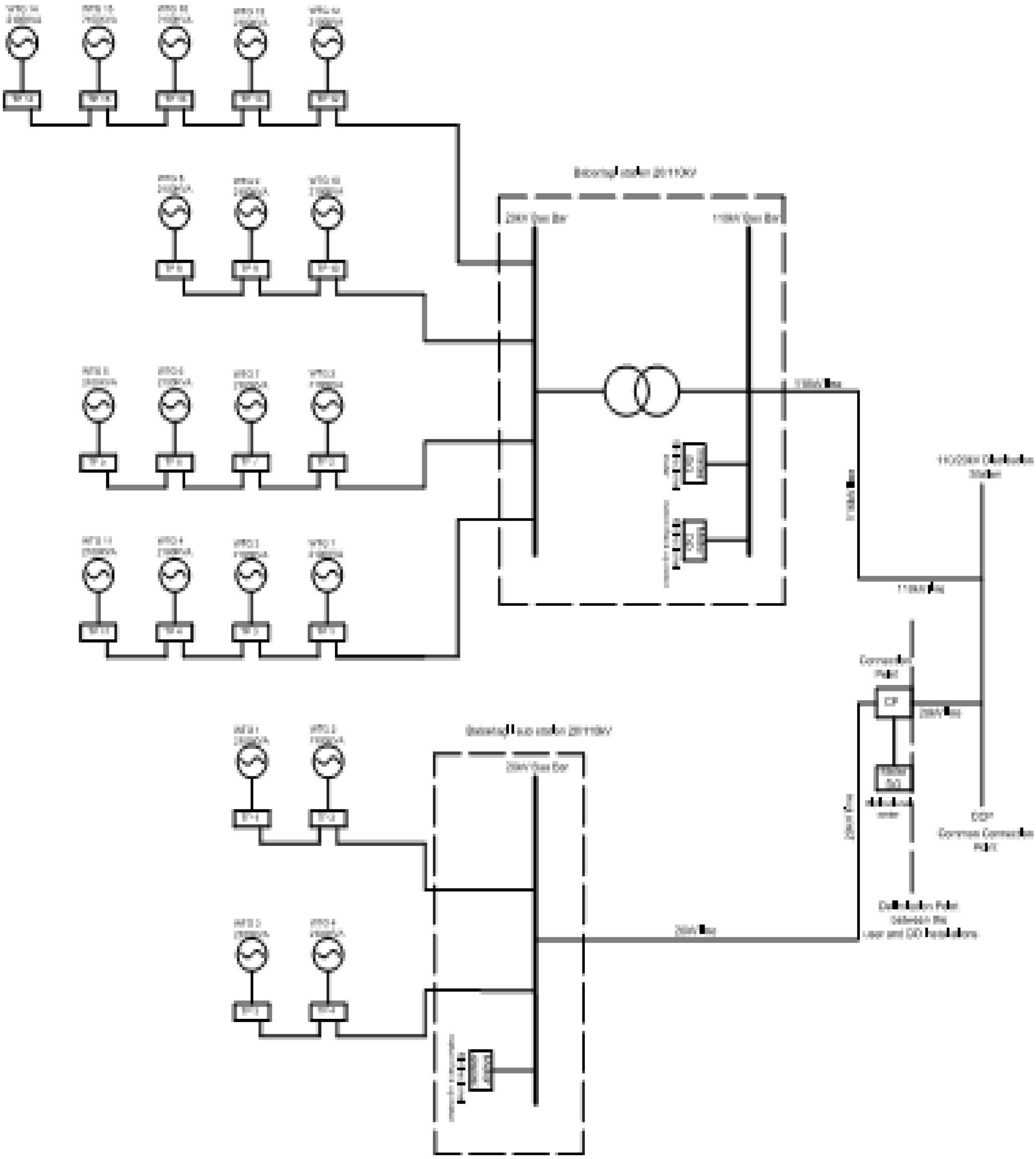
All installed meters will respect the National Code for power generators mentioned previously, along with its associated standards (this is a condition for being connected).

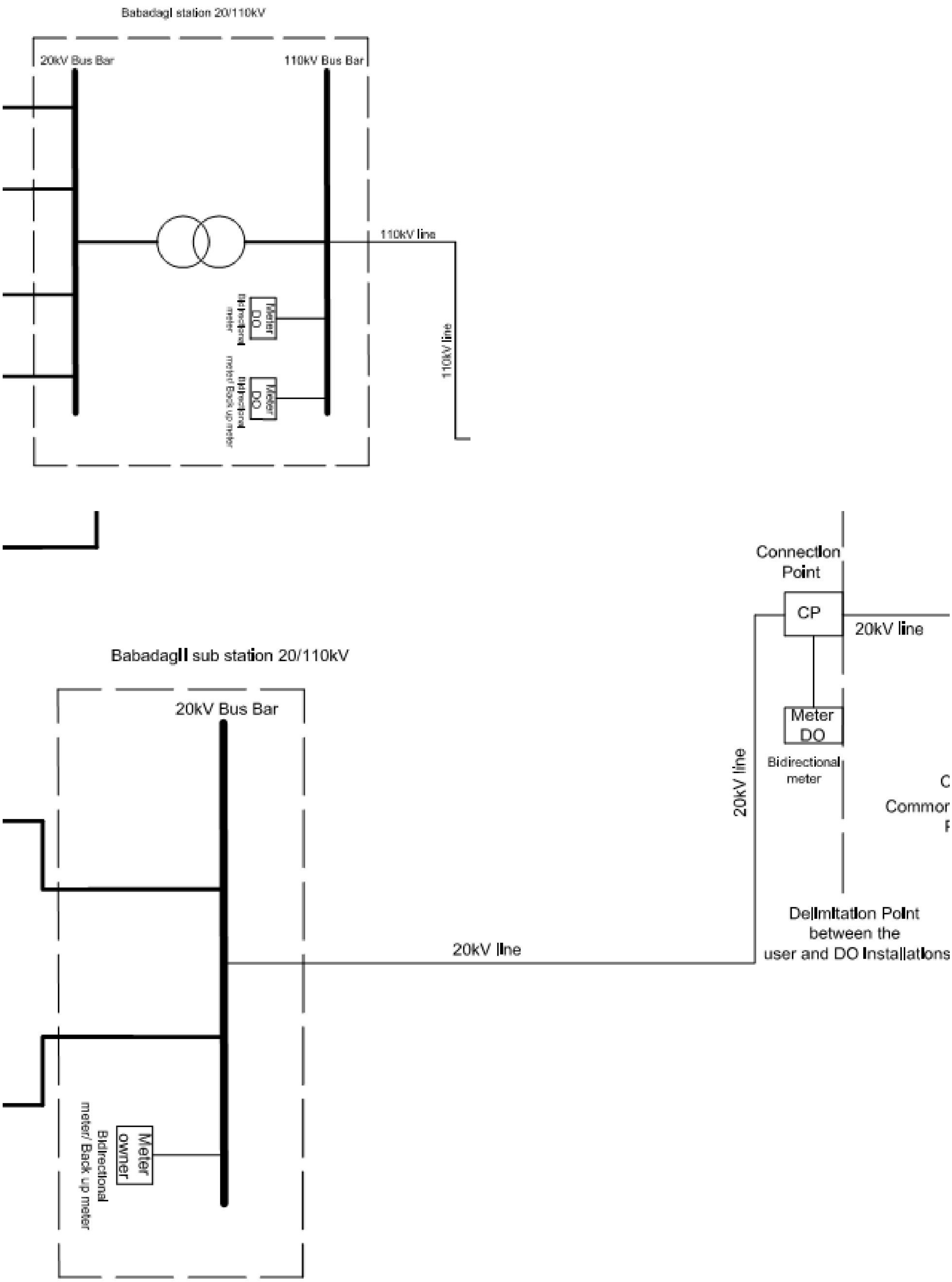
Once installed, meters are transferred to the ownership of the National operator in charge of measuring power. In this case the entity acting as measuring operator is OMEPA. OMEPA was set up as a TRANSELECTRICA branch, as per the Decisions No. 3/22.01.2002 and 22/18.06.2002 on reshaping the Company's activities. OMEPA is operating as an economic entity, performing all accounting operations necessary for checking power balances across the grid as per provisions of the Accounting Law no. 82/1991.

[49] http://www.anre.ro/documente.php?id=251 " **Codul de masurare a energiei electrice - Ord. 17 /2002**"

Annex 4. Details of single line digram

Babadag WPP single line diagram




Babadagl station 20/110kV
20kV Bus Bar
110kV Bus Bar
110kV line
Meter DO
Bidirectional meter
Meter DO
Bidirectional meter/ Back up meter
110kV line
Connection Point
CP
20kV line
Meter DO
Bidirectional meter
20kV line
Commor
Delimitation Point between the user and DO Installations
Babadagll sub station 20/110kV
20kV Bus Bar
20kV line
Meter owner
Bidirectional meter/ Back up meter