DETERMINATION REPORT
VEMA S.A.

DETERMINATION OF THE JI PROJECT

Modernization of the heat supply system in Mykolaiv region

REPORT NO. UKRAINE-DET/0613/2012

VERSION NO. 02

BUREAU VERITAS CERTIFICATION

DETERMINATION REPORT

Date of first issue:	Organizational unit:
29/07/2012	Bureau Veritas Certification Holding SAS
Client: VEMA S.A.	**Client ref.:** Fabian Knodel

Summary:

Bureau Veritas Certification has made the determination of the "Modernization of the heat supply system in Mykolaiv region" project of VEMA S.A. located in the territory of Mykolaiv region, 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 Actions 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.:	Subject Group:
UKRAINE-DET/0613/2012	JI

Project title:
"Modernization of the heat supply system in Mykolaiv region"

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1 INTRODUCTION

VEMA S.A. has commissioned Bureau Veritas Certification to determine the JI project "Modernization of the heat supply system in Mykolaiv region" (hereafter called "the project") located in the territory of Mykolaiv region, 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 emissions reductions 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:

Oleg Skoblyk – Bureau Veritas Certification Team Leader, Climate Change Lead Verifier

Viacheslav Yeriomin
Bureau Veritas Certification Team Member, Technical Expert

This determination report was reviewed by:

Ivan Sokolov
Bureau Veritas Certification Internal Technical Reviewer

Vasyl Kobzar
Bureau Veritas Certification Technical Expert

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, consisting of two tables, is enclosed in Appendix A to this report.

2.1 Review of Documents

The Project Design Document (PDD) submitted by VEMA S.A. 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, VEMA S.A. revised the PDD version 01 dated 26/07/2012 and resubmitted the PDD as version 02 dated 14/08/2012.

The determination findings presented in this report relate to the project as described in the PDD versions 01 and 02.

2.2 Follow-up Interviews

On 29/07/2012 Bureau Veritas Certification Determination team performed (on-site) interviews with project stakeholders to confirm selected

information and to resolve issues identified in the document review. Representatives of RUC "Mykolaivoblteploenerho" and VEMA S.A. were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
RUC "Mykolaivoblteploenerho"	➢ Project history ➢ Project approach ➢ Project boundary ➢ Implementation Schedule ➢ Organizational structure ➢ Responsibilities and authorities ➢ Training of personnel ➢ Quality management procedures and technology ➢ Modernization /installation of equipment (records) ➢ Metering equipment control ➢ Metering record keeping system, database ➢ Technical documents ➢ Plan and procedures of monitoring ➢ Permissions and licenses ➢ Environmental impact assessment ➢ Stakeholders' responses
VEMA S.A.	➢ Baseline methodology ➢ Monitoring plan ➢ Proof of additionality ➢ Emission reduction calculations ➢ Project design ➢ Legal issues related to the project ➢ Environmental impact ➢ Approval by the Host Party

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.

Corrective Action Request (CAR) is issued, where:

(a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;

(b) The JI requirements have not been met;

(c) There is a risk that emission reductions cannot be monitored or calculated.

The determination team may also issue Clarification Request (CL), if information is insufficient or not clear enough to determine whether the applicable JI requirements have been met.

The determination team may also issue Forward Action Request (FAR), informing the project participants of an issue that needs to be reviewed during the verification.

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

3 PROJECT DESCRIPTION

The purpose of the project is reduction of fossil fuel consumption by modernization of a centralized heat supply system of Mykolaiv city and Mykolaiv region. The project, initiated by RUC "Mykolaivoblteploenerho", will lead to the reduction of greenhouse gas (GHG) emissions to the atmosphere and contribute to the improvement of ecological situation in the region. The purpose of the project is to promote sustainable development of the region by introducing energy saving technologies.

One of the main objectives of RUC "Mykolaivoblteploenerho" is uninterrupted heat supply to consumers in Mykolayiv city and Mykolayiv region, as well as implementation of advanced solutions for the economical use of fossil fuel. For the implementation of the above, special attention is paid to the improvement of quality of maintenance of heat supply systems, timely overhaul thereof, pipelines protection from corrosion and other damage. However, the structure of existing tariffs heat and hot water supply that is regulated by the state does not take into consideration amortization and investment needs of heat generation companies. This hinders the flow of sufficient funds for the purposes of repair, modernization and development of heat supply networks, procurement of appropriate technological equipment and components.
The project provides for the modernization of the boiler equipment and heat supply networks that will increase efficiency and reduce heat losses in heating systems, improving the quality of service of heat and hot water supply.
The project involves the reduction of greenhouse gases (GHG) due to:
- Replacement of old boilers with new higher energy efficient ones;

- Modernization of boiler equipment:
    - Replacement of burners;
    - Replacement of the convective and screen pipes;
    - Restoration of the lining and laying insulation;
    - Chemical flushing and cleaning.
- Modernization of heating systems, installation of pre-insulated pipes;
- Establishment of modern systems of gas, heat measuring devices.

The Project implementation will provide significant economic and social benefits, positive impact on the environment of Mykolaiv city and Mykolaiv region. The social impact of the project is positive, because after its implementation the heating services will improve.

Estimated project risks are limited and minimized because the Government of Ukraine declared the district heating and municipal energy sector as the priority of national energy saving measures.

History of the project activities
01/09/2004 – RUC “Mykolaivoblteploenerho” started implementation of measures to modernize the district heating system of Mykolaiv city and Mykolaiv region as a JI project.

21/05/2012 –VEMA S.A. and RUC “Mykolaivoblteploenerho” signed an agreement on project design document elaboration for the Joint Implementation project «Modernization of the heat supply system in Mykolaiv region».

21/06/2012– project idea note on the justification of anthropogenic GHG emission reductions was developed and submitted to the State Environmental Investment Agency of Ukraine

25/07/2012 – The State Environmental Investment Agency of Ukraine issued a Letter of Endorsement № 1967/23/7 of the JI project «Modernization of the heat supply system in Mykolaiv region».

Determination protocol of the project contains CARs and CLs for PDD versions 01 and 02.

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 33 Corrective Action Requests and 7 Clarification Requests.

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

4.1 Project approvals by Parties involved (19-20)

The project ”Modernization of the heat supply system in Mykolaiv region” has already obtained endorsement from the government of Ukraine, namely a Letter of Endorsement No. 1967/23/7 issued by the State Environmental Investment Agency of Ukraine dated 25/07/2012.

Bureau Veritas Certification received this letter from the project participants and does not doubt its authenticity.

After the Determination Report is complete, the Project Design Documents will be submitted to the State Environmental Investment Agency of Ukraine to receive a Letter of Approval.

Since the project has not been approved by the Host Party, CAR 13 is pending and will be closed after the report is completed (see Appendix A).

The identified areas of concern as to the project approval by the Parties, project participants responses and BVC’s conclusion are described in Appendix A to the Determination report (refer to CAR 13).

4.2 Authorization of project participants by Parties involved (21)

The participation for each of the legal entities listed as project participants in the PDD will be authorized through written Letters of Approval (from the Government of Switzerland, as the country – investor, and from Ukraine, as the Host Party). Refer to CAR 13 of this Report.

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 “specific approach”) was the selected approach for identifying the baseline (in accordance with

paragraph 11 of Guidance on criteria for baseline setting and monitoring (Version 03).

The proposed project uses the specific approach based on the approved Methodology AM0044 “Energy efficiency improvement projects: boiler rehabilitation or replacement in industrial and district heating sectors” - Version 1.0

The principal challenge for implementation of the JI Projects for reconstruction of heat supply systems in Ukraine is the actual absence of monitoring equipment for measuring amounts of heat and heating agent used at municipal boiler and heating plants. Only usage of fossil fuel is registered on the regular basis. This makes virtually impossible the application of AM0044 Methodology, because the main calculation factor is the amount of heat output that has to be measured by meter (of heat output) and by temperature sensor (boiler temperature regime) on a monthly basis.

The specific approach used by the project was based on the permanent control of fuel usage and taking other factors into account, such as: consumer switching on or off, change of fuel efficiency, climate change, ratio between usage of fuel for heating and for hot water supply, usage for own needs, etc.

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

(a) By listing and describing the following plausible future scenarios on the basis of conservative assumptions and selecting the most plausible one:
   a. Alternative 1.1: Proceeding with the current practice without realization of JI project.
   b. Alternative 1.2: Project activities without using the JI mechanism.

(b) 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. In this context, the following key factors that affect a baseline are taken into account:

   a. High priority of the heat supply sector for the national energy saving policy declared by the Ukrainian Government and

stated in the State Program of Communal Economics Restructuring and Development for 2004-2010 (Law of Ukraine "On heat supply" No. 2479-VI dated 09/07/2010), Law of Ukraine "On energy saving" No. 74/94-VR dated 01/07/1994 and Law of Ukraine "On amendments to the Law of Ukraine "On energy saving" No. 1026-V dated 16/05/2007. New Law of Ukraine "On heat supply" No. 2633-IV dated 02/06/2005 which regulates relations in the heat supply market and provides for the implementation of energy saving measures and more efficient technologies.

b. In the framework of the existing market model for the heat supply, the effective competition among heat supplying companies can't be achieved; this market model can't also provide for the competitive heat pricing, which would stimulate suppliers to improve efficiency and increase investment in the sector. Existing market mechanisms and targeted administrative measures don't provide the necessary modernization and upgrading of the existing heat transportation systems. The situation is becoming particularly critical given the growth of the need for fossil fuel in the near future, the lack of which represents a threat to safe operation of local heating and hot water supply systems.

c. Existing tariffs for heat supply are regulated by the state and do not include depreciation and investment needs of heat supplying companies. This situation leads to a constant shortage of funds and the inability of timely capital repair of equipment, ensuring equipment operation, investment in modernization and development of the infrastructure.

d. The system of heat supply tarrif formation existing in Ukraine does not include investment component for modernization of boiler equipment and heat supply networks. In accordance with the Law of Ukraine "On heat supply" RUC "Mykolaivoblteploenerho" is not obliged and not motivated to spend their own money on modernization of boiler equipment. At the same time, public investment programs in most cases are focused only on the administrative and organizational measures.

e. The state support in the sphere of heat supply is available in accordance with funds provided by the State Budget of Ukraine for the corresponding year.

f. The project scenario requires attracting significant additional funds. Such investment is characterized by a significant

payback period and high investment risks, that is why it is not attractive for investors.

g. Ukraine already implements JI projects in the sphere of heat supply ("Rehabilitation of the District Heating System in Donetsk City", "Rehabilitation of the Communal Heating System in Rivne region", "Rehabilitation of the District Heating System in Lugansk City") by selling emission reduction units.

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

The methods of calculation used to determine the expected and actual baseline emissions, are sufficiently described in sections E and D of the PDD, respectively.

The identified areas of concern as to the baseline, project participants responses and BVC's conclusion are described in Appendix A to the Determination report (refer to CAR 14 - CAR 19, CL 06).

4.4 Additionality (27-31)

The most recent version of the "Tool for the demonstration and assessment of additionality" approved by the CDM Executive Board was used according to the JI specific approach determined as per paragraph 9 (a) of the "Guidance on criteria for baseline setting and monitoring", Version 03. All explanations, descriptions and analyses are made in accordance with the selected tool or method.

The PDD provides a justification of the applicability of the approach with a clear and transparent description, as per item 4.3 above.

The developer of the project proved that the amount of project anthropogenic emissions is lower than the emissions that would occur in the absence of project activity.
Additionality proofs are provided.
Two plausible and realistic alternative scenarios of the project were identified:

- Alternative 1.1: Continuation of the current practice without realization of JI project.
- Alternative 1.2: Project activities without using the JI mechanism.

and the mandatory compliance of the scenarios with the legislation and legal acts was demonstrated.

According to the "Tool for the demonstration and assessment of additionality" (Version 06.0.0) investment analysis and common practice analysis were used in the PDD to justify additionality of the project.

Thus, the overall conclusion is that the project activity meets the criteria of additionality, is not a baseline scenario and is additional.

Additionality is demonstrated properly, as a result of the analysis using the selected approach.
The identified areas of concern as to the additionality, project participants responses and BVC's conclusion are described in Appendix A to the Determination report (refer to CAR 20 – CAR 24, CL 05).

4.5 Project boundary (32-33)

According to the specific approach, the project boundary includes technological equipment used in the production of heat, a list of the equipment is provided in the register of basic technological equipment as of June 1, 2012. The project boundary 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, such as:
- CO_2 emissions caused by heat production and supply;

(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 CO_2 equivalent, whichever is lower.

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

4.6 Crediting period (34)

The PDD states the starting date of the project as the date when RUC "Mykolaivoblteploenerho" started implementation of measures to modernize the heat supply system in Mykolaiv city and Mykolaiv region in the framework of JI project and the starting date is 01/09/2004, which is after the beginning of 2000.

The PDD states the expected operational lifetime of the project in years and months, which is 21 years or 252 months, from 01/01/2005 to 31/12/2025.

The PDD states the length of the crediting period in years and months, which is 21 years or 252 months, and its starting date is 01/01/2005, which is the date when the first emission reductions are expected to be generated.

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's 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 the crediting period, project participants responses and BVC's conclusion are described in Appendix A to the Determination report (refer to CAR 25 CAR 26).

4.7 Monitoring plan (35-39)

The PDD, in its monitoring plan section, explicitly indicates that the JI specific approach was 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 reporting forms, the operational structure and management structure of the enterprise, that will be applied when implementing the monitoring plan.

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 such as: total amount of FF-type fossil fuel consumption, Net calorific value of FF-type fossil fuel, Carbon emission factor in the course of FF-type fossil fuel combustion, Carbon oxidation factor in the course of FF-type fossil fuel combustion, average outdoor temperature during the heating period, average indoor temperature during the heating period, average number of consumers, personal bills, duration of hot water supply service provision, duration of heat supply service provision, heated area.

The monitoring plan draws on the list of standard variables contained in appendix B of "Guidance on criteria for baseline setting and monitoring" developed by the JISC, as appropriate, among which: baseline emissions (BE_y), project emissions (PE_y), Net Calorific Value (NCV_y).

According to Guidance for users of JI PDD forms, version 04, described approach to monitoring clearly and accurately specifies:

(i) Data and parameters that are not monitored throughout the crediting period, but are determined only once , and that are available already at the stage of the PDD development:

$FC^{j}_{b,FF}$	Total amount of FF-type fossil fuel consumption, in historical period «j», in the baseline scenario, ths m3, t
$NCV^{j}_{b,FF}$	Net calorific value of FF-type fossil fuel, in historical period «j», in the baseline scenario, TJ/mln m3, TJ/ths t
$EF^{j}_{b,C,FF}$	Carbon emission factor in the course of FF-type fossil fuel combustion , in historical period «j», in the baseline scenario, t C/TJ
$OXID^{j}_{b,FF}$	Carbon oxidation factor in the course of FF-type fossil fuel combustion, in historical period «j», in the baseline scenario, Relative units
$T^{j}_{out,b}$	Average outdoor temperature in heating historical period «j», oC
$T^{j}_{in,b}$	Average indoor temperature in heating historical period «j», oC
$n^{j}_{w,b}$	Average number of consumers, personal bills, in historical period «j», people
$N^{j}_{w,b}$	Duration of hot water supply service provision in historical period «j», h
$N^{j}_{h,b}$	Duration of heat supply service provision in historical period «j», h

(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 PDD development: absent.

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

$FC^{y}_{p,FF}$	Total amount of FF-type fossil fuel consumption, in monitoring period «y», in the project scenario, ths m3, t
$NCV^{y}_{p,FF}$	Net calorific value of FF-type fossil fuel, in monitoring period «y», in the project scenario, TJ/mln m3, TJ/ths t
$EF^{y}_{p,C,FF}$	Carbon emission factor in the course of FF-type fossil fuel combustion, in monitoring period «y», in the project scenario, t C /TJ
$OXID^{y}_{p,FF}$	Carbon oxidation factor in the course of FF-type fossil fuel combustion, in monitoring period «y», in the project scenario, Relative units
$T_{out,p}$	Average outdoor temperature during the heating period, oC
$T_{in,p}$	Average indoor temperature during the heating period, oC
$n_{w,p}$	Average number of consumers, personal bills, people
$N_{w,p}$	Duration of hot water supply service provision, h
$N_{h,p}$	Duration of heat supply service provision, h
$F_{h,p}$	Heated area, ths m2

The monitoring plan describes the methods employed for data monitoring (including its frequency) and recording, such as data archiving by using accounting and statistical software.
The most objective and cumulative factor that provides a clear picture of whether the emission reductions took place is the fact of GHG emission reduction by fossil fuel replacement with natural gas. It can be defined as the difference between baseline GHG emissions and GHG emissions after the project implementation.

The monitoring plan elaborates all algorithms and formulae used for the estimation/calculation of baseline emissions and project emissions, such as:

Formulae used to estimate project emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

Greenhouse gas (GHG) emissions in the project scenario:

$$PE_p^y = PE_{p,HEAT}^y, \quad (1)$$

$PE_{p,HEAT}^y$ - GHG emissions from fossil fuel combustion in the course of heat generation in monitoring period *y*, in the project scenario, (t CO_2eq);
[y]- index corresponding to monitoring period;
[p] - index corresponding to the project scenario;
[HEAT] - index relating to heat carrier supplied by a boiler house.

$$PE_{p,HEAT}^y = \frac{NCV_{p,FF}^y \cdot FC_{p,FF,i}^y \cdot EF_{p,CO2,FF}^y}{1000}, \quad (2)$$

$NCV_{p,FF}^y$ - net calorific value of FF-type fossil fuel, in monitoring period *y,* in the project scenario, GJ/ ths m^3 (GJ/t);
$EF_{p,CO2,FF}^y$ - default carbon dioxide emission factor for stationary combustion of FF-type fossil fuel, in monitoring period *y,* in the project scenario (t CO_2/TJ);
$FC_{p,FF,i}^y$ - total amount of FF-type fossil fuel, combusted by consumer *i*, in monitoring period *y,* in the project scenario, ths m^3 (t).
1000 – index to convert ths m^3 into million m^3;
[y]- index corresponding to monitoring period;
[p] - index corresponding to the project scenario;
[FF]- index corresponding to fossil fuel type;
[i]- index corresponding to consumer;
[HEAT] - index relating to heat carrier supplied by a boiler house.

$$EF^{y}_{p,CO2,FF} = EF^{y}_{p,C,FF} \cdot OXID^{y}_{p,FF} \cdot \frac{44}{12}, \quad (3)$$

$EF^{y}_{p,C,FF}$ - carbon emission factor for FF-type fossil fuel combustion, in monitoring period *y*, in the project scenario, (t C/TJ);

$OXID^{y}_{p,FF}$ - carbon oxidation factor for FF-type fossil fuel combustion, in monitoring period *y*, in the project scenario, (relative units);

$\frac{44}{12}$ - stoichiometric ratio between CO_2 and C molecular masses, (t CO_2/t C);

[y]- index corresponding to monitoring period;

[p] - index corresponding to the project scenario;

[FF] - index relating to fossil fuel.

Formulae used to estimate baseline emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

Baseline GHG emissions:

$$BE^{y}_{b} = BE^{y}_{b,HEAT} = \frac{NCV^{y}_{b,FF} \cdot EF^{y}_{b,CO2,FF} \cdot FC^{y}_{b,FF,i}}{1000}, \quad (4)$$

$NCV^{y}_{b,FF}$ - net calorific value of FF-type fossil fuel in monitoring period *y* in the baseline scenario, GJ/t (GJ/ths m^3);

$EF^{y}_{b,CO2,FF}$ - default carbon dioxide emission factor for stationary combustion of FF-type fossil fuel in monitoring period *y* in the baseline scenario (t CO_2/TJ);

$FC^{y}_{b,FF,i}$ - total amount of FF-type fossil fuel, which would have been combusted by consumer *i*, in monitoring period *y* in the baseline scenario, (ths m^3, t);

1000 – index to convert ths m^3 into million m^3.

[y]- index corresponding to monitoring period;

[b] - index corresponding to baseline scenario;

[FF]- index corresponding to fossil fuel type;

[i]- index relating to consumer;

[HEAT] - index relating to heat carrier supplied by a boiler house.

$$EF^{y}_{b,CO2,FF} = EF^{y}_{b,C,FF} \cdot OXID^{y}_{b,FF} \cdot \frac{44}{12} \quad (5)$$

$EF^{y}_{b,C,FF}$ - carbon emission factor for FF-type fossil fuel combustion in monitoring period *y* in the baseline scenario, (t C/TJ);

$OXID^{y}_{b,FF}$ - carbon oxidation factor for FF-type fossil fuel combustion in monitoring period *y* in the baseline scenario, (relative units);

$\frac{44}{12}$ - stoichiometric ratio between CO_2 and C molecular masses, (t CO_2/t C);

[y]- index corresponding to monitoring period;

[b] - index corresponding to baseline scenario;

[FF]- index corresponding to fossil fuel;

According to Dynamic Baseline assumption, the value of $BE^{y}_{b,HEAT}$ may vary:

$$BE^{y}_{b,HEAT} = BE^{y}_{b,HEAT,h} + BE^{y}_{b,HEAT,w}, \quad (6)$$

$BE^{y}_{b,HEAT,h}$ - emissions from fossil fuel combustion for heat generation for heating in monitoring period *y* in the baseline scenario, (t CO_2eq);

$BE^{y}_{b,HEAT,w}$ - emissions from fossil fuel combustion for heat generation for hot water supply in monitoring period *y* in the baseline scenario, (t CO_2eq).

For the cases when hot water supply existed in the baseline period (irrelevant of the service duration, $(1-a_b \neq 0)$, the following formula is used for $BE^{y}_{b,HEAT}$:

$$BE^{y}_{b,HEAT} = \frac{NCV^{j}_{b,FF} \cdot EF^{j}_{b,CO2,FF} \cdot \left[FC^{j}_{b,FF} \cdot a^{j}_{b} \cdot K_1 \cdot K_h + FC^{j}_{b,HEAT}\left(1 - a^{j}_{b}\right) \cdot K_1 \cdot K_w\right]}{1000}, \quad (7)$$

For the cases when no hot water supply existed in the baseline period $((1-a_b) = 0)$, and hot water supply only started in the reporting period (thanks to the improved heat supply services), the following formula is used:

$$BE^{y}_{b,HEAT} = \frac{NCV^{j}_{b,FF} \cdot EF^{j}_{b,CO2,FF} \cdot \left[FC^{j}_{b,FF} \cdot a^{j}_{b} \cdot K_1 \cdot K_h + FC^{y}_{p,FF}\left(1 - a^{y}_{p}\right) \cdot K_1 \cdot K_{w0}\right]}{1000} \quad (8)$$

$NCV^{j}_{b,FF}$ - net calorific value of FF-type fossil fuel in monitoring period *y* in the baseline scenario, GJ/t (GJ/ths m^3);

$EF^{j}_{b,CO2,FF}$ - default CO_2 emission factor for stationary combustion of FF-type fossil fuel in monitoring period *y* in the baseline scenario (t CO_2/TJ);

$FC^{j}_{b,FF}$ - total amount of FF-type fossil fuel, which would have been combusted by consumer *i*, in monitoring period *y* in the baseline scenario, ths m^3 (t).

$FC^{y}_{p,FF}$ - total amount of FF-type fossil fuel, which would have been combusted by consumer *i*, in monitoring period *y* of the project scenario, ths m^3 (t);

K_1, K_h, K_w, K_{w0} – adjustment factors;

a^{j}_{b} – part of fuel (heat) consumed for heating;

$(1-a^{j}_{b})$ – part of fuel (heat) consumed for hot water supply.

1000 – index to convert ths m^3 into million m^3.

$$a^{j}_{b} = L^{j}_{h,b} \cdot g \cdot N^{j}_{h,b} / (L^{j}_{h,b} \cdot g \cdot N^{j}_{h,b} + L^{j}_{w,b} \cdot N^{j}_{w,b}), \quad (9)$$

$L^{j}_{h,b}, L^{j}_{w,b}$ – maximum load for heating and hot water supply services, MW;

g – factor for recalculation of the average heat load during heating period (defined for every boiler house individually on historical basis (usually 0.4-0.8);

$N^{j}_{h,b}, N^{j}_{w,b}$ – duration of heating period and period of hot water supply services;

[j]- index corresponding to historical period;

[b] - index corresponding to baseline scenario;

[p]- index corresponding to the project scenario;

[FF]- index corresponding to fossil fuel type;

[h]- index relating to heating;

[w]- index relating to hot water supply;

[HEAT] - index relating to heat carrier supplied by a boiler house.

Adjustment factors:

$$K_1 = NCV^{j}_{b,FF} / NCV^{y}_{p,FF} \quad , \quad (10)$$

K_1 - factor of the change of net calorific value of fossil fuel.

$NCV^{j}_{b,FF}$ - net calorific value of FF-type fossil fuel in historical period j in the baseline scenario, GJ/ths m^3 (GJ/t);

$NCV^{y}_{p,FF}$ - net calorific value of FF-type fossil fuel in monitoring period *y* in the project scenario, MJ/m^3 (TJ/mln m^3);

To establish the Dynamic Baseline that takes into account external factors such as weather conditions, heated area, etc., adjustment factor for heating should be used.

The amount of fuel consumed for heating is proportional to the necessary amount of heat in heating period Q_h:

$$FC^{y}_{b,FF,h} = FC^{y}_{b,FF,i} \cdot a = Q_h * 3{,}6 / NCV^{y}_{b,FF} \cdot \eta_h, \quad (11)$$

$FC^{y}_{b,FF,h}$ - total amount of FF-type fossil fuel, which would have been combusted by consumer *i* for heating, in monitoring period *y* in the baseline scenario, ths m^3 (t).

$FC^{y}_{b,FF,i}$ - total amount of FF-type fossil fuel, which would have been combusted by consumer *I* , in monitoring period *y* in the baseline scenario, ths m^3, (t).

Q_h - necessary heat for heating, kWh;

3,6 – factor of kWh into MJ conversion;

a – part of fuel (heat) consumed for heating;

$NCV^{y}_{b,FF}$ - net calorific value of FF-type fossil fuel in monitoring period *y* in the baseline scenario, GJ/ths m^3 (GJ/t);

η_h – overall boiler-house efficiency.

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

$Q_{h,b,p} = Q_{h,b} * K_h = Q_{h,p}$, (12)

$Q_{h,b,p}$ – necessary heat for the Dynamic Baseline, assumed as equal to $Q_{p,}$ kWh;

Q_{hp} – necessary heat for reporting period, kWh;

$Q_{h,b}$ – necessary heat for the baseline period, kWh;

K_h – average adjustment factor for heating.

[b] - index corresponding to baseline scenario;

[p]- index corresponding to the project scenario;

[h]- index relating to heating;

This equasion allows us to determine the average adjustment factor:

$K_h = Q_{h,p} / Q_{h,b}$, (13)

Q_{hp} – necessary heat for reporting period, kWh;

$Q_{h,b}$ – necessary heat for the baseline period, kWh;

The necessary amount of heat for heating of premises during the year, according to the “Standards and standardization guidelines for fuel and heat consumption for heating of residential and public buildings as well as for public and utility needs in Ukraine. KTM 204 Ukraine 244-94”, (formula 2.17):

$Q_h = F_h * K_h * (T_{in} - T_{out}) * N_h$, (14)

Q_h – necessary amount of heat for heating, kWh;

F_h – heated area in premises, m^2;
K_h – average heat exchange coefficient for buildings, kW/m^2*K;
T_{in} – average indoor temperature in the heating period, K (or ^0C);
T_{out} – average outdoor temperature in the heating period, K (or ^0C);
N_h – duration of the heating period per year, h.
[in] - index corresponding to indoor temperature;
[out]- index corresponding to outdoor temperature;
[h]- index relating to heating;
[p]- index corresponding to the project scenario;

Therefore:

$$K_h = (F_{h,p}*K_{h,p})*(T_{in,p} - T_{out,p})*N_{h,p} \ / \ F_{h,b}*K_{h,b}*(T_{in,b} - T_{out,b})*N_{h,b} \ , \quad (15)$$

Temperature change factor:

$$K_2=(T_{in,p} -T_{out,p}) / (T_{in,b}-T_{out,b}) \ , \quad (16)$$

Heated area and thermal insulation change factor:

$$K_3 = (F_{h,p} *k_{h,p}) / F_{h,b}*K_{h,b} = [(F_{h,n,p} – F_{h,t,p} – F_{h,n,p})*K_{h,b} + (F_{h,n,p} + F_{h,t,p})*K_{h,n}] / F_{h,b}*K_{h,b}, \quad (17)$$

$F_{h,b}$ – heated area in premises in the baseline period, m^2;
$F_{h,p}$ – heated area in premises in the reporting period, m^2;
$F_{h,n,p}$ – heated area of new buildings connected to the heat supply system (assumed, with new improved thermal insulation) in the reporting period, m^2;
$F_{h,t,p}$ – heated area of buildings (existing in the baseline year) in the reporting period with improved thermal insulation, m^2;
$K_{h,b}$ – average heat exchange coefficient for buildings in the baseline year, kW/m^2*K;
$K_{h,p}$ – average heat exchange coefficient for buildings in the reporting year, kW/m^2*K;
$K_{h,n}$ – heat exchange factor of heated buildings with new thermal insulation (new or old buildings with new thermal insulation), kW/m^2*K;
[in] - index corresponding to indoor temperature;
[out]- index corresponding to outdoor temperature;
[h]- index relating to heating;
[b] - index corresponding to baseline scenario;
[p]- index corresponding to the project scenario;

Coefficient of the change of heating period duration:

$$K_4 = N_{h,p} / N^j_{h,b} \ , \quad (18)$$

$N^j_{h,b}$ – duration of heating period in the baseline period, h;
$N_{h,p}$ – duration of heating period in the reporting period, h.

[h]- index relating to heating;
[p]- index corresponding to the project scenario;
[b] - index corresponding to baseline scenario;

Thus,

$K_h = K_2 * K_3 * K_4$, (19)

To establish the Dynamic Baseline that takes into account external factors such as weather conditions, number of consumers, etc., adjustment factor for hot water supply should be used.

The amount of fuel consumed for hot water supply is proportional to the necessary amount of heat in the period of service provision, Q_w:

$$FC^{y}_{b,FF,w} = FC^{y}_{b,FF,i} \cdot (1-a) = Q_w / NCV^{y}_{b,FF} \cdot \eta_w , \quad (20)$$

$FC^{y}_{b,FF,w}$ - total amount of FF-type fossil fuel, which would have been combusted by consumer *i* for hot water, in monitoring period *y* in the baseline scenario, ths m^3 (t).

$FC^{y}_{b,FF,i}$ - total amount of FF-type fossil fuel, which would have been combusted by consumer *i* , in monitoring period *y* in the baseline scenario, ths m^3 (t).

Q_h – necessary heat for hot water supply, kWh;
3,6 – factor of kWh into MJ conversion;
a – part of fuel (heat) consumed for heating;

$NCV^{y}_{b,FF}$ - net calorific value of FF-type fossil fuel in monitoring period *y* in the baseline scenario, GJ/ths m^3 (GJ/t);

η_w – overall hot water system efficiency.

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

$Q_{w,b,p} = Q_{w,b} * K_w = Q_{w,p}$, (21)

$Q_{w,b,p}$ – necessary amount of heat for hot water supply for the Dynamic Baseline, assumed to be equal to $Q_{w,p,}$ kWh ;
$Q_{w,p}$ – necessary amount of heat for hot water supply in the reporting period, kWh;
$Q_{w,b}$ – necessary amount of heat for hot water supply in the baseline period, kWh;
K_w – average adjustement coefficient for hot water supply.
[b] - index corresponding to baseline scenario;

[p]- index corresponding to the project scenario;
[h]- index relating to heating;
[w]- index relating to hot water supply;

This equasion allows us to determine the average adjustment coefficient:
$K_w = Q_{w,p} / Q_{w,b}$, (22)
Kw component can be determined by correlation of heat used for hot water supply in the baseline and reporting periods:
$Q_w = n_w * v_w * N_w$, (23)
Q_w – Necessary amount of heat for hot water supply, kWh;
n_w – average number of consumers, individual accounts;
v_w – standard specific hot water consumption per individual account (in thermal units, kWh/h);
N_w – duration of service provision per year, h.
[b] - index corresponding to baseline scenario;
[p]- index corresponding to the project scenario;
[w]- index relating to hot water supply;

Thus:
$K_w = n_{w,p} * v_{w,p} * N_{w,p} / n_{w,b} * v_{w,b} * N_{w,b}$, (24)
Coefficient of the change of the number of consumers:
$K_5 = n_{w,p} / n^{j}_{w,b}$, (25)
Coefficient of the change of standard specific hot water consumption per individual account:
$K_6 = v_{w,p} / v_{w,b}$, (26)
At the moment, standard specific hot water consumption proposed in KTM 204 Ukraine 244-94 in 1993 is effective. There is no information concerning changes, therefore K_6 = 1 and is not subject to special monitoring.
Coefficient of the change of the duration of the period of hot water supply services:
$K_7 = N_{w,p} / N_w$, (27)
$N_{w,b}$ – duration of the period of hot water supply services in the baseline period, h;
$N_{w,p}$ – duration of the period of hot water supply services in the reporting period, h.
[b] - index corresponding to baseline scenario;
[p]- index corresponding to the project scenario;
[w]- index relating to hot water supply;

Thus,

$K_w = K_5 * K_6 * K_7$, (28)

Adjustment coefficients for hot water supply in the case when there was no hot water supply in the baseline period, but the service was provided in the reporting period:

In the case when there was no hot water supply in the baseline period, number of consumers, standard specific hot water consumption, duration of the period of hot water supply services in the baseline year are assumed to be equal to the corresponding values in the reporting period,

K5 = K6 = K7 = 1, (29)

Therefore

Kw0=1, (30)

Formulae used to estimate leakage (for each gas, source etc.; emissions in units of CO_2 equivalent):

According to a JI specific approach based on the Joint Implementation requirements in accordance with paragraph 9 (a) of the JI Guidance on criteria for baseline setting and monitoring, Version 03, approved CDM methodology AM0044 version 1.0 («Energy efficiency improvement projects: boiler rehabilitation or replacement in industrial and district heating sectors» - Version 1.0» no leakage is expected.

Formulae used to calculate emission reductions from the project (for each gas, source etc.; emissions/emission reductions in units of CO_2 equivalent):

Reduction of GHG emissions under the Project in period "y" (ER_y) is calculated by the formula:

$$ER^y = BE_b^y - PE_p^y \quad (31)$$

where:

ER^y - emission reductions due to the project activity in monitoring period «y» (t CO_2eq);

PE_p^y - total estimated GHG emissions in monitoring period «y» in the project scenario (t CO_2eq);

BE_b^y - total estimated GHG emissions in monitoring period «y» in the baseline scenario (t CO_2eq);

[y] – index that corresponds to monitoring period;
[p] – index that corresponds to the project scenario;
[b] – index that corresponds to the baseline scenario.

The monitoring plan presents the quality assurance and control procedures for the monitoring process, which are sufficiently described in tabular form in sections of the PDD D.1.1.1., D.1.1.3. and D.2. This includes, as appropriate, information on calibration and on how records on data and/or method validity and accuracy are kept.

The monitoring plan clearly identifies the responsibilities and the authority regarding the monitoring activities. Collection of all the key parameters required for monitoring and calculation of GHG emission reductions are continuously carried out according to the practice, established at RUC "Mykolaivoblteploenerho". Monitoring of the project does not require any changes in the existing and data collection and accounting system.

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, project participants responses and BVC's conclusion are described in Appendix A to the Determination report (refer to CAR 27- CAR 32).

4.8 Leakage (40-41)

The PDD appropriately describes an assessment of the potential leakage of the project and appropriately explains which sources of leakage are to be calculated, and which can be neglected.

According to a JI specific approach based on the Joint Implementation requirements in accordance with paragraph 9 (a) of the JI Guidance on criteria for baseline setting and monitoring, Version 03, approved CDM methodology AM0044 version 1.0 («Energy efficiency improvement projects: boiler rehabilitation or replacement in industrial and district heating sectors» - Version 1.0» no leakage is expected.

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

The PDD indicates assessment of emissions 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 forecasted estimates of:

(a) Emissions or net removals for the project scenario (within the project boundary), which are 454 993 tons of CO_2eq for 2005-2007, 717 787 tons of CO_2eq for 2008-2012, 2 185 001 tons of CO_2eq for 2013-2025;

(b) Leakage is not expected in the project boundary;

(c) Emissions or net removals for the baseline scenario (within the project boundary), which are 606 463 tons of CO_2eq for 2005-2007, 1 100 662 tons of CO_2eq for 2008-2012, 3 261 375 tons of CO_2eq for 2013-2025;

(d) Emission reductions or enhancements of net removals adjusted by leakage (based on (a)-(c) above), which are 151 470 tons of CO_2eq for 2005-2007, 382 874 tons of CO_2eq for 2008-2012, 1 076 374 tons of CO_2eq for 2013-2025.

The estimates referred to above are given:

(a) On an annual basis;

(b) From 01/01/2005 to 31/12/2025, 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 CO_2 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 formulae used for calculating the estimates referred above, are given in Section 4.7. All formulae are consistent throughout the PDD.
For calculating the estimates referred to above, key factors, e.g. the Ukrainian environmental legislation and other national legislation, as well as key relevant factors such as availability of funds for implementation of the project activities, tariffs established by the state, modern technology and the possibility of know-how implementation in the heat supply sector 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 documents and archive data of the enterprise, standards and statistical

forms, results of periodic inspections of meters are clearly identified, reliable and transparent.
Emission factors such as carbon emission factor in the course of FF-type fossil fuel combustion ($EF^{y}_{C,FF}$) 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.

Detailed algorithms of calculation and their results are described in Sections D and E and supporting documents to the PDD.

4.10 Environmental impacts (48)

Sections F.1. and F.2. of the PDD provide information about documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party.

The PDD states that according to the Ukrainian legislation, projects of new construction, reconstruction and technical reequipment of industrial and public facilities must include Environmental Impact Assessment (EIA), the basic requirements to which are listed in the State building norms of Ukraine A.2.2-1-2003. "Structure and Content of Environmental Impact Assessment (EIA) for the design and construction of factories, buildings and structures."

RUC “Mykolaivoblteploenerho” has the necessary Environmental Impact Assessment for its activity in accordance with the Ukrainian law.

According to the PDD, the facilities included in the project boundary meet all standards and requirements of the Law of Ukraine "On Air Protection" and "On Environmental Protection" as well as DSP-96 "Planning and development of human settlements", are environmentally safe and do not cause any negative impact on the environment.

In general the project «Modernization of the heat supply system in Mykolaiv region» will have a positive impact on the environment. The project facilities are not included in the list of facilities of environmental hazard.

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.

The identified areas of concern as to the environmental impacts, project participants responses and BVC's conclusion are described in Appendix A to the Determination report (refer to CAR 33).

4.11 Stakeholder consultation (49)

In pursuance of requirements of Article 18 of the Law of Ukraine "On planning and development of areas" and Article 11 of the Law of Ukraine "On ecological expertise", RUC "Mykolaivoblteploenerho" informs the public through local media on the implementation of area planning.
The media, which published information about modernization and renovations at the enterprise:
- The newspaper "Evening Mykolaiv";
- Publication "Ecology, Environment and Natural Resources of Ukraine."

All obtained comments related to the project implementation were positive. Negative comments and critical comments relating to the project were not made.

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 "Modernization of the heat supply system in Mykolaiv region" 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 participants used the latest tool for demonstration of the additionality. In line with this tool, the PDD provides investment 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 one pending issue related to the current determination stage of the project: the issue of the written approval of the project by the host Party. If the written approval by the host Party is awarded, it is our opinion that the project as described in the Project Design Document, Version 02 dated 14/08/2012 meets all the relevant UNFCCC requirements for the determination stage and the relevant host Party criteria.

The review of the project design documentation (version 02 dated 14/08/2012) 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 VEMA S.A. that relate directly to the GHG components of the project.

/1/	PDD «Modernization of the heat supply system in Mykolaiv region», version 01 dated 26/07/2012;
/2/	PDD «Modernization of the heat supply system in Mykolaiv region», version 02 dated 14/08/2012;
/3/	Supporting document 1 to the PDD "Calculation of CO2 emission reduction in the heat supply system of RUC Mykolaivoblteploenerho"
/4/	Supporting document 2 "Investment analysis of the Joint Implementation Project "Modernization of the heat supply system in Mykolaiv region"
/5/	Letter of Endorsement № 1967/23/7 dated 25/07/2012 issued by the State Environmental Investment Agency of Ukraine;
/6/	Guidelines for users of the JI PDD form, version 04, JISC;
/7/	Clean Development Mechanism methodology AM0044 version 1.0 " Energy efficiency improvement projects: boiler rehabilitation or replacement in industrial and district heating sectors ";
/8/	Tool for the demonstration and assessment of additionality, Version 06.0.0;
/9/	Kyoto Protocol;
/10/	Marrakech Agreement, JI methods;
/11/	National inventory of greenhouse gas anthropogenic emissions by sources and removals by sinks in Ukraine for the period of 1990-2010;
/12/	Third National Communication of Ukraine on climate change under the Kyoto Protocol
/13/	Fourth National Communication of Ukraine on climate change under the Kyoto Protocol
/14/	Fifth National Communication of Ukraine on climate change under the Kyoto Protocol
/15/	Guidelines on the assessment of investment analysis ver.05
/16/	Law of Ukraine "On metrology and metrological activity"
/17/	Law of Ukraine "On licensing of certain types of activities"
/18/	Law of Ukraine "On heat supply"
/19/	Law of Ukraine "On Environmental Protection"
/20/	Law of Ukraine "On State Statistics"

/21/	Law of Ukraine "On Waste"
/22/	Law of Ukraine "On the Planning and Development of Areas"
/23/	JI Guidelines. Annex to decision 9/CDM.1
/24/	Determination and verification manual, version 01;
/25/	Guidance on criteria for baseline setting and monitoring, JISC. Version 03.

Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents.

/1/	Emission reductions purchase agreement relating tot the joint implementation project concluded between VEMA S.A. and RUC “Mykolaivoblteploenerho” dated 21/05/2012
/2/	Registry of main technological equipment that is included in the project boundary as of June 1, 2012 JI project «Modernization of the heat supply system in Mykolaiv region»
/3/	Fixed assets commissionning certificate (boiler unit NIIST 9-5 shk-4f)
/4/	Fixed assets commissionning certificate (boiler unit NIISTU 5 MK -4f)
/5/	Fixed assets commissionning certificate (pumping unit k 20/30)
/6/	Fixed assets commissionning certificate (pumping unit DAV ALP 2000T) dated 2006
/7/	Fixed assets commissionning certificate (pumping unit KM 80-65-160) dated 25/03/2005
/8/	Fixed assets commissionning certificate (boiler unit NIISTU 5 MK -4f) dated 2008
/9/	Fixed assets commissionning certificate (pumping unit IPH 50/170-7,5/2 WILO)
/10/	Fixed assets commissionning certificate (pumping unit 2k–20–30) dated 2008
/11/	Fixed assets commissionning certificate (electrical pumping unit KM 80-65-161) dated 2011
/12/	Fixed assets commissionning certificate (boiler unit NIISTU 5 MK -4f) dated April 2007
/13/	Fixed assets commissionning certificate (boiler unit NIISTU 5 MK -4f) dated October 2007
/14/	Fixed assets commissionning certificate (boiler unit NIISTU 5 MK -4f) dated February 2009
/15/	Fixed assets commissionning certificate (electrical pumping unit KALPEDA №M 50/16 VE SAEREDA) dated April 2010
/16/	Fixed assets commissionning certificate (boiler unit NIISTU 5 MK -4f) dated September 2009

/17/	Fixed assets commissionning certificate (pumping unit NTsV 63/30)
/18/	Fixed assets commissionning certificate (pump ESM 14/4)
/19/	Fixed assets commissionning certificate (boiler unit NIISTU 5 MK -2f) dated September 2009
/20/	Fixed assets commissionning certificate (boiler unit NIISTU 5) dated 25/03/2005
/21/	Fixed assets commissionning certificate (pump of 220D type 90) dated October 2010
/22/	Fixed assets commissionning certificate (boiler unit NIISTU 5) dated April 2006
/23/	Fixed assets commissionning certificate (pumps POSA 5-20)
/24/	Fixed assets commissionning certificate (hydraulic pump NH-1,0/2,5) dated June 2011
/25/	Fixed assets commissionning certificate (boiler unit NIISTU 5) dated April 2007
/26/	Fixed assets commissionning certificate (boiler unit NIISTU 5 MK -2f) dated September 2006
/27/	Fixed assets commissionning certificate (pumping unit k20/30) dated October 2007
/28/	Fixed assets commissionning certificate (boiler unit NIISTU 5 MK -2) dated October 2008
/29/	Certificate of natural gas consumption per each boiler house of RUC “Mykolaivoblteploenerho”
/30/	Power balance, power equipment and power plant (power generation units) operation report in 2004
/31/	Power balance, power equipment and power plant (power generation units) operation report in 2005
/32/	Power balance, power equipment and power plant (power generation units) operation report in 2006
/33/	Power balance, power equipment and power plant (power generation units) operation report in 2007
/34/	Power balance, power equipment and power plant (power generation units) operation report in 2008
/35/	Power balance, power equipment and power plant (power generation units) operation report in 2009
/36/	Power balance, power equipment and power plant (power generation units) operation report in 2010
/37/	Power balance, power equipment and power plant (power generation units) operation report in 2011
/38/	Fuel, heat and power consumption report, January-December 2004 (form No. 11-MTP)
/39/	Fuel, heat and power consumption report, January-December 2005 (form No. 11-MTP)
/40/	Fuel, heat and power consumption report, January-December 2006 (form No. 11-MTP)

/41/	Fuel, heat and power consumption report, January-December 2007 (form No. 11-MTP)
/42/	Fuel, heat and power consumption report, January-December 2008 (form No. 11-MTP)
/43/	Fuel, heat and power consumption report, January-December 2009 (form No. 11-MTP)
/44/	Fuel, heat and power consumption report, January-December 2010 (form No. 11-MTP)
/45/	Fuel, heat and power consumption report, January-December 2011 (form No. 11-MTP)
/46/	Certificate on data collection and processing structure
/47/	Photo of computer program of data collection and processing

Persons interviewed:

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

	Name	Organization	Position
/1/	Bereznytskyi V.M.	RUC “Mykolaivoblteploenerho”	Director
/2/	Pisnia V.O.	RUC “Mykolaivoblteploenerho”	Chief engineer
/3/	Klys O.V.	RUC “Mykolaivoblteploenerho”	Chief accountant
/4/	Tarasiuk L.K.	RUC “Mykolaivoblteploenerho”	Head of fuel and power resource department
/5/	Voronov I.H.	RUC “Mykolaivoblteploenerho”	Head of production and technical department
/6/	Iliina T.O.	“CEP” LLC	Consultant of VEMA S.A.

APPENDIX A: COMPANY PROJECT DETERMINATION PROTOCOL

BUREAU VERITAS CERTIFICATION HOLDING SAS

Checklist for determination according to the DETERMINATION AND VERIFICATION MANUAL (Version 01)

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
Guidelines for Users of the JI PDD form Section A General description of the project				
A.1. Title of the project				
A.1	Is the title of the project presented?	The title of the project is presented: Modernization of the heat supply system in Mykolaiv region"	OK	OK
A.1	Is the sectoral scope to which the project pertains presented?	Sectoral scope: Sectoral scope 1. Energy industries (renewable/non-renewable sources)	OK	OK
A.1	Is the current version number of the document presented?	The current version of the document: PDD version 02 dated 14/08/2012. See Section A.1.	OK	OK
A.1	Is the date when the document was created presented?	The date when the document was created: 14/08/2012.	OK	OK
A.2. Description of the project				
A.2	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	The purpose of the project is reduction of fossil fuel consumption by modernization of the centralized heat supply system of Mykolaiv city and Mykolaiv region. The project, initiated by RUC "Mykolaivoblteploenerho",	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	date of the project b) Baseline scenario and c) Project scenario (expected outcome, including a technical description)?	will lead to the reduction of greenhouse gas (GHG) emissions to the atmosphere and contribute to the improvement of ecological situation in the region. The purpose of the project is to promote sustainable development of the region by introducing energy saving technologies. The project provides for the modernization of the boiler equipment and heat supply networks that will increase efficiency and reduce heat losses in heating systems, improve the quality of service of heat and hot water supply. Detailed information on the baseline and project scenarios as well as their technical description is provided in Sections A.2 and A.4.2. of the PDD.		
A.2	Is the history of the project (incl. its JI component) briefly summarized?	**CAR 01**. Please, provide information on the Letter of Endorsement in the description of the project history.	**CAR 01**	OK
A.3. Project participants				
A.3	Are project participants and Party (ies) involved in the project listed?	Parties involved in the project: RUC "Mykolaivoblteploenerho" (Ukraine – the Host Party), VEMA S.A. (Switzerland).	OK	OK
A.3	Is the data of the project participants presented in tabular format?	The data on project participants are given in tabular form.	OK	OK

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A.3	Is contact information provided in Annex 1 of the PDD?	Contact information of RUC "Mykolaivoblteploenerho" and VEMA S.A. is provided in Annex 1 of the PDD. **CAR 02.** Tables in Annex 1 shall meet the format set forth in the Guidelines for users of the JI PDD form. **CAR 03.** Please, write an e-mail of RUC "Mykolaivoblteploenerho" in Annex 1. **CAR 04**. The first name and the middle name of the person that represents RUC "Mykolaivoblteploenerho" are written in wrong boxes.	**CAR 02** **CAR 03** **CAR 04**	OK OK OK
A.3	Is it indicated, if it is the case, that the Party involved is a host Party?	Ukraine is the Host Party.	OK	OK
A.4 Technical description of the project				
Location of the project				
A.4.1.1	Host Party(ies)	Ukraine is the Host Party.	OK	OK
A.4.1.2	Region/State/Province etc.	Mykolaiv region, Ukraine	OK	OK
A.4.1.3	City/Town/Community etc.	Mykolaiv city and Ochakiv city, Mykolaiv region	OK	OK
A.4.1.4	Detail of the physical location, including information allowing the unique identification of the project. (This section should not exceed one page).	Information about location is given in Section A.4.1.4 of the PDD.	OK	OK
A.4.2. Technologies to be employed, or measures, operations or actions to be implemented by the project				
A.4.2	Are the technology (ies) to be employed, or measures, operations or actions to be	PDD Section A.4.2 provides the description of the main stages of the project implementation, the annual project	**CAR 05** **CAR 06**	OK OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	implemented by the project, including all relevant technical data and the implementation schedule described?	activities schedule, some relevant technical data relating to main equipment to be installed as well as project activities to be implemented in the framework of the project. Project design represents the current cutting-edge practice. **CAR 05.** Please, provide information on specifications of REX-240 boiler that is planned to be implemented under the project. **CAR 06**. Please, provide a photo of JNT burner that is planned to be implemented under the project. **CAR 07**. Specifications of LHK-150-Eh gas meter that are stated in the PDD are different from those stated on the producer's web-site. **CAR 08**. Please, provide information on the primary use of flow control and weather-driven boiler control modules that are planned to be implemented under the project. **CAR 09**. Please, in Section A.4.2 provide information as to whether it is planned to replace the project equipment. **CAR 10**. Please, provide information on personnel	**CAR 07** **CAR 08** **CAR 09** **CAR 10** **CL 01** **CL 02** **CL 03**	OK OK OK OK OK OK OK OK OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
		training, if any, necessary for the project activity. **CL 01**. Please, provide a reference to the web-site of the producer of flow control and weather-driven boiler control modules. **CL 02.** Please, provide information on positive changes caused by implementation of JNT burners. **CL 03**. Please, provide the explanation of Figure 6 in Section A.4.2.		
A.4.3. Brief explanation of how the anthropogenic emissions of greenhouse gases by sources are to be reduced by the proposed JI project, including why the emission reductions would not occur in the absence of the proposed project, taking into account national and/or sectoral policies and circumstances				
A.4.3	Is it stated how anthropogenic GHG emission reductions are to be achieved? (This section should not exceed one page)	The project activities, including reconstruction of boilers and heat distribution networks, will increase the energy efficiency of the heat supply system in Mykolaiv city and Mykolaiv region so that it will produce the same amount of heat while consuming less fossil fuel. Reduction in fossil fuel consumption will reduce greenhouse gas emissions. In the absence of the proposed project, all equipment, including old one with low efficiency, but able to operate, will operate normally for a long time and will not reduce emissions.	OK	OK
A.4.3	Is it provided the estimation of emission	The estimation of emission reductions over the	**CAR 11**	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	reductions over the crediting period?	crediting period is provided in Section A.4.3.1. of the PDD. **CAR 11**. Tables in Section A.4.3.1. shall comply with Guidelines for users of the JI PDD form. **CAR 12**. The period that precedes the first commitment period is incorrect in the name of Table 5 in Section A.4.3.1.	**CAR 12**	OK
A.4.3	Is it provided the estimated annual reduction for the chosen crediting period in tCO_2e?	The estimated annual emission reductions for the first commitment period in tCO_2e are provided; the estimated annual emission reductions for the periods before and after the first commitment period within the project are also provided.	OK	OK
A.A.4.3	Are the data from questions above presented in tabular format?	The data are presented in tabular format, for the first commitment period and for the periods before and after the first commitment period. Refer to the PDD (Version 02) Tables 2, 3, 4 Section A.4.3.1.	OK	OK
A.4.3.1. Estimated amount of emission reductions over the crediting period				
A.4.3.1	Is the length of the crediting period Indicated?	The length of the crediting period is indicated in the PDD Section A.4.3.1 and Section C.	OK	OK
A.4.3.1	Are estimates of total as well as annual and average annual emission reductions in tonnes of CO_2 equivalent provided?	Total as well as annual and average annual emission reductions in tonnes of CO_2 equivalent are provided in accordance with the calculated values in the tables of Section A4.3.1 of PDD and the Supporting documents.	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
Project approvals by Parties				
19	Have the DFPs of all Parties listed as "Parties involved" in the PDD provided written project approvals?	**CAR 13**. The project has no approval of the Host Party and the country – investor. To obtain the Letter of Approval the final Determination report together with this Determination Protocol and the list of sources of Reference Information must be submitted to the State Environmental Investment Agency of Ukraine. A Letter of Approval of Switzerland as the investing country is also not obtained at the current stage of the Project. **CAR 13** will be closed after the Letters of Approval are issued by the Host Party and the country-investor.	**CAR 13**	Pending
19	Does the PDD identify at least the host Party as a "Party involved"?	Host Party involved in project is Ukraine.	OK	OK
19	Has the DFP of the host Party issued a written project approval?	Reference to **CAR 13**	**CAR 13**	Pending
20	Are all the written project approvals by Parties involved unconditional?	Reference to **CAR 13**	**CAR 13**	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,	Party involved 1: Ukraine (the Host Party), legal entity is RUC "Mykolaivoblteploenerho". Party involved 2: Switzerland, legal entity is VEMA S.A.	**CAR 13**	Pending

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	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?	The project participants will be authorized in accordance with the relevant project approvals. Pending **CAR 13**.		
Baseline setting				
22	Does the PDD explicitly indicate which of the following approaches is used for identifying the baseline? − JI specific approach − Approved CDM methodology approach	The chosen baseline is described in sections A.1. and B.1. of the PDD. A JI specific approach is used for setting the baseline. **CAR 14.** Please, state the full name of AM0044 methodology elements of which were used in setting the baseline. **CL 04**. Please, provide a reference to AM0044 methodology in Section B.1.	**CAR 14** **CL 04**	OK OK
JI specific approach only				
23	Does the PDD provide a detailed theoretical description in a complete and transparent manner?	The choice of the applicable baseline for the project category is sufficiently justified; detailed theoretical description is provided in section B.1 of the PDD version 02. **CL 05**. Please, provide a clarification why approved methodology AM0044 was not used for setting the baseline.	**CL 05**	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
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? (c) In a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, date sources and key factors? (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	The PDD provides detailed, full and transparent description and justification that the baseline is established by: (a) Identifying plausible future scenarios and choosing the most plausible one. As a result of evaluation of several alternatives the most plausible of them have been identified and will be used as a baseline: - Alternative 1.1: Continuation of the current practice without realization of JI project; - Alternative 1.2: The project activities without the use of the Joint Implementation mechanism. (b) Taking into account key factors such as for example technological requirements to the heat supply in Ukraine, Ukrainian environmental legislation and other national legislation, and key relevant factors, such as the ability of financing of the heat supply system modernization, tariffs for heat supply, availability of local technologies and methods of the project, skills and experience in implementing similar projects (c) In a transparent manner with regard to the choice of JI approach and assumptions, parameters, data sources and key factors for identifying initial conditions listed in tabular format in Section B.1.	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	and monitoring", as appropriate?	(d) Taking into account of uncertainties 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. The baseline is set; the description is given in Section B of the PDD.		
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?	The baseline assumptions of the developed JI specific approach are clearly described in full in Section B.1 of the PDD version 03. **CAR 15**. Please, provide the algorithm of baseline calculations in Section B 1. of the PDD. **CAR 16**. The table in section B.1. of the PDD contains incorrect data units for net calorific value of FF-type fuel combustion. Please, make the necessary corrections. **CAR 17**. Data units of $EF^{j}_{b,C,FF}$ parameter in Section B.1. are not correct. Please, make the necessary corrections. **CAR 18**. Description of some parameters differs throughout the PDD. Please, correct the discrepancies. **CAR 19**. Name of the Guidelines, which are the source	**CAR 15** **CAR 16** **CAR 17** **CAR 18** **CAR 19** **CL 06**	OK OK OK OK OK OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
		for data verification of $OXID_{b,FF}^{j}$ parameter is incorrect. **CL 06**. Please, provide a reference to the "Guidance on criteria for baseline setting and monitoring" in the tables in Section B 1.		
25	If a multi-project emission factor is used, does the PDD provide appropriate justification?	In order to set the baseline the following factors are used: Carbon emission factor in the course of FF-type fossil fuel (coal, fuel oil) combustion. Data source that was (will be) used: "National inventory report of anthropogenic greenhouse gas emissions by sources and removals by sinks in Ukraine for 1990-2010"	OK	OK
CDM methodology approach only				
Additionality				
JI specific approach only				
28	Does the PDD indicate which of the following approaches for demonstrating 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	The PDD indicates that the project scenario is not a part of the established baseline scenario. It is also stated that the project will lead to emission reductions. Additionality of the project activity is demonstrated in Section B.2. PDD by using the "Tool for the demonstration and assessment of additionality", version 06.0.0. **CAR 20**. At the beginning of Section B.2. of the PDD it is stated that the additionality of the project activity is	**CAR 20** **CAR 21** **CAR 22** **CAR 23** **CAR 24**	OK OK OK OK OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	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".	demonstrated and assessed by using the "Tool for the demonstration and assessment of additionality" (Version 5.2). But version 06.0.0. is used for the project. **CAR 21**. Alternatives that differ from those that were mentioned in Section B.1. of the PDD are stated in Sub-step 1c in Section B.2. of the PDD. **CAR 22**. In Sub-step 2b the reference is made to the document that doesn't provide for the use of WACC rate. **CAR 23**. Discount rate can't be adjusted for inflation index. Please, correct the mistake. **CAR 24**. Supporting Document 2 provides an incorrect method of determination of the residual value of equipment that adjusts the IRR. Correct the investment analysis.		
29 (a)	Does the PDD provide a justification of the applicability of the approach with a clear and transparent description?	Detailed analysis described in Sections A.4.3, B.1 and B.2, shows that emissions of the baseline scenario are likely to exceed emissions of the project scenario due to the implementation of project activities.	OK	OK
29 (b)	Are additionality proofs provided?	Refer to Section B.2. of the PDD.	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
29 (c)	Is the additionality demonstrated appropriately as a result?	The fact that the project activity itself is not the baseline scenario is clearly demonstrated in Sections A.2, B.1, B.2 of the PDD.	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?	All explanations, descriptions and analyses are made in accordance with the latest version of the "Tool for the demonstration and assessment of additionality". (Version 06.0.0)	OK	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 participants? (ii) Reasonably attributable to the project? (iii) Significant?	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, such as: - CO2 emissions caused by heat generation and supply; (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 CO_2	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
		equivalent, whichever is lower.		
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?	Project boundary is defined on the basis of case-by-case assessment of different emission sources.	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 if it is possible?	The project boundary is presented in a tabular form and is understandable enough; so there is no need to provide its graphic description.	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?	All gases and sources included are explicitly stated. See Section B of the PDD.	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?	According to the Guidelines for users of JI PDD form (version 04) the starting date of the project is the date when the implementation or construction or real action of the project begins. The starting date of the project is identified and specified in Section C. 1 of the PDD. Starting date of the project is 01/09/2004, when RUC	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
		"Mykolaivoblteploenerho" started implementation of measures to modernize the heat supply system in Mykolaiv city and Mykolaiv region in the framework of JI project.		
34 (a)	Is the starting date after 2000?	The starting date 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?	**CAR 25**. The expected operational lifetime of the project in years and months is incorrect.	**CAR 25**	OK
34 (c)	Does the PDD state the length of the crediting period in years and months?	The length of the crediting period is stated in Section C.3. **CAR 26.** The length of the crediting period in years and months is incorrect.	**CAR 26**	OK
34 (c)	Is the starting date of the crediting period before 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 01/01/2007, which is the date when the first emission reductions will be generated.	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?	Generation of ERUs relates to the first commitment period of 5 years (January 1, 2008 – December 31, 2012).	OK	OK
34 (d)	If the crediting period extends beyond 2012, does the PDD state that the	The PDD states that the prolongation of the crediting period beyond 2012 is subject to approval of the Host	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	extension is subject to the host Party approval? Are the estimates of emission reductions or enhancements of net removals presented separately for those until 2012 and those after 2012?	Party and estimation of emission reductions is presented separately for those until 2012 and those after 2012 in the relevant sections of the PDD. If after the first commitment period under the Kyoto protocol its validity is prolonged, the crediting period under the project will be prolonged by 13 years or 156 months until December 31, 2025.		
Monitoring Plan				
35	Does the PDD explicitly indicate which of the following approaches is used? − JI specific approach − Approved CDM methodology approach	The proposed project uses a JI specific approach based on the JI requirements in accordance with paragraph 9 (a) of the Guidance on criteria for baseline setting and monitoring, version 03.	OK	OK
JI specific approach only				
36 (a)	Does the monitoring plan describe: − All relevant factors and key characteristics subject to monitoring? − The period in which they will be monitored? − All critical factors for the control and reporting of project performance?	The monitoring plan specifies all decisive factors for the control and reporting on project performance: quality control (QC) and quality assurance (QA) procedures; operational and management structures that will be applied when implementing the monitoring plan. **CAR 27**. Description of $FC^{y}_{p,FF,i}$ parameter in the table in Section D 1.1.1. does not comply with the description that was stated in the formula. **CAR 28**. The data source for $NCV^{y}_{p,FF}$ parameter is	**CAR 27** **CAR 28** **CAR 29** **CAR 30**	OK OK OK OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
		incorrect. **CAR 29**. Check the data unit for the parameters of formula (D2). **CAR 30**. Check the data units for the parameters of formula (D4).		
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 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. Data to be monitored are presented in Section D of the PDD.	OK	OK
36 (b)	If default values are used: − Are accuracy and reasonableness carefully balanced in their selection? − 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?	Default values are provided in the table of Annex 3 to the PDD. They originate from recognized sources and are presented in a transparent manner.	OK	OK
36 (b) (i)	For those values that are to be provided by the project participants, does the monitoring plan clearly indicate how the	Monitoring plan clearly specifies which values should be chosen and justified.	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	values are to be selected and justified?			
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?	**CAR 31**. Please, check the numbering of formulae in Section D of the PDD. **CAR 32**. Please, provide all the values of emission reductions in tonnes of CO2 equivalent in the PDD.	**CAR 31** **CAR 32**	OK OK
36 (b) (iii)	For all data sources, does the monitoring plan specify the procedures to be followed if expected data are unavailable?	Refer to Section D of the PDD.	OK	OK
36 (b) (iv)	Are International System Units (IS units) used?	IS units are used for certain parameters.	OK	OK
36 (b) (v)	Does the monitoring plan note any parameters, coefficients, variables, etc. that are used to calculate baseline emissions or net removals but are obtained through monitoring?	Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases within the project boundary is presented in table D.1.1.3. of the PDD.	OK	OK
36 (b) (v)	Is the use of parameters, coefficients, variables, etc. consistent between the baseline and monitoring plan?	The use of parameters, coefficients and variables 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	The monitoring plan is established taking into account the latest version of “Guidance on criteria for baseline	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	appendix B of "Guidance on criteria for baseline setting and monitoring"?	setting and monitoring" version 03.		
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 yet available at the stage of determination? (iii) Data and parameters that are monitored throughout the crediting period?	The monitoring plan clearly distinguishes three types of data and parameters. Refer to Section D.1. of the PDD. (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 monitored throughout the crediting period. (iii) 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 yet available at the stage of determination, such data are absent.	OK	OK
36 (e)	Does the monitoring plan describe the methods employed for data monitoring (including its frequency) and recording?	In tables of parameters provided in section D.1.1.1. of the PDD the time of monitoring (frequency) and the source of data to be used, as well as recording method are indicated for all the monitored parameters and data.	OK	OK
36 (f)	Does the monitoring plan elaborate all	All algorithms and formulae used for the estimation of	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	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?	baseline and project emissions are indicated and explained in the PDD. The description of formulae is provided in Section D.1 of the PDD		
36 (f) (i)	Is the underlying rationale for the algorithms/formulae explained?	Refer to section 36 (f) of this table.	OK	OK
36 (f) (ii)	Are consistent variables, equation formats, subscripts etc. used?	Consistent variables, equation formats, subscripts etc. are used.	OK	OK
36 (f) (iii)	Are all equations numbered?	Refer to **CAR 31.**	**CAR 31**	OK
36 (f) (iv)	Are all variables with units indicated defined?	Yes. Refer to Section D of the PDD.	OK	OK
36 (f) (v)	Is the conservativeness of the algorithms/procedures justified?	Yes, algorithms/procedures comply with state norms and are conservative.	OK	OK
36 (f) (v)	To the extent possible, are methods to quantitatively account for uncertainty in key parameters included?	Uncertainty in parameters used is low taking into account the algorithms of data monitoring.	OK	OK
36 (f) (vi)	Is consistency between the elaboration of the baseline scenario and the procedure for	There is consistency between the elaboration on the baseline scenario and procedure for calculating the baseline emissions in the monitoring plan and in tables.	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	calculating the emissions or net removals of the baseline ensured?			
36 (f) (vii)	Are any parts of the algorithms or formulae that are not self-evident explained?	The formulae used in the PDD are sufficiently described.	OK	OK
36 (f) (vii)	Is it justified that the procedure is consistent with standard technical procedures in the relevant sector?	Monitoring under the project does not require any changes in the existing data accounting and data collection system of RUC “Mykolaivoblteploenerho”.	OK	OK
36 (f) (vii)	Are references provided as necessary?	All necessary references are provided in the PDD.	OK	OK
36 (f) (vii)	Are implicit and explicit key assumptions explained in a transparent manner?	All key assumptions are explained in a transparent manner.	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?	N/A	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?	Meters are calibrated in accordance with the quality management procedures, the Law of Ukraine "On metrology and metrological activity." Thus, the question of the uncertainty range and confidence level does not matter for these measurements.	OK	OK
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?	The monitoring plan was set according to national norms and standards.	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	Does the monitoring plan provide a reference as to where a detailed description of the standard can be found?			
36 (h)	Does the monitoring plan document statistical techniques, if used for monitoring, and that they are used in a conservative manner?	Yes	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?	Inspection (calibration) of metering and measuring devices is carried out in accordance with manuals of the manufacturer, approved methodologies on inspection/calibration of measuring devices as well as according to the national standards of Ukraine.	OK	OK
36 (j)	Does the monitoring plan clearly identify the responsibilities and the authority regarding the monitoring activities?	Detailed operational structure and management structure are provided in Section D.3. of the PDD. **CL 07**. Please, provide information about the entity that determined the monitoring plan.	**CL 07**	OK
36 (k)	Does the monitoring plan, on the whole, reflect good monitoring practices appropriate to the project type?	Monitoring of the project does not require any changes in the existing system of data accounting and collection.	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	If it is a JI LULUCF project, is the good practice guidance developed by IPCC applied?			
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?	Tables D.1.1.1 and D.1.1.3 provide compilation of all data needed to monitor project and baseline emissions.	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?	Data to be monitored and required for determination will be kept for two years after the last transfer of ERUs under the project.	OK	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, together with elements supplementary developed by the project participants in line with 36 above?	Yes, selected elements of approved CDM methodology are used for setting the baseline scenario. The selected elements and combinations together with additional elements that were additionally developed by the project participants are in line with requirements of paragraph 36 above.	OK	OK
Approved CDM methodology approach only_Paragraphs 38(a) – 38(d)_Not applicable				

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
Applicable to both JI specific approach and approved CDM methodology approach				
39	If the monitoring plan indicates overlapping monitoring periods during the crediting period: (a) Is the underlying project composed of clearly identifiable components for which emission reductions or enhancements of removals can be calculated independently? (b) Can monitoring be performed independently for each of these components (i.e. the data/parameters monitored for one component are not dependent on/effect data/parameters to be monitored for another component)? (c) Does the monitoring plan ensure that monitoring is performed for all components and that in these cases all the requirements of the JI guidelines and further guidance by the JISC regarding monitoring are met? (d) Does the monitoring plan explicitly	Periods will not overlap in the crediting period.	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	provide for overlapping monitoring periods of clearly defined project components, justify its need and state how the conditions mentioned in (a)-(c) are met?			
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?	According to a JI specific approach based on the Joint Implementation requirements in accordance with paragraph 9 (a) of the JI Guidance on criteria for baseline setting and monitoring, Version 03, approved CDM methodology AM0044 version 1.0 («Energy efficiency improvement projects: boiler rehabilitation or replacement in industrial and district heating sectors» - Version 1.0» no leakage is expected.	OK	OK
40 (b)	Does the PDD provide a procedure for an ex ante estimate of leakage?	The PDD states that there isn't any leakage.	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	The approach of estimation of emissions in the baseline scenario and in the project scenario is indicated.	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	reductions			
43	If the approach (a) in 42 is chosen, 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?	PDD provides ex ante estimates of: (a) Emissions in the project scenario (Section E.1) (b) Leakage (Section E.2) (c) Emissions in the baseline scenario (Section E.4) (d) Emission reductions adjusted by leakage (Section E.6).	OK	OK
44	If the approach (b) in 42 is chosen, 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) Emission reductions or enhancements of net removals adjusted by leakage?	N/A	N/A	N/A
45	For both approaches in 42 (a) Are the estimates in 43 or 44 given: (i) On a periodic basis?	(a) Estimates in 43 are given on the periodic basis, in tonnes of CO_2 equivalent, on a source-by-source basis, before, during and after the crediting period.	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	(ii) At least from the beginning until the end of the crediting period? (iii) On a source-by-source/sink-by-sink basis? (iv) For each GHG? (v) In tonnes of CO_2 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 formulae 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,	(b) The formulae used in PDD are consistent. (c) Key factors influencing the baseline emissions and the activity level of the project and the project emissions are taken into account, as appropriate. (d) Data sources used to calculate the estimates are clearly identified, reliable and transparent. (e) Default emission factors are taken from identified sources. (f) Estimation in 43 is based on conservative assumptions and the most plausible scenario in a transparent manner. (g) Estimates in 43 are consistent throughout the PDD. (h) The annual average of estimated emission reductions are calculated correctly (by dividing the total estimated emission reductions over the crediting period by the total months of the crediting period and multiplying by twelve).		

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	reliable and transparent? (e) Are emission factors (including 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?			
46	If the calculation of the baseline emissions or net removals is to be performed de facto, does the PDD include an illustrative forecasted emissions or net removals calculation?	The baseline level of emissions is determined on a basis of the specific approach with the use of elements of approved Clean Development Mechanism methodology AM0044. Calculations of the estimated emissions are clearly presented in the PDD.	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
Approved CDM methodology approach only_Paragraphs 47(a) – 47(b)_Not applicable				
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?	The EIA of the project was sufficiently described in the PDD.	OK	OK
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 Accompanying documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party?	**CAR 33.** Please, provide the information relating to the transboundary impact of the project activities.	**CAR 33**	OK
Stakeholder consultations				
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	In pursuance of requirements of Article 18 of the Law of Ukraine "On planning and development of areas" and Article 11 of the Law of Ukraine "On ecological expertise", RUC “Mykolaivoblteploenerho” informs the public through local media on the implementation of	OK	OK

Guidelines for Users of the JI PDD form or DVM Paragraph	Check Item	Initial finding	Project participants' actions review	Final Conclusion
	comments on the projects have been received, if any? (b) The nature of the comments? (c) A description on whether and how the comments have been addressed?	area planning. The media, which published information about modernization and renovations at the enterprise: - The newspaper "Evening Mykolaiv"; - Publication "Ecology, Environment and Natural Resources of Ukraine." All obtained comments related to the project implementation were positive. Negative comments and critical comments relating to the project were not made.		
Determination regarding small-scale projects (additional elements for assessment)				
Determination regarding land use, land-use change and forestry projects (additional/alternative elements for assessment)				
Determination regarding programmes of activities (additional/alternative elements for assessment)				

TABLE 2 RESOLUTION OF CORRECTIVE ACTION AND CLARIFICTION REQUESTS

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 1	Summary of project participants' responses	Determination team conclusion
CAR 01. Please, provide information on the Letter of Endorsement in the description of the project history.	A.2	25/07/2012 – The State Environmental Investment Agency of Ukraine issued a Letter of Endorsement № 1967/23/7 of the JI project «Modernization of the heat supply system in Mykolaiv region».	Information relating to the Letter of Endorsement was provided in Section A.2.
CAR 02. Tables in Annex 1 shall meet the format set forth in the Guidelines for users of the JI PDD form.	A.3	The tables of relevant format were provided in the PDD version 02.	Corrections were made, the issue is closed.
CAR 03. Please, write an e-mail of RUC "Mykolaivoblteploenerho" in Annex 1.	A.3	The e-mail of RUC “Mykolaivoblteploenerho” (nikteplo@optima.com.ua) was stated in the PDD version 02.	Relevant information was provided, the issue is closed.
CAR 04. The first name and the middle name of the person that represents RUC "Mykolaivoblteploenerho" are written in wrong boxes.	A.3	Relevant corrections were made. Refer to the PDD version 02.	The issue is closed as relevant corrections were made.
CAR 05. Please, provide information on specifications of REX-240 boiler that is planned to be implemented under the project.	A.4.2	Information on specifications of REX-240 boiler that is planned to be implemented under the project was provided in the PDD version 02.	Necessary information was provided, the issue is closed.
CAR 06. Please, provide a photo of JNT burner that is planned to be implemented under the project.	A.4.2	A photo of JNT burner that is planned to be implemented under the project was provided in the PDD version 02.	Photo was provided. The issue is closed.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 1	Summary of project participants' responses	Determination team conclusion
		Refer to Figure 4.	
CAR 07. Specifications of LHK-150-Eh gas meter that are stated in the PDD are different from those stated on the producer's web-site.	A.4.2	The mistake was corrected. Correct specifications that are stated on the producer's web-site were provided in the PDD version 02.	Mistake was corrected. The issue is closed.
CAR 08. Please, provide information on the primary use of flow control and weather-driven boiler control modules that are planned to be implemented under the project.	A.4.2	Flow control and weather-driven boiler control modules are complex shop-assembled products designed for automated control of heat transfer agent parameters in heating systems of residential and industrial buildings based on the outside air temperature, creation of comfortable thermal environment inside heated objects under the optimal thermal emission.	Inforamtion was provided, the issue is closed.
CAR 09. Please, in Section A.4.2 provide information as to whether it is planned to replace the project equipment.	A.4.2	With proper maintenance service replacement of implemented equipment within the project during the project period is not expected, since it meets all the criteria of world modern general practice.	Inforamtion was provided in the relevant sector, the issue is closed.
CAR 10. Please, provide information on personnel training, if any, necessary for the project activity.	A.4.2	Training of employees and specialists of RUC "Mykolaivoblteploenerho" will take place in accordance with practice that existed prior to the project, and in case of necessity, such as lack of	Inforamtion was provided, the issue is closed.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 1	Summary of project participants' responses	Determination team conclusion
		skills for working with equipment that is implemented in the framework of the project activities, equipment manufacturers will conduct briefings and training, as stipulated in contracts for the purchase of equipment.	
CAR 11. Tables in Section A.4.3.1. shall comply with the Guidelines for users of the JI PDD form.	A.4.3	The tables were corrected according to the Guidelines for users of the JI PDD form. Refer to the PDD version 02.	Corrections were made, the issue is closed.
CAR 12. The period that precedes the first commitment period is incorrect in the name of Table 5 in Section A.4.3.1.	A.4.3	Table 5. Estimated emission reductions in the period preceding the first commitment period (2005-2007)	Corrections were made, the issue is closed.
CAR 13. The project has no approval of the Host Party and the country – investor.	19	The project is implemented as a bilateral JI project. Ukraine is the Host Country, Switzerland is the country – buyer. To obtain the Letter of Approval the final Determination report together with this Determination Protocol and the list of sources of Reference Information must be submitted to the State Environmental Investment Agency of Ukraine. A Letter of Approval of Switzerland as the investing country is also not obtained at the current stage of the Project.	The issue will be closed after the Letters of Approval are issued by the Host Party and the country-investor.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 1	Summary of project participants' responses	Determination team conclusion
CAR 14. Please, state the full name of AM0044 methodology elements of which were used in setting the baseline.	22	The proposed project uses the specific approach based on the approved Methodology AM0044 "Energy efficiency improvement projects: boiler rehabilitation or replacement in industrial and district heating sectors" - Version 1.0.	Inforamtion was provided, the issue is closed.
CAR 15. Please, provide the algorithm of baseline calculations in Section B 1. of the PDD.	24	The algorithm of baseline calculations is provided in Section B 1. of the PDD version 02.	Formulae were provided, the issue is closed.
CAR 16. The table in section B.1. of the PDD contains incorrect data units for net calorific value of FF-type fuel combustion. Please, make the necessary corrections.	24	Net calorific value of FF-type fuel combustion, in historical period "j", in the baseline scenario (TJ/mln m3, TJ/ths t).	Corrections were made, the issue is closed.
CAR 17. Data units of $EF^{j}_{b,C,FF}$ parameter in Section B.1. are not correct. Please, make the necessary corrections.	24	$EF^{j}_{b,C,FF}$ Carbon emission factor in the course of FF-type fossil fuel combustion , in historical period «j», in the baseline scenario, t C/TJ	The issue is closed as necessary corrections were made.
CAR 18. Description of some parameters differs throughout the PDD. Please, correct the discrepancies.	24	The discrepancy is corrected. Refer to the PDD version 02.	Verified. The issue is closed.
CAR 19. Name of the Guidelines, which are the source for data verification of $OXID^{j}_{b,FF}$ parameter is incorrect.	24	Guidance on criteria for baseline setting and monitoring, JISC. Version 03. Refer to the PDD version 02.	The issue is closed as necessary corrections were made.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 1	Summary of project participants' responses	Determination team conclusion
CAR 20. At the beginning of Section B.2. of the PDD it is stated that the additionality of the project activity is demonstrated and assessed by using the "Tool for the demonstration and assessment of additionality" (Version 5.2). But version 06.0.0. is used for the project.	28	Additionality of the project activity is demonstrated by using the "Tool for the demonstration and assessment of additionality" (Version 06.0.0).	The issue is closed as necessary corrections were made.
CAR 21. Alternatives that differ from those that were mentioned in Section B.1. of the PDD are stated in Sub-step 1c in Section B.2. of the PDD.	28	The mistake was corrected. Alternatives in Section B.1. of the PDD are the same as the ones in Sub-step 1 c in Section B.2. Refer to the PDD version 02.	The issue is closed as relevant corrections were made.
CAR 22. In Sub-step 2b the reference is made to the document that doesn't provide for the use of WACC rate.	28	The approach recommended in paragraph 12 of the "Guidelines on the assessment of investment analysis version 05" provides for using of a discount rate that is determined by considering the weighted average cost of capital (WACC).	Corrections were made, the issue is closed.
CAR 23. Discount rate can't be adjusted for inflation index. Please, correct the mistake.	28	The cash flow is adjusted by inflation index for the eurozone (2.3%),since the calculation was made in Euros.	Mistake was corrected, the issue is closed.
CAR 24. Supporting Document 2 provides an incorrect method of determination of the residual value of equipment that adjusts the IRR. Correct the investment analysis.	28	Investment analysis was corrected. Refer to the PDD version 02.	The issue is closed, corrections were made.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 1	Summary of project participants' responses	Determination team conclusion
CAR 25. The expected operational lifetime of the project in years and months is incorrect.	34 (b)	The expected operational lifetime of the project in years and months is 21 years or 252 months from 01/01/2005 to 31/12/2025.	The issue is closed as corrections were made.
CAR 26. The length of the crediting period in years and months is incorrect.	34(c)	The length of the crediting period in years and months is 21 years or 252 months and the starting date of the crediting period is 01/01/2007, which is the date when the first emission reductions will be generated.	The length of the crediting period in months is stated in Section C.3. of the PDD. The issue is closed.
CAR 27. Description of $FC^{y}_{p,FF,i}$ parameter in the table in Section D 1.1.1. does not comply with the description that was stated in the formula.	36(a)	The mistake was corrected. Refer to the PDD version 02.	Corrections were made, the issue is closed.
CAR 28. The data source for $NCV^{y}_{p,FF}$ parameter is incorrect.	36(a)	The data source is company's data. Information on net calorific value of natural gas combustion is stated in the certificate of PJSC "Mykolaivgas." Information on net calorific value of coal is stated in certificates of a supplier.	Corrections were accepted, the issue is closed.
CAR 29. Check the data unit for the parameters of formula (D2).	36(a)	The data units for the parameters of formula (D2) were checked. Relevant corrections were made.	The issue is closed as relevant corrections were made.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 1	Summary of project participants' responses	Determination team conclusion
CAR 30. Check the data units for the parameters of formula (D4).	36(a)	The data units for the parameters of formula (D4) were checked. Relevant corrections were made.	The issue is closed as relevant corrections were made.
CAR 31. Please, check the numbering of formulae in Section D of the PDD.	36 (b) (ii)	The numbering of formulae was checked. Relevant corrections were made.	The issue is closed as relevant corrections were made.
CAR 32. Please, provide all the values of emission reductions in tonnes of CO2 equivalent in the PDD.	36 (b) (ii)	All the values of emission reductions were provided in tonnes of CO2 equivalent in the PDD.	The issue is closed as relevant corrections were made.
CAR 33. Please, provide the information relating to the transboundary impact of the project activities.	48 (b)	Transboundary impacts of the project activity according to their definition in the text of "Convention on Long-Range Transboundary Pollution" ratified by Ukraine do not take place.	Information is provided, the issue is closed.
CL 01. Please, provide a reference to the web-site of the producer of flow control and weather-driven boiler control modules.	A.4.2	The reference to the web-site of the producer of flow control and weather-driven boiler control modules was provided. Refer to the PDD version 02.	The issue is closed as relevant reference was provided.
CL 02. Please, provide information on positive changes caused by implementation of JNT burners.	A.4.2	JNT provides for the possibility to switch boiler units from mid to low level of gas pressure, and supply heat to consumers regardless of gas pressure in the mains. More detailed information is provided in the PDD version 02.	The issue is closed as necessary clarification was provided.
CL 03. Please, provide the explanation of	A.4.2	The explanation of Figure 6 is provided in the PDD version 02 -	Information was verified, the issue

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 1	Summary of project participants' responses	Determination team conclusion
Figure 6 in Section A.4.2.		Boiler unit heating surface pipes.	is closed.
CL 04. Please, provide a reference to AM0044 methodology in Section B.1.	22	The relevant reference was provided in Section B.1. of the PDD. Refer to the PDD version 02.	The issue is closed as relevant reference was provided.
CL 05. Please, provide a clarification why approved methodology AM0044 was not used for setting the baseline.	23	The principal challenge for implementation of the JI Projects for reconstruction of heat supply systems in Ukraine is the actual absence of monitoring equipment for measuring amounts of heat and heating agent used at municipal boiler and heating plants. Only usage of fossil fuel is registered on the regular basis. This makes the application of AM0044 Methodology, virtually impossible because the main calculation factor is the amount of heat output that has to be measured by meter (of heat output) and by temperature sensor (boiler temperature regime) on a monthly basis.	Clarification is sufficient, the issue is closed.
CL 06. Please, provide a reference to the "Guidance on criteria for baseline setting and monitoring" in the tables in Section B 1.	24	Relevant references were provided. The issue is closed.	References are accepted, the issue is closed.

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in table 1	Summary of project participants' responses	Determination team conclusion
CL 07. Please, provide information about the entity that determined the monitoring plan.	36 (j)	It is written in Section D.4. that VEMA S.A. and RUC "Mykolaivoblteploenerho" determined the monitoring plan. Contact information on the project participants is presented in Annex 1.	The issue is closed as necessary corrections were made.