JOINT IMPLEMENTATION PROJECT

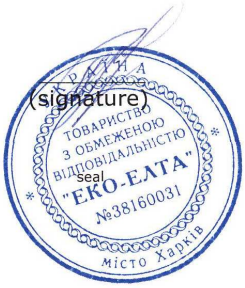
"The Reconstruction of the Electricity Grid of the "Sumyoblenergo" PJSC. in order to lower the electricity transportation loses"

(project title)

Position of the head of the company, project developer

Director "Eco-Elta" LLC
(position)

(signature)



seal

Rogoviy Maksym Ivanovich
(surname, name and patronymic of the person)

Position of the head of the company, project owner, owner of the source

Chairman of Board of the "Sumyoblenergo" PJSC
(position)

(signature)

seal

Dyrbavka Igor Bogdanovych
(surname, name and patronymic of the person)

Kharkiv, 2012

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

CONTENTS

SECTION A. General description of the project

A.1. Title of the project:

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Title: **"**The Reconstruction of the Electricity Grid of the "Sumyoblenergo" PJSC. in order to lower the electricity transportation loses**"**

Sectoral scope 2: Energy distribution.

Version: 1.1

Date: 7 December 2012

A.2. Description of the project:

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The "Sumyoblenergo' PJSC supplies the electricity for the all Sumy region of Ukraine.
The first power plant in the current territory of the Sumy region was built in 1902 in Sumy town. There were two steam lokomobiles with the generatos by "Wolf" company with the overall capacity of kW.

In 1903 the 50 kW power plant was built in Okhtyrka town ordered by the trading association. The first power plants in Glukhiv, Romny and Konotop were built in 1912 – 1914.

In 1931 the "Sumyenergo" enterprise was created to continue the development of the Sumy region electricity grid.

During the WWII the electricity infrastructure of the region was totally destroyed.

Sumy town was freed from the fascists on the 2 September 1943. And straight after that, on 11 September 1943 "Sumyenergo" resumed the operation. Two small steam lokomobile power plants were put into operation. The reconstruction of the demolished power plant in Sumy has started. The power plant with the steam lokomobile and the generator 120 kW was put into operation 1944. In 1946 the 300 horse power "MAN" diesel was mounted and put into operation on the power plant. In 1949 a 900 horse power "Enterprise" energy carriage was started. The CHP of the mashinery plant named afdter Frunze has also delivered the electricity into the Sumy town grid.

The 24 MW thermal power plant was built in Sumy in 1957 to satisfy the growing demand.

In this time also the wide implementation of the electricity in the agricultural production.

In 1959 the designing and the building of the first 330 kV electricity grids was started to provide the electricity for the agricultural consumers. The first line "Zmiyiv SRPP - Sumy" with the substation 330(310)/35/6,3 kV with the 120 MW transformer was put into operation in Sumy in 1964. In 1965 the 330 kV transmission line "Sumy - Konotop" and the 330/110/10 kV substationwith the 63 MW transformer in Kanatop town were put into operation.

The Sumy high voltage grid enterprise was developed in 1964 for the high voltage grids and substations servicing. The local grids were serviced by the Sumy production grid enterprise. The rural grids were under control of the "Silenergo" enterprise, which was in 1960 reorganized into a regional agricultural energy servicing enterprise.

In 1970 the high and low voltage servicing enterprises were united into a "The enterprise of the Sumy electricity grids".

In 1978 three separate enterprises were created in Sumy region – The Central Sumy Electricity Grids Enterprise, The South Sumy Electricity Grids Enterprise and Shostka Electricity Grids Enterprise. All of them were under control of the "Kharkivenergo" Company.

In 1990 in the Sumy region (Romny district) the construction of the first stage of the 750 kV substation "Pivnichnoukrainska" and the high voltage 750 kV transmission line "Kurska AES – Pivnichnoukrainska".

In 1995 according to the President of Ukraine Order № 282 dated 04 April 1995 the State Joint-Stock Company "Sumyoblenergo" was created. The main activities of the company were – transportation and distribution of the electricity to the suppliers.

On October 1, 1998 the General Meeting of the Shareholders have decided to create an Open Joint Stock Company "Sumyoblenergo", which is the assignee of the State Joint-Stock Company "Sumyoblenergo"

At the latest General Meeting of the Shareholders on April 22, 2011 there was a desigion made to create the "Sumyoblenergo" PJSC, which is the assignee of the Open State Joint-Stock Company "Sumyoblenergo".

In the early 2000s the situation in the energy sector of Ukraine was quite bad. All the major generating and transmission equipment was in bad technical condition. The lack of financing lead to the equipment efficiency decrease. In the case of the electricity transportation it means the increase of the electricity loses in a grid during the transportation. So, the **Baseline Scenario** is that the efficiency of the electricity transportation through the ""Sumyoblenergo" PJSC grid was getting lower and the electricity loses were rising constantly.

In this situation the Investment Program of the "Sumyoblenergo" PJSC was settled and the Project implementation had started. The decision for the Project implementation was based on the information of the possibility of the Joint Implementation mechanism use for the partial investment refund.

The Project foresees the implementation of the electricity loses reduction measures at the transmission lines of the "Sumyoblenergo" PJSC. as well as the electricity transportation and loses registration precision increase measures.

The electricity loses reduction measures at the transmission lines include the replacement of the power transformers with the installation of the more efficient ones (with the less loses coefficient), the replacement of the depreciated and outmoded parts of the transmission lines to increase their capacity and reduce the transportation electricity loses.

There also the power transmission towers replacement will be implemented to ensure and increase the security and reliability of the equipment use.

Thus due to the above-mentioned actions the specific electricity loses at the grid will be lowered. That will lead to the electricity production reduction at the Ukrainian TPPs by the value of the electricity loses reduction that, in its turn, will lead to the GHG emission reduction.

The technological aspect of the Project foresees:

1. The replacement of the power transformers at the electricity substations that will lower the loses significantly (2003 - 2023). For example, in 2006 at the substation Davydovka-Pivnichna-110 the transformer TDTNG-31500/110 (loses coefficient – 5,05) was replaced by the TDTN-40000/110 (loses coefficient – 0,21) transformer.

2. The replacement of the cables and wires of the transmission lines by the armored ones (AS/ASO/ASU types) with the bigger section and, as the result, reliability (2003 - 2023).

3. The installation of the glass and polymeric insulators (2003 - 2023).

4. The replacement of the 1- and 3- phase electricity meters for the electronic ones.

5. The purchase of the equipment for the accurate electricity meters operation.

6. The implementation of the Automatic Electricity Control and Accounting System based on the NP-06 electricity meters.

The technology that will be implemented by the Project is the modern and up-to-date. It will not be replaced for at least 20-30 years.

A.3. Project participants:

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Party involved (*)	Legal entity project participants (as applicable)	Please indicate if the Party involved wishes to be considered as project participant (Yes/No)
Ukraine (Host Party)	"Sumyoblenergo" PJSC	No
Poland	«IMEX ENERGO», sp. z o. o.	No

* Please indicate if the Party involved is a host Party.

- "Sumyoblenergo" PJSC
  Project Owner, Owner of the emission reduction units
  USREOU code: 23293513
  The main acrivities are:
  35.13 Electricity distribution
  35.11 Electricity production
  35.12 Electricity transportation
  42.22 Electricity supply and telecomunication constructions building
  43.21 Electricity mounting
  71.12 Engeneering, geological and geodesy activities; technical consulting in these areas.

- «IMEX ENERGO», sp. z o. o.
  The potential buyer of the emission reduction units.

A.4. Technical description of the project:

A.4.1. Location of the project:

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The Project is implemented in Ukraine.

Figure 1. Ukraine

A.4.1.1. Host Party(ies):

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The "Sumyoblenergo" PJSC provides electricity transportation and supply services in the Sumy region of Ukraine.

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

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Sumy region, Eastern Part of Ukraine

Figure 2. Sumy region[1]

[1] http://travel.kyiv.org/map/e_sumy.gif

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

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The JI Project is implemented at the territory of the Sumy region of Ukraine, including the towns and Cities.

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

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The JI Project is implemented at the territory of the Sumy region of Ukraine.

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

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The Electricity Grids are used for the transportation and the distribution of the electricity by means of the wires placed on the open air and fixed by the insulators and the linear fittings at the towers. The main measures that will be implemented by the owner of the Project are:

- the modernization and the rehabilitation of the existing equipment to ensure it's accurate operation, the reliability and the transportation loses reduction;
- the implementation of the new modern equipment to increase the reliability of the whole electricity grid.

For these purpose the Project foresees such a measures:

1. The replacement of the power transformers for the new and more powerful ones at the electricity substations that will lower the loses significantly (2003 - 2023). For example, the substitution of the transformers TDTNG-31500/110 with the nominal capacity of 31 500 kVA and the loses coefficient – 5,05 by the TDTN-40000/110 with the nominal capacity of 40 000 kVA and loses coefficient – 0,21 transformers.

The reconstrustion of the substations leads to the electricity loses decrease, the equipment reliability increase and, as the result, to the GHG emission reduction.

Figure 3. The Power transformer at the Substation before the reconstruction

Figure 4. The The Power transformer at the Substation after the reconstruction

Figure 5. The Circuit Breakers before and after the Reconstruction.

Figure 6. The Control Panel of the Substation before and after the Reconstruction

2. The Project foresees the replacement of the cables and wires of the transmission lines by the new ones (AS/ASO/ASU types – aluminium cable with the steel core basic, armoured and the lightened ones

respectively) with the bigger section and, as the result, reliability (2003 - 2023). That measure gives the opportunity to increase the reliability of the grid, to lower the tension at the wires and lower the electricity transportation loses and the GHG emission. These wires have a bigger section and better transmission coefficient.

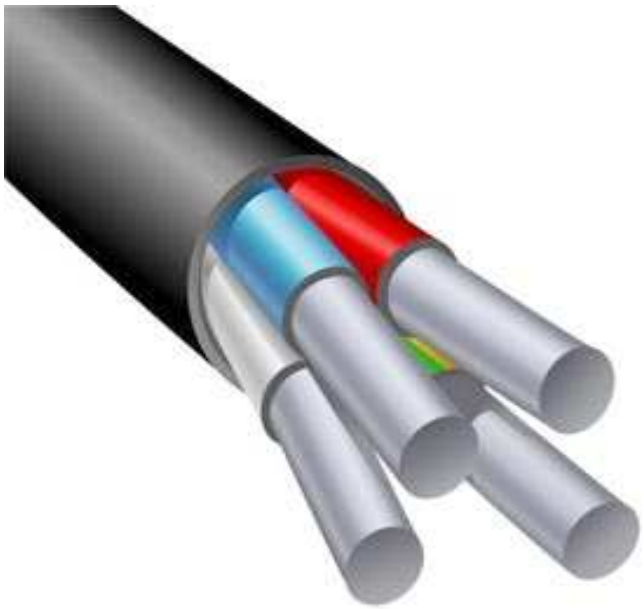

Figure 7. Self-supporting insulated wire.

3. The other significant aspect of the Project is the installation of the glass and polymer insulators (2003 - 2023). That is the important part of the electricity transmission process and the reliability of the insulators makes an influence on the value of the electricity transmitted. These insulators have a higher insulation efficiency.

Figure 8. The glass insulator

Figure 9. Polymer insulators

4. The Project foresees the replacement of 1- and 3-phase electricity meters for the new, more reliable electronic ones with the accuracy class 0,2 – 0,5. These measures allow the more accurate definition of the quantity of the electricity effectively consumed. That leads to the electricity consumption and, as the result, the production lowering. And as the electricity production is lowered, the GHG emission is also reduced (2003 - 2013).

5. The purchase of the equipment for the accurate electricity meters operation (2003 - 2013).

6. The implementation of the Automatic Electricity Control and Accounting System based on the NP-06 electricity meters (2008 - 2013). That is very important issue for the effective electricity consumption implementation.

The Project activity doesn't need a specific technical economical assessment.

The technology that will be implemented by the Project is the modern and up-to-date and is not a common practice in Ukraine. It will not be replaced for at least 20-30 years.

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 main objective of the Project activities is to reduce the electricity loses during the transportation through the electricity grids of the "Sumyoblenergo" PJSC. That will lead to the to the GHG emission reduction from the fossil fuel combustion for the electricity production at the Ukrainian power plants by the volume of the loses reduction.

The Project Owner activity is ruled by the wide range of the legal acts of Ukraine. For example:

1. The Law of Ukraine "On Power Industry" №575/97-BP dated 16.10.1997y.[2];
2. The Resolution of The National Comission for the Power Industry Regulation of Ukraine "On Approval of the Rules of the Power Use" №28 dated 31.07.1996y.[3];
3. The Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Order of State Supervision in the Power Industry" №189 dated 15.02.1999y.[4];
4. The Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Sanctions for the Violations of the Law on Power ndustry" №1139 dated 19.07.2000y.[5];
5. The Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Order of the Fining of the Business Entities for the Violation of th Law on Power Industry and Heat Supply" №1312 dated 21.07.1999y.[6];
6. The Law of Ukraine "On Energy Saving" №74/94-BP dated 01.07.1994y.[7];
7. The Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Rules of the Electricity Transmission Lines" №209 dated 04.03.1997y.[8];
8. The Law of Ukraine "On the Licensing of the Certain Economic Activities" №1775-III dated 01.06.2000y.[9];
9. The Law of Ukraine "On Natural Monopolies" №1682-III dated 20.04.2000y.[10];
10. The Resolution of The National Comission for the Power Industry Regulation of Ukraine "On the Order of the Definition of the Class of the Consumers" №1052 dated 13.08.1998y[11]. and others.

According to the above mentioned legal acts the "Sumyoblenergo" PJSC does not set the price for it's services (tarifs). Besides, the acts mentioned define the order of the tarifs setting, which does not encourage the power transmission companies to reduce the power loses, because it will not be compensated. There is no financial benefit for the Project Owner from the Project implementation. Thus, the only motive for the Project implementation is its registration as a JI Project and the posibility of the emission reduction units purchase. So, the Project activity is not a common practice for the electricity transmission companies in Ukraine.

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

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During the Project crediting period, monitoring data will be used to determine the actual realized emission reductions in compliance with the annual energy transportation value. For the period 2004 – 2011 the actual data of the the volume of the electricity supplied to the Grid (***Qybl***), the carbon dioxide emission factor for the production of the electricity, supplied to the Grid in Ukraine ***(EFy***), factual transportation electricity loses (***Vy***) was used. To calculate the emissions and emission reductions during 2012 – 2023 the planned data was used.

The period of 20 years was taken because the reconstruction of the generating equipment extends its operational lifetime to 20 years.

[2] http://zakon2.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=575%2F97-%E2%F0

[3] http://zakon2.rada.gov.ua/laws/show/z0417-96

[4] http://zakon3.rada.gov.ua/laws/show/189-99-п

[5] http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=1139-2000-%EF

[6] http://search.ligazakon.ua/l_doc2.nsf/link1/KP991312.html

[7] http://zakon1.rada.gov.ua/laws/show/74/94-вр

[8] http://zakon2.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=209-97-%EF...

[9] http://zakon2.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=1775-14

[10] http://zakon2.rada.gov.ua/laws/show/1682-14

[11] http://www.cogeneration.com.ua/ru/analytics/legislative-regulation/nkre/N-1052__13-08-98/

The calculations provided for the three periods: 2004-2007 (48 months), 2008-2012 (60 months), 2013-2023 (132 months). The calculations for 2004-2012 covers the energy efficiency measures implemented in these years by the Project Owner. These measures allowed achieving the lowering of loses coefficient, as the result, the emission reductions. The calculations for 2013-2023 were made with the assumption of the continuation of the JI mechanisms in these years.

Table 1. ***Annual estimation of emission reductions in the early credits period***

	Years
Length of the period	4
Years	Estimate of annual emission reductions in tCO2eq.
2004	174219
2005	181580
2006	179857
2007	196414
Total estimated emission reductions over the Period (tCO2eq.)	732070
Annual average of estimated emission reductions over the period (tCO2eq.)	183017

The total amount of emissions reduction is 732 070 tCO2eq.
The annual average amount of GHG emissions is 183 017 tCO2eq.

The example of the Emission Reduction calculation for the 2007:

The volume of the electricity supplied to the Grid (***Qy***) in 2007 was 2 932 010 MWh;
The factual volume of the electricity loses (***Vy***) in 2007 was 274 198 MWh, which is 9,35 % of the electricity supplied.
The electricity loses coefficient in the Baseline scenario (***PPER***) was 17,65 % of the volume of the electricity supplied to the Grid.
The carbon dioxide emission factor for the production of the electricity, supplied to the Grid in Ukraine ***(EFy)*** was estimated as 0,807 tCO2eq./MWh.
Thus, the Baseline Emission (***BEy***) in 2007 was:
BEy = 2 932 010 * 0,1765 * 0,807 = 417 691 tCO2eq..
The Project Emission in 2007 was:
PEy = 274 198 * 0,807 = 221 278 tCO2eq..
The Emission Reductions in 2007 were:

***ERy* = 417 691 – 221 278 = 196 414 tCO2eq.**

The final values were taken from the Microsoft Excel calculation sheet, where the roundings for the coefficients are more accurate.

Table 2. Annual estimation of emission reductions for the crediting period

	Years
Length of the crediting period	5
Years	Estimate of annual emission reductions in tCO2eq.
2008	267630
2009	229019
2010	284398
2011	291894
2012	291894

Total estimated emission reductions over the crediting period (tCO2eq.)	1364835
Annual average over the crediting period of estimated reductions (tCO2eq)	272967

The total amount of emissions reduction is **1 364 835** tCO2eq.
The annual average amount of GHG emissions is **272 967** tCO2eq.

The example of the Emission Reduction calculation for the 2009:

The volume of the electricity supplied to the Grid (***Qy***) in 2009 was 2 723 953 MWh;
The factual volume of the electricity loses (***Vy***) in 2009 was 271 899 MWh, which is 9,98 % of the electricity supplied.
The electricity loses coefficient in the Baseline scenario (***PPER***) was 17,65 % of the volume of the electricity supplied to the Grid.
The carbon dioxide emission factor for the production of the electricity, supplied to the Grid in Ukraine ***(EFy)*** was estimated as 1,096 tCO2eq./MWh.
Thus, the Baseline Emission (***BEy***) in 2009 was:
BEy = 2 723 953 * 0,1765 * 1,096 = 527 020 tCO2eq.
The Project Emission in 2009 was:
PEy = 271 899 * 1,096 = 298 001 tCO2eq.
The Emission Reductions in 2009 were:
***ERy* = 527 020 – 298 001 = 229 018 tCO2eq.**
The final values were taken from the Microsoft Excel calculation sheet, where the roundings for the coefficients are more accurate.

Table 3. ***Annual estimation of emission reductions for the post-Kyoto period***

	Years
Length of the crediting period	11
Years	Estimate of annual emission reductions in tCO2eq.
2013	291894
2014	291894
2015	291894
2016	291894
2017	291894
2018	291894
2019	291894
2020	291894
2021	291894
2022	291894
2023	291894
Total estimated emission reductions over the crediting period (tCO2eq.)	3210834
Annual average over the crediting period of estimated reductions (tons of CO2 e)	291894

The total amount of emissions reduction is **3 210 834** tCO2eq.
The annual average amount of GHG emissions is **291 894** tCO2eq.

A.5. Project approval by the Parties involved:

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The Letter of Endorsement #3774/23/7 dated 07.12.2012 has been received from the State Environmental Investments Agency of Ukraine.

The project has been approved by the Host Party. Letter of Approval #890/23/7 dated 14/03/2013 has been issued by State Environment Investment Agency of Ukraine. Letter of approval #DOPpek-4430-33/11551/13/MK/EBS dated 22/03/2013 has been issued by Ministry of Environment protection of Poland, the Party-buyer of ERUs

SECTION B. Baseline

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

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A baseline for a JI project has to be set in accordance with Appendix B of the Annex to decision 9/CMP.1 (JI guidelines), and with the "Guidance on criteria for baseline setting and monitoring, version 0.3" [12] developed by the Joint Implementation Supervisory Committee (JISC) (hereinafter referred to as "Guidance").

A JI specific approach regarding baseline setting and monitoring has been developed in accordance with Appendix B of the JI Guidelines and with the JISC Guidance.

Project will use a baseline in accordance with the Methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 04.0.0) [13]. Using this tool is a common practice in determining the baseline and demonstrateion additionality.

Baseline scenario is determined according to the following four Steps:
STEP 1. Identification of alternative scenarios;
STEP 2. Barrier analysis;
STEP 3. Investment analysis (if applicable);
STEP 4. Common practice analysis.

In the proposed project CO2 emissions to the atmosphere will be reduced due to electricity loses reduction during its transportation, that will lead to the GHG emission from the fossil fuel combustion for the electricity production at the Ukrainian power plants by the volume of the loses.

The energy production and transportation depends on the demand of the market. The Project Owner can increase the energy transportation. It means that all the additional energy transported during the Project period will substitute the energy, which would have been transported by the "Sumyoblenergo" PJSC, but with the less efficiency and higher GHG emission (higher loses coefficient).

The proposed Approach for the emission reductions' calculation uses the electricity loses coefficient in the Baseline Scenario (***PPER***) parameter. This parameter shows the efficiency level of electricity transportation through the grid in the Baseline scenario.

The "Sumyoblenergo" PJSC is one of the first private electricity transportation companies in Ukraine and the situation in the Ukrainian Energy Sector was quite bad. The lack of financing lead to the equipment degradation. The efficiency was getting lower and the loses were growing. The 2000 was chosen as the Baseline, because the "Sumyoblenergo" PJSC thes year has developed the Investment Program for the Electricity Grids Rehabilitation and reconstruction. We assume that the ***PPER*** coefficient would have remained the same during the Project implementation period in the situation of the absence of the Project (the real situation was that the electricity loses coefficient was getting bigger).

$$PPER = \frac{Vybl}{Qybl} \quad \textbf{(1),}$$

where:

PPER – the electricity loses coefficient in the Baseline scenario;

[12] http://ji.unfccc.int/Ref/Documents/Baseline_setting_and_monitoring.pdf

[13] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v4.0.0.pdf

Vybl – factual transportation electricity loses in year *y* in the Baseline Scenario, MW*h;

Qybl – the volume of the electricity supplied to the Grid in year *y* in the Baseline Scenario, MW*h;

The Baseline Scenario for the Project activity is the scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases (GHG) that would occur in the absence of the proposed project activity. For the proposed Project activity the JI specific approach was used.
For the proposed Project the Baseline Scenario is the continuation of the Grid use without any major repairs or reconstructions of the equipment. The calculation of the Baseline Emission is based on the assumption that the electricity loses coefficient (***PPER***) of the Grid will remain the same for the whole Project lifetime. It is determined in the Annex 2 according to the data for the baseline year (2000), which is prior to the Project Implementation.

$$BEy = Qy * PPER * EFy \quad \textbf{(2)},$$

where:

BEy – the Baseline Emission in year *y*, tCO2eq.;

Qy – the volume of the electricity supplied to the Grid in year *y* in Project Scenario, MW*h;

PPER – the electricity loses coefficient in the Baseline scenario;

EFy – the carbon dioxide emission factor for the electricity transportation through the electricity Grid in Ukraine in year *y*, tCO2eq./MWh;

The other parameters, such as factual transportation electricity loses in year *y* (*Vy*), the volume of the electricity supplied to the Grid in year *y* (*Qy*), the carbon dioxide emission factor for the production of the electricity, supplied to the Grid in Ukraine in year *y* (*EFy*) are the same in the Baseline and the Project Scenarios.

Key Parameters used to identify the Baseline Scenario:

Data/ Parameter	***PPER***
Data unit	% / 100
Description	The electricity loses coefficient in the Baseline Scenario. The share of the electricity loses during the transportation of the electricity through the "Sumyoblenergo" PJSC electricity grid that would have had occur in the absence of the Project.
Time of determination/monitoring	Determined in the PDD. Not monitored throughout the Crediting Period. Available at the Determination.
Source of data (to be) used	The calculations to be made using the volume of the electricity supplied to the Grid and the factual transportation electricity loses in 2000 - the year prior to the Project implementation. The value of this coefficient is determined in the PDD and fixed as the coefficient for the Baseline Scenario.

Value of data applied (for ex ante calculations/determinations)	0,1765 (17,65%)
Justification of the choice of data or description of measurement methods and procedures (to be) applied	For the *PPER* coefficient calculation the factual measured data was used. The volume of the electricity supplied to the Grid and the factual transportation electricity loses are being monitored by the Project Owner using the electricity meters and the data achieved is stored at the enterprise and is given to the national supervision authorities. The measuring equipment is regularly controlled and calibrated.
QA/QC procedures (to be) applied	All measurement equipment should be calibrated and regularly maintained and checked for it's functioning according to manufacturer's specification and relevant national or international standards. Measurement accuracies or other uncertainties in all of the variables need to be taken into account in calculating emission reductions.
Any comment	The information should be archived and stored on the electronic and paper sources.

Data/ Parameter	***Vybl***
Data unit	MWh
Description	The factual transportation electricity loses in the Baseline Scenario
Time of determination/monitoring	Determined in the PDD. Not monitored throughout the Crediting Period. Available at the Determination.
Source of data (to be) used	Electricity meters. The difference between the volume of the electricity coming into the "Sumyoblenergo" PJSC grid in the year *y* of the Baseline Scenario and the value of the electricity supplied from the grid in year *y* of the Baseline Scenario.
Value of data applied (for ex ante calculations/determinations)	The electricity loses in the Baseline year (2000) were: 2000 – 454 125 MWh.
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The volume of the factual transportation electricity loses is being monitored by the Project Owner using the electricity meters and the data achieved is stored at the enterprise and is given to the national supervision authorities. The measuring equipment is regularly controlled and calibrated.
QA/QC procedures (to be) applied	All measurement equipment should be calibrated and regularly maintained and checked for it's functioning according to manufacturer's specification and relevant national or international standards. Measurement accuracies or other uncertainties in all of the variables need to be taken into account in calculating emission reductions.

Any comment	The information should be archived and stored on the electronic and paper sources.

Data/ Parameter	***Qybl***
Data unit	MWh
Description	The volume of the electricity supplied to the electricity Grid in year *y* in the Baseline Scenario.
Time of determination/monitoring	Determined in the PDD. Not monitored throughout the Crediting Period. Available at the Determination.
Source of data (to be) used	Electricity meters
Value of data applied (for ex ante calculations/determinations)	The electricity supplied to the "Sumyoblenergo" PJSC grid in the Baseline year was: 2000 – 2 572 520 MWh.
Justification of the choice of data or description of measurement methods and procedures (to be) applied	The Project Owner is monitoring the volume of the electricity supplied to the Grid using the electricity meters and the data achieved is stored at the enterprise and is given to the national supervision authorities. The measuring equipment is regularly controlled and calibrated.
QA/QC procedures (to be) applied	All measurement equipment should be calibrated and regularly maintained and checked for it's functioning according to manufacturer's specification and relevant national or international standards. Measurement accuracies or other uncertainties in all of the variables need to be taken into account in calculating emission reductions.
Any comment	The information should be archived and stored on the electronic and paper sources.

Data/ Parameter	***EFy***
Data unit	kg of CO2 equivalent / kWh (tCO2eq. / MWh)
Description	The carbon dioxide emission factor for the electricity transported through the Ukrainian Electricity Grid.
Time of determination/monitoring	Determined in the PDD. Monitored throughout the Crediting Period. Available at the Determination for the period 2002-2011. For the next years the Emission Factor will be taken from the approved National Data sources (SEIA orders or other) and used in the Monitoring Reports.
Source of data (to be) used	To calculate the Baseline Emission such a data was used: 1. for the period 2002 – 2005 the data was taken from the Table B2 Baseline carbon emission factors for JI projects reducing electricity consumption, Operational guidelines for project design documents of joint implementation projects (volume 1:

<table>
<tr><td></td><td>general guidelines Version 2.3)[14].
2. for the period 2006 – 2007 the data was taken from the “Carbon dioxide emission factors (for energy consumption according to the methodology "Ukraine - Assessment of new calculation of CEF", approved by TUV SUD 17.08.2007)[15].
3. for 2008 the data was taken from the NEIA of Ukraine Order: “On approval of the carbon dioxide specific emission factors for 2008” # 62 dated 15.04.2011[16];
4. for 2009 the data was taken from the NEIA of Ukraine Order: “On approval of the carbon dioxide specific emission factors for 2009” # 63 dated 15.04.2011[17];
5. for 2010 the data was taken from the NEIA of Ukraine Order: “On approval of the carbon dioxide specific emission factors for 2010” # 43 dated 28.03.2011[18];
6. for 2011 the data was taken from the NEIA of Ukraine Order: “On approval of the carbon dioxide specific emission factors for 2011” # 75 dated 12.05.2011[19];
To calculate the Baseline Emission for the other years the data for the 2011 was used but it will be revised during the monitoring on the appearance of the new data available.</td></tr>
<tr><td>Value of data applied (for ex ante calculations/determinations)</td><td>
<table>
<tr><td>Year</td><td>2002</td><td>2003</td><td>2004</td><td>2005</td><td>2006</td><td>2007</td><td>2008</td><td>2009</td><td>2010</td><td>2011</td></tr>
<tr><td>EF_y, tCO2eq/ MWh</td><td>0,785</td><td>0,770</td><td>0,755</td><td>0,740</td><td>0,807</td><td>0,807</td><td>1,082</td><td>1,096</td><td>1,093</td><td>1,090</td></tr>
</table>
</td></tr>
<tr><td>Justification of the choice of data or description of measurement methods and procedures (to be) applied</td><td>The data was taken from the most reliable and justified sources at the time of the PDD development.</td></tr>
<tr><td>QA/QC procedures (to be) applied</td><td>-</td></tr>
<tr><td>Any comment</td><td>-</td></tr>
</table>

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:

>>

In the proposed project CO_2 emissions to the atmosphere will be reduced due to electricity loses reduction during its transportation through the “Sumyoblenergo” PJSC electricity grid, that will lead to the GHG emission from the fossil fuel combustion for the electricity production at the Ukrainian power plants by the volume of the loses.

The additionality was proved using the Methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 04.0.0) [20].

[14] http://ji.unfccc.int/CallForInputs/BaselineSettingMonitoring/ERUPT/index.html

[15] http://ji.unfccc.int/UserManagement/FileStorage/46JW2KL36KM0GEMI0PHDTQF6DVI514

[16] http://www.neia.gov.ua/nature/doccatalog/document?id=127171

[17] http://www.neia.gov.ua/nature/doccatalog/document?id=127172

[18] http://www.neia.gov.ua/nature/doccatalog/document?id=126006

[19] http://www.neia.gov.ua/nature/doccatalog/document?id=127498

In the proposed project CO_2 emissions to the atmosphere will be reduced due to electricity loses reduction during its transportation through the "Sumyoblenergo" PJSC electricity grid, that will lead to the GHG emission from the fossil fuel combustion for the electricity production at the Ukrainian power plants by the volume of the loses.
The additionality was proved using the Methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 04.0.0) [21].
A JI specific approach regarding baseline setting and monitoring has been developed in accordance with Appendix B of the JI Guidelines and with the JISC Guidance.
Project will use a baseline in accordance with the Methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 04.0.0) [22]. Using this tool is a common practice in determining the baseline and demonstration additionality.

Baseline scenario is determined according to the following four Steps:
STEP 1. Identification of alternative scenarios;
STEP 2. Barrier analysis;
STEP 3. Investment analysis (if applicable);
STEP 4. Common practice analysis.

Step 1: Identification of alternative scenarios
Step 1a: Define alternative scenarios to the proposed JI project activity

Only two alternatives are the most veritable for the suggested project activity.
Alternative 1: Continuation of the existing situation.
Alternative 2: Implementation of proposed project activity without JI registration.
Alternative 3: The implementation of the part of the Project measures.
Partial implementation of the reconstruction and loses reduction program in the "Sumyoblenergo" PJSC electric power grid will reduce the effect of its implementation. That's why this scenario is not considered as an alternative to the proposed project activity.

Outcome of Step 1a: Three most plausible alternatives were identified. List of identified alternatives is presented above.

Sub-step 1b: Consistency with mandatory applicable laws and regulations
At the start of the project (2000) there were a number of regulation acts existed (Law on energy saving) aiming at directing the producers and suppliers to the sphere of energy saving. However, these acts mostly had formal character and were ineffective. It is confirmed by the permanent increase of electricity loses in the electricity grid of the "Sumyoblenergo" PJSC before the start of the project.
All the alternatives to the project outlined in Step 1a above are in compliance with applicable laws and regulations.
The Project Owner activity is ruled by the wide range of the legal acts of Ukraine. For example:
1.The Law of Ukraine "On Power Industry" №575/97-BP dated 16.10.1997y. [23];
2. The Resolution of The National Comission for the Power Industry Regulation of Ukraine "On Approval of the Rules of the Power Use" №28 dated 31.07.1997y. [24];

[20] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v4.0.0.pdf

[21] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v4.0.0.pdf

[22] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v4.0.0.pdf

[23] http://zakon2.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=575%2F97-%E2%F0

[24] http://zakon2.rada.gov.ua/laws/show/z0417-96

3.The Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Order of State Supervision in the Power Industry" №189 dated 15.02.1999y. [25];
4.The Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Sanctions for the Violations of the Law on Power ndustry" №1139 dated 19.07.2000y. [26];
5.The Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Order of the Fining of the Business Entities for the Violation of th Law on Power Industry and Heat Supply" №1312 dated 21.07.1999y. [27];
6.The Law of Ukraine "On Energy Saving" №74/94-BP dated 01.07.1994y. [28];
7.The Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Rules of the Electricity Transmission Lines" №209 dated 04.03.1997y. [29];
8.The Law of Ukraine "On the Licensing of the Certain Economic Activities" №1775-III dated 01.06.2000y. [30];
9.The Law of Ukraine "On Natural Monopolies" №1682-III dated 20.04.2000y. [31];
10.The Resolution of The National Comission for the Power Industry Regulation of Ukraine "On the Order of the Definition of the Class of the Consumers" №1052 dated 13.08.1998y. [32] and others.

Outcome of Step 1b: *Alternative 1*, *Alternative 2* and *Alternative 3* is in compliance with applicable laws and regulations.

Step 2: Barrier analysis
Sub-step 2a: Identify barriers that would prevent the implementation of alternative scenarios
Alternative 1: Continuation of the existing situation.
There are no barriers for this Alternative.

Alternative 2: Implementation of proposed project activity without JI registration

Investment barriers: The project activity within the framework of the suggested project is a perpetual process which requires considerable annual investments and manpower attraction.

- This is connected with:
- Annual electrotechnical equipment renewal, which is represented in the Ukrainian market;
- Necessity of the perpetual stuff training to work with he new equipment.

Constant funding in Ukraine is possible only in case of financial attraction of the project. The current system of electric power tariff formation shifts the financial burden of technological power consumption on the final consumers and does not allow to receive the income from their reduction.

The access to the financial resources on the international level is highly limited for the suggested project. The investment environment in Ukraine is rather poor in comparison with the neighbor countries. The

[25] http://zakon3.rada.gov.ua/laws/show/189-99-п

[26] http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=1139-2000-%EF

[27] http://search.ligazakon.ua/l_doc2.nsf/link1/KP991312.html

[28] http://zakon1.rada.gov.ua/laws/show/74/94-вр

[29] http://zakon2.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=209-97-%EF...

[30] http://zakon2.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=1775-14

[31] http://zakon2.rada.gov.ua/laws/show/1682-14

[32] http://www.cogeneration.com.ua/ru/analytics/legislative-regulation/nkre/N-1052__13-08-98/

confirmation of this is the sovereign rating of Ukraine according to the Fitch ratings[33], [34] in comparison with some neighbor countries of the Eastern Europe.
Ukraine B
Poland A-
Hungary BB+
Slovakia A+
Russian Federation - B
Due to the considerable volume of capital investments, needed for the accomplishment of the project, the funding obtaining from the international institutions may be rather difficult. Funding chances on the national level are also restricted. Nowadays commercial banks of Ukraine grant project financing at about 15% annually in the national currency on a three-year term[35]..
Taking into consideration all the hereinbefore mentioned, the funding of the project is possible only under the condition of funds attraction from the selling of greenhouse gases emission reduction units.
Moreover, according to the above-mentioned Ukrainian legal acts the "Sumyoblenergo" PJSC does not set the price for it's services (tarifs). Besides, the acts mentioned define the order of the tarifs setting, which does not encourage the power transmission companies to reduce the power loses, because it will not be compensated. There is no financial benefit for the Project Owner from the Project implementation. Thus, the only motive for the Project implementation is its registration as a JI Project and the posibility of the emission reduction units purchase. So, the Project activity is not a common practice for the electricity transmission companies in Ukraine.

Alternative 3: The implementation of the part of the Project measures.
This alternative meets the same barriers as the *Alternative 2* does, but the effectiveness of the partial implementation of the Project measures is significantly lower (the synergetic effect of the implemented measures is quite high). So, this alternative is technically possible, but not reasonable and feasible.

Outcome of Step 2a: List of barriers is provided above.

Sub-step 2b: Eliminate alternative scenarios which are prevented by the identified barriers
Only *Alternative 1* is not prevented by the identified barriers..

Outcome of Step 2b: Only *Alternative 1* is not prevented by the identified barriers.

Step 3: Investment analysis

For the justification of the baseline scenario and additionality demonstration barrier analyse was used.

Outcome of Step 3: N/A.

Step 4: Common practice analysis

Most similar projects (like utilization of coal mine methane) were implemented with grants or other non-commercial finance terms (for example JI investment). The common practice for Ukraine at the beginning of the project introduction was the operation work implementation in the volume necessary to keep the network in a good working order and the technological power consumption reduction activity.

[33] http://www.fitchratings.ru/regional/country/ratings/list/index.wbp

[34] http://en.wikipedia.org/wiki/List_of_countries_by_credit_rating#cite_note-fitch-8

[35] http://news.finance.ua/ru/~/2/20/ua/2003/06/11/34266

Outcome: In consideration of mentioned above *Alternative 1* is most plausible baseline scenario that is not prevented by any barriers and is in line with host Party common practice.

Step 4 is satisfied. The proposed project activity is additional.

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

>>

Project boundary

The spatial extent of the project boundary includes the Electricity transmission lines exploited by the "Sumyoblenergo" PJSC: 32 299,9 km of the electricity transmission lines (air and cable) with the voltage of 0,4; 6; 10; 35 and 110 kV, 179 high voltage (35 – 110kV) and 7370 low-voltage transformer substations. All the equipment from the project boundary will remain in the Project Owner's property during the all lifetime of the Project.

Figure 10. Diagram of the project boundary

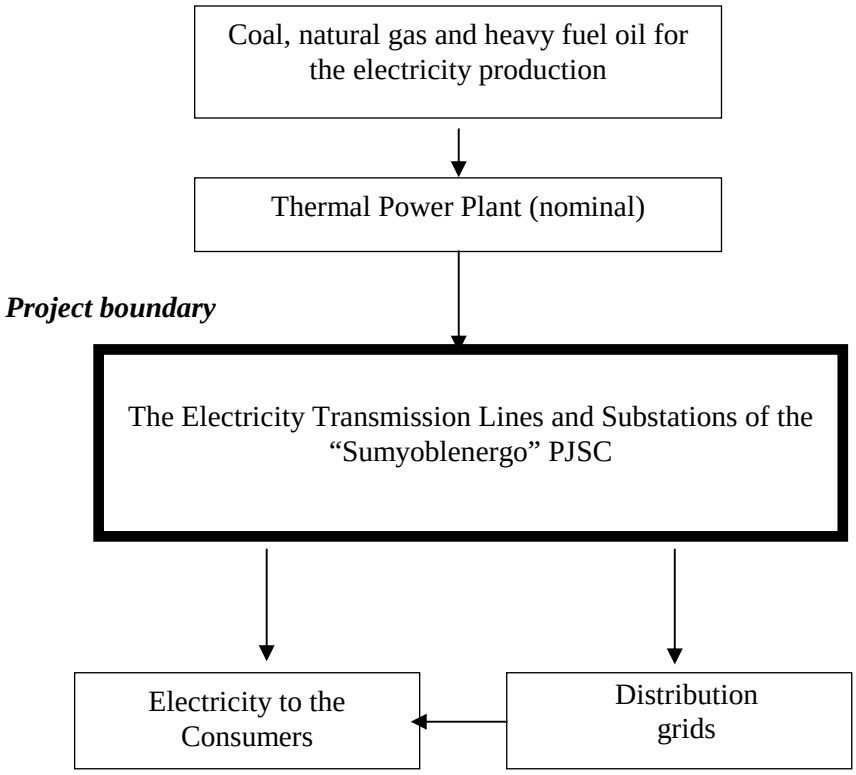

Table 4. Sources of emission in the Baseline Scenario and in the Project

	Source	Gas	Included	Justification / Explanation
Baseline	Power plant (nominal) emission.	CO_2	Yes	CO_2 is formed with the combustion of fuels.
		CH_4	No	Minor source, can be neglected (conservative approach).
		N_2O	No	Minor source, can be neglected.
		SF6	No	Remains the same in the Baseline and in the Project. Excluded from the calculations (conservative approach)

Project Activity	Power plant (nominal) emission.	CO_2	Yes	CO_2 is formed with the combustion of fuels.
		CH_4	No	Minor source, can be neglected (conservative approach).
		N_2O	No	Minor source, can be neglected
		SF6	No	Remains the same in the Baseline and in the Project. Excluded from the calculations (conservative approach)

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

>>

Date of the baseline setting: 12/08/2012

Name of the person(s)/entities setting the baseline: “Eco - Elta” LLC
Not a Project Participant.
Rogovoy Maksym Ivanovich, Director.
Tel: +38 050 595 0311
Fax: +38 057 713 41 02
E-mail: m_rogovoy@elta.kharkov.ua

Detailed contact information in Annex 1.

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

>>
02/09/2002 (The Investment Program set by the National Comission for the Electrcity Regulation according to the request of the Ministry of the Fuel and Energy of Ukraine № 8/32-935 dated 02.09.2002).

C.2. Expected operational lifetime of the project:

>>
20 years (240 months).
The rehabilitations provided as the Project Scenario provides the operational lifetime increase for 20 years.

C.3. Length of the crediting period:

>>
The beginning of the crediting period is 01/01/2008 – the first day of the ERUs generation by the Project.
The end date is 31/12/2012.
The crediting period before the start of the Kyoto Protocol – 4 years (48 months).
The starting date of the period – 01/01/2004.
The end date of the period – 31/12/2007.
The crediting period after the end of the first commitment period of the Kyoto Protocol is 11 years (132 months).
The starting date of the period – 01/01/2013.
The end date of the period – 31/12/2023.
The status of the emission reductions made by project in post Kyoto period will be determined by respective decision of the UNFCCC parties.

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

>>

The JI specific approach is used for monitoring in accordance with paragraph 9 (a) of the "Guidance on criteria for baseline setting and monitoring". According to the Baseline chosen the Monitoring plan supposes the measurement of the volume of the electricity supplied by the electricity grid of the "Sumyoblenergo" PJSC (***Qy***) and the factual transportation electricity loses (***Vy***). The monitoring plan of the Projects is based on the existing monitoring system of the Project owner – "Sumyoblenergo" PJSC. The data for the Project Emission, Baseline Emission and the Emission Reduction calculation is taken from the 1B-TVE form "The Structure of the Ballance and the Technological Consumption of the Electricity for the Transportation", approved by the Ministry of Energy and Coal Industry of Ukraine Order #07/141-379 dated 08.04.1998 (the electricity supply to the grid value and the loses during the transportation are measured by the regularly calibrated electricity meters).

The transportation electricity loses consists of a technical (due to the physical processes that occur during the electricity transportation, own consumption by the substations and the instrumental loses, caused by the uncertainties of the measuring equipment) and non-technical parts. In the proposed project the calculation is based on the level of the technical loses data with the measuring equipment loses excluded from the calculation.

The baseline Emission calculation is made using the electricity loses coefficient in the Baseline Scenarion (***PPER***), calculated using the factual data of the electricity transportation and the factual electricity loses level in the year prior to the Project implementation (2000) (see Annex 2).

All the Data monitored and required for the ERUs calculation will be stored during two (2) years after the last ERUs transfer according to the "Sumyoblenergo" PJSC Order #8/329 dated 29/11/2012.

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

D.1.1.1. Data to be collected in order to monitor emissions from the project, and how these data will be archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
P1 *PEy*	Project emission in year *y*	calculations	t of CO_2 eq	c	yearly	100%	electronic, paper	Calculated by formulae (3) in chapter D.1.1.2., see below

P2 *Vy*	The volume of the electricity loses in the Grid in year *y* in the Project Scenario	Monitoring, 1B-TVE form	MWh	c	yearly	100%	electronic, paper	Measured, then calculated monthly in the 1B-TVE form "The Structure of the Ballance and the Technological Consumption of the Electricityfor the Transportation", approved by the Ministry of Energy and Coal Industry of Ukraine Order #07/141-379 dated 08.04.1998
P3 *EFy*	The Carbon dioxide emission factor for the electricity transported through the Ukrainian Electricity Grid in year *y*	The default values were taken (see Section B.1)	TCO2eq. / MWh	e	yearly	100%	electronic, paper	See Section B.1.

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 calculation of the Project Emissions is provided by the getting of the volume of the electricity loses during the transportation through the "Sumyoblenergo" PJSC Grid in year *y* and then by the multiplication of this parameter by the carbon dioxide emission factor for the electricity transported through the Ukrainian Electricity Grid in year *y*.

The Project emission is being calculated as follows:

$$PEy = Vy * EFy \quad \textbf{(3),}$$

where

PEy – the Project Emission in year *y*, tCO2eq.;

Vy – the volume of the electricity loses in year *y* in the Project scenario, MWh;

EFy – the carbon dioxide emission factor for the electricity transportation through the electricity Grid in Ukraine in year *y*, tCO2eq./MWh;

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
B1 *BEy*	Baseline emission	calculations	t of CO_2 eq	c	Yearly	100%	electronic, paper	Calculated by formulae (5) in chapter D.1.1.4., see below

B2 *PPER*	The Electricity Loses Coefficient in the Baseline Scenario	Historical data	% / 100	c	Before start	100%	electronic, paper	Measured, then calculated using the historical data (Annex 2, formula (7))
B3 *Qy*	The volume of the electricity supplied to the "Sumyoblenergo" PJSC Grid in year *y* in the Project Scenario	monitoring	MWh	m	Yearly	100%	Electronic, paper	Measured, then recorded monthly in the 1B-TVE form "The Structure of the Ballance and the Technological Consumption of the Electricityfor the Transportation", approved by the Ministry of Energy and Coal Industry of Ukraine Order #07/141-379 dated 08.04.1998

B4 *Qybl*	The volume of the electricity supplied to the "Sumyoblenergo" PJSC Grid in year *y* in the Baseline Scenario	monitoring	MWh	m	Yearly	100%	Electronic, paper	Measured, then recorded monthly in the 1B-TVE form "The Structure of the Ballance and the Technological Consumption of the Electricityfor the Transportation", approved by the Ministry of Energy and Coal Industry of Ukraine Order #07/141-379 dated 08.04.1998
B5 *Vybl*	The volume of the electricity loses in the "Sumyoblenergo" PJSC Grid in year *y* in the Baseline Scenario	Monitoring, 1B-TVE form	MWh	c	Yearly	100%	electronic, paper	Measured, then calculated monthly in the 1B-TVE form "The Structure of the Ballance and the Technological Consumption of the Electricityfor the Transportation", approved by the Ministry of Energy and Coal Industry of Ukraine Order #07/141-379 dated 08.04.1998

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 Baseline emission is being calculated for the situation, when the electricity loses coefficient in the "Sumyoblenergo" PJSC Grid remains the same as if there were no reconstruction or rehabilitation of the equipment. The Electricity Loses Coefficient in the Baseline Scenario was calculated as follows:

$$PPER = \frac{Vybl}{Qybl} \quad \textbf{(4),}$$

where:

PPER – the electricity loses coefficient in the Baseline scenario, % / 100;

Vybl – factual transportation electricity loses in year *y* in the Baseline Scenario, MWh;

Qybl – the volume of the electricity supplied to the Grid in year *y* in the Baseline Scenario, MWh;

The Baseline emission is being calculated as follows:

$$BEy = Qy * PPER * EFy \quad \textbf{(5),}$$

where:

BEy – the Baseline Emission in year *y*, tCO2eq.;

Qy – the volume of the electricity supplied to the Grid in year *y* in Project Scenario, MWh;

PPER – the electricity loses coefficient in the Baseline scenario % / 100;

EFy – the carbon dioxide emission factor for the production of the electricity, supplied to the Grid in Ukraine in year *y*, tCO2eq./MWh;

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

This section left blank. No direct monitoring expected.

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

See sec. D.1.2.

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):

>>

See sec. D.1.2.

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

This section is left blank, as due to the Project implementation there are no Leakage.

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):

See sec. D.1.3

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

>>

The emission reductions achieved during the project period are calculated as a difference between annual baseline emission and annual project emission. It is shown by the formula:

$$ERy = BEy - PEy \quad (6)$$

where:

ERy – emission reductions achieved by the project activity in year *y*, tCO2eq/year;

BEy – baseline CO2 emission in year *y*, tCO2eq /year;

PEy – project CO2 emission in year *y*, tCO2eq /year.

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:

>>

For the purposes of the safe and reliable operation and monitoring of the installed equipment the quality control and quality assurance measures are implemented on all the Grids, substations, transformers and other equipment of the "Sumyoblenergo" PJSC Grid in accordance with the current legislation and requirements. According to these requirements of the quality control system regular servicing and test mode of the instrumentation is provided. All the measurement equipment is being regularly calibrated. The information of the calibration is being stored and to be checked by the independent entity annually. The check for the data accuracy and calculation of the emission reductions shall be made and collected monthly.
The main legal acts ruling the Project activities are: The Law of Ukraine "For the Environmental Protection" #1264-XII issued 13.06.2012[36].
The Law of Ukraine "For the Atmosphere Air Protection" #2707-XII issued 14.07.2011[37]
The International Standard "Environmental Management System" ISO 14001-2004[38].

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.
B3 *Qy*	Low	The uncertainty level of the parameter is determined at the level of the electricity meters uncertainty, which is lower than 1%.
P2 *Vy*	Low	The uncertainty level of the parameter is determined at the level of the electricity meters uncertainty, which is lower than 1%.

The measuring equipment (electricity meters) is calibrated in accordance with the national requirements and the recommendations of the manufacturer. The schedule of the calibrations is set out annually. The calibrations are provided by the State Enterprise "Sumystandartmetrologiya" in accordance with the contract specification signed annually.
The replacement of the meters schedule is set quarterly in accordance with the "Sumyoblenergo" PJSC order.
All the data monitored and required for the ERUs calculation is available for the Project Developer, AIE and SEIA at the enterprise at all time (at least for two years after the last emission reductions transaction) – Order # ___ dated 27.11.2012. If the monitoring data is unavailable the calculation of the emission reduction interrupts and the all-necessary documents will be presented to the AIE, SEIA and JISC.

[36] http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=1264-12

[37] http://zakon1.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=2707-12

[38] http://www.iso.org/iso/catalogue_detail?csnumber=31807

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

>>

The Operational structure of the Project is based on the existing monitoring system of the "Sumyoblenergo"PJSC. All the necessary data for the Baseline Emission, Project Emission and the Emission Reductions calculation will be taken from the 1B-TVE form "The Structure of the Ballance and the Technological Consumption of the Electricityfor the Transportation", approved by the Ministry of Energy and Coal Industry of Ukraine Order #07/141-379 dated 08.04.1998 (the electricity supply to the grid value and the loses during the transportation are measured by the regularly calibrated electricity meters) is used.

The 1B-TVE form "The Structure of the Ballance and the Technological Consumption of the Electricity for the Transportation", approved by the Ministry of Energy and Coal Industry of Ukraine Order #07/141-379 dated 08.04.1998 is being filled by the Balance and Technical Loses Graduation Department (Responsible – Deputy Head of the Department) and is signed by the Chairman of Board (Dyrbavka Igor Bogdanovych).

The values of the volume of the electricity supplied to the "Sumyoblenergo"PJSC Grid is taken from the meters and checked by the acceptance protocols signed with the suppliers and the consumers of the electricity and the State Enterprise "Energorynok".

The volume of the electricity supply off the grid is taken from the meters and fixed by the acceptance protocols with the suppliers and consumers of the electricity.

The data for the 1B-TVE form filling is provided by the Central Supervising Department of the Company (the Head of the Department – Ogiyenko O.I.);; the Electricity Sales Department (the Head of the Department – Loshak I.V.); the Electriucity Market Relations Department (the Head of the Department – Vusyk L.O)

The measuring equipment (electricity meters) is calibrated in accordance with the national requirements and the recommendations of the manufacturer. The schedule of the calibrations is set out annually. The calibrations are provided by the State Enterprise "Sumystandartmetrologiya" in accordance with the contract specification signed annually.
The replacement of the meters is provided quarterly in accordance with the "Sumyoblenergo"PJSC order.

The filled forms 1B-TVE will be sent to the Project Developer Eco-Elta LLC, which will be rsponsible for the calculations.
There is also a carbon emission factor for the electricity production in the host country (Ukraine) (approved by the NEIA or internationally) is used for the calculations.

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

>>

Date of the completion of the Monitoring plan: 12.08.2012

Mr. Maksym Rogovoy
ECO-ELTA JSC
14/3, Stadionny proezd str.
Kharkov, Ukraine
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SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions:

>>

The following calculations are based on the baseline determined in the Section B.1. and formulas (3), (5) and (6) in the Sections D.1.1.2, D.1.1.4. and D.1.4. The electricity loses coefficient in the Project Scenario is lower then the one in the Baseline. The conservative assumptions are used in all the calculations. All the uncertainties of the measures were taken into account in the calculations. All the data used for the calculations consists the precision and accuracy of the measuring equipment.
As the Project uses the own Approach, all the formulas used to calculate the Project emissions, the Baseline emissions and the Emission reductions are original.

*Table **E-1.** Estimated project emissions (see formula (3) in Section D.1.1.2)*

ESTIMATED PROJECT EMISSIONS [T CO2 EQ / YEAR], EARLY CREDITS PERIOD	
Years	Estimated project emissions in tCO2eq.
2004	206282
2005	197273
2006	218025
2007	221278
Total 2004 - 2007 (tCO2eq.)	842858

ESTIMATED PROJECT EMISSIONS [T CO2 EQ / YEAR], CREDITING PERIOD	
Years	Estimated project emissions in tCO2eq.
2008	301 572
2009	298 001
2010	284 606
2011	306 960
2012	306 960
Total 2008 - 1012 (tCO2eq.)	1 498 099

ESTIMATED PROJECT EMISSIONS [T CO2 EQ / YEAR], POST-KYOTO PERIOD	
Years	Estimated project emissions in tCO2eq.
2013	306 960
2014	306 960
2015	306 960
2016	306 960
2017	306 960
2018	306 960
2019	306 960
2020	306 960
2021	306 960
2022	306 960
2023	306 960
Total 2013 – 2023 (tCO2eq.)	3 376 560

E.2. Estimated leakage:

>>

This section is left blank. See. Section D.1.3.

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

>>

*Table **E-2.** Estimated project emissions plus leakages.*

ESTIMATED PROJECT EMISSIONS PLUS LEAKAGE [T CO2 EQ / YEAR], EARLY CREDITS PERIOD	
Years	Estimated project emissions plus leakage in tCO2eq.
2004	206282
2005	197273
2006	218025
2007	221278
Total 2004 - 2007 (tCO2eq.)	842858

ESTIMATED PROJECT EMISSIONS PLUS LEAKAGE [T CO2 EQ / YEAR], CREDITING PERIOD	
Years	Estimated project emissions plus leakage in tCO2eq.
2008	301 572
2009	298 001
2010	284 606
2011	306 960
2012	306 960
Total 2008 - 1012 (tCO2eq.)	1 498 099

ESTIMATED PROJECT EMISSIONS PLUS LEAKAGE [T CO2 EQ / YEAR], POST-KYOTO PERIOD	
Years	Estimated project emissions plus leakage in tCO2eq.
2013	306 960
2014	306 960
2015	306 960
2016	306 960
2017	306 960
2018	306 960
2019	306 960
2020	306 960
2021	306 960
2022	306 960
2023	306 960
Total 2013 – 2023 (tCO2eq.)	3 376 560

E.4. Estimated baseline emissions:

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*Table **E-3.** Estimated baseline emissions (see formula (5) Section D.1.1.4)*

ESTIMATED BASELINE EMISSIONS [T CO2 EQ / YEAR], EARLY CREDITS PERIOD	
Years	Estimated baseline emissions in tCO2eq.
2004	380501
2005	378853
2006	397882
2007	417691
Total 2004 - 2007 (tCO2eq.)	1574927

ESTIMATED BASELINE EMISSIONS [T CO2 EQ / YEAR], CREDITING PERIOD	
Years	Estimated baseline emissions in tCO2eq.
2008	569202
2009	527020
2010	569004
2011	598854
2012	598854
Total 2008 - 1012 (tCO2eq.)	2862934

ESTIMATED BASELINE EMISSIONS [T CO2 EQ / YEAR], POST-KYOTO PERIOD	
Years	Estimated baseline emissions in tCO2eq.
2013	598854
2014	598854
2015	598854
2016	598854
2017	598854
2018	598854
2019	598854
2020	598854
2021	598854
2022	598854
2023	598854
Total 2013 – 2023 (tCO2eq.)	6587394

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

>>

*Table **E-4.** Emission reductions of the project (formula (6) from Section D.1.4)*

ESTIMATED EMISSION REDUCTIONS [T CO2 EQ / YEAR], EARLY CREDITS PERIOD	
Years	Estimated emission reductions in tCO2eq.
2004	174219
2005	181580
2006	179857
2007	196413
Total 2004 - 2007 (tCO2eq.)	732069

ESTIMATED EMISSIONS REDUCTIONS [T CO2 EQ / YEAR], CREDITING PERIOD	
Years	Estimated emission reductions in tCO2eq.
2008	267630
2009	229019
2010	284398
2011	291894
2012	291894
Total 2008 - 1012 (tCO2eq.)	1364835

ESTIMATED EMISSION REDUCTIONS [T CO2 EQ / YEAR], POST-KYOTO PERIOD	
Years	Estimated emission reductions in tCO2eq.
2013	291894
2014	291894
2015	291894
2016	291894
2017	291894
2018	291894
2019	291894
2020	291894
2021	291894
2022	291894
2023	291894
Total 2013 – 2023 (tCO2eq.)	3210834

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

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Table E-5. *Project emissions and emission reductions of the early crediting period (2004-2007)*

Year	Estimated project emissions (tCO2eq)	Estimated leakage (tCO2eq)	Estimated baseline emissions (tCO2eq)	Estimated emission reductions (tCO2eq)
2004	206282	0	380501	174219
2005	197273	0	378853	181580
2006	218025	0	397882	179857
2007	221278	0	417691	196413
Total (tCO2eq.)	842858	0	1574927	732069
Annual average value of the CO2 emission reductions (tCO2eq.)	210714	0	393732	183017

Table E-6. *Project emissions and emission reductions of the crediting period (2008-2012)*

Year	Estimated project emissions (tCO2eq)	Estimated leakage (tCO2eq)	Estimated baseline emissions (tCO2eq)	Estimated emission reductions (tCO2eq)

2008	301572	0	569202	267630
2009	298001	0	527020	229019
2010	284606	0	569004	284398
2011	306960	0	598854	291894
2012	306960	0	598854	291894
Total (tCO2eq.)	1498099	0	2862934	1364835
Annual average value of the CO2 emission reductions (tCO2eq.)	299620	0	572587	272967

Table E-7. *Project emissions and emission reductions of the post-Kyoto period (2013-2023).*

Year	Estimated project emissions (tCO2eq)	Estimated leakage (tCO2eq)	Estimated baseline emissions (tCO2eq)	Estimated emission reductions (tCO2eq)
2013	306 960	0	598854	291894
2014	306 960	0	598854	291894
2015	306 960	0	598854	291894
2016	306 960	0	598854	291894
2017	306 960	0	598854	291894
2018	306 960	0	598854	291894
2019	306 960	0	598854	291894
2020	306 960	0	598854	291894
2021	306 960	0	598854	291894
2022	306 960	0	598854	291894
2023	306 960	0	598854	291894
Total (tCO2eq)	3 376 560	0	6587394	3210834
Annual average value of the CO2 emission reductions (tCO2eq.)	306 960	0	598854	291894

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:

>>

No transboundary impacts are expected. The environmental impacts assessment can be developed only for some of the measures within the Project activity if needed.

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:

>>

No negative environmental impacts of the project are expected and there are no special procedures required by Ukraine for this Project.

SECTION G. Stakeholders' comments

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

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The Project was presented to the Government of Ukraine and to the Local Authorities as a Project Idea and, later, as the Technical Documentation. The Government and Local Authorities has approved the Project. The Letter of Endorsement has been received from the State Environmental Investments Agency of Ukraine.

All the comments received were positive.

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

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THE POTENTIAL BUYER OF THE EMISSION REDUCTION UNITS

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Annex 2

BASELINE INFORMATION

In the proposed project CO_2 emissions to the atmosphere will be reduced due to electricity loses reduction during its transportation, that will lead to the GHG emission from the fossil fuel combustion for the electricity production at the Ukrainian power plants by the volume of the loses.
The energy production and transportation depends on the demand of the market. The Project Owner can increase the energy transportation. It means that all the additional energy transported during the Project period will substitute the energy, which would have been transported by the "Sumyoblenergo" PJSC, but with the less efficiency and higher GHG emission (higher loses coefficient).
The proposed Approach for the emission reductions' calculation uses the electricity loses coefficient in the Baseline Scenario (***PPER***) parameter. This parameter shows the efficiency level of electricity transportation through the grid. We assume that the ***PPER*** coefficient would have remained the same during the Project implementation period in the situation of the absence of the Project.

$$PPER = \frac{Vybl}{Qybl} \quad \textbf{(7)},$$

where:

PPER – the electricity loses coefficient in the Baseline scenario;

Vybl – factual transportation electricity loses in year *y* in the Baseline Scenario, MW*h;

Qybl – the volume of the electricity supplied to the Grid in the Baseline year, MW*h;

For the proposed Project the parameters used for the calculation were:

Qybl 2000 = 2 572 520 MWh;
Vybl 2000 = 454 125 MWh.

According to this data the ***PPER*** of the Project is 17,65%.

The other parameters, such as factual transportation electricity loses in year *y* (*Vy*), the volume of the electricity supplied to the Grid in year *y* (*Qy*), the carbon dioxide emission factor for the production of the electricity, supplied to the Grid in Ukraine in year *y* (*EFy*) are the same in the Baseline and the Project Scenarios.

To calculate the Baseline Emission such a data was used:

1. For the period 2002 – 2005 the data was taken from the Table B2 Baseline carbon emission factors for JI projects reducing electricity consumption, Operational guidelines for project design documents of joint implementation projects (volume 1: general guidelines Version 2.3)[39].
2. for the period 2006 – 2007 the data was taken from the "Carbon dioxide emission factors (for energy consumption according to the methodology "Ukraine - Assessment of new calculation of CEF", approved by TUV SUD 17.08.2007)[40].

[39] http://ji.unfccc.int/CallForInputs/BaselineSettingMonitoring/ERUPT/index.html

3. for 2008 the data was taken from the NEIA of Ukraine Orders: "On approval of the carbon dioxide specific emission factors for 2008" # 62 dated 15.04.2011[41];
4. for 2009 the data was taken from the NEIA of Ukraine Orders: "On approval of the carbon dioxide specific emission factors for 2009" # 63 dated 15.04.2011[42];
5. for 2010 the data was taken from the NEIA of Ukraine Orders: "On approval of the carbon dioxide specific emission factors for 2010" # 43 dated 28.03.2011[43];
6. for 2011 the data was taken from the NEIA of Ukraine Orders: "On approval of the carbon dioxide specific emission factors for 2011" # 75 dated 12.05.2011[44];

To calculate the Baseline Emission for the other years the data for the 2011 was used but it will be revised during the monitoring on the appearance of the new data available.

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
EF, tCO2eq/MWh	0,785	0,770	0,755	0,740	0,807	0,807	1,082	1,096	1,093	1,090

The Baseline Emissions are calculated for each year in accordance with the electricity supply in this particular year.

[40] http://ji.unfccc.int/UserManagement/FileStorage/46JW2KL36KM0GEMI0PHDTQF6DVI514

[41] http://www.neia.gov.ua/nature/doccatalog/document?id=127171

[42] http://www.neia.gov.ua/nature/doccatalog/document?id=127172

[43] http://www.neia.gov.ua/nature/doccatalog/document?id=126006

[44] http://www.neia.gov.ua/nature/doccatalog/document?id=127498

Annex 3

MONITORING PLAN

The Project emission reduction monitoring system will be implemented on the basis of the existing control system of the enterprise. Thus the data will be accurate and reliable to make the monitoring system more transparent and clear.

The Operational structure of the Project is based on the existing monitoring system of the "Sumyoblenergo"PJSC. All the necessary data for the Baseline Emission, Project Emission and the Emission Reductions calculation will be taken from the 1B-TVE form "The Structure of the Ballance and the Technological Consumption of the Electricityfor the Transportation", approved by the Ministry of Energy and Coal Industry of Ukraine Order #07/141-379 dated 08.04.1998 (the electricity supply to the grid value and the loses during the transportation are measured by the regularly calibrated electricity meters) is used.

The 1B-TVE form "The Structure of the Ballance and the Technological Consumption of the Electricity for the Transportation", approved by the Ministry of Energy and Coal Industry of Ukraine Order #07/141-379 dated 08.04.1998 is being filled by the Balance and Technical Loses Graduation Department (Responsible – Deputy Head of the Department) and is signed by the Chairman of Board (Dyrbavka Igor Bogdanovych).

The values of the volume of the electricity supplied to the "Sumyoblenergo"PJSC Grid is taken from the meters and checked by the acceptance protocols signed with the suppliers and the consumers of the electricity and the State Enterprise "Energorynok".

The volume of the electricity supply off the grid is taken from the meters and fixed by the acceptance protocols with the suppliers and consumers of the electricity.

The data for the 1B-TVE form filling is provided by the Central Supervising Department of the Company (the Head of the Department – Ogiyenko O.I.); the Electricity Sales Department (the Head of the Department – Loshak I.V.); the Electriucity Market Relations Department (the Head of the Department – Vusyk L.O)

The measuring equipment (electricity meters) is calibrated in accordance with the national requirements and the recommendations of the manufacturer. The schedule of the calibrations is set out annually. The calibrations are provided by the State Enterprise "Sumystandartmetrologiya" in accordance with the contract specification signed annually.
The replacement of the meters is provided quarterly in accordance with the "Sumyoblenergo"PJSC order.

The filled forms 1B-TVE will be sent to the Project Developer Eco-Elta LLC, which will be rsponsible for the calculations.
There is also a carbon emission factor for the electricity production in the host country (Ukraine) (approved by the NEIA or internationally) is used for the calculations.

All the meters re regularly calibrated (in accordance with the national requirements and the requirements of the manufacturer). The meters are EA02RAL, EA05RAL, A1805RAL and A180505RAL type. The accuracy type of the meters are mainly 0,5 type, but some of them are 0,2 and 2 accuracy type. The information on the installation dates, dates of calibration and total quantity of the meters will be provided in the Monitoring Reports for the exact time period.

All the uncertainties are taken into account.

All the data monitored and required for the ERUs calculation is available for the Project Developer, AIE and SEIA at the enterprise at all time (at least for two years after the last emission reductions transaction) – Order №8/329 dated 29.11.2012.. If the monitoring data is unavailable the calculation of the emission reduction interrupts and the all-necessary documents will be presented to the AIE, SEIA and JISC.

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