JOINT IMPLEMENTATION PROJECT

"The Reconstruction of the Electricity Grid of the "LUGANSK ENERGY INTERCONNECTION" LLC. in order to lower the electricity transportation loses"

Position of the head of the company, project developer

Director " Eco-Elta" LLC

(signature)

seal

Rogovyi Maksym Ivanovich

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

General Director "LUGANSK ENERGY INTERCONNECTION" LLC

(signature)

seal

Tkach Volodymyr Ivanovich

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:

>>

Title: **"**The Reconstruction of the Electricity Grid of the "Lugansk Energy Interconnection" LLC. in order to lower the electricity transportation loses**"**

Sectoral scope 2: Energy distribution.

Version: 1.1

Date: 25 October 2012

A.2. Description of the project:

>>

The "Lugansk Energy Interconnection" LLC is situated in the Lugansk region of Ukraine and provides electricity for the whole region territory. The region area covers 26,7 thousands of square kilometres.

The history of the enterprise starts in the 20-th years of the XX century, when the circling of the power plants was started at Donbass and the electricity system of the Donetsk and Lugansk regions was created. Not only the connection of the existing low capacity power plants took place in these years but also the construction of the brand new power plants (for example, the Shterivska power plant with the installed capacity of 152 MW in 1932) and the transmission lines and transformer substations that could connect the existing separate energy systems and power plants into the big and powerful one.

In 1930 the state production trust "The Association of the State Power Plants of the Donetsk Coal Basin "Donbasstrum" and in 1931 it was renamed into "Donenergo".
All the years before the World War II the enterprise was constantly increasing it's capacity: the new power plants, substations and the transmission lines were constructed and commissioned. Most of them are in use until now.

During The Great Patriotic War the energetics were to solve the new problems: to transfer the capacities to the rear and to avoid its destruction. They also had to commission the new generating capacities in the shortest periods of time.
In 1943 "Donenergo" was transformed into the regional energy department "Donbasenergo".
After the War the main goal of the company was the constant and reliable provision of the electricity for the Country reconstruction and renovation, the equipment reliability and the transformer capacity increase.

In the 1950-s the system recovered and the main principle of its functioning was the advanced development. In this time the commissioning of the new power plants, transformer substations and the transmission lines took place. Up to 1500 kilometers of the different voltage classes transmission lines were commissioned every year.

On May 21-th 1994 the president of Ukraine L.M.Kravchuk has signed the Order #244 "On the market transformation measures in the energy industry of Ukraine". According to the order of the Minister of the energy and electrification of Ukraine #77 dated 24.04.1995 the "Donbasenergo" was disbanded and in the Lugansk region the SE "Luganskoblenergo" was crated. It contained of Krasnodon, Kranyy Luch, Lisychansk, Lugansk, Pivnichni and Serhiyivsky electricity grids, Lisychansk CHP, Severodonetsk CHP, Severodonetsk Heating Network and Donbasenergosilprom-2.

In 1998 SEC "Luganskoblenergo" was transformed into a "Luganskoblenergo" OJSC.

02.04.2001 the “Lugansk Energy Interconnection” Limited Liability Company was created and became the owner of the “Luganskoblenergo” OJSC.

05.12.2001 The National Comission for the Power Industry Regulation of Ukraine issued the licenses #88 and #1042 for the electricity transmission and supply for the “Lugansk Energy Interconnection” LLC.

Since 01.04.2002 the “Lugansk Energy Interconnection” LLC has started its licensed activity of the transportation and supply of the electricity in the Lugansk region. The inspection of the technical conditions of the equipment was provided, the long-term investment program was developed and the large-scale repair and reconstruction program was started. It contained of the replacement and the reconstruction of the equipment aimed to the lowering of the electricity loses reduction in the grid and to the energy use efficiency increase.

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 “LUGANSK ENERGY INTERCONNECTION” LLC grid was getting lower and the electricity loses were rising constantly.

In this situation the Investment Program of the “Lugansk Energy Interconnection” LLC 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 “LUGANSK ENERGY INTERCONNECTION” LLC. 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, the of the transformers TDTNG-31500/110 (loses coefficient – 5,05) by the TDTN-40000/110 (loses coefficient – 0,21) transformers.

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:

>>

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)	"Lugansk Energy Interconnection" LLC	No
Poland	«IMEX ENERGO», sp. z o. o.	No

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

- "Lugansk Energy Interconnection" LLC.
  Project Owner, Owner of the emission reduction units
  USREOU code: 31443937
  The main activities are:
  40.13.0 Electricity distribution and supply
  33.20.2 Mounting of the control-metering devices
  33.20.3 Repairs and servicing of the control-metering devices
  45.21.4 Building of the lokal pipelines, communication and electricity transmission lines
  74.20.1 Engeneering activities
  40.12.0 Electricity transmission

- «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:

>>

The Project is implemented in Ukraine.

Figure 1. Ukraine

A.4.1.1. Host Party(ies):

>>

The "Lugansk Energy Interconnection" LLC provides electricity transportation and supply services in the Lugansk region, which is most eastern one in Ukraine.

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

>>

Lugansk region, Eastern Part of Ukraine

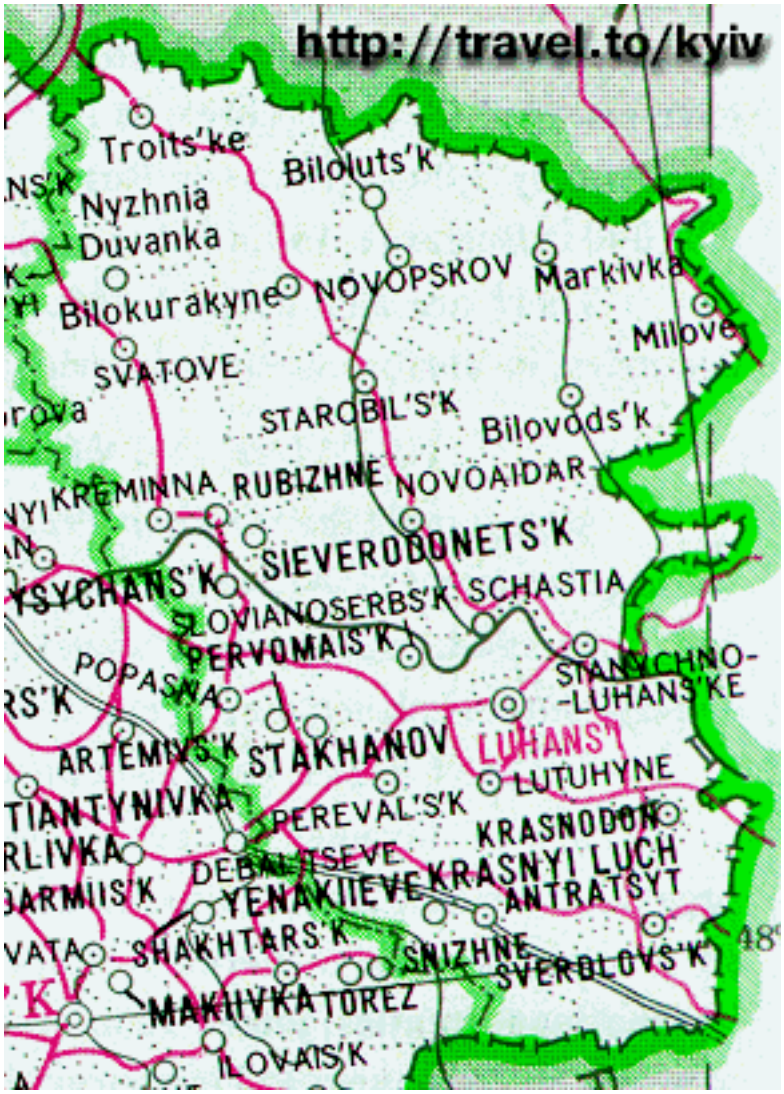

Figure 2. Lugansk region[1]

[1] http://travel.kyiv.org/map/e_lug.htm

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

>>

The JI Project is implemented at the territory of the Lugansk 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):

>>

The JI Project is implemented at the territory of the Lugansk region.

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

>>

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.

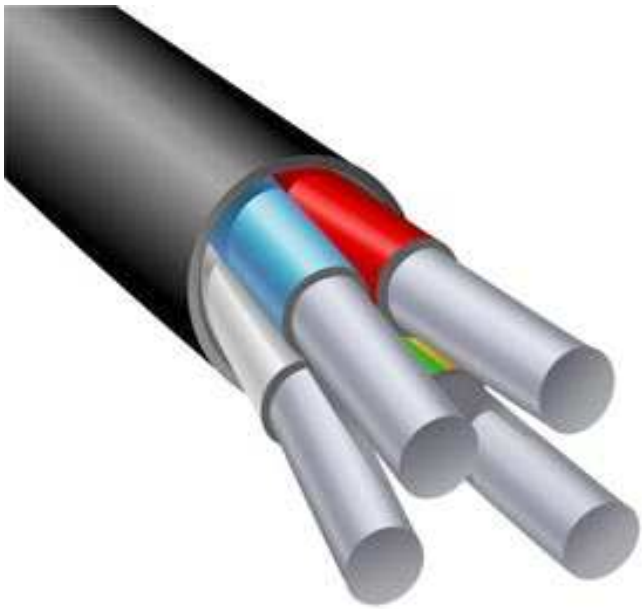

Figure 7. Self-supporting insulated wire.

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:

>>

The main objective of the Project activities is to reduce the electricity loses during the transportation through the electricity grids of the "LUGANSK ENERGY INTERCONNECTION" LLC. 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 "LUGANSK ENERGY INTERCONNECTION" LLC 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:

>>

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	583 047
2005	721 076
2006	888 581
2007	939 087
Total estimated emission reductions over the Period (tCO2eq.)	3 131 791
Annual average of estimated emission reductions over the period (tCO2eq.)	782 948

The total amount of emissions reduction is 3 131 791 tCO2eq.
The annual average amount of GHG emissions is 782 948 tCO2eq.
The example of the Emission Reduction calculation for the 2007:
The volume of the electricity supplied to the Grid (***Qy***) in 2007 was 12 824 067 MWh;
The factual volume of the electricity loses (***Vy***) in 2007 was 1 314 022 MWh, which is 10,25 % of the electricity supplied.
The electricity loses coefficient in the Baseline scenario (***PPER***) was 19,32 % 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 = 12 824 067 * 0,1932 * 0,807 = 1 999 503 tCO2eq..
The Project Emission in 2007 was:
PEy = 1 824 067 * 0,807 = 1 060 416 tCO2eq..
The Emission Reductions in 2007 were:
***ERy* = 1 999 503 – 1 060 416 = 939 087 tCO2eq.**

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	1 314 803
2009	1 161 822
2010	1 284 182
2011	1 357 267
2012	1 357 267

Total estimated emission reductions over the crediting period (tCO2eq.)	6 475 341
Annual average over the crediting period of estimated reductions (tCO2eq)	1 295 068

The total amount of emissions reduction is **6 475 341** tCO2eq.
The annual average amount of GHG emissions is **1 295 068** tCO2eq.

The example of the Emission Reduction calculation for the 2009:

The volume of the electricity supplied to the Grid (***Qy***) in 2009 was 11 685 282 MWh;
The factual volume of the electricity loses (***Vy***) in 2009 was 1 197 621 MWh, which is 10,25 % of the electricity supplied.
The electricity loses coefficient in the Baseline scenario (***PPER***) was 19,32 % 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 = 11 685 282 * 0,1932 * 1,096 = 2 474 415 tCO2eq.
The Project Emission in 2009 was:
PEy = 11 685 282 * 1,096 = 1 312 593 tCO2eq.
The Emission Reductions in 2009 were:
***ERy* = 2 474 415 – 1 312 593 = 1 161 822 tCO2eq.**

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	1 357 267
2014	1 357 267
2015	1 357 267
2016	1 357 267
2017	1 357 267
2018	1 357 267
2019	1 357 267
2020	1 357 267
2021	1 357 267
2022	1 357 267
2023	1 357 267
Total estimated emission reductions over the crediting period (tCO2eq.)	14 929 937
Annual average over the crediting period of estimated reductions (tons of CO2 e)	1 357 267

The total amount of emissions reduction is **14 929 937** tCO2eq.

The annual average amount of GHG emissions is **1 357 267** tCO2eq.

A.5. Project approval by the Parties involved:

>>

The Letter of Endorsement #3674/23/7 dated 29.11.2012 has been received from the State Environmental Investments Agency of Ukraine.

The Project has been approved by the both Parties-involved. Letter of Approval #3899/23/7 dated 19/12/2012 has been issued by State Environment Investment Agency of Ukraine. Letter of Approval #DOPpek-4430-33/11550/13/MK/EBS dated 22/03/2013 has been issued by Ministry of Environment protection of Poland Republic – Party-buyer of ERUs.

SECTION B. Baseline

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

>>

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 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.

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 "LUGANSK ENERGY INTERCONNECTION" LLC, 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 year, which is 2002.

The "LUGANSK ENERGY INTERCONNECTION" LLC 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. 2002 was chosen as the Baseline, because the "LUGANSK ENERGY INTERCONNECTION" LLC in 2002 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:

[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

PPER – the electricity loses coefficient in the Baseline scenario;

Vybl – factual transportation electricity loses in Baseline year (2002), MW*h;

Qybl – the volume of the electricity supplied to the "LUGANSK ENERGY INTERCONNECTION"LLC Grid in the Baseline year (2002), 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 2002, the year, 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 production of the electricity, supplied to the 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.

The data for 2003 was excluded from the calculation as it was the year of the preparation and the effect of the implemented measures was reached in 2004.

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 "LUGANSK ENERGY INTERCONNECTION" LLC 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 2002 - 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)	0,1932 (19,32%)
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 "LUGANSK ENERGY INTERCONNECTION"LLC 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 (2002) were 2 257 026 MWh
Justification of the choice of	The volume of the factual transportation electricity loses is being

data or description of measurement methods and procedures (to be) applied	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 (2002).
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 "LUGANSK ENERGY INTERCONNECTION"LLC grid in 2002 was 11 681 908 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***

<table>
<tr><td></td><td></td></tr>
<tr><td>Data unit</td><td>kg of CO2 equivalent / kWh (tCO2eq. / MWh)</td></tr>
<tr><td>Description</td><td>The carbon dioxide emission factor for the electricity transported through the Ukrainian Electricity Grid.</td></tr>
<tr><td>Time of determination/monitoring</td><td>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.</td></tr>
<tr><td>Source of data (to be) used</td><td>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)[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</td><td>-</td></tr>
</table>

[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

(to be) applied	
Any comment	-

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 "LUGANSK ENERGY INTERCONNECTION"LLC 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].

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) [21]. 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 "LUGANSK ENERGY INTERCONNECTION" LLC 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 (2002) 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 "LUGANSK ENERGY INTERCONNECTION" LLC 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.

[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

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. [22];
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. [23];
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. [24];
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. [25];
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. [26];
6.The Law of Ukraine "On Energy Saving" №74/94-BP dated 01.07.1994y. [27];
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. [28];
8.The Law of Ukraine "On the Licensing of the Certain Economic Activities" №1775-III dated 01.06.2000y. [29];
9.The Law of Ukraine "On Natural Monopolies" №1682-III dated 20.04.2000y. [30];
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. [31] 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.

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

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

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

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

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

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

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

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

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

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

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 confirmation of this is the sovereign rating of Ukraine according to the Fitch ratings[32], [33] 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[34]..
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 "Lugansk Energy Interconnection" LLC 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

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

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

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

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.

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:

>>

The spatial extent of the project boundary includes the Electricity transmission lines owned by the "Lugansk Energy Interconnection" LLC.

Figure 10. Diagram of the project boundary

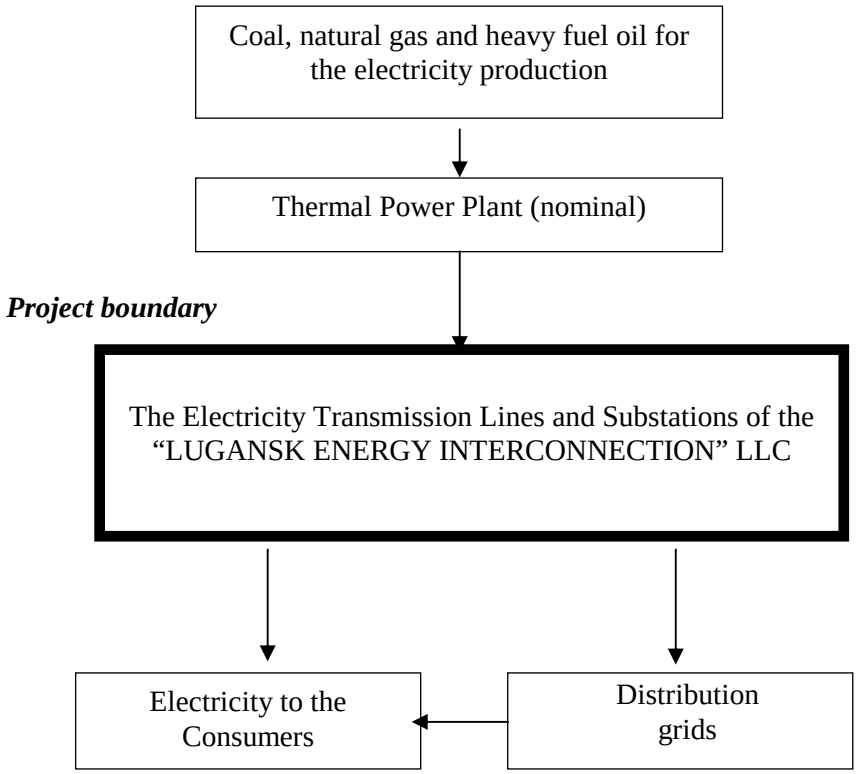

Table 4. Sources of emission in the Baseline Scenario and in the Project

	Source	Gas	Included	Justification / Explanation
Baseline	Power plant	CO_2	Yes	CO_2 is formed with the combustion of fuels.

	(nominal) emission.	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:

>>
17/07/2002 (The Order of the General Director of the "Lugansk Energy Interconnection" LLC # 199 dated 17.07.2002 "On the Settlement of the plans for the Investment Program 2002 – 2003 implementation").

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 "LUGANSK ENERGY INTERCONNECTION" LLC (***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 – "LUGANSK ENERGY INTERCONNECTION" LLC. 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 (2002) (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 "LUGANSK ENERGY INTERCONNECTION" LLC Order #480 dated 27/11/2012.

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 "LUGANSK ENERGY INTERCONNECTION" LLC 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 Ukrainian Electricity Grid 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 LUGANSK ENERGY INTERCONNECTION LLC 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 LUGANSK ENERGY INTERCONNECTION LLC 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 Grid in year *y* in the Baseline year (2002)	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 "LUGANSK ENERGY INTERCONNECTION" LLC 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 year (2002), MWh;

Qybl – the volume of the electricity supplied to the "LUGANSK ENERGY INTERCONNECTION"LLC Grid in year *y* in the Baseline year (2002), 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 "LUGANSK ENERGY INTERCONNECTION" LLC 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[35].
The Law of Ukraine "For the Atmosphere Air Protection" #2707-XII issued 14.07.2011[36]
International Standart "Environmental Management System" ISO 14001-2004[37].

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

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

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

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 1%.
P2 *Vy*	Low	The uncertainty level of the parameter is determined at the level of the electricity meters uncertainty, which is 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 "Luganskstandartmetrologiya" in accordance with the contract specification signed annually.
The replacement of the meters schedule is set quarterly in accordance with the "Lugansk Energy Interconnection" LLC 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 # 480 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.

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 "LUGANSK ENERGY INTERCONNECTION" LLC. 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 – Temenko Yevgen Mykolayovych) and is signed by the Company Manager (General director).

The values of the volume of the electricity supplied to the "LUGANSK ENERGY INTERCONNECTION"LLC 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 – Tikhomirov Maksym Volodymyrovych); the Distribution Grids Department (the Head of the Department – Panarin Yevgen Viktorovych); the Electricity Sales Department (the Head of the Department – Bogodukh Olena Volodymyrivna); the Electriucity Market Relations Department (the Head of the Department – Novikova Yuliya Viktorivna).

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 "Luganskstandartmetrologiya" in accordance with the contract specification signed annually.
The replacement of the meters is provided quarterly in accordance with the "Lugansk Energy Interconnection" LLC 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 LLC (not a Project participant)
14/3, Stadionny proezd str.
Kharkov, Ukraine
61091
Telephone: + 38 050 5950311
Fax: + 38 057 392 0045
M_rogovoy@elta.kharkov.ua
The detailed contact information see in the Annex 1.

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	1 111 553
2005	1 007 598
2006	1 051 695
2007	1 060 416
Total 2004 - 2007 (tCO2eq.)	4 231 262

ESTIMATED PROJECT EMISSIONS [T CO2 EQ / YEAR], CREDITING PERIOD	
Years	Estimated project emissions in tCO2eq.
2008	1 362 853
2009	1 312 593
2010	1 366 977
2011	1 400 492
2012	1 400 492
Total 2008 - 1012 (tCO2eq.)	6 843 407

ESTIMATED PROJECT EMISSIONS [T CO2 EQ / YEAR], POST-KYOTO PERIOD	
Years	Estimated project emissions in tCO2eq.
2013	1 400 492
2014	1 400 492
2015	1 400 492
2016	1 400 492
2017	1 400 492
2018	1 400 492
2019	1 400 492
2020	1 400 492
2021	1 400 492
2022	1 400 492
2023	1 400 492
Total 2013 – 2023 (tCO2eq.)	15 405 412

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	1 111 553
2005	1 007 598
2006	1 051 695
2007	1 060 416
Total 2004 - 2007 (tCO2eq.)	4 231 262

ESTIMATED PROJECT EMISSIONS PLUS LEAKAGE [T CO2 EQ / YEAR], CREDITING PERIOD	
Years	Estimated project emissions plus leakage in tCO2eq.
2008	1 362 853
2009	1 312 593
2010	1 366 977
2011	1 400 492
2012	1 400 492
Total 2008 - 1012 (tCO2eq.)	6 843 407

ESTIMATED PROJECT EMISSIONS PLUS LEAKAGE [T CO2 EQ / YEAR], POST-KYOTO PERIOD	
Years	Estimated project emissions plus leakage in tCO2eq.
2013	1 400 492
2014	1 400 492
2015	1 400 492
2016	1 400 492
2017	1 400 492
2018	1 400 492
2019	1 400 492
2020	1 400 492
2021	1 400 492
2022	1 400 492
2023	1 400 492
Total 2013 – 2023 (tCO2eq.)	15 405 412

E.4. Estimated baseline emissions:

>>

*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	1 694 600
2005	1 728 674
2006	1 940 276
2007	1 999 503
Total 2004 - 2007 (tCO2eq.)	7 363 053

ESTIMATED BASELINE EMISSIONS [T CO2 EQ / YEAR], CREDITING PERIOD	
Years	Estimated baseline emissions in tCO2eq.
2008	2 677 656
2009	2 474 415
2010	2 651 159
2011	2 757 759
2012	2 757 759
Total 2008 - 1012 (tCO2eq.)	13 318 748

ESTIMATED BASELINE EMISSIONS [T CO2 EQ / YEAR], POST-KYOTO PERIOD	
Years	Estimated baseline emissions in tCO2eq.
2013	2 757 759
2014	2 757 759
2015	2 757 759
2016	2 757 759
2017	2 757 759
2018	2 757 759
2019	2 757 759
2020	2 757 759
2021	2 757 759
2022	2 757 759
2023	2 757 759
Total 2013 – 2023 (tCO2eq.)	30 335 349

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	583 047
2005	721 076
2006	888 581
2007	939 087
Total 2004 - 2007 (tCO2eq.)	3 131 791

ESTIMATED EMISSIONS REDUCTIONS [T CO2 EQ / YEAR], CREDITING PERIOD	
Years	Estimated emission reductions in tCO2eq.
2008	1 314 803
2009	1 161 822
2010	1 284 182
2011	1 357 267
2012	1 357 267
Total 2008 - 1012 (tCO2eq.)	6 475 341

ESTIMATED EMISSION REDUCTIONS [T CO2 EQ / YEAR], POST-KYOTO PERIOD	
Years	Estimated emission reductions in tCO2eq.
2013	1 357 267
2014	1 357 267
2015	1 357 267
2016	1 357 267
2017	1 357 267
2018	1 357 267
2019	1 357 267
2020	1 357 267
2021	1 357 267
2022	1 357 267
2023	1 357 267
Total 2013 – 2023 (tCO2eq.)	14 929 937

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

>>

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	1 111 553	0	1 694 600	583 047
2005	1 007 598	0	1 728 674	721 076
2006	1 051 695	0	1 940 276	888 581
2007	1 060 416	0	1 999 503	939 087
Total (tCO2eq.)	4 231 262	0	7 363 053	3 131 791
Annual average value of the CO2 emission reductions (tCO2eq.)	1 057 815	0	1 840 763	782 948

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	1 362 853	0	2 677 656	1 314 803
2009	1 312 593	0	2 474 415	1 161 822
2010	1 366 977	0	2 651 159	1 284 182
2011	1 400 492	0	2 757 759	1 357 267
2012	1 400 492	0	2 757 759	1 357 267
Total (tCO2eq.)	6 843 407	0	13 318 748	6 475 341
Annual average value of the CO2 emission reductions (tCO2eq.)	1 368 681	0	2 663 749	1 295 068

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	1 400 492	0	2 757 759	1 357 267
2014	1 400 492	0	2 757 759	1 357 267
2015	1 400 492	0	2 757 759	1 357 267
2016	1 400 492	0	2 757 759	1 357 267
2017	1 400 492	0	2 757 759	1 357 267
2018	1 400 492	0	2 757 759	1 357 267
2019	1 400 492	0	2 757 759	1 357 267
2020	1 400 492	0	2 757 759	1 357 267
2021	1 400 492	0	2 757 759	1 357 267
2022	1 400 492	0	2 757 759	1 357 267
2023	1 400 492	0	2 757 759	1 357 267
Total (tCO2eq)	15 405 412	0	30 335 349	14 929 937
Annual average value of the CO2 emission reductions (tCO2eq.)	1 400 492	0	2 757 759	1 357 267

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:

>>

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

PROJECT OWNER

Organisation:	«Lugansk Energy Interconnection» LLC
Street/P.O.Box:	Kotelnikova
Building:	1
City:	Lugansk
State/Region:	Lugansk
Postal code:	91055
Country:	Ukraine
Phone:	+38 0642 351450
Fax:	+38 0642 332995
E-mail:	info@en.lg.ua
USREOU code	31443937
URL:	www.en.lg.ua
Represented by:	Bespalov Oleksiy Oleksandrovych
Title:	General Director
Salutation:	Mister
Last name:	Bespalov
Middle name:	Oleksandrovych
First name:	Oleksiy
Department:	-
Phone (direct):	+38 0642 351450
Fax (direct):	+38 0642 332995
Mobile:	-
Personal e-mail:	Aleksey.bespalov@en.lg.ua

PROJECT DEVELOPER

Organisation:	Eco-Elta LLC
Street/P.O.Box:	Stadionny proezd
Building:	14/3
City:	Kharkov
State/Region:	
Postal code:	61091
Country:	Ukraine
Phone:	+38 (057) 713 4102
Fax:	+38 (057) 392 0045
E-mail:	elta@elta.kharkov.ua
URL:	www.elta.kherkov.ua
Represented by:	Rogovoy Maksym
Title:	Director
Salutation:	Mister
Last name:	Rogovoy
Middle name:	Ivanovich
First name:	Maksym
Department:	
Phone (direct):	
Fax (direct):	+38 057 713 41 02
Mobile:	+38 050 595 0311
Personal e-mail:	m_rogovoy@elta.kharkov.ua

THE POTENTIAL BUYER OF THE EMISSION REDUCTION UNITS

Organisation:	"Imex Energo" Sp.z o. o.
Street/P.O.Box:	Przemyslowa
Building:	14
City:	Rzeshow
State/Region:	
Postal code:	35-105
Country:	Poland
Phone:	+48 603366 67 00
Fax:	+48 1 777 88 408
URL:	
Represented by:	
Title:	Director
Salutation:	
Last name:	Warchol
Middle name:	Janusz
First name:	
Department:	
Fax (direct):	+48 1 777 88 408
Phone (direct):	+48 603366 67 00
Mobile:	+48 603366 67 00
Personal e-mail:	jwarchol@wp.pl

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 "LUGANSK ENERGY INTERCONNECTION" LLC, 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 year (2002), MW*h;

Qybl – the volume of the electricity supplied to the "LUGANSK ENERGY INTERCONNECTION"LLC Grid in year *y* in the Baseline year (2002), MW*h;

For the proposed Project the parameters used for the calculation were:
Vybl 2002 = 2 257 026 MWh;

Qybl 2002 = 11 681 908 MWh;

According to this data the ***PPER*** of the Project is 19,32%.

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)[38].

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

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)[39].
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[40];
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[41];
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[42];
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[43];

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.

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

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

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

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

[43] 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 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 – Temenko Yevgen Mykolayovych) and is signed by the Company Manager (General director).

The values of the volume of the electricity supplied to the "LUGANSK ENERGY INTERCONNECTION"LLC 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 – Tikhomirov Maksym Volodymyrovych); the Distribution Grids Department (the Head of the Department – Panarin Yevgen Viktorovych); the Electricity Sales Department (the Head of the Department – Bogodukh Olena Volodymyrivna); the Electriucity Market Relations Department (the Head of the Department – Novikova Yuliya Viktorivna).

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 "Luganskstandartmetrologiya" in accordance with the contract specification signed annually.
The replacement of the meters is provided quarterly in accordance with the "Lugansk Energy Interconnection" LLC order.

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 # 480 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.

- - - - -