DETERMINATION REPORT CARBON MARKETING AND TRADING LTD

DETERMINATION OF THE

"Reconstruction of the electrical and heating systems in Kyiv"

REPORT NO. UKRAINE-DET/0819/2012

REVISION NO. 02

BUREAU VERITAS CERTIFICATION

Date of first issue: 09/11/2012	Organizational unit: Bureau Veritas Certification Holding SAS
Client: CARBON MATKETING AND TRADING	Client ref.: Tahir Musayev

Summary:
Bureau Veritas Certification has made the determination of the "Reconstruction of electrical and heating systems in Kyiv" project of PJSC "KYIVENERGO located in the Kyiv city, Ukraine, on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

The determination scope is defined as an independent and objective review of the project design document, the project's baseline study, monitoring plan and other relevant documents, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final determination report and opinion. The overall determination, from Contract Review to Determination Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the determination process is a list of Clarification and Corrective Action Requests (CL and CAR), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas Certification's opinion that the project correctly applies Guidance on criteria for baseline setting and monitoring and meets the relevant UNFCCC requirements for the JI and the relevant host country criteria.

Report No.: UKRAINE det/0819/2012	Subject Group: JI
Project title: "Reconstruction of electrical and heating systems in Kyiv"	
Work carried out by: Kateryna Zinevych - team leader, Lead Verifier Sergii Verteletskyi – team member, Verifier Vyacheslav Yeriomin – Technical Specialist	
Work reviewed by: Ivan Sokolov - Internal Technical Reviewer Vasiliy Kobzar – Technical Specialist Iullia Pylnova – Technical Specialist	
Work approved by: Ivan Sokolov – Operational Manager	
Date of this revision: 16/11/2012	Rev. No.: 02 / Number of pages: 71

Indexing terms

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1 INTRODUCTION

CARBON MATKETING AND TRADING LTD has commissioned Bureau Veritas Certification to determine its JI project “Reconstruction of electrical and heating systems in Kyiv" (hereafter called “the project”) at the Kyiv city, Ukraine.

This report summarizes the findings of the determination of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The determination serves as project design verification and is a requirement of all projects. The determination is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project’s compliance with relevant UNFCCC and host country criteria are determined in order to confirm that the project design, as documented, is sound and reasonable, and meets the stated requirements and identified criteria. Determination is a requirement for all JI projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reduction units (ERUs).

UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

1.2 Scope

The determination scope is defined as an independent and objective review of the project design document, the project’s baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The determination is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 Determination team

The determination team consists of the following personnel:

Kateryna Zinevych
Bureau Veritas Certification Team Leader, Climate Change Verifier

Sergii Verteletskyi

Bureau Veritas Certification, Climate Change Verifier

Vyacheslav Yeriomin

Bureau Veritas Certification, Technical Specialist

This determination report was reviewed by:

Ivan Sokolov
Bureau Veritas Certification, Internal Technical Reviewer

Iullia Pylnova
Bureau Veritas Certification, Technical Specialist

2 METHODOLOGY

The overall determination, from Contract Review to Determination Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a determination protocol was customized for the project, according to the version 01 of the Joint Implementation Determination and Verification Manual, issued by the Joint Implementation Supervisory Committee at its 19 meeting on 04/12/2009. The protocol shows, in a transparent manner, criteria (requirements), means of determination and the results from determining the identified criteria. The determination protocol serves the following purposes:

- It organizes, details and clarifies the requirements a JI project is expected to meet;
- It ensures a transparent determination process where the determiner will document how a particular requirement has been determined and the result of the determination.

The completed determination protocol is enclosed in Appendix A to this report.

2.1 Review of Documents

The Project Design Document (PDD) submitted by CARBON MATKETING AND TRADING LTD and additional background documents related to the project design and baseline, i.e. country Law, Guidelines for users of the joint implementation project design document form, Approved CDM methodology and/or Guidance on criteria for baseline setting and monitoring, Kyoto Protocol, Clarifications on Determination Requirements to be Checked by an Accredited Independent Entity were reviewed.

To address Bureau Veritas Certification corrective action and clarification requests, CARBON MATKETING AND TRADING LTD revised the PDD and resubmitted it on 13/11/2012.

The determination findings presented in this report relate to the project as described in the PDD version(s) 2.0.

2.2 Follow-up Interviews

On 09/11/2012 Bureau Veritas Certification performed on-site interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of CARBON MATKETING AND TRADING LTD and PJSC "KYIVENERGO were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
PJSC "KYIVENERGO	➢ Project history ➢ Project approach ➢ Project boundary ➢ Implementation schedule ➢ Organizational structure ➢ Responsibilities and authorities ➢ Training of personnel ➢ Quality management procedures and technology ➢ Rehabilitation/Implementation of equipment (records) ➢ Metering equipment control ➢ Metering record keeping system, database ➢ Technical documentation ➢ Monitoring plan and procedures ➢ Permits and licenses
CONSULTANT: CARBON MATKETING AND TRADING LTD	➢ Baseline methodology, ➢ Monitoring plan, ➢ Additionality proofs, ➢ Calculation of emission reduction

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the determination is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the project design.

If the determination team, in assessing the PDD and supporting documents, identifies issues that need to be corrected, clarified or

improved with regard to JI project requirements, it will raise these issues and inform the project participants of these issues in the form of:

(a) Corrective action request (CAR), requesting the project participants to correct a mistake in the published PDD that is not in accordance with the (technical) process used for the project or relevant JI project requirement or that shows any other logical flaw;

(b) Clarification request (CL), requesting the project participants to provide additional information for the determination team to assess compliance with the JI project requirement in question;

(c) Forward action request (FAR), informing the project participants of an issue, relating to project implementation but not project design, that needs to be reviewed during the first verification of the project.

The determination team will make an objective assessment as to whether the actions taken by the project participants, if any, satisfactorily resolve the issues raised, if any, and should conclude its findings of the determination.

To guarantee the transparency of the determination process, the concerns raised are documented in more detail in the determination protocol in Appendix A.

3 PROJECT DESCRIPTION

The main objective of the project "Reconstruction of electrical and heating systems in Kyiv", which is implemented by PJSC "KYIVENERGO is to reduce greenhouse gas emissions by reducing fossil fuel and electricity consumption and reduction of heat and electric energy looses, increasing of equipment and systems efficiency in general.

Sub-project 1. Reconstruction and modernization HPP-5 and HPP-6

Implementation of the proposed project activity will allow generate electricity and heat more efficiently, thereby significantly reducing the amount of fossil fuel combustion in comparison with the absence of the project.

The proposed project is intended to modernise of all for units at the HPP in order to:

- Improve energy efficiency and reduce auxiliary equipment consumption;
- improve stability and reliability of generation and transmission of electricity and heat power;
- Improve efficiency;
- Introduce modern control systems.

Sub-project 2. Rehabilitation of the District Heating System

The project employs the reconstruction of central heating supply system which includes replacement and reconstruction of old boilers and distribution networks, frequency controllers, replacement of heat exchanger, implementation of frequency controllers, transition from the existing CHSS to IHSS.
Project provides increase of fuel and electricity consumption efficiency to reduce greenhouse gas emissions relative to current practice.
The following activities will ensure fuel saving:
1. Replacement of old boilers by the new highly efficient boilers;
2. Rehabilitation of boilers with increasing of their efficiency;
3. Switching of load from boiler-houses with obsolete equipment to modern equipped boiler
houses;
4. Burners replacement;
5. Installation of heat utilizers;
6. Application of the pre-insulated pipes;
7. Etc.

Sub-project 3. Reduction of Electricity Technical Losses in the KYIVENERGO PJSC grid
The basis of the Project is the introduction of new energy-efficient equipment and activities:
- organizational and technical measures;
- technical measures that aim to eliminate energy losses when transporting electricity via distribution grids.
Measures to be implemented under the project, as well as application and implementation of ongoing monitoring of possible sources of loss and preventing from their occurrence would significantly reduce energy losses in the electrical grids of PJSC "KYIVENERGO.

The identified areas of concern as to project description, project participants response and Bureau Veritas Certification's conclusion are described in Appendix A to Determination report (refer to CAR01 – CAR06).

4 DETERMINATION CONCLUSIONS

In the following sections, the conclusions of the determination are stated.

The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are described in the Determination Protocol in Appendix A.

The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Determination Protocol in Appendix A. The determination of the Project resulted in 15 Corrective Action Requests and 02 Clarification Requests.

The number between brackets at the end of each section corresponds to the DVM paragraph

4.1 Project approvals by Parties involved (19-20)

The project has been officially presented for endorsement to the Ukrainian authorities. State Environmental Investments Agency of Ukraine has issued a Letter of Endorsement for the project #2682/23/7 dated 20/09/2012.

According to the national Ukrainian procedure, the LoAs by Ukraine is expected after the project determination.

The identified areas of concern as to project approvals by parties involved, project participants response and Bureau Veritas Certification's conclusion are described in Appendix A to Determination report (refer to CAR07 – CAR09).

4.2 Authorization of project participants by Parties involved (21)

After finishing of project determination report, the PDD with supporting documents and Determination Report will be presented to State Environmental Agency of Ukraine for receiving the Letter of Approval that will authorized project participants.

No outstanding issues were raised.

4.3 Baseline setting (22-26)

The PDD explicitly indicates that using a methodology for baseline setting and monitoring developed in accordance with appendix B of the JI guidelines (hereinafter referred to as JI specific approach) was the selected approach for identifying the baseline.

The PDD provides a detailed theoretical description in a complete and transparent manner, as well as justification, that the baseline is established:

1) By listing and describing the following plausible future scenarios on the basis of conservative assumptions and selecting the most plausible one:

Sub-project 1

a) Status quo.

The first version of Baseline scenario is a business-as-usual scenario with minimum reconstruction works balanced by overall degradation of DH system. For this baseline scenario there are no barriers (no investment barrier since this scenario doesn't require the attraction of additional investments, and no

technological barrier since the equipment is operated by existing skilled personnel, and additional re-training is not required), and represent the common practice in Ukraine.

b) Reconstruction without Joint Implementation mechanism.
The second version of Baseline scenario is construction of a modern module boiler house without JI mechanism. In this case there exist both investment barrier since this scenario requires the attraction of large additional investments, and due to very large payback time and high risks it is not attractive for investments, and as well the technological barrier since operation of the new modern equipment will require additional re-training of personnel.

c) Exclusion from the project any non-key type of measures.

The third version of Baseline scenario is the shortened project activity, without any of the non-key type of activity, for example, the exclusion of the modernization of existing units and the construction of an entirely new heat power plant. But it was concluded that this alternative is too costly.

Sub-project 2

a) Status quo.

The first version of Baseline scenario is a business-as-usual scenario with minimum reconstruction works balanced by overall degradation of DH system. For this Baseline scenario there are no barriers (no investment barrier since this scenario doesn't require the attraction of additional investments, and no technological barrier since the equipment is operated by existing skilled personnel, and additional re-training is not required), and represent the common practice in Ukraine.

b) Reconstruction without Joint Implementation mechanism.
The second version of Baseline scenario is construction of a modern module boiler house without JI mechanism. In this case there exist both investment barrier since this scenario requires the attraction of large additional investments, and due to very large payback time and high risks it is not attractive for investments, and as well the technological barrier since operation of the new modern equipment will require additional re-training of personnel. Rehabilitation of heat supply equipment in order to improve its efficiency is not a common practice in Ukraine.

c) Exclusion from the project any non-key type of measures.

The third version of Baseline scenario is the shortened project activity, without any of the non-key type of activity, for example excluded frequency controllers, etc., from the project. This makes project economically less attractive, with the longer pay back period.

Sub-project 3

a) Continuation of the current situation, without JI project implementation.
b) The proposed project activity without the use of Joint Implementation mechanism.
c) Partial project activities (to implement not all project equipment) without the use of the Joint Implementation Mechanism.

2) Taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector.

Sub-project 1

Since the barriers identified in section B.1 of the PDD, directly related to investment in modernization of HPPs , in PJSC "KYIVENERGO" there are no barriers to the further operation of HPPs on the same level. The status quo does not face any barriers. All alternatives to the status quo face realistic and credible barriers that would prevent their implementation without registration as a JI project activity.

Therefore the continuation of the status quo is the only remaining alternative and is selected as baseline scenario.

Sub-project 2

Since the barriers identified in section B.1 of the PDD, directly related to investment in modernization of district heating there are no barriers to the further operation of district heating the same level.The status quo does not face any barriers. All alternatives to the status quo face realistic and credible barriers that would prevent their implementation without registration as a JI project activity.

Therefore the continuation of the status quo is the only remaining alternative and is selected as baseline scenario.

Sub-project 3

Since the barriers identified in section B.1 of the PDD, directly related to investment in modernization of electricity system there are no barriers to the further operation of system at the same level.The status quo does not face any barriers. All alternatives to the status quo face realistic and credible barriers that would prevent their implementation without registration as a JI project activity.

Therefore the continuation of the status quo is the only remaining alternative and is selected as baseline scenario.

No outstanding issues were raised.

4.4 Additionality (27-31)

Sub-project 1

The most recent version of the "Tool for the demonstration and assessment of additionality" approved by the CDM Executive Board was used in order demonstrate the additionality of the sub-project. All explanations, descriptions and analyses are made in accordance with the selected tool or method.

Taking into account analyses made in section B.2 of the PDD, it is possible to make the following conclusion stated below.

Registration of the proposed project as JI will allow overcoming barriers connected with financing of the project. The additional benefit obtained from emission reductions sale will help to overcome barriers connected with the existing practice.Implementation of the proposed project as JI will eliminate economical/financial barriers and improve the project's indicators. The project scenario is additional compared to the baseline scenario.

Sub-project 2

According to Paragraph 44 of Annex 1 to the Guidance on criteria for baseline setting and monitoring Version 03, approach B has been selected for demonstration of this project's additionality:

(b) Provision of traceable and transparent information that an accredited independent entity has already positively determined that a comparable project (to be) implemented under comparable circumstances (same GHG mitigation measure, same country, similar technology, similar scale) would result in a reduction of anthropogenic emissions by sources or an enhancement of net anthropogenic removals by sinks that is additional to any that would otherwise occur and a justification why this determination is relevant for the project at hand.

To support the choice of baseline and demonstrate additionality was chosen similar JI project such as "Rehabilitation of the District Heating System in Donetsk Region" (ITL project ID: UA1000026). In the checking of this approach, designated focal point (DFP) carefully evaluated and reviewed the reliability and accuracy of all data, rationale, assumptions, opinions and documents submitted by participants of similar project to support the choice of baseline and demonstrate additionality.

The above mentioned projects have same GHG mitigation measure, same country, similar technology, similar scale.

1) The proposed and comparative projects suggest **same GHG mitigation measure**: The proposed GHG mitigation measure under the complex modernization of heat-generating and distribution equipment by introducing technologies proposed in the project activities and appropriate reducing combustion of fossil fuel.

2) The proposed and comparative projects are implemented within the **same country**: Projects are located in Ukraine.

3) The proposed and comparative projects utilize **similar technology**: The projects use the same technology, including the replacement of old boilers by new with highly efficient, setting frequency controllers, replacing outdated distribution network using pre-insulated pipes and others.

4) The proposed and comparative projects have **similar scale**: Projects are large scale JI projects. Both projects are large-scale joint implementation projects that have had approximately the same level of emission reductions over the crediting period about 1200 thousand CO2e.

Thus the criteria identified by the Guidance are satisfied and the identified project is indeed a comparable project implemented under comparable circumstances. Therefore, this sub-project is additional.

Sub-project 3

According to Paragraph 44 of Annex 1 to the Guidance on criteria for baseline setting and monitoring Version 03, approach B has been selected for demonstration of this project's additionality:

(b) Provision of traceable and transparent information that an accredited independent entity has already positively determined that a comparable project (to be) implemented under comparable circumstances (same GHG mitigation measure, same country, similar technology, similar scale) would result in a reduction of anthropogenic emissions by sources or an enhancement of net anthropogenic removals by sinks that is additional to any that would otherwise occur and a justification why this determination is relevant for the project at hand.

To support the choice of baseline and demonstrate additionality was chosen similar JI project such as "Reduction of Process Losses in Power Lines Vinnytsyaoblenergo PJSC " (ITL project ID: UA1000321). In the checking of this approach, designated focal point (DFP) carefully evaluated and reviewed the reliability and accuracy of all data, rationale, assumptions, opinions and documents submitted by participants of similar project to support the choice of baseline and demonstrate additionality.

The above mentioned projects have same GHG mitigation measure, same country, similar technology, similar scale.

1) The proposed and comparative projects suggest **same GHG mitigation measure**: The proposed GHG mitigation measure under the complex modernization of grid by the implementing technologies proposed in the project activities and described above.

2) The proposed and comparative projects are implemented within the **same country**: Projects are located in Ukraine.

3) The proposed and comparative projects utilize **similar technology**: The projects use the same technology, including organizational measures with methodological support, organizational and technical measures, technical measures for the processes of transmission and distribution of electricity.

4) The proposed and comparative projects have **similar scale**: Projects are large scale JI projects. Both projects are large-scale joint implementation projects that have had approximately the same level of emission reductions over the crediting period about 1200 thousand CO2e.

Thus the criteria identified by the Guidance are satisfied and the identified project is indeed a comparable project implemented under comparable circumstances. Therefore, this sub-project is additional.

Additionality is demonstrated appropriately as a result of the analysises using the approaches chosen.

The identified areas of concern as to additionality by parties involved, project participants response and Bureau Veritas Certification's conclusion are described in Appendix A to Determination report (refer to CL01).

4.5 Project boundary (32-33)

The project boundary defined in the PDD encompasses all anthropogenic emissions by sources of greenhouse gases (GHGs) that are:

(i) Under the control of the project participants;

(ii) Reasonably attributable to the project; and

(iii) Significant, i.e., as a rule of thumb, would by each source account on average per year over the crediting period for more than 1 per cent of the annual average anthropogenic emissions by sources of GHGs, or exceed an amount of 2,000 tonnes of CO2 equivalent, whichever is lower.

Sub-project 1

For sub-project 1 the project boundary is described below:

	Source	Gas	Included/ Excluded	Justification / Explanation
Baseline	Baseline HPP emission	CO2	Included	CO2 is formed with the combustion of fuels.
		CH4	Excluded	Minor source, can be neglected (conservative approach).
		N2O	Excluded	Minor source, can be neglected.
Project Activity	Project HPP emission	CO2	Included	CO2 is formed with the combustion of fuels.
		CH4	Excluded	Minor source, can be neglected (conservative approach).
		N2O	Excluded	Minor source, can be neglected

Sub-project 2

For sub-project 2 the project boundary is described below:

On-site emissions			
Current situation	Project	Direct or indirect	Include or exclude
CO_2 emissions from fuel combustion in boilers	Reduced CO_2 emissions from fuel combustion in boilers due to increased efficiency and fuel saving.	Direct	Include
CH4, NO_x and CO emission from combustion in existing boilers/ burners	Reduced CH4, NO_x and CO emissions from fuel combustion after boiler / burners' replacement	Direct	Exclude. Minor source, can be neglected
Off-site emissions			
Current situation	Project	Direct or indirect	Include or exclude
CO_2 emissions from heat and power plant(s) due to electricity production to the grid, that is consumed by boiler houses, which will be upgraded.	Reduced CO_2 emissions from heat and power plant(s) due to reduction of electricity consumption by boiler houses	Direct	Include

CO_2 emissions from fuel extraction and transportation.	Reduced CO_2 emissions from fuel extraction and transportation due to fuel saving.	Indirect	Exclude, not under control of project developer

Sub-project 3

For sub-project 3 the project boundary is described below:

	Source	Gas	Included / Excluded	Justification / Explanation
Baseline emissions	Ukrainian grid electric power stations that consume fossil fuel.	CO_2	Included	Emission is caused by burning of the fossil fuel by the Ukrainian grid electric power stations to generate electricity which is necessary to make amends for consumption in the electrical network of KYIVENERGO PJSC in the baseline.
		CH_4	Excluded	Excluded for simplification
		N_2O	Excluded	Excluded for simplification
Project emissions	Emissions related to the equipment installed in the project	SF_6	Excluded	Insulating gas (SF6), used in circuit breakers and other equipment KYIVENERGO PJSC is toxic and is listed as gas circulation and utilization of which is under the control of state environment organizations. Equipment containing Insulating gas is hermetically sealed and prevents leakage of gas into the atmosphere. In the case of it failure or decommissioning SF6 will be collected and reused by filling in new similar equipment. In connection with all the above SF6 emissions were excluded from the calculations.

	Ukrainian grid electric power stations that consume fossil fuel	CO_2	Included	Emission is caused by burning of the fossil fuel by the Ukrainian grid electric power stations to generate electricity which is necessary to make amends for technological power consumption in the electrical network of KYIVENERGO PJSC after the reduction of the technological power consumption volume as a result of the project activity.
		CH_4	Excluded	Excluded for simplification
		N_2O	Excluded	Excluded for simplification

The delineation of the project boundary and the gases and sources included are appropriately described and justified in the PDD.

No outstanding issues were raised.

4.6 Crediting period (34)

The PDD states the starting date of the project as the date on which the implementation or construction or real action of the project began, and the starting date is 01/01/2004, which is after the beginning of 2000.

The PDD states the expected operational lifetime of the project in years and months, which is 19 years and 00 months.

The PDD states the length of the crediting period in years and months, which is 19 years and 00 months, and its starting date as 01/01/2004, which is on the date the first emission reductions are generated by the project.

The PDD states that the crediting period for the issuance of ERUs starts only after the beginning of 2008 and does not extend beyond the operational lifetime of the project.

The PDD states that the extension of its crediting period beyond 2012 is subject to the host Party approval, and the estimates of emission reductions or enhancements of net removals are presented separately for those until 2012 and those after 2012 in all relevant sections of the PDD.

The identified areas of concern as to crediting period by parties involved, project participants response and Bureau Veritas Certification's conclusion are described in Appendix A to Determination report (refer to CAR10-CAR11, CL02).

4.7 Monitoring plan (35-39)

The PDD, in its monitoring plan section, explicitly indicates that JI specific approach was the selected.

The monitoring plan describes all relevant factors and key characteristics that will be monitored, and the period in which they will be monitored, in particular also all decisive factors for the control and reporting of project performance, such as mentined below.

For sub-project 1: specific fuel rate, the share of fuel combusted by the heat and power plant for the energy production, oxidation factor of the fuel, emission factor of the fuel, the amount of the output heat.

For sub-project 2: fuel consumption at a boiler-house (natural gas), heat caloric value of fuel, average outside temperature during the heating period, average inside temperature during the heating period, number of customers for hot water supply service, heating area , average heat transfer factor of buildings, heating area of newly connected, heat transfer factor of new buildings and buildings with new thermal insulation, heating period duration, Duration of the period of hot water supply service, maximum connected load to the boiler-house, that is required for heating, maximum connected load to the boiler-house, that is required for providing the hot water supply service, carbon dioxide emission factor for different fuels, recalculating factor for average load during heating period, Electric power consumption, carbon dioxide emissions factor at electricity consumption.

For sub-project 3: total reduction of technical power losses in the power grid during the period y of the project scenario compared with the baseline scenario, carbon dioxide emission factor for projects of power loss reduction in power transport networks of Ukraine.

The monitoring plan specifies the indicators, constants and variables that are reliable (i.e. provide consistent and accurate values), valid (i.e. are clearly connected with the effect to be measured), and that provide a transparent picture of the emission reductions to be monitored.

The monitoring plan draws on the list of standard variables indicated in appendix B of "Guidance on criteria for baseline setting and monitoring" developed by the JISC , including including: baseline emissions (BEy), project emissions (PEy), emission factor of fule consumed (EFiy),oxidation factor of the fuel (OXIDiy), B_b fuel consumption, etc.

The monitoring plan explicitly and clearly distinguishes:

(i) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination.

(ii) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of determination.

(iii) Data and parameters that are monitored throughout the crediting period.

The monitoring plan describes the methods employed for data monitoring (including its frequency) and recording, such as internal technical reports, frequent cross checking, electric meters, gas meters and heat meters.

The monitoring plan elaborates all algorithms and formulae used for the estimation/calculation of baseline emissions/removals and project emissions/removals or direct monitoring of emission reductions from the project, leakage, as appropriate.

Project emissions:

Sub-project 1

$$PEy = 29,3*\sum(SFRy * SFiy * OXIDi * EFi) * (4,187*AHSy) \quad (1.1)$$

where:

PEy - project emission in period y, tons of CO2;
SFRy - specific fuel rate of the HPP in period y, tef/GJ;
SFiy - share of fuel i (coal, natural gas or a heavy fuel oil), consumed in period y, ratio;
OXIDiy - oxidation factor of the fuel i,ratio;
EFiy - emission factor of the consumed fuel i, tons of CO2/GJ;
AHSy - amount of the output heat of the HPP in period y, Gkal;
4,187 - conversion factor, GJ/Gkal;
29,3 - conversion factor, GJ/tef;

$$SFRy= \sum(Fiy)/(4,187*AHSy) \quad (1.2)$$

where:
SFRy - specific fuel rate of the HPP in period y, tef/GJ;
Fiy - amout of fuel i consumed in period y, tef.;
AHSy - amount of the output heat of the HPP in period y, Gkal;
4,187 - conversion factor, GJ/Gkal;

Sub-project 2

$$E_i^r = E_{1i}^r + E_{cons\ i}^r ; \quad (2.1)$$

where:
E_{1i}^r – CO_2 emissions due to fuel consumption for heating and hot water supply service for an i boiler-house in the reporting period, t CO_2e;

$E_{cons\ i}^{r}$ – CO_2 emissions due to electric power consumption from greed by the i boiler-house in the reporting period, t CO_2e.

$$E_{1i}^{r} = HCV_r * Cef_r * B_{ri} , \quad (2.2)$$

where:
B_{ri} – amount of fuel consumed by a boiler-house in the reporting period, ths m^3 or tons;
HCV_{ri} – Average annual lower heating value for each type of fuel, MJ/m^3 (MJ/kg)
Cef_i – carbon dioxide emission factor for each type of fuel, $ktCO_2/TJ$;

$$E_{cons\ i}^{r} = P_r * EFgrid \quad (2.3)$$

where:
P_r – electric power consumption by the boiler-houses and central heating points with energy saving measures implemented (frequency controllers, new pumps and heat exchangers will be installed), MWh;
EFgrid – Carbon dioxide emission factors for reducing electricity consumption in Ukraine, tCO_2e/MWh;
[r] index – related to the reporting period

Sub-project 3

The mission reduction will be achieved by reducing power losses in the company's power grids which in its turn will be achieved as a result of the project implementation. Since the baseline emissions are calculated based on difference between of power loss before and after the project implementation, consequently the project emission will equal zero.

$$PE_y = 0$$

Baseline emissions

Sub-project 1

$$SFRy = \sum(Fiy) / (4.187 * AHSy) \quad (1.1)$$

where

SFRy - specific fuel rate of the HPP in period *y*, tef/GJ;
Fiy - amout of fuel *i* consumed in period *y*, tef.;
AHSy - amount of the heat output in period *y*, Gkal;
4.187 - conversion factor, GJ/Gkal;

$$BEy = 29,3 * \Sigma (SFR_b * SFiy * OXIDi * EFi) * 4,187 * AHSy \quad (1.2)$$

where:

BEy - Baseline emission in period *y,* tons of CO2;

SFR_b - specific fuel rate of the heat and heat and power plant in the Baseline Scenario, tef/GJ;
SFiy - share of fuel *i* (coal, natural gas or a heavy fuel oil), consumed in period *y*, ratio;
OXIDiy - oxidation factor of the fuel *i*,ratio;
EFiy - emission factor of the fuel *i* consumed, tons of CO2/GJ;
AHSy - amount of the heat output in period *y*, Gkal;
4.187 - conversion factor, GJ/Gkal;
29.3 - conversion factor, GJ/tef;

$$SFRb = \sum((Fib)/(4.187*AHSb)) \quad (1.3)$$

where:

SFRb - specific fuel rate of the heat and heat and power plant in the Baseline Scenario, tef/GJ;
Fib - amout of fuel *i* consumed in the Baseline Scenario, tef.;
AHSb - amount of the heat output of the HPP in the Baseline Scenario, Gkal;
4.187 - conversion factor, GJ/Gkal;

Sub-project 2

$$E_i^b = E_{1i}^b + E_{cons\ i}^b , \quad (2.1)$$

where:
E_{1i}^b – CO_2 emissions due to fuel consumption for heating and hot water supply service for an i boiler-house in the base period, t CO_2e;
$E_{cons\ i}^b$ – CO_2 emissions due to electric power consumption from greed by the i boiler-house in the base period, t CO_2e.

For each i boiler-house:

$$E_1^b = HCV_b*Cef_b*B_b ; \quad (2.2)$$

$$E_{cons}^b = P_b*EFgrid , \quad (2.3)$$

where:

HCV_b – lower heating value of fuel in the baseline scenario, MJ/m^3 (MJ/kg);
Cef_b – carbon dioxide emission factor of fuel combustion in the baseline scenario, kt CO_2/TJ;
B_b – fuel consumption by a boiler-house in the baseline scenario, ths m^3 or tons;
P_b – electric power consumption by a boiler-house where energy saving measures are scheduled to be implemented, MWh;
EFgrid – carbon dioxide emission factors for reducing electricity consumption in Ukraine, tCO_2e/MWh;

[$_b$] index – related to the base period;

If any boiler-house consumes more than one type of fuel, the calculations of E are to be made for each type of fuel separately, and results are to be summed.

According to the Dynamic Baseline assumption, the efficient value of E_1^b may be defined as follows:

$$E_{1i}^b = E_{hi}^b + E_{wi}^b, \quad (2.\ 4)$$

where the first term describes emissions from fuel consumption for heating, and the second one – from fuel consumption for hot water supply.

For the case when in the base period the hot water supply service was provided (independent of this service duration, $(1-a_b) \neq 0$), the formulae for E_1^b is:

$$E_1^b = HCV_b * Cef_b * [B_b * a_b * K_1 * K_h + B_b * (1-a_b) * K_1 * K_w], \quad (2.\ 5)$$

where the first term in brackets describes fuel consumption for heating, and the second one – fuel consumption for hot water supply.

For the case when in the base period the hot water supply service was absent at all ($(1-a_b) = 0$), and in the reporting period this service was provided (due to improvement of heat supply service quality for population), the formulae for E_1^b is:

$$E_1^b = HCV_b * Cef_b * [B_b * a_b * K_1 * K_h + B_r * (1-a_r) * K_1 * K_{w0}], \quad (2.\ 6)$$

where:
HCV_b – lower heating value, MJ/m^3 (MJ/kg);
Cef_b – carbon dioxide emission factor, kt CO_2/TJ;
$B_{b,r}$ – amount of fuel consumed by a boiler-house, ths m^3 or tons per period;
K_1, K_h, K_w, K_{w0} – adjustment factors;
$a_{b,r}$ – portion of fuel (heat), consumed for heating purposes;
$(1-a_r)$ – portion of fuel (heat), consumed for hot water supply services;
[b] index – related to the base period;
[r] index – related to the reporting period.

$$a_b = L_h^b * g * N_h^b / (L_h^b * g * N_h^b + L_w^b * N_w^b); \quad (2.\ 7)$$
$$a_r = L_h^r * g * N_h^r / (L_h^r * g * N_h^r + L_w^r * N_w^r), \quad (2.\ 8)$$

where:
L_h, L_w – maximum connected load to the boiler-house, that is required for heating and for hot water supply service, MW;
g – recalculating factor for average load during heating period (is determined for each boiler-house on historical base, usually is in the range 0,4 – 0,8);
N_h, N_w – duration of heating period and period of hot water supply service per period, hours.

Adjustment factors:

K_1 (change in the lower heating value of fuel):

$$K_1 = HCV_b / HCV_r , \quad (2.\ 9)$$

Adjustment factors for heating should be used for creation the Dynamic Baseline which takes into account changes of the external factors such as weather conditions, heating area, etc.

Fuel consumption for heating is proportional to the required amount of heat during heating period, Q_h:

$$B_h = B_b * a_b = Q_h / HCV_b * \eta, \quad (2.\ 10)$$

where η is overall heating system efficiency.

According to the assumption of the Dynamic Baseline, the required amount of heat in the base period for correct comparison should be reduced to real conditions (external to the project) in the reporting period:

$$Q_{h\,br} = Q_{h\,b} * K_h = Q_{h\,r}, \quad (2.\ 11)$$

where:
$Q_{h\,br}$ – required heat for Dynamic Baseline, is assumed equal to Q_r – required heat in the reporting period,
$Q_{h\,b}$ – required heat in the base period,
K_h – averaged adjustment factor for heating.

From this 2. it is possible to determine the averaged adjustment factor:

$$K_h = Q_{h\,r} / Q_h, \quad (2.\ 12)$$

Required amount of heat for heating of buildings during a year, according to the “Codes and regulations on rationing of fuel and heat energy for heating of residential and public buildings, as well as for communal and domestic requirements in Ukraine. KTM 204 Ukraine 244-94”, is determined by [ibid, 2. 2.17]:

$$Q_h = F_h * k_h * (T_{in} - T_{out}) * N_h, \quad (2.\ 13)$$

where:
Q_h – required amount of heat for heating, kWh;
F_h – heating area of buildings, m^2;
k_h – average heat transfer factor of buildings, kW/m^2*K;
T_{in} – average inside temperature for the heating period, K (or ^0C);
T_{out} – average outside temperature for the heating period, K (or ^0C);
N_h – duration of the heating period per period, hours.

Then:

$$K_h = (F_{h\,r} * k_{h\,r}) * (T_{in\,r} - T_{out\,r}) * N_{h\,r} / F_{h\,b} * k_{h\,b} * (T_{in\,b} - T_{out\,b}) * N_{h\,b} , \quad (2.\ 14)$$

2.1. K_2 (temperature change factor):

$$K_2 = (T_{in\,r} - T_{out\,r}) / (T_{in\,b} - T_{out\,b}), \quad (2.\ 15)$$

2.2. K_3 (heating area and building thermal insulation change factor):

$$K_3 = (F_{h\,r} * k_{h\,r}) / F_{h\,b} * k_{h\,b} = [(F_{h\,r} - F_{h\,t\,r} - F_{h\,n\,r}) * k_{h\,b} + (F_{h\,n\,r} + F_{h\,t\,r}) * k_{h\,n}] / F_{h\,b} * k_{h\,b}, \quad (2.\ 16)$$

where:
$F_{h\,b}$ – heating area of buildings in the base period, m^2;
$F_{h\,r}$ – heating area of buildings in the reporting period, m^2;
$F_{h\,n\,r}$ – heating area of new buildings connected to DH system (assumed with the new (improved) thermal insulation) in the reporting period, m^2;
$F_{h\,t\,r}$ – heating area of buildings (previously existed in the base period) in reporting period with the renewed (improved) thermal insulation, m^2;
$k_{h\,b}$ – average heat transfer factor of heated buildings in the base period, W/m^2*K;
$k_{h\,r}$ – average heat transfer factor of heated buildings in the reporting period, W/m^2*K;
$k_{h\,n}$ – heat transfer factor of heated buildings with the new thermal insulation (new buildings or old ones with improved thermal insulation), W/m^2*K.

2.3. K_4 (heating period duration change factor):

$$K_4 = N_{h\,r} / N_{h\,b} \quad (2.\ 17)$$

where:
$N_{h\,b}$ – duration of the heating period in the base period, hours;
$N_{h\,r}$ – duration of the heating period in the reporting period, hours.

Thus,

$$K_h = K_2 * K_3 * K_4, \quad (2.\ 18)$$

3. Adjustment factors for hot water supply service should be used for creation the Dynamic Baseline which takes into account changes of the external factors such as weather conditions, number of customers, etc.:

Fuel consumption for hot water supply service is proportional to the required amount of heat during the service rendered period, Q_w:

$$B_w = B_b*(1-a_b) = Q_w / HCV_b * \eta, \quad (2.\ 19)$$

where ŋ is overall hot water supply system efficiency.

According to the assumption of the Dynamic Baseline, the required amount of heat for hot water supply service in the base period for correct comparison should be reduced to real conditions (external to the project) in the reporting period:

$$Q_{w\,br} = Q_{w\,b} * K_w = Q_{w\,r}, \quad (2.\ 20)$$

where:
$Q_{w\,br}$ – required heat for hot water supply service for Dynamic Baseline, is assumed equal to $Q_{w\,r}$ – required heat for hot water supply service in the reporting period,

$Q_{w\,b}$ – required heat for hot water supply service in the base period,
K_w – averaged adjustment factor for hot water supply service.

From this 2. it is possible to determine the averaged adjustment factor:
$K_w = Q_{w\,r} / Q_{w\,b.}$ (2. 21)

The components of K_w may be illustrated by correlation of heat used for hot water supply service in the base and reporting periods:

$Q_w = n_w * v_w * N_w,$ (2. 22)

where:
Q_w – required amount of heat for hot water supply service, kWh;
n_w – average number of service's customers, personal accounts;
v_w – standard specific discharge of hot water per personal account (in heat units, kWh/h);
N_w – duration of the service period per period, hours.

Then:
$K_w = n_{w\,r} * v_{w\,r} * N_{w\,r} / n_{w\,b} * v_{w\,b} * N_{w\,b},$ (2. 23)

3.1. K_5 (number of customers change factor):

$K_5 = n_{w\,r} / n_{w\,b},$ (2. 24)

3.2. K_6 (standard specific discharge of hot water per personal account change factor):
$K_6 = v_{w\,r} / v_{w\,b},$ (2. 25)

At present the standard specific discharge of hot water is valid in Ukraine that was established by the KTM 204 Ukraine 244-94[1] in 1993. and no information is available on any propositions to change it, thus $K_6 = 1$ and does not require special monitoring.

3.3. K_7 (hot water supply period duration change factor):

$K_7 = N_{w\,r} / N_{w\,b},$ (2. 26)

where:
$N_{w\,b}$ – duration of the hot water supply period in the base period, hours;
$N_{w\,r}$ – duration of the hot water supply period in the reporting period, hours.

Thus,

$K_w = K_5 * K_6 * K_7.$ (2. 27)

3.4. Adjustment factors for hot water supply service in case when there was no hot water supply service in base period, and in the reporting period this service was provided:

Since in case when there was no hot water supply service in base period, number of customers, standard specific discharge of hot water per personal account and duration of hot water supply period in the base period are assumed to be equal to these values in the reporting period,

$K_5 = K_6 = K_7 = 1.$ (2. 28)

Thus

$K_{w0} = 1.$. (2. 29)

Sub-project 3

Therefore, the baseline emissions are:

$$BE_y = V_y \cdot CEF_y,$$

where

BE_y - baseline emissions (tCO2e);

V_y - total technical loss reduction in the power distribution system during the period *y* of the project scenario compared with the baseline, MWh;

CEFy - CO2 emission factor in UPS of Ukraine for the the power replacement projects in the period y, tCO_2e/MWh;

y - the period for which estimates are made;

Emissions reductions are defined by the following equation:

$$ER_y = BE_y - (PE_y + LE_y),$$

Where:

ER_y - emission reduction during the period y, t CO2e;

BE_y - baseline emission of the greenhouse gases in the period y, t CO2e;

PE_y - greenhouse gases emission caused by the project activity in the period y, t CO2e;

LE_{y-} leakages in the period y , t CO2e;

The monitoring plan presents the quality assurance and control procedures for the monitoring process. This includes, as appropriate, information on calibration and on how records on data and/or method validity and accuracy are kept and made available on request.

The monitoring plan clearly identifies the responsibilities and the authority regarding the monitoring activities.
The operational and management structure (as shown in below the figure) and the responsibilities of the principals are as follows. Ultimate responsibility for the project rests with the JI Project Manager.

JI Project Management Team		
Internal Audit Department (Director)	Monitoring Staff	Operation and Maintenance Staff

The JI Project Manager is responsible for:

- Checking and signing off all project operational-related activities
- Appointing and liaising with the accredited independent entity (AIE)
- Identifying an audit team leader to be appointed by the Chief Engineer or a delegated authority
- Appointing a JI technical team to undertake the operational activities
- Organizing training and refresher courses
- Preparing and supervising a Health and Safety Plan for the JI technical team
- Supervising the work of the JI technical team
- Cross checking reported volumes and sales receipts

Internal Audit Department (Director)

The project owner – KYIVENERGO PJSC will implement provisions of this monitoring plan into its organizational and quality management structure. For monitoring, collection, registration, visualization, archiving, reporting of the monitored data and periodical checking of the measurement devices the management team headed by the management led by Project Manager according to the order № 750 dated 01/11/2012.

The monitoring staff is responsible for:

- Monitoring and recording of the relevant parameters

The operation and maintenance staff are responsible for:

- Operation and maintenance of the project infrastructure
- Service and maintenance equipment is performed by technical personnel of KYIVENERGO PJSC.

On the whole, the monitoring plan reflects good monitoring practices appropriate to the project type.

The monitoring plan provides, in tabular form, a complete compilation of the data that need to be collected for its application, including data that are measured or sampled and data that are collected from other sources (e.g. official statistics, expert judgment, proprietary data, IPCC, commercial and scientific literature etc.) but not including data that are calculated with equations.

The monitoring plan indicates that the data monitored and required for verification are to be kept for two years after the last transfer of ERUs for the project.

The identified areas of concern as to the monitoring plan by parties involved, project participants response and Bureau Veritas Certification's conclusion are described in Appendix A to Determination report (refer to CAR12-CAR14).

4.8 Leakage (40-41)

There is no leakages within the project.

No outstanding issues were raised.

4.9 Estimation of emission reductions or enhancements of net removals (42-47)

The PDD indicates assessment of emission in the baseline scenario and in the project scenario as the approach chosen to estimate the emission reductions or enhancement of net removals generated by the project.

The PDD provides the ex ante estimates of:

(a) Emission reductions from the project (within the project boundary), which are 8117278 tonnes of CO2eq within the first commitment period of the Kyoto Protocol and 15719810 tonnes of CO2eq after the first commitment period of the Kyoto Protocol.

(b) Leakage, as applicable, which are not expected within the project.

(c) Emission reductions adjusted by leakage (based on (a)-(b) above), which are 8117278 tonnes of CO2eq within the first commitment period of the Kyoto Protocol and 15719810 tonnes of CO2eq after the first commitment period of the Kyoto Protocol.

The estimates referred to above are given:

(a) On an annual basis;

(b) From 01/01/2008 to 31/12/2022, covering the whole crediting period;

(c) On a source-by-source/sink-by-sink basis;

(d) For each GHG gas, which is CO_2;

(e) In tonnes of CO2 equivalent, using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5 of the Kyoto Protocol;

The formula used for calculating the estimates referred above, which are mention in the section 4.6 above, are consistent throughout the PDD.

For calculating the estimates referred to above, key factors, influencing the baseline emissions or removals and the activity level of the project and the emissions as well as risks associated with the project were taken into account, as appropriate.

Data sources used for calculating the estimates referred to above, such as National Inventory Report in Ukraine for 1990 – 2010, internal reports are clearly identified, reliable and transparent.

Emission factors, such as emission factors of the fuels and dioxide emission factor for projects of power loss reduction in power transport networks of Ukraine were selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice.

The estimation referred to above is based on conservative assumptions and the most plausible scenarios in a transparent manner.

The estimates referred to above are consistent throughout the PDD.

The annual average of estimated emission reductions or enhancements of net removals over the crediting period is calculated by dividing the total estimated emission reductions or enhancements of net removals over the crediting period by the total months of the crediting period, and multiplying by twelve.

No outstanding issues were raised.

4.10 Environmental impacts (48)

Sub-project 1

According to Ukrainian legislation, the environmental impacts of the project should be analyzed in the EIA, which is part of the project documentation, which receives approval after a comprehensive examination. For the proposed JI project was not necessary to develop a single project document, because the project is to modernize separate parts of the existing facility. The project was implemented in accordance with the documentation developed for its components (replacement capacitors, installing condensing pumps, installation of the control system of the new monitoring equipment, sensors and actuators, etc.), for which EIA is not required. So he does not pass authorization procedure, part of which is to collect comments of relevant stakeholders. Existing EIA covers measures taken at the HPP for its modernization was carried out on a voluntary basis as a measure to improve the environmental management system.

Also, these achievements are important in the cross-border impact of the project as atmospheric pollution tend to be transported over long distances from the emission source. Reducing air pollution reached by project has positive transboundary impact.

The project is located outside the national parks, species of flora and fauna species listed as endangered, in the project do not occur. In fact, the project is limited to the territory of HPP, it requires no additional territory.

Sub-project 2

According to the Ukrainian legislation, the design documentation for the new building, reconstruction and technical re-equipment of industrial and civil objects must include the

environmental impact assessment, the main requirements for which are listed in the State Building Norms of Ukraine A.2.2-1-2003.

KYIVENERGO PJSC has the necessary Environmental Impact Assessment for its activity according to Ukrainian legislation.

Overall, the Project will have a positive effect on environment.

The main environmental impacts of the project caused by emissions of combustion products from the boiler (NO2, CO, SO2). These emissions are monitored annually and emissions reported to the State Environmental Inspection of Kyiv by submitting official annual statistical sample form 2-TP (air) Data on Air Protection. Emissions of these gases are within permitted levels.

Sub-project 3

List of the ecological reportings of the company:
- atmospheric air protection report;
- water usage report;
- report balance of the groundwaters usage;
- report of the environmental protection expenses and the ecological payments;
- report of the formation, handling and utilization of the I-III hazard classes wastes;
- monthly reports from all SU about the carrying out of the environmental protection measures;
- wastes registration is carried out in every SU according to the approved typical form № 1-VT;
- package of documents is made to receive the permission and the limit for the formation and location of the wastes; permission for the emission of pollutants into the atmospheric air; permission for the special water usage.

Process of the wastes utilization is carried out in every SU of the company.
Wastes utilization procedure:
- a person in charge of the ecological problems proposes the company administration the offers of several firms, which have the economic activity licences in the sphere of the hazard wastes handling (storage, transportation, utilization) ;
- every SU chooses the firm with which it is easy to work, signs an agreement and hands over the wastes for the utilization once in a quarter and receives tax invoices as well as the acts of performed works.

Implementation of the works will not cause any substantial influences on the environment except the reduction of greenhouse gasses emissions into the atmosphere.

Transboundary impacts on the environment by the project activity are not anticipated.

The PDD provides conclusion and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party, if the analysis referred to above indicates that the environmental impacts are considered significant by the project participants or the host Party.

The identified areas of concern as to environmental impacts by parties involved, project participants response and Bureau Veritas Certification's conclusion are described in Appendix A to Determination report (refer to CAR15).

4.11 Stakeholder consultation (49)

Stakeholder consultation was not undertaken as it is not required by the host party.

4.12 Determination regarding small scale projects (50-57)

Not applicable

4.13 Determination regarding land use, land-use change and forestry (LULUCF) projects (58-64)

Not applicable

4.14 Determination regarding programmes of activities (65-73)

Not applicable

5 SUMMARY AND REPORT OF HOW DUE ACCOUNT WAS TAKEN OF COMMENTS RECEIVED PURSUANT TO PARAGRAPH 32 OF THE JI GUIDELINES

No comments, pursuant to paragraph 32 of the JI Guidelines, were received.

6 DETERMINATION OPINION

Bureau Veritas Certification has performed a determination of the "Reconstruction of electrical and heating systems in Kyiv" Project in Ukraine. The determination was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The determination consisted of the following three phases: i) a desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) the resolution of outstanding issues and the issuance of the final determination report and opinion.

Project participant/s used the latest tool for demonstration of the additionality. In line with this tool, the PDD provides barrier analysis and common practice analysis, to determine that the project activity itself is not the baseline scenario.

Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented and maintained as designed, the project is likely to achieve the estimated amount of emission reductions.

The determination revealed two pending issues related to the current determination stage of the project: the issue of the written approval of the project and the authorization of the project participant by the host Party. If the written approval and the authorization by the host Party are awarded, it is our opinion that the project as described in the Project Design Document, Version 2.0 meets all the relevant UNFCCC requirements for the determination stage and the relevant host Party criteria.

The review of the project design documentation version 2.0 and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the JI and the relevant host country criteria.

The determination is based on the information made available to us and the engagement conditions detailed in this report.

7 REFERENCES

Category 1 Documents:
Documents provided by CARBON MATKETING AND TRADING that relate directly to the GHG components of the project.

/1/ Project Design Document the “Reconstruction of electrical and heating systems in Kyiv" version 1.0 dated 30/10/2012

/2/ Project Design Document the “Reconstruction of electrical and heating systems in Kyiv" version 2.0 dated 13/11/2012

/3/ Emission reductions calculation spreadsheet version 1.0 dated 30/10/2012

/4/ Emission reductions calculation spreadsheet version 2.0 dated 13/11/2012

/5/ Letter of Endorsement № 2682/23/7 dated 20.09.2012 on the JI project “Reconstruction of electrical and heating systems in Kyiv", issued by State Environmental Investment Agency of Ukraine.

Category 2 Documents:
Background documents related to the design and/or methodologies employed in the design or other reference documents.

/1/ Permit # 8036100000-005 on stationary source air pollution, HPP # 5 (valid from 01/07/2010 till 01/07/2015)

/2/ Permit # 8036100000-005 on waste disposal for 2012, HPP # 5 (valid from 01/01/2012 till 01/12/2012)

/3/ Agreement # 06/11-131 БО-41 dated 28/01/2011 natural gas supply service

/4/ Agreement # 06/11-130 БО-41 dated 28/01/2011 natural gas supply service

/5/ Agreement # 06/11-128 БО-41 dated 28/01/2011 natural gas supply service

/6/ Agreement # 06/11-129 БО-41 dated 28/01/2011 natural gas supply service

/7/ Agreement # 06/11-7 ТЕ-41 dated 12/01/2011 natural gas supply service

/8/ Agreement # 06/11-5 ТЕ-41 dated 12/01/2011 natural gas supply service

/9/ Agreement # 06/11-6 ТЕ-41 dated 12/01/2011 natural gas supply service

/10/ Agreement # 06/11-133 ТЕ-41 dated 28/01/2011 natural gas supply service

/11/ Agreement # 06/11-34 dated 28/01/2011 natural gas supply service

/12/ Commissioning statement dated 17/04/2009 on automatic system for commercial accounting of power consumption

/13/ Order # 428 dated 30/11/2010 on automatic system for commercial accounting of power consumption (2 phase)

/14/ Automatic system for commercial accounting of power consumption. Detail project

/15/ Technical report for 2003 (technical part)

/16/ Technical report for 2004 (technical part)

/17/ Technical report for 2005 (technical part)

/18/ Technical report for 2006 (technical part)

/19/ Technical report for 2007 (technical part)

/20/ Technical report for 2008 (technical part)

/21/ Technical report for 2009 (technical part)

/22/ Technical report for 2010 (technical part)

/23/ Technical report for 2011 (technical part)

/24/ Report on HPP work for 2003

/25/ Report on HPP work for 2004

/26/ Report on HPP work for 2004

/27/ Report on HPP work for 2005

/28/ Report on HPP work for 2006

/29/ Report on HPP work for 2007

/30/ Report on HPP work for 2008

/31/ Report on HPP work for 2009

/32/ Report on HPP work for 2010

/33/ Report on HPP work for 2011

/34/ Fuel consuming and production program at PJSC "KYIVENERGO filiations for 2003

/35/ Fuel consuming and production program at PJSC "KYIVENERGO filiations for 2004

/36/ Fuel consuming and production program at PJSC "KYIVENERGO filiations for 2004

/37/ Fuel consuming and production program at PJSC "KYIVENERGO filiations for 2005

/38/ Fuel consuming and production program at PJSC "KYIVENERGO filiations for 2006

/39/ Fuel consuming and production program at PJSC "KYIVENERGO filiations for 2007

/40/ Fuel consuming and production program at PJSC "KYIVENERGO filiations for 2008

/41/ Fuel consuming and production program at PJSC "KYIVENERGO filiations for 2009

/42/ Fuel consuming and production program at PJSC "KYIVENERGO filiations for 2010

/43/ Fuel consuming and production program at PJSC "KYIVENERGO filiations for 2011

/44/ Report on usage of fuel, heat energy and electric energy for 2008

/45/ Report on usage of fuel, heat energy and electric energy for 2009

/46/ Report on usage of fuel, heat energy and electric energy for 2010

/47/ Report on usage of fuel, heat energy and electric energy for 2011

/48/ Report on usage of fuel, heat energy and electric energy for 2003

/49/ Report on usage of fuel, heat energy and electric energy for 2004

/50/ Report on usage of fuel, heat energy and electric energy for 2005

/51/ Report on usage of fuel, heat energy and electric energy for 2006

/52/ Report on usage of fuel, heat energy and electric energy for 2007

/53/ Permit dated 20/04/2011 on special water usage

/54/ Permit dated 21/08/2012 on special water usage

/55/ Agreement # 410 –П157/12 dated 24/02/2012 on Service purchase for state fund

/56/ Inquiry on current repairs at HPP # 5

/57/ Certificate of completion dated 07/09/2010 on the middle repair of block equipment

/58/ Certificate of completion dated 21/07/2010 on the middle repair of block equipment

/59/ Certificate of completion dated 19/07/2010 on the heavy repair of block equipment

/60/ Certificate of completion dated 20/06/2008 on the heavy repair of block equipment

/61/ Certificate of completion dated 04/09/2008 on the heavy repair of block equipment

/62/ Certificate of completion dated 07/07/2009 on the heavy repair of block equipment

/63/ Work committee acceptance act # 1-B dated 29/02/2008 on switchgear – 6 kV

/64/ Work committee acceptance act # 2-B dated 29/02/2008 on switchgear – 6 kV

/65/ Work committee acceptance act # 3-B dated 27/03/2008 on “Reconstruction of telemetry and telesignalization with the replacement of intellectual controlling items type MKSU”

/66/ Work committee acceptance act # 3-B dated 27/03/2008 on construction works readiness

/67/ Work committee acceptance act # 5-B dated 30/04/2008 on construction works readiness

/68/ Work committee acceptance act # 6-B dated 30/05/2008 on construction works readiness

/69/ Work committee acceptance act # 7-B dated 10/07/2008 on construction works readiness

/70/ Work committee acceptance act # 8-B dated 30/07/2008 on construction works readiness

/71/ Work committee acceptance act # 10-B dated 28/11/2008 on construction works readiness

/72/ Work committee acceptance act # 12-B dated 30/12/2008 on construction works readiness

/73/ Work committee acceptance act # 12-B dated 30/12/2008 on construction works readiness

/74/ Work committee acceptance act # 1-B dated 30/06/2009 on construction works readiness

/75/ Work committee acceptance act # 2-B dated 30/06/2009 on construction works readiness

/76/ Work committee acceptance act # 3-B dated 14/10/2009 on construction works readiness

/77/ Work committee acceptance act # 4-B dated 30/10/2009 on construction works readiness

/78/ Work committee acceptance act # 5-B dated 30/11/2009 on construction works readiness

/79/ Work committee acceptance act # 6-B dated 30/11/2009 on construction works readiness

/80/ Work committee acceptance act # 7-B dated 30/12/2009 on construction works readiness

/81/ Work committee acceptance act # 28 dated 30/11/2011 on construction works readiness

/82/ Work committee acceptance act # 1 dated 31/05/2010 on construction works readiness

/83/ Work committee acceptance act # 4 dated 30/07/2010 on construction works readiness

/84/ Work committee acceptance act # 5 dated 27/09/2010 on construction works readiness

/85/ Work committee acceptance act # 10 dated 30/10/2010 on construction works readiness

/86/ Work committee acceptance act # 10 dated 30/12/2010 on construction works readiness

/87/ Work committee acceptance act # 30 dated 30/12/2010 on construction works readiness

/88/ Work committee acceptance act # 29 dated 30/12/2011 on construction works readiness

/89/ Work committee acceptance act # 27 dated 31/10/2011 on construction works readiness

/90/ Work committee acceptance act # 30 dated 21/10/2011 on construction works readiness

/91/ Work committee acceptance act # 19 dated 29/07/2011 on construction works readiness

/92/ Work committee acceptance act # 17 dated 30/06/2011 on construction works readiness

/93/ Work committee acceptance act # 15 dated 30/06/2011 on construction works readiness

/94/ Work committee acceptance act # 14 dated 31/03/2011 on construction works readiness

Persons interviewed:

List persons interviewed during the determination or persons that contributed with other information that are not included in the documents listed above.

/1/ Andriy Gajdukevich – chief of production and technical department, HPP# 6

/2/ Yuriy Sirovec – chief of boiler-and-turbine workshop, HPP# 6

/3/ Vladimir Shiponog– leader of labor protection group, HPP# 6

/4/ Igor Laskoviy – deputy chief engineer of repairmen, HPP# 5

/5/ Vladimir Shirokov – chief of production and technical department, HPP# 5

/6/ Lyubov Kirilenko – accounting team leader of production and technical department, HPP# 5

/7/ Ekaterina Vavrinchuk – specialist of measuring group of electro-and-technical laboratory

/8/ Mykita Galchenko - production and technical department of PJSC "KYIVENERGO"

/9/ Sergii Chulkov – head of production department (JI project head manager), PJSC "KYIVENERGO"

/10/ Victor Semenuta – head of prospective department (JI project head manager), PJSC "KYIVENERGO"

/11/ Igor Poberegniy – 1st category engineer of electric and technical department, PJSC "KYIVENERGO"

/12/ Marina Vorontsova - representative of the project Developer CARBON MATKETING AND TRADING

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APPENDIX A: DETERMINATION PROTOCOL

BUREAU VERITAS CERTIFICATION HOLDING SAS

DETERMINATION PROTOCOL

Check list for determination, according JOINT IMPLEMENTATION DETERMINATION AND VERIFICATION MANUAL (Version 01)

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
General description of the project				
Title of the project				
-	Is the title of the project presented?	The title of the project: "Reconstruction of the electrical and heating systems in Kyiv"	OK	OK
-	Is the sectoral scope to which the project pertains presented?	Yes, the sectoral scopes are: Energy destribution (2), Energy demend (3), Fugitive emissions from fuels (solid, oil and gas). CAR01 Please delete ukrainian column from the table "sectoral scopes" in the PDD.	CAR01	OK
-	Is the current version number of the document presented?	The current version is 01.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
-	Is the date when the document was completed presented?	The document was completed on 30/10/2012	OK	OK
Description of the project				
-	Is the purpose of the project included with a concise, summarizing explanation (max. 1-2 pages) of the: a) Situation existing prior to the starting date of the project; b) Baseline scenario; and c) Project scenario (expected outcome, including a technical description)?	<u>Sub-project 1. Reconstruction and modernization HPP-5 and HPP-6.</u> a,b) The common practice for heating and electricity supply companies in Ukraine, including heat and heat and power plant that implementing the project is fulfils annual minimal repairing of boilers and to keep it working. Continuation of this situation is the baseline. Minimal annual repairing doesn't lead to drooping of baseline emissions because of degradation of the whole system with efficiency droop at other objects, the overall actual emissions of Supplier would stay on the same level. c) The proposed project is intended to modernise of all for units at the HPP in order to: • Improve energy efficiency and reduce auxiliary equipment consumption; • improve stability and reliability of generation and transmission of electricity and heat power; • Improve efficiency; • Introduce modern control system	CAR02	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		Sub-project 2. Rehabilitation of the District Heating System. a,b) The base scenario supposes to fulfill annual minimal repairing of the DH system to keep it working. Particularly it executes repairing of network's parts and boilers that might cause accidents. Minimal annual repairing doesn't lead to drooping of baseline emissions because of degradation of the whole system with efficiency droop at other objects, the overall actual emissions of Supplier would stay on the same level. This base scenario is the same scenario which was before project implementation, with minimal volume of system repairing just to maintain its working. c) The project employs the reconstruction of central heating supply system which includes replacement and reconstruction of old boilers and distribution networks, frequency controllers, replacement of heat exchanger, implementation of frequency controllers, transition from the existing CHSS to IHSS. Sub-project 3. Reduction of Electricity Technical Losses in the KYIVENERGO PJSC grid. a,b) By the beginning of the Project KYIVENERGO		

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		PJSC had only carried out measures aimed at maintaining electrical grids in operational state. In most cases, these measures included repairs intended to correct defects arising during the operation of the electrical grids. The baseline scenario assumes the continued use of existing equipment with doing routine repair work without significant investment. c) The basis of the Project is the introduction of new energy-efficient equipment and activities: - organizational and technical measures; - technical measures that aim to eliminate energy losses when transporting electricity via distribution grids. CAR02 It is stated that the project "Reconstruction of electrical and heating systems in Kyiv" was initiated in 2003. Please provide document evidence that states so.		
-	Is the history of the project (incl. its JI component) briefly summarized?	CAR03 JI component is absent in the PDD. Please add it.	CAR03	OK
Project participants				
-	Are project participants and Party(ies)	PJSC «KYIVENERGO» - Ukraine	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	involved in the project listed?	OHANA LLP – the Netherlands		
-	Is the data of the project participants presented in tabular format?	Yes, the data of the project participants are presented in tabular form.	OK	OK
-	Is contact information provided in Annex 1 of the PDD?	Yes, contact information is provided in Annex 1 of the PDD.	OK	OK
-	Is it indicated, if it is the case, if the Party involved is a host Party?	Yes, it is indicated that Ukraine is a host Party.	OK	OK
Technical description of the project				
Location of the project				
-	Host Party(ies)	Ukraine	OK	OK
-	Region/State/Province etc.	Kyiv Region	OK	OK
-	City/Town/Community etc.	Kyev		
-	Detail of the physical location, including information allowing the unique identification of the project. (This section should not exceed one page)	Geographic coordiantes: 50° 27′ 0″ N, 30° 31′ 25″E CAR04 Please rearrange geographical coordinates in the following manner: ##°##'##" N, ##°##'##"E	CAR04	OK OK
Technologies to be employed, or measures, operations or actions to be implemented by the project				
-	Are the technology(ies) to be employed, or measures, operations or actions to be implemented by the project, including all relevant technical data and the implementation schedule described?	Yes, technologies used in the project are properly described, including all relevant technical data. CAR05 Please add implementation schedule in the PDD for each sub-project or specify key activities in line with dates of their realization.	CAR05 CAR06	OK OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		CAR06 For power lines weight is specific value, thus it should follow with the length value such as: m, km, etc. Please add appropriate information through all the all PDD.		
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				
-	Is it stated how anthropogenic GHG emission reductions are to be achieved? (This section should not exceed one page)	Sub-project 1. The proposed measures within the JI project include replacement and rehabilitation of heat and electricity producing equipment; this will increase overall energy efficiency and reduce fuel consumption for heat and electricity producing. Natural gas savings for heat and electricity producing and reduction of power consumption for the own needs after HPPs reconstraction will lead to CO2 emissions reduction. Sub-project 2. The project activities including rehabilitation of boilers, heat distribution networks will increase energy efficiency of Kyiv City DH system, thus enabling it to produce the same amount of heat energy with less fuel consumption. Reduced fuel	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		consumption will lead to reduction of CO_2 emissions. Sub-project 3. Introduction of the project will secure the reduction of greenhouse gasses emissions, due to the power production cut down in the national grid.		
-	Is it provided the estimation of emission reductions over the crediting period?	Yes, the estimation of emission reductions is provided over the crediting period.	OK	OK
-	Is it provided the estimated annual reduction for the chosen credit period in tCO2e?	Yes, the estimation of annual reductions for the chosen crediting period is provided in tCO2e.	OK	OK
-	Are the data from questions above presented in tabular format?	The data from questions above are presented in tabular format.	OK	OK
Estimated amount of emission reductions over the crediting period				
-	Is the length of the crediting period Indicated?	Yes, the length of the crediting period is indicated.	OK	OK
-	Are estimates of total as well as annual and average annual emission reductions in tonnes of CO2 equivalent provided?	The estimates of total as well as annual and average annual emission reductions are provided in tonnes of CO2 equivalent.	OK	OK
Project approvals by Parties				
19	Have the DFPs of all Parties listed as “Parties involved” in the PDD provided written project approvals?	CAR07 The letter of approval is absent.	CAR07 CAR08 CAR09	OK Pending OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		CAR08 Please provide the letter of endorsement. CAR09 The date when LoE was issued is probably wrong. Please correct it.		
19	Does the PDD identify at least the host Party as a "Party involved"?	Ukraine is identified as a Host Party in the PDD.	OK	OK
19	Has the DFP of the host Party issued a written project approval?	See section 19 above.	Pending	Pending
20	Are all the written project approvals by Parties involved unconditional?	See section 19 above.	Pending	Pending
Authorization of project participants by Parties involved				
21	Is each of the legal entities listed as project participants in the PDD authorized by a Party involved, which is also listed in the PDD, through: − A written project approval by a Party involved, explicitly indicating the name of the legal entity? or − Any other form of project participant authorization in writing, explicitly indicating the name of the legal entity?	After finishing of project determination report, the PDD with supporting documents and Determination Report will be presented to State Environmental Agency of Ukraine for receiving the Letter of Approval that will authorized project participants.	OK	OK
Baseline setting				
22	Does the PDD explicitly indicate which	JI specific approach was used for identifying the	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	of the following approaches is used for identifying the baseline? − JI specific approach − Approved CDM methodology approach	baseline.		
JI specific approach only				
23	Does the PDD provide a detailed theoretical description in a complete and transparent manner?	The PDD provides a detailed theoretical description in a complete and transparent manner.	OK	OK
23	Does the PDD provide justification that the baseline is established: (a) By listing and describing plausible future scenarios on the basis of conservative assumptions and selecting the most plausible one? (b) Taking into account relevant national and/or sectoral policies and circumstance? − Are key factors that affect a baseline taken into account? (c) In a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, date sources and key factors? (d) Taking into account of uncertainties	Yes, the PDD provides justification that the baseline is established: a) By listing and describing plausible future scenarios on the basis of conservative assumptions and selecting the most plausible one. b) Taking into account relevant national and/or sectoral policies and circumstance. c) In a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, date sources and key factors. d) Taking into account of uncertainties and using conservative assumptions.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	and using conservative assumptions? (e) In such a way that ERUs cannot be earned for decreases in activity levels outside the project or due to force majeure? (f) By drawing on the list of standard variables contained in appendix B to "Guidance on criteria for baseline setting and monitoring", as appropriate?	e) In such a way that ERUs cannot be earned for decreases in activity levels outside the project or due to force majeure f) By drawing on the list of standard variables contained in appendix B to "Guidance on criteria for baseline setting and monitoring", as appropriate. For details see section B.1.		
24	If selected elements or combinations of approved CDM methodologies or methodological tools for baseline setting are used, are the selected elements or combinations together with the elements supplementary developed by the project participants in line with 23 above?	As indicated in the PDD no CDM methodologies or methodological tools are used for baseline choice.	OK	OK
25	If a multi-project emission factor is used, does the PDD provide appropriate justification?	Yes, the PDD provides appropriate justification for the multi-project emission factors usage.	OK	OK
Approved CDM methodology approach only_Paragraphs 26(a) – 26(d)_Not applicable				
Additionality				
JI specific approach only				
28	Does the PDD indicate which of the following approaches for demonstrating	The PDD indicates that the following approach for demonstrating additionality is used:	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	additionality is used? (a) Provision of traceable and transparent information showing the baseline was identified on the basis of conservative assumptions, that the project scenario is not part of the identified baseline scenario and that the project will lead to emission reductions or enhancements of removals; (b) Provision of traceable and transparent information that an AIE has already positively determined that a comparable project (to be) implemented under comparable circumstances has additionality; (c) Application of the most recent version of the "Tool for the demonstration and assessment of additionality. (allowing for a two-month grace period) or any other method for proving additionality approved by the CDM Executive Board".	<u>Sub-project 1.</u> Application of the most recent version of the "Tool for the demonstration and assessment of additionality. (allowing for a two-month grace period) or any other method for proving additionality approved by the CDM Executive Board". <u>Sub-projects 2,3.</u> (b) Provision of traceable and transparent information that an AIE has already positively determined that a comparable project implemented under comparable circumstances has additionality;		
29 (a)	Does the PDD provide a justification of the applicability of the approach with a clear and transparent description?	Yes, the PDD provides a justification of the applicability of the approaches with a clear and transparent description.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
29 (b)	Are additionality proofs provided?	For Sub-project1 "Tool for the demonstration and assessment of additionality" version 6.0.0 which is approved by the CDM Executive Board has been used to demonstrate the additionality proofs. For sub-projects 2,3 Paragraph 44 of Annex 1 to the Guidance on criteria for baseline setting and monitoring Version 03 (approach B) has been selected for demonstration of additionality.	OK	OK
29 (c)	Is the additionality demonstrated appropriately as a result?	Yes, the additionality is demonstrated appropriately as a result	OK	OK
30	If the approach 28 (c) is chosen, are all explanations, descriptions and analyses made in accordance with the selected tool or method?	Yes, the approach 28 (c) is chosen for sub-project 1.All explanations and analyses are made in accordance with the selected tool. CL01 Please point out that the most recent version "Tool for the demonstration and assessment of additionality" 6.0 is updated to 6.1 and grace period ends in two months.	CL01	OK
Approved CDM methodology approach only_ Paragraphs 31(a) – 31(e)_Not applicable				
Project boundary (applicable except for JI LULUCF projects				
JI specific approach only				
32 (a)	Does the project boundary defined in the PDD encompass all anthropogenic emissions by sources of GHGs that are: (i) Under the control of the project	The project boundary defined in the PDD encompasses all anthropogenic emissions by sources of GHGs that are: (i) Under the control of the project participants. (ii) Reasonably attributable to the project.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	participants? (ii) Reasonably attributable to the project? (iii) Significant?	(iii) Significant. Project boundaries for all sub-projects are described in section B.3 of the PDD.		
32 (b)	Is the project boundary defined on the basis of a case-by-case assessment with regard to the criteria referred to in 32 (a) above?	Yes, the project boundary is defined on the basis of a case-by-case assessment with regard to the criteria referred to in 32 (a) above.	OK	OK
32 (c)	Are the delineation of the project boundary and the gases and sources included appropriately described and justified in the PDD by using a figure or flow chart as appropriate?	Project boundary for all sub-projects is described properly on figures 15-17.	OK	OK
32 (d)	Are all gases and sources included explicitly stated, and the exclusions of any sources related to the baseline or the project are appropriately justified?	The list of the sources and the greenhouse gases that were included into the boundaries of the project is provided in the section B.3.	OK	OK
Approved CDM methodology approach only_Paragraph 33_ Not applicable				
Crediting period				
34 (a)	Does the PDD state the starting date of the project as the date on which the implementation or construction or real action of the project will begin or began?	The starting date of the project is: 01.01.2004 CAR10 Please provide document proove that date 01/01/2004 is the date of first emission reductions of the project.	CAR10	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
34 (a)	Is the starting date after the beginning of 2000?	Yes, the starting day of the project is after 2000.	OK	OK
34 (b)	Does the PDD state the expected operational lifetime of the project in years and months?	The expected operational life time of the project is 19 years or 228 months. CL02 Please clarify what kinds of data were used for the estimation of expected operational life time of the project.	CL02	OK
34 (c)	Does the PDD state the length of the crediting period in years and months?	Yes, the length of the crediting period is stated in the PDD in years and months.	OK	OK
34 (c)	Is the starting date of the crediting period on or after the date of the first emission reductions or enhancements of net removals generated by the project?	The starting date of the crediting period is on after the date of the first emission reductions.	OK	OK
34 (d)	Does the PDD state that the crediting period for issuance of ERUs starts only after the beginning of 2008 and does not extend beyond the operational lifetime of the project?	The PDD states that the crediting period for issuance of ERUs starts only after the beginning of 2008 and does not extend beyond the operational lifetime of the project.	OK	OK
34 (d)	If the crediting period extends beyond 2012, does the PDD state that the extension is subject to the host Party approval? Are the estimates of emission	CAR11 PDD does not state that the extension is subject to the host Party approval. Please make appropriate amendments.	CAR11	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	reductions or enhancements of net removals presented separately for those until 2012 and those after 2012?			
Monitoring plan				
35	Does the PDD explicitly indicate which of the following approaches is used? − JI specific approach − Approved CDM methodology approach	The PDD explicitly indicates that JI specific approach is used for the monitoring plan establishing.	OK	OK
JI specific approach only				
36 (a)	Does the monitoring plan describe: − All relevant factors and key characteristics that will be monitored? − The period in which they will be monitored? − All decisive factors for the control and reporting of project performance?	Monitoring plan describes: − All relevant factors and key characteristics that will be monitored. − The period in which they will be monitored. − All decisive factors for the control and reporting of project performance.	OK	OK
36 (b)	Does the monitoring plan specify the indicators, constants and variables used that are reliable, valid and provide transparent picture of the emission reductions or enhancements of net removals to be monitored?	The monitoring plan specifies the indicators, constants and variables used that are reliable, valid and provides transparent picture of the emission reductions to be monitored.	OK	OK
36 (b)	If default values are used: − Are accuracy and reasonableness carefully balanced in their selection?	Yes, the default values are used: - Accurate and reasonable.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	− Do the default values originate from recognized sources? − Are the default values supported by statistical analyses providing reasonable confidence levels? − Are the default values presented in a transparent manner?	- Originates from recognized source. - Supported by statistical analyses are providing reasonable confidence levels. - Presented in a transparent manner.		
36 (b) (i)	For those values that are to be provided by the project participants, does the monitoring plan clearly indicate how the values are to be selected and justified?	Yes, for those values that are to be provided by the project participants, the monitoring plan clearly indicates how the values are to be selected and justified.	OK	OK
36 (b) (ii)	For other values, − Does the monitoring plan clearly indicate the precise references from which these values are taken? − Is the conservativeness of the values provided justified?	Yes, it is clearly stated from which source these values are taken. Moreover, the conservativeness of the values is provided.	OK	OK
36 (b) (iii)	For all data sources, does the monitoring plan specify the procedures to be followed if expected data are unavailable?	Yes, the monitoring plan specifies the procedures to be followed if expected data are unavailable.	OK	OK
36 (b) (iv)	Are International System Unit (SI units) used?	Yes, the International System Unit (SI units) are used	OK	OK
36 (b) (v)	Does the monitoring plan note any parameters, coefficients, variables, etc.	The monitoring plan doesn't note any parameters that are required for baseline calculations but	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	that are used to calculate baseline emissions or net removals but are obtained through monitoring?	obtained through monitoring		
36 (b) (v)	Is the use of parameters, coefficients, variables, etc. consistent between the baseline and monitoring plan?	Yes, the use of parameters, coefficients, variables, etc. is consistent between the baseline and monitoring plan	OK	OK
36 (c)	Does the monitoring plan draw on the list of standard variables contained in appendix B of "Guidance on criteria for baseline setting and monitoring"?	The monitoring plan draws on the list of standard variables contained in appendix B of "Guidance on criteria for baseline setting and monitoring"	OK	OK
36 (d)	Does the monitoring plan explicitly and clearly distinguish: (i) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination? (ii) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of determination? (iii) Data and parameters that are	CAR12 Please divide all parameters into 3 groups such as: (i) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination? (ii) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of determination? (iii) Data and parameters that are monitored throughout the crediting period?	CAR12	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	monitored throughout the crediting period?			
36 (e)	Does the monitoring plan describe the methods employed for data monitoring (including its frequency) and recording?	The monitoring plan describes the methods employed for data monitoring (including its frequency) and recording.	OK	OK
36 (f)	Does the monitoring plan elaborate all algorithms and formulae used for the estimation/calculation of baseline emissions/removals and project emissions/removals or direct monitoring of emission reductions from the project, leakage, as appropriate?	Yes, the monitoring plan elaborates all algorithms and formulae used for the calculation of baseline emissions and project emissions, leakages, as appropriate	OK	OK
36 (f) (i)	Is the underlying rationale for the algorithms/formulae explained?	The underlying rationale for the formulas is explained.	OK	OK
36 (f) (ii)	Are consistent variables, equation formats, subscripts etc. used?	Variables, equation formats, subscripts are used in consistent way.	OK	OK
36 (f) (iii)	Are all equations numbered?	All equations are numbered.	OK	OK
36 (f) (iv)	Are all variables, with units indicated defined?	All variables with units indicated are defined	OK	OK
36 (f) (v)	Is the conservativeness of the algorithms/procedures justified?	The conservativeness of the algorithms is justified.	OK	OK
36 (f) (v)	To the extent possible, are methods to quantitatively account for uncertainty in key parameters included?	Yes, the level of uncertainty of parameters is provided in table D.2 of the section D.1.5.	OK	OK
36 (f) (vi)	Is consistency between the elaboration of the	There is consistency between the elaboration of	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	baseline scenario and the procedure for calculating the emissions or net removals of the baseline ensured?	the baseline scenario and the procedure for calculating the emissions of the baseline scenario.		
36 (f) (vii)	Are any parts of the algorithms or formulae that are not self-evident explained?	The all part of used formulae are explained	OK	OK
36 (f) (vii)	Is it justified that the procedure is consistent with standard technical procedures in the relevant sector?	Yes, that procedure is consistent with standard technical procedure of waste heaps dismantling in Ukraine	OK	OK
36 (f) (vii)	Are references provided as necessary?	Yes, the references are provided as necessary	OK	OK
36 (f) (vii)	Are implicit and explicit key assumptions explained in a transparent manner?	The all part of used formulae are explained	OK	OK
36 (f) (vii)	Is it clearly stated which assumptions and procedures have significant uncertainty associated with them, and how such uncertainty is to be addressed?	In the project design document there is not stated any information about significant uncertainty level of assumptions and procedures.	OK	OK
36 (f) (vii)	Is the uncertainty of key parameters described and, where possible, is an uncertainty range at 95% confidence level for key parameters for the calculation of emission reductions or enhancements of net removals provided?	The uncertainty of key parameters is described and, where possible, an uncertainty range at 95% confidence level for key parameters for the calculation of emission reductions is provided	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
36 (g)	Does the monitoring plan identify a national or international monitoring standard if such standard has to be and/or is applied to certain aspects of the project? Does the monitoring plan provide a reference as to where a detailed description of the standard can be found?	Monitoring plan does not identify a national or international monitoring standard.	OK	OK
36 (h)	Does the monitoring plan document statistical techniques, if used for monitoring, and that they are used in a conservative manner?	Not applicable for given JI project.	OK	OK
36 (i)	Does the monitoring plan present the quality assurance and control procedures for the monitoring process, including, as appropriate, information on calibration and on how records on data and/or method validity and accuracy are kept and made available upon request?	Yes, the comprehensive data are provided in section D.2. of the PDD.	OK	OK
36 (j)	Does the monitoring plan clearly identify the responsibilities and the authority regarding the monitoring activities?	Yes, the monitoring plan clearly identifies the responsibilities and the authority regarding the monitoring activities	OK	OK
36 (k)	Does the monitoring plan, on the	Yes, there are a lot of projects that are similar to	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	whole, reflect good monitoring practices appropriate to the project type? If it is a JI LULUCF project, is the good practice guidance developed by IPCC applied?	this particular project		
36 (l)	Does the monitoring plan provide, in tabular form, a complete compilation of the data that need to be collected for its application, including data that are measured or sampled and data that are collected from other sources but not including data that are calculated with equations?	Monitoring plan provides a complete compilation of the data that need to be collected for its application, including data that are measured or sampled and data that are collected from other sources. Data connected with baseline scenario and emission reduction calculation are stated in tabular format in section D of the PDD.	OK	OK
36 (m)	Does the monitoring plan indicate that the data monitored and required for verification are to be kept for two years after the last transfer of ERUs for the project?	CAR13 Please provide order on special data gathering and storage for at least two years after the last transfer of ERUs for the project. CAR14 Please provide order on creation of special monitoring group.	CAR13 CAR14	OK
37	If selected elements or combinations of approved CDM methodologies or methodological tools are used for establishing the monitoring plan, are the selected elements or combination,	N\A	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	together with elements supplementary developed by the project participants in line with 36 above?			
Approved CDM methodology approach only_Paragraphs 38(a) – 38(d)_Not applicable				
Applicable to both JI specific approach and approved CDM methodology approach_Paragraph 39_Not applicable				
Leakage				
JI specific approach only				
40 (a)	Does the PDD appropriately describe an assessment of the potential leakage of the project and appropriately explain which sources of leakage are to be calculated and which can be neglected?	Leakeges are absent within the project in each of the sub-projects.	OK	OK
40 (b)	Does the PDD provide a procedure for an ex ante estimate of leakage?	N/A	OK	OK
Approved CDM methodology approach only_Paragraph 41_Not applicable				
Estimation of emission reductions or enhancements of net removals				
42	Does the PDD indicate which of the following approaches it chooses? (a) Assessment of emissions or net removals in the baseline scenario and in the project scenario (b) Direct assessment of emission reductions	Assessment of emissions in the baseline scenario and in the project scenario is approach chosen in the PDD.	OK	OK
43	If the approach (a) in 42 is chosen,	Yes, the PDD provides ex ante estimates of :	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	does the PDD provide ex ante estimates of: (a) Emissions or net removals for the project scenario (within the project boundary)? (b) Leakage, as applicable? (c) Emissions or net removals for the baseline scenario (within the project boundary)? (d) Emission reductions or enhancements of net removals adjusted by leakage?	a) Emissions for the project scenario (within the project boundary). b) Leakages. c) Emissions for the baseline scenario (within the project boundary). d) Emission reductions adjusted by leakage.		
44	If the approach (b) in 42 is chosen, does the PDD provide ex ante estimates of: (a) Emission reductions or enhancements of net removals (within the project boundary)? (b) Leakage, as applicable? (c) Emission reductions or enhancements of net removals adjusted by leakage?	N\A	OK	OK
45	For both approaches in 42 (a) Are the estimates in 43 or 44 given: (i) On a periodic basis? (ii) At least from the beginning until	The baseline emissions and project emissions are given on a periodic basis from the beginning to the end of the crediting period for each year.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	the end of the crediting period? (iii) On a source-by-source/sink-by-sink basis? (iv) For each GHG? (v) In tones of CO2 equivalent, using global warming potentials defined by decision 2/CP.3 or as subsequently revised in accordance with Article 5 of the Kyoto Protocol? (b) Are the formula used for calculating the estimates in 43 or 44 consistent throughout the PDD? (c) For calculating estimates in 43 or 44, are key factors influencing the baseline emissions or removals and the activity level of the project and the emissions or net removals as well as risks associated with the project taken into account, as appropriate? (d) Are data sources used for calculating the estimates in 43 or 44 clearly identified, reliable and transparent? (e) Are emission factors (including	Baseline and project emissions are carried out for CO2 as GHG gas. Formulae used for calculating the estimates concerning in section D and section E are consistent throughout the PDD and calculation Excel spreadsheets. As there was already mentioned above, data sources used for calculating the estimates are clearly identified. Among key factors influencing the baseline emissions or the activity level of the project as well as risks associated with the project Carbon Emission Factor each type of fuel and carbon dioxide emission factor of power loss reduction in power transport networks of Ukraine are taken into account. The emission factor of Ukrainian grid that used for calculation of the estimates in the JI project is selected for usage with appropriate accuracy. Choice of emission factors is justified in the project design documents. Conservative assumptions are taken into account while estimating emission reduction.		

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	default emission factors) if used for calculating the estimates in 43 or 44 selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice? (f) Is the estimation in 43 or 44 based on conservative assumptions and the most plausible scenarios in a transparent manner? (g) Are the estimates in 43 or 44 consistent throughout the PDD? (h) Is the annual average of estimated emission reductions or enhancements of net removals calculated by dividing the total estimated emission reductions or enhancements of net removals over the crediting period by the total months of the crediting period and multiplying by twelve?	In the PDD there are provided tables with calculation results of CO2 emission reductions. As a fact, estimated total value of CO2 emission reductions for the first crediting period is 8117278 t CO2 equivalent; moreover, estimated total value of CO2 emission reductions for the period 2013-2022 is 15719810 t CO2 equivalent.		
46	If the calculation of the baseline emissions or net removals is to be performed ex post, does the PDD include an illustrative ex ante emissions or net removals calculation?	The calculations of the baseline emissions and project emissions are to be performed ex post. Also, in the PDD provided ex ante calculation of emissions. All estimated values are presented in section E of the PDD and Excel spreadsheets.	OK	OK
Approved CDM methodology approach only_Paragraphs 47(a) – 47(b)_Not applicable				

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
Environmental impacts				
48 (a)	Does the PDD list and attach documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party?	Sub-project 1. The project was implemented in accordance with the documentation developed for its components (replacement capacitors, installing condensing pumps, installation of the control system of the new monitoring equipment, sensors and actuators, etc.), for which EIA is not required. Sub –project 2. KYIVENERGO PJSC has the necessary Environmental Impact Assessment for its activity according to Ukrainian legislation. Sub-project 3. List of the ecological reportings of the company: - atmospheric air protection report; - water usage report; - report balance of the groundwaters usage; - report of the environmental protection expenses and the ecological payments; - report of the formation, handling and utilization of the I-III hazard classes wastes; - monthly reports from all SU about the carrying out of the environmental protection measures; - wastes registration is carried out in every SU according to the approved typical form № 1-VT; - package of documents is made to receive the	CAR15	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		permission and the limit for the formation and location of the wastes; permission for the emission of pollutants into the atmospheric air; permission for the special water usage. CAR15 Please provide all documents mentioned in Sub-project 3 section.		
48 (b)	If the analysis in 48 (a) indicates that the environmental impacts are considered significant by the project participants or the host Party, does the PDD provide conclusion and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party?	The PDD provides conclusion and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party.	OK	OK
Stakeholder consultation				
49	If stakeholder consultation was undertaken in accordance with the procedure as required by the host Party, does the PDD provide: (a) A list of stakeholders from whom comments on the projects have been	The Host Party doesn't require stakeholders' consultation process for the JI project. No stakeholders' comments connected with JI project were obtained.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	received, if any? (b) The nature of the comments? (c) A description on whether and how the comments have been addressed?			
Determination regarding small-scale projects (additional elements for assessment)_Paragraphs 50 - 57_Not applicable				
Determination regarding land use, land-use change and forestry projects _Paragraphs 58 – 64(d)_Not applicable				
Determination regarding programmes of activities_Paragraphs 66 – 73_Not applicable				

Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Determination team conclusion
CAR01 Please delete ukrainian column from the table “sectoral scopes” in the PDD.		Ukrainian column from the table “sectoral scopes” is deleted.	The issue is closed
CAR02 It is stated that the project “Reconstruction of electrical and heating systems in Kyiv” was initiated in 2003. Please provide document evidence that states so.		The document evidence of started data of the project is provided to the determination group.	The issue is closed

CAR03 JI component is absent in the PDD. Please add it.		JI component is added.	The issue is closed
CAR04 Please rearrange geographical coordinates in the following manner: ##°##′##” N, ##°##′##”E		The geographical coordinates is corrected.	The issue is closed
CAR05 Please add implementation schedule in the PDD for each sub-project or specify key activities in line with dates of their realization.		Implementation schedule for each sub-project is added in section A.4.2. of the PDD.	The issue is closed
CAR06 For power lines weight is specific value, thus it should follow with the length value such as: m, km, etc. Please add appropriate information through all the all PDD.		Information about power lines weight is added in a section A4.2. of PDD.	The issue is closed
CAR07 The letter of Approval is absent.	19	State Environmental Investment Agency of Ukraine provided Letter of Endorsement № 2682/23/7 dated 20.09.2012. According to the national Ukrainian procedure, the LoA by Ukraine is expected after the project determination.	The issue is closed
CAR08 Please provide the letter of endorsement.	19	The letter of endorsement is provided to the determination group.	The issue is closed

CAR09 The date when LoE was issued is probably wrong. Please correct it.	19	The date when LoE was issued is corrected.	The issue is closed
CL01 Please point out that the most recent version "Tool for the demonstration and assessment of additionality" 6.0 is updated to 6.1 and grace period ends in two months.	30	We appreciate your note and for next projects we will use the most recent "Tool for the demonstration and assessment of additionality" version 6.1.	The issue is closed
CAR10 Please provide document proove that date 01/01/2004 is the date of first emission reductions of the project.	34(a)	In accordance with order № 1 dated 03.01.2004 KYIVENERGO and with instructions number PL-32 dated 05.05.98 and № C-78 dated 01.04.2004 was developed and start implement their own energy saving program for 2004-2010 period, which include current and long-term measures to save energy resources of the Company. As the base period for the calculation in the PDD to take a year, the reductions is calculated for the whole of 2004 01/01/2004 to 31/12/2004	The issue is closed

CL02 Please clarify what kinds of data were used for the estimation of expected operational life time of the project.	34(b)	The minimal nominal lifetime of the new equipment for boilers, heat supply network or distribution grid is 25 years. The real average lifetime of the new network equipment is estimated to be up to 30 – 40 years. To confirm the data passports of equipment and experience with similar equipment in Ukraine are used Thus the expected operational lifetime of the project may be about 30 years which is also confirmed in comparable projects.	The issue is closed
CAR11 PDD does not state that the extension is subject to the host Party approval. Please make appropriate amendments.	34(d)	The crediting period can extend beyond 2012 subject to the approval by the Host Party. Appropriate amendments are made in section C PDD.	The issue is closed

CAR12 Please divide all parameters into 3 groups such as: (i) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), and that are available already at the stage of determination? (ii) Data and parameters that are not monitored throughout the crediting period, but are determined only once (and thus remain fixed throughout the crediting period), but that are not already available at the stage of determination? (iii) Data and parameters that are monitored throughout the crediting period?	36(d)	All parameters is divided into 3 groups and provided in section D.1. PDD.	The issue is closed
CAR13 Please provide order on special data gathering and storage for at least two years after the last transfer of ERUs for the project.	36(m)	The order on special data gathering and storage for at least two years after the last transfer of ERUs for the project and creation of special monitoring group is provided to the determination group.	The issue is closed
CAR14 Please provide order on creation of special monitoring group.	36(m)	See answer to CAR13.	The issue is closed

CAR15 Please provide all documents mentioned in Sub-project 3 section.	48(a)	All documents mentioned in Sub-project 3 section is provided to the determination group.	The issue is closed