JOINT IMPLEMENTATION PROJECT

"Reconstruction of the Electricity Grid of the "Service-Invest" LLC."
(project title)

Position of the head of the company, project developer

Director "Elta-Eco" LLC
(position)

(signature)

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

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

Acting General Director
"Servise-Invest" LLC
(position)

(signature)

Protopopova Iryna Mykolayivna
(surname, name and patronymic of the person)

Kharkiv, July 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: **"**Reconstruction of the Electricity Grid of the "Service-Invest" LLC.**"**

Sectoral scope 2: Energy distribution.

Version: 1.2.2

Date: 25 June 2012

A.2. Description of the project:

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The "Service-Invest" LLC. is the key enterprise inside the DTEK Holding for the electricity transportation and supply. The enterprise is the member of the Wholesale Electricity Market.
The main consumers of the "Service-Invest" LLC. are the Ukrainian mining sector enterprises. The significant parts among them are the coalmines, metal works and machinery plants. The "Metinvest Holding" LLC enterprises cover 47,7% of the "Service-Invest" LLC electricity supply. The electricity supply to the DTEK Holding enterprises covers about 7,3% of the whole electricity supply by the "Service-Invest" LLC.

In early 2000ths 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 situation before the Project was that the efficiency of the electricity transportation through the "Service-Invest" LLC grid was getting lower and the electricity loses were rising constantly.

The "Service-Invest" LLC started it's activity in 2001 and in 2003 the first investment programme was developed. This programme included the implementation of the efficiency measures and the lowering of the electricity loses coefficient. One of the objectives for the investments was the possibility of the GHG emission lowering and potential JI registration.

The Project foresees the implementation of the electricity loses reduction measures at the transmission lines of the "Service-Invest" LLC. as well as the electricity transportation and loses registration precision increase measures.
Moreover, the Project foresees the implementation of the Automatic Electricity Registration System for the Company balance compilation and, starting from 2011, for the commercial accounting with the SE "Energorynok".

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.

It should be mentioned, that there are no non-technical loses (as they are described in the GKD 34.09.104-2003) among the electricity loses at the "Service-Invest" LLC Grid. Thus, the electricity loses reduction in the Grid will lead to the equivalent 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).

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)	"Service-Invest" LLC	No
Ukraine	"Elta-Eco" LLC	No
The Netherlands	ING Bank N.V.	No

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

- Service-Invest LLC.
  Project Owner, Owner of the emission reduction units

- Elta-Eco LLC.
  Project Developer.

- ING Bank N.V.
  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 Service-Invest LLC provides electricity transportation and supply services in Ukraine. The main equipment of the Service_invest LLC is located in Donetsk and Dnipropetrovsk regions.

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

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Donetsk region, Eastern Part of Ukraine

Figure 2. Donetsk region[1]

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

Dnipropetrovsk region, Eastern Part of Ukraine

Figure 3. Dnipropetrovsk region[2]

[2] http://www.business-assistant-ua.eu/cont/img/Dnipropetrovsk_region_large.png

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

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The JI Project is implemented at the territory of above-mentioned regions 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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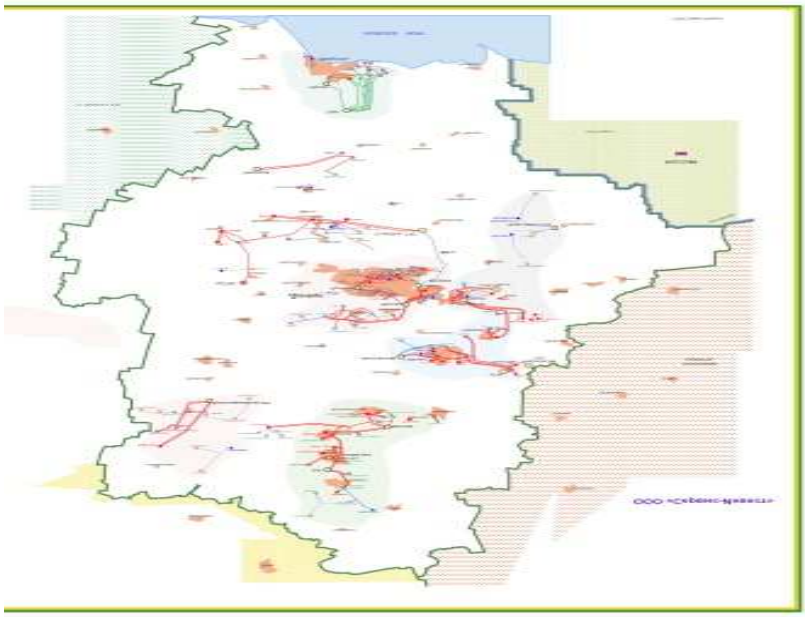

Figure 4. **The main Electricity Grids of the Service-Invest LLC in Donetsk region**

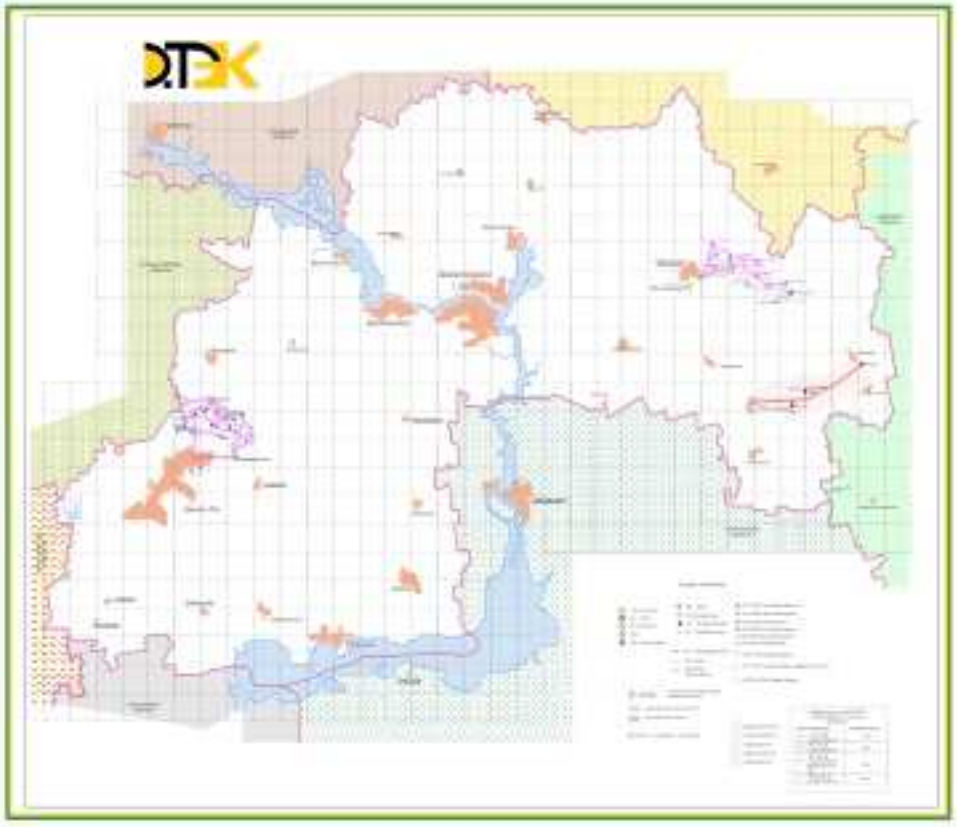

Figure 5. The main Electricity Grids of the Service-Invest LLC in Dnipropetrovsk region

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, circuit breakers, control panels and other equipment at the electricity substations that will lower the loses significantly. 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.

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 6. The Power transformer at the Substation before the reconstruction

Figure 7. The The Power transformer at the Substation after the reconstruction

Figure 8. The Circuit Breakers before and after the Reconstruction.

Figure 9. The Control Panel of the Substation before and after the Reconstruction

2. The Project foresees the replacement of the wires and cables for those with the bigger section and the higher transmission capacity. 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.

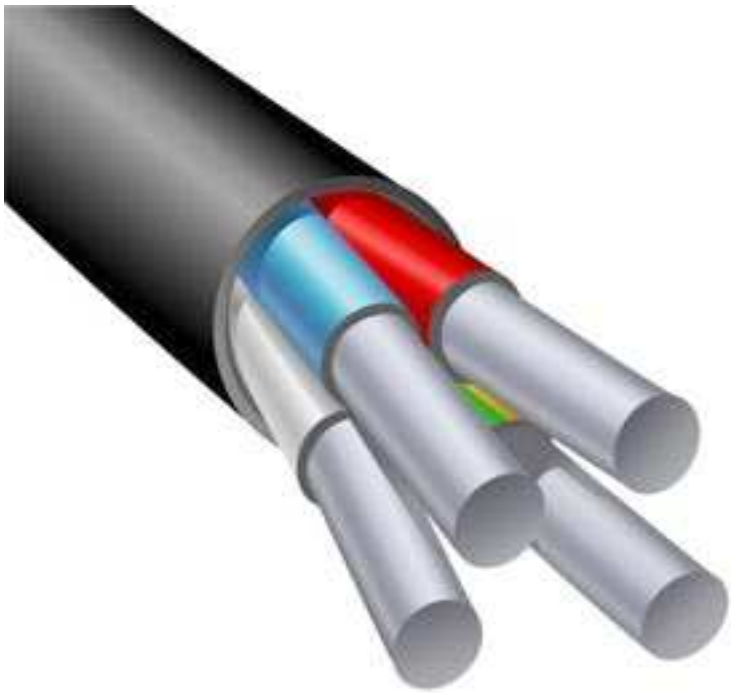

Figure 10. Self-supporting insulated wire.

3. The other significant aspect of the Project is the installation of the glass and polymer insulators. 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 11. The glass insulator

Figure 12. Polymer insulators

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 Service-Invest 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.[3];
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.[4];
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.[5];
4. The Resolution of the Cabinet of Ministers of Ukraine "On Approval of the Sanctions for the

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

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

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

Violations of the Law on Power ndustry" №1139 dated 19.07.2000y.[6];
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.[7];
6. The Law of Ukraine "On Energy Saving" №74/94-BP dated 01.07.1994y.[8];
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.[9];
8. The Law of Ukraine "On the Licensing of the Certain Economic Activities" №1775-III dated 01.06.2000y.[10];
9. The Law of Ukraine "On Natural Monopolies" №1682-III dated 20.04.2000y.[11];
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[12]. and others.

According to the above mentioned legal acts the "Service-Invest" 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. Moreover, the most electricity transmission enterprises in Ukraine reach the electricity loses lowering by the implementation of the organizational measures (the lowering of the non-technical loses). The Service-Invest LLC does not have the non-technical loses in the loses structure, so all the effect obtained is due to the investment and technical rehabilitations.

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.
The calculations provided for the three periods: 2004-2007 (48 months), 2008-2012 (60 months), 2013-2023 (132 months). The calculations for 2005-2012 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***

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

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

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

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

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

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

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

	Years
Length of the period	4
Years	Estimate of annual emission reductions in tCO2eq.
2004	23 659
2005	27 318
2006	33 019
2007	41 891
Total estimated emission reductions over the Period (tCO2eq.)	125 887
Annual average of estimated emission reductions over the period (tCO2eq.)	31 472

The total amount of emissions reduction is 125 887 tCO2eq.
The annual average amount of GHG emissions is 31 472 tCO2eq.

The example of the Emission Reduction calculation for the 2007:

The volume of the electricity supplied to the Grid (***Qy***) in 2007 was 18 623 350 MWh;
The factual volume of the electricity loses (***Vy***) in 2007 was 172 020 MWh, which is 0,92 % of the electricity supplied.
The electricity loses coefficient in the Baseline scenario (***PPER***) was 1,20 % 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 = 18 623 350 * 0,012 * 0,807 = 180 711 tCO2eq..
The Project Emission in 2007 was:
PEy = 172 020 * 0,807 = 138 820 tCO2eq..
The Emission Reductions in 2007 were:
***ERy* = 180 711 – 138 820 = 41 891 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	113 879
2009	95 173
2010	122 616
2011	128 800
2012	95 383
Total estimated emission reductions over the crediting period (tCO2eq.)	555 851
Annual average over the crediting period of estimated reductions (tCO2eq)	111 170

The total amount of emissions reduction is 555 851 tCO2eq.
The annual average amount of GHG emissions is 111 170 tCO2eq.

The example of the Emission Reduction calculation for the 2009:

The volume of the electricity supplied to the Grid (***Qy***) in 2009 was 18 212 825 MWh;
The factual volume of the electricity loses (***Vy***) in 2009 was 132 157 MWh, which is 0,73 % of the electricity supplied.
The electricity loses coefficient in the Baseline scenario (***PPER***) was 1,2 % 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 = 18 212 825 * 0,012 * 1,096 = 240 017 tCO2eq.
The Project Emission in 2009 was:
PEy = 132 157 * 1,096 = 144 844 tCO2eq.
The Emission Reductions in 2009 were:
***ERy* = 240 017 – 144 844 = 95 173 tCO2eq.**

Table 5. ***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	107 189
2014	112 155
2015	108 330
2016	111 461
2017	116 872
2018	122 491
2019	128 419
2020	134 492
2021	141 650
2022	149 336
2023	157 583
Total estimated emission reductions over the crediting period (tCO2eq.)	1 389 978
Annual average over the crediting period of estimated reductions (tons of CO2 e)	126 362

The total amount of emissions reduction is 1 389 978 tCO2eq.
The annual average amount of GHG emissions is 126 362 tCO2eq.

A.5. Project approval by the Parties involved:

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The Letter of Endorsement #3540/23/7 dated 01.12.2011 has been received from the State Environmental Investments Agency of Ukraine.

After finishing of project determination report, the PDD and Determination Report will be presented to National Environmental Investments Agency of Ukraine for receiving of the Letter of Approval. The Letter of Approval from the country - investor will be provided after approval of project by Ukraine.

State Environmental Investment Agency of Ukraine

35, Urytskogo str.

03035 Kiev
Ukraine
Email: info.neia@gmail.com

SECTION B. Baseline

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

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

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" [13] 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 "Tool for the demonstration and assessment of additionality" (Version 05.2.1) [14].

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 Service-Invest 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 2003.

The Service-Invest 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. 2003 was chosen as the Baseline, because the Service-Invest LLC in 2003 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;

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.

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

[14] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v5.2.1.pdf

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 II according to the data for 2003, 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.

Step 2: Application of the approach chosen.

Sub-step 2a: Identification and listing of plausible alternative baseline scenarios

The alternatives to the project activity's measures are:

Alternative 1. The proposed project activity not undertaken as a JI project;

Alternative 2. The implementation of the part of the Project measures.

Alternative 3. The continuation of the existing situation. The existing situation is the situation of the equipment usage without any major investments in the reliability and repairs. The repairs are being provided on occasion, if some emergency accidents occur. There would not be any schedule for the repairs or major repairs. In this situation the Service-Invest LLC grid would continue it's operation with the constant lowering of the efficiency (loses coefficient increase).

Sub-step 2b. Assessment of the alternative scenarios

1. The *Alternative 1* is elliminated by the situation that in the host country (Ukraine) there are no compensations for the electricity loses reduction in the grid. The loses reduction is taken into account while calculating the loses normative for the next reporting year. Thus, there are no financial benefits from the Project implementation except the ERUs selling.

2. The *Alternative 2* is also unacceptable, because the electricity loses in the "Service-Invest" LLC grid are quite low and the partial Project implementation will not give any significant effect and it will be too low for the JI registration. So, the *Alternative 2* is technically possible, but not reasonable and feasible.

3. The continuation of the existing situation is the most plausible alternative (*Alternative 3*). The existing situation in the Ukrainian Power Sector has already been described in the A.4.3. of the PDD. 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.

Outcome of Step 2b:

There is only one alternative scenario that is not prevented by any barrier, and this alternative is not the proposed project activity undertaken without being registered as a JI project. This scenario is *Alternative 3.* The continuation of the existing situation. The existing situation is the situation of the equipment usage without any major investments in the reliability and repairs. The repairs are being provided on occasion, if some emergency accidents occur. There would not be any schedule for the repairs or major repairs. In this situation the Service-Invest LLC grid would continue its operation with the constant lowering of the efficiency (loses coefficient increase).

Demonstration of additionality

Please, see section B.2.

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 Service-Invest 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 2003 - 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)	0,012 (1,2 %)
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	-

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 Service-Invest 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 (2003) were 172 521,6 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	-

Data/ Parameter	***Qybl***
Data unit	MWh
Description	The volume of the electricity supplied to the electricity Grid in year *y* in the Baseline Scenario (2003).
Time of	Determined in the PDD.

determination/monitoring	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 Service-Invest LLC grid in 2003 was 14 347 939 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	-

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 2003-2011. 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 2003 – 2005 the data was taken from the Table B2 Baseline carbon emission factors for JI projects reducing electricity consumption, з документу Operational guidelines for project design documents of joint implementation projects (volume 1: general guidelines Version 2.3)[15]. 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)[16].

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

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

<table>
<tr><td></td><td>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[17];
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[18];
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[19];
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[20];
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>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>0,770</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, 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.

Project will use a baseline in accordance with the “Tool for the demonstration and assessment of additionality” (Version 05.2.1) [21].

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

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

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

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

[21] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v5.2.1.pdf

Identification of the most plausible baseline scenario for the rehabilitation and/or energy efficiency improvement of the power plant through the application of the following steps:

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

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

See section B.1

Outcome of Step 1a:
Alternative 1. The proposed project activity not undertaken as a JI project;

Alternative 2. The implementation of the part of the Project measures.

Alternative 3. The continuation of the existing situation. The existing situation is the situation of the equipment usage without any major investments in the reliability and repairs. The repairs are being provided on occasion, if some emergency accidents occur. There would not be any schedule for the repairs or major repairs. In this situation the Service-Invest LLC grid would continue it's operation with the constant lowering of the efficiency (loses coefficient increase).

Sub-step 1b. Consistency with mandatory applicable laws and regulations
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.;
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.;
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.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.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.The Law of Ukraine "On Energy Saving" №74/94-BP dated 01.07.1994y.;
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.The Law of Ukraine "On the Licensing of the Certain Economic Activities" №1775-III dated 01.06.2000y.;
9.The Law of Ukraine "On Natural Monopolies" №1682-III dated 20.04.2000y.;
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. and others.

Outcome of Step 1b:
Alternative 1. The proposed project activity not undertaken as a JI project;

Alternative 2. The implementation of the part of the Project measures.

Alternative 3. The continuation of the existing situation. The existing situation is the situation of the equipment usage without any major investments in the reliability and repairs. The repairs are being provided on occasion, if some emergency accidents occur. There would not be any schedule for the

repairs or major repairs. In this situation the Service-Invest LLC grid would continue it's operation with the constant lowering of the efficiency (loses coefficient increase).

Step 2. Investment Analysis

Sub-step 2a: Determine appropriate analysis method

The proposed project generates cost savings, so cost analysis (sub-step 2b Option I) of the Additionality Tool cannot be used.
In line with the CDM Additionality Tool version 05.2.1 Option III – benchmark analysis – has been chosen. The project participants have chosen to use Project NPV as the assessment indicator. In order to select a proper benchmark for the indicator chosen project participants have assessed options contained in the Additionality Tool.
The 4b approach of the Option III was selected. Project participants have taken the average commercial lending rates (factual data for period 2003-2005[22]) relevant for the decision making context of this project as a benchmark for the Project NPV.

Sub-step 2b. Application of the benchmark analysis

The benchmark for the present project is the NPV calculated using discount rate based on average lending rates in Ukraine in national currency. The discount rate is 15% [23].. The project owner would not consider the investment if the project is generating cash flow with NPV below 0.

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

The project's cash flow was calculated using the following assumptions:

- The benchmark for the present project is the NPV calculated using discount rate based on average lending rates in Ukraine in national currency. The discount rate is 15%[24]. The project owner would not consider the investment if the project is generating cash flow with NPV below 0.
- Cash flow calculation was made for the period 2004-2023 (20 years).
- The total investment costs of the Project are 1 935 852 000 UAH.

The decision to start the reconstruction was made in 2003.
The calculations are made, taking into account the factual price of electricity transportation.
Due to a higher expected transportation efficiency of the grid after the reconstruction, the bigger amount of the electricity will be transported through the Service-Invest LLC grid, thus the project generates cost saving.

The resulting **Project NPV is equal to – 177 341 950 UAH.** The project would not have been financially attractive without the JI component. Even the JI registration of the Project would not make the Project financially attractive. If the ERU price is 4 Euro per ERU and 1 Euro per AAU, the Project NPV is **– 159 243 430 UAH.**

Sub-step 2d. Sensitivity analysis

In the Sensitivity Analysis two most important factors fluctuations were considered:

- Scenario 1 - Investment costs down 20%.

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

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

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

- Scenario 2 -.Electricity transportation price up 20%.

The result of the Sensitivity Analysis:

Scenario 1: NPV – 93 975 310 UAH.

Scenario 2: NPV – 133 723 840 UAH.

Outcome of Step 2: After the sensitivity analysis it is concluded that the proposed JI project activity is unlikely to be financially/economically attractive. Proceeding to Step 4 (Common practice analysis).

Step 3. Barrier analysis (optional)
Not applicable

Step 4. Common practice analysis

According to the above Ukrainian legal acts the "Service-Invest" 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. Moreover, the most electricity transmission enterprises in Ukraine reach the electricity loses lowering by the implementation of the organizational measures (the lowering of the non-technical loses). The Service-Invest LLC does not have the non-technical loses in the loses structure, so all the effect obtained is due to the investment and technical rehabilitations.

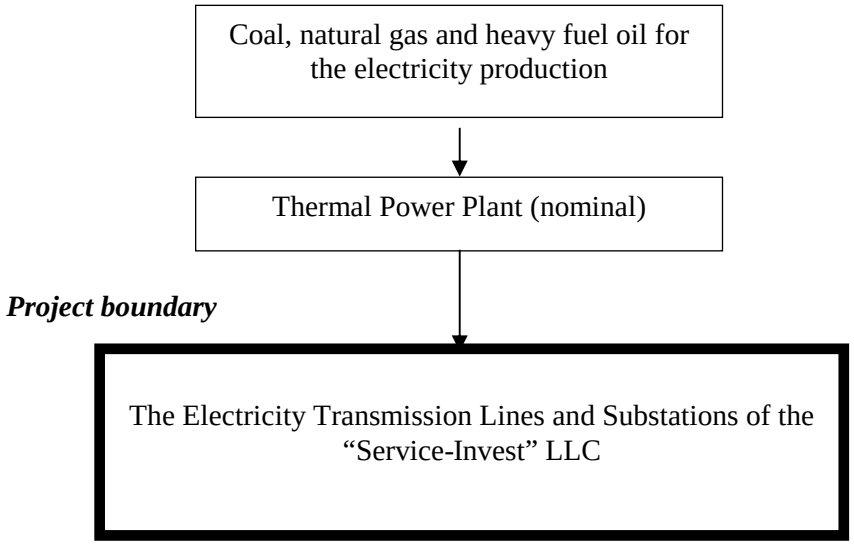
Sub-step 4 is satisfied because the similar activities are observed but there are essential distinctions between the proposed JI project activity and similar activities occurs. Then the proposed project activity is additional.

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 and transformer substations owned by the "Service-Invest" LLC.

Figure 13. Diagram of the project boundary



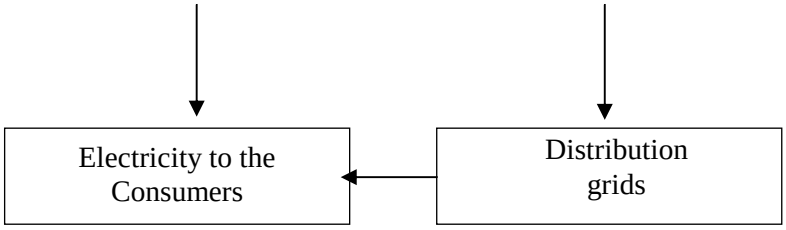


Table 4. Sources of emission in the Baseline Scenario and in the Project

	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: 12/01/2012

Name of the person(s)/entities setting the baseline: "Elta-Eco" 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:

>>

06/06/2003 (Contract for the Working Project Development for the "Ilyich" Substation Reconstruction № 54-03-P493/2003 dated 06.06.2003).

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 Service-Invest 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 – Service-Invest LLC. The data for the Project Emission, Baseline Emission and the Emission Reduction calculation is taken from the 1B-TRE 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 (2003) (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 Service-Invest LLC Order #191/1 dated 05/04/2011.

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	The volume of	Monitoring, 1B-	MWh	c	yearly	100%	electronic, paper	Measured, then

Vy	the electricity loses in the Grid in year *y* in the Project Scenario	TRE form						calculated monthly in the 1B-TRE 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 Service-Invest 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:

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

where

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

Vyp **–** 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 (4) 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 Service-Invest LLC Grid in year *y* in the Project Scenario	monitoring	MWh	m	Yearly	100%	Electronic, paper	Measured, then recorded monthly in the 1B-TRE 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 Service-Invest LLC Grid in year *y* in the Baseline Scenario	monitoring	MWh	m	Yearly	100%	Electronic, paper	Measured, then recorded monthly in the 1B-TRE 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 Scenario	Monitoring, 1B-TRE form	MWh	c	Yearly	100%	electronic, paper	Measured, then calculated monthly in the 1B-TRE 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 Service-Invest 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 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 Service-Invest 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 25.06.1991[25];
The Law of Ukraine "For the Atmosphere Air Protection" #2707-XII issued 16.10.1992[26];
International Standart "Environmental Management System" ISO 14001-2004[27].

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.
P1 *PEy*	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%.

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 Service-Invest LLC. All the necessary data for the Baseline Emission, Project Emission and the Emission Reductions calculation will be taken from the 1B-TRE 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 filled forms 1B-TRE will be sent to the Project Developer Elta-Eco LLC, which will be rsponsible for the calculations.

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

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

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

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: 12.05.2011

Mr. Maksym Rogovoy
ELTA JSC
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	121 027
2005	114 260
2006	128 489
2007	138 820
Total 2004 - 2007 (tCO2eq.)	520 596

ESTIMATED PROJECT EMISSIONS [T CO2 EQ / YEAR], CREDITING PERIOD	
Years	Estimated project emissions in tCO2eq.
2008	148 624
2009	144 844
2010	137 304
2011	144 665
2012	211 024
Total 2008 - 1012 (tCO2eq.)	786 460

ESTIMATED PROJECT EMISSIONS [T CO2 EQ / YEAR], POST-KYOTO PERIOD	
Years	Estimated project emissions in tCO2eq.
2013	227 265
2014	234 459
2015	241 653
2016	249 719
2017	255 169
2018	260 292
2019	265 197
2020	269 775

2021	273 822
2022	277 929
2023	282 098
Total 2013 – 2023 (tCO2eq.)	2 837 377

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	121 027
2005	114 260
2006	128 489
2007	138 820
Total 2004 - 2007 (tCO2eq.)	520 596

ESTIMATED PROJECT EMISSIONS PLUS LEAKAGE [T CO2 EQ / YEAR], CREDITING PERIOD	
Years	Estimated project emissions plus leakage in tCO2eq.
2008	148 624
2009	144 844
2010	137 304
2011	144 665
2012	211 024
Total 2008 - 1012 (tCO2eq.)	786 460

ESTIMATED PROJECT EMISSIONS PLUS LEAKAGE [T CO2 EQ / YEAR], POST-KYOTO PERIOD	
Years	Estimated project emissions plus leakage in tCO2eq.
2013	227 265
2014	234 459
2015	241 653
2016	249 719
2017	255 169
2018	260 292

2019	265 197
2020	269 775
2021	273 822
2022	277 929
2023	282 098
Total 2013 – 2023 (tCO2eq.)	2 837 377

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	144 687
2005	141 578
2006	161 508
2007	180 711
Total 2004 - 2007 (tCO2eq.)	628 484

ESTIMATED BASELINE EMISSIONS [T CO2 EQ / YEAR], CREDITING PERIOD	
Years	Estimated baseline emissions in tCO2eq.
2008	262 503
2009	240 017
2010	259 920
2011	273 465
2012	306 407
Total 2008 - 1012 (tCO2eq.)	1 342 311

ESTIMATED BASELINE EMISSIONS [T CO2 EQ / YEAR], POST-KYOTO PERIOD	
Years	Estimated baseline emissions in tCO2eq.
2013	334 454
2014	346 614
2015	349 983
2016	361 180
2017	372 041
2018	382 783
2019	393 616
2020	404 267
2021	415 472

2022	427 265
2023	439 681
Total 2013 – 2023 (tCO2eq.)	4 227 357

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	23 659
2005	27 318
2006	33 019
2007	41 891
Total 2004 - 2007 (tCO2eq.)	125 887

ESTIMATED EMISSIONS REDUCTIONS [T CO2 EQ / YEAR], CREDITING PERIOD	
Years	Estimated emission reductions in tCO2eq.
2008	113 879
2009	95 173
2010	122 616
2011	128 800
2012	95 383
Total 2008 - 1012 (tCO2eq.)	555 851

ESTIMATED EMISSION REDUCTIONS [T CO2 EQ / YEAR], POST-KYOTO PERIOD	
Years	Estimated emission reductions in tCO2eq.
2013	107 189
2014	112 155
2015	108 330
2016	111 461
2017	116 872
2018	122 491
2019	128 419
2020	134 492
2021	141 650
2022	149 336
2023	157 583

Total 2013 – 2023 (tCO2eq.)	1 389 978

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	121 027	0	144 687	23 659
2005	114 260	0	141 578	27 318
2006	128 489	0	161 508	33 019
2007	138 820	0	180 711	41 891
Total (tCO2eq.)	520 596	0	628 484	125 887
Annual average value of the CO2 emission reductions (tCO2eq.)	125 649	0	157 121	31 472

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	148 624	0	262 503	113 879
2009	144 844	0	240 017	95 173
2010	137 304	0	259 920	122 616
2011	144 665	0	273 465	128 800
2012	211 024	0	306 407	95 383
Total (tCO2eq.)	786 460	0	1 342 311	555 851
Annual average value of the CO2 emission reductions (tCO2eq.)	157 292	0	268 462	111 170

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	227 265	0	334 454	107 189
2014	234 459	0	346 614	112 155
2015	241 653	0	349 983	108 330
2016	249 719	0	361 180	111 461
2017	255 169	0	372 041	116 872
2018	260 292	0	382 783	122 491
2019	265 197	0	393 616	128 419
2020	269 775	0	404 267	134 492
2021	273 822	0	415 472	141 650
2022	277 929	0	427 265	149 336
2023	282 098	0	439 681	157 583
Total (tCO2eq)	2 837 377	0	4 227 357	1 389 978
Annual average				

value of the CO2 emission reductions (tCO2eq.)	257 943	0	384 305	126 362

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&

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:	Service-Invest LLC
Street/P.O.Box:	Shevchenko blvd.
Building:	11
City:	Donetsk
State/Region:	
Postal code:	83001
Country:	Ukraine
Phone:	+38 (062) 303 1359
Fax:	+38 (062) 303 1359
E-mail:	
USREOU code	31018149
URL:	http://www.dtek.com/ru/our-operations/electricity-trade-and-supply/service-invest
Represented by:	Protopopova Iryna Mykolayivna
Title:	Acting Director
Salutation:	Missis
Last name:	Protopopova
Middle name:	Mykolayivna
First name:	Iryna
Department:	
Phone (direct):	+38 (062) 303 1359
Fax (direct):	+38 (062) 303 1359
Mobile:	
Personal e-mail:	

PROJECT DEVELOPER

Organisation:	Elta-Eco 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:	Deputy Director
Salutation:	Mister
Last name:	Rogovoy
Middle name:	Ivanovich
First name:	Maksym
Department:	
Phone (direct):	
Fax (direct):	+38 062 713 41 02
Mobile:	+38 050 595 0311
Personal e-mail:	m_rogovoy@elta.kharkov.ua

THE POTENTIAL BUYER OF THE EMISSION REDUCTION UNITS

Organisation:	ING Bank N.V.
Street/P.O.Box:	Bijlmerplein 888
Building:	AMP D.05.007
City:	Amsterdam
State/Region:	
Postal code:	1102 MG
Country:	The Netherlands
Phone:	-
Fax:	-
E-mail:	-
URL:	www.ing.com
Represented by:	Peter van Eijndhoven
Title:	Director
Salutation:	Mister
Last name:	van Eijndhoven
Middle name:	-
First name:	Peter
Department:	Commercial Banking Structure Finance
Phone (direct):	+31 20 565 82 07
Fax (direct):	+31 20 565 82 07
Mobile:	+31 65 021 30 41
Personal e-mail:	Peter.van.eijndhoven@ingbank.com

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 Service-Invest 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 Scenario, MW*h;

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

For the proposed Project the parameters used for the calculation were:
V2003 **=** 172 521,6 MWh;

Q2003 **=** 14 347 938,96 MWh;

According to this data the ***PPER*** of the Project is 1,2%.

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 2003 – 2005 the data was taken from the Table B2 Baseline carbon emission factors for JI projects reducing electricity consumption, з документу Operational guidelines for project design documents of joint implementation projects (volume 1: general guidelines Version 2.3)[28].

[28] 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)[29].
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[30];
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[31];
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[32];
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[33];

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	2003	2004	2005	2006	2007	2008	2009	2010	2011
EF, tCO2eq/MWh	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.

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

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

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

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

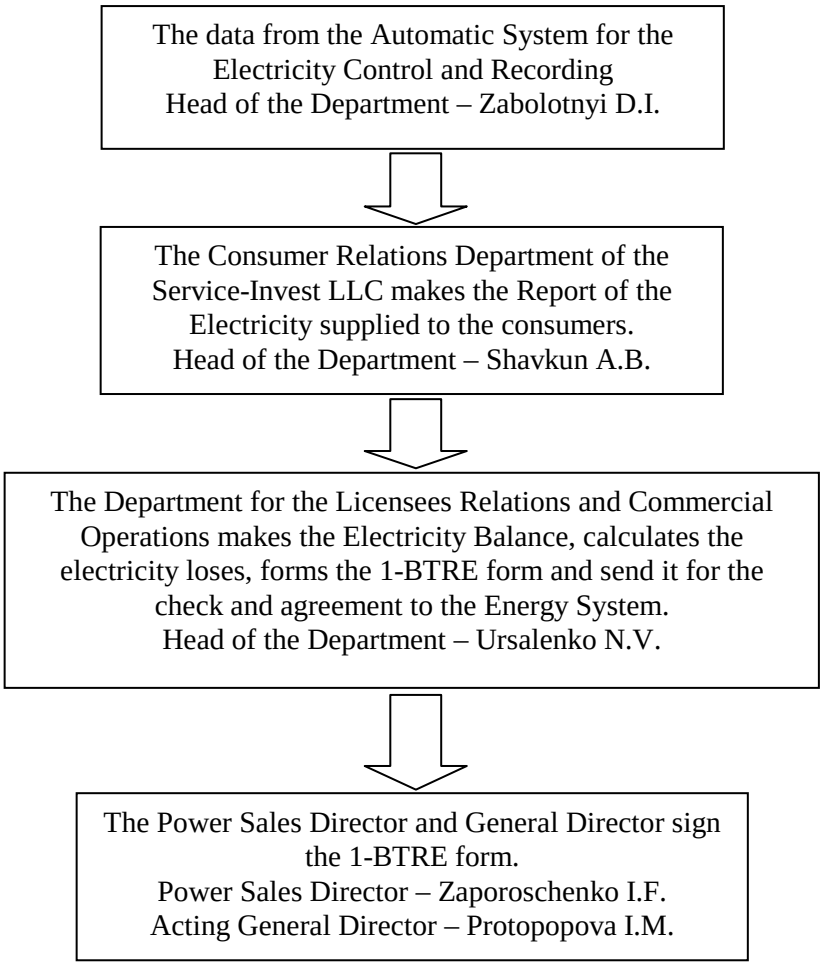
[33] http://www.neia.gov.ua/nature/doccatalog/document?id=127498

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.

Figure 4. The Monitoring Data control at the Service-Invest LLC



During 2003 – 2010 the electricity meters at all the electricity connections of the Service-Invest LLC were replaced by the new more accurate ones. 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. 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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