



**BUREAU  
VERITAS**

# **VERIFICATION REPORT** **LCME “TEPLOCOMUNENERGO”**

## **VERIFICATION OF THE “REHABILITATION OF THE DISTRICT HEATING SYSTEM IN LUHANSK CITY”**

**(FOURTH PERIODIC VERIFICATION 01/01/2011-31/12/2011)**

**REPORT No. UKRAINE-VER/0489/2012**

**REVISION No. 02**

**BUREAU VERITAS CERTIFICATION**



## VERIFICATION REPORT

Date of first issue: 14/05/2012	Organizational unit: Bureau Veritas Certification Holding SAS
Client: LCME "Teplocomunenergo"	Client ref.: Mr. Yuriy Negrey

## Summary:

Bureau Veritas Certification has made the 4<sup>nd</sup> periodic verification of the "Rehabilitation of the District Heating System in Luhansk City", JI Registration Reference Number UA1000157, project of LCME "Teplocomunenergo" located in Luhansk city, Ukraine, and applying JI specific approach], 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 verification scope is defined as a periodic independent review and ex post determination by the Accredited Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the monitoring report against 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 verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the verification process is a list of Clarification, Corrective Actions Requests, Forward Actions Requests (CR, CAR and FAR), presented in Appendix A.

In summary, Bureau Veritas Certification confirms that the project is implemented as per determined changes. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reduction is calculated accurately and without material errors, omissions, or misstatements, and the ERUs issued totalize 63945 tonnes of CO<sub>2</sub> equivalent for the monitoring period from 01/01/2011 to 31/12/2011.

Our opinion relates to the project's GHG emissions and resulting GHG emission reductions reported and related to the approved project baseline and monitoring, and its associated documents.

Report No.: Ukraine-ver/0489/2012	Subject Group: JI
Project title: "Rehabilitation of the District Heating System in Luhansk City"	
Work carried out by:  Oleg Skoblyk – Team Leader, Lead Verifier Sergii Verteletskyi – Team Member, Verifier	
Work reviewed by: Ivan Sokolov – Internal Technical Reviewer Vyacheslav Yeriomin – technical specialist	
Work approved by:  Ivan Sokolov – Operational Manager	
Date of this revision: 25/05/2012	Rev. No.: 02
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## 1 INTRODUCTION

LCME “Teplocomunenergo” has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project “Rehabilitation of the District Heating System in Luhansk City” (hereafter called “the project”) at Luhansk city, Ukraine.

This report summarizes the findings of the verification 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

Verification is the periodic independent review and ex post determination by the Accredited Independent Entity of the monitored reductions in GHG emissions during defined verification period.

The objective of verification can be divided in Initial Verification and Periodic Verification.

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

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications, corrective and/or forward actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

### 1.3 Verification Team

The verification team consists of the following personnel:

Oleg Skoblyk  
Bureau Veritas Certification                      Team Leader, Climate Change Verifier

Sergii Verteletskyi  
Bureau Veritas Certification                      Climate Change Verifier

This verification report was reviewed by:

Ivan Sokolov  
Bureau Veritas Certification,                      Internal Technical Reviewer



Vyacheslav Yeriomin  
Bureau Veritas Certification, Technical Specialist

## 2 METHODOLOGY

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

In order to ensure transparency, a verification 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 verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

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

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

### 2.1 Review of Documents

The Monitoring Report (MR) submitted by Institute of Engineering Ecology and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), and Guidance on criteria for baseline setting and monitoring, Host party criteria, Kyoto Protocol, Clarifications on Verification Requirements to be Checked by an Accredited Independent Entity were reviewed.

The verification findings presented in this report relate to the Monitoring Report version 02 and project as described in the determined PDD.

### 2.2 Follow-up Interviews

On 11/05/2012 Bureau Veritas Certification performed on-site interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of LCME "Teplocomunenergo" and Institute of Engineering Ecology were interviewed (see References). The main topics of the interviews are summarized in Table 1.

**Table 1 Interview topics**

Interviewed organization	Interview topics
LCME "Teplocomunenergo"	Organizational structure Responsibilities and authorities Roles and responsibilities for data collection and processing Installation of equipment Data logging, archiving and reporting



	Metering equipment control Metering record keeping system, database Training of personnel Quality management procedures and technology
CONSULTANT: Institute of Engineering Ecology	Monitoring plan Monitoring report Deviations from PDD ERUs calculation model

### 2.3 Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification 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 GHG emission reduction calculation.

If the Verification Team, in assessing the monitoring report and supporting documents, identifies issues that need to be corrected, clarified or improved with regard to the monitoring requirements, it should raise these issues and inform the project participants of these issues in the form of:

- (a) Corrective action request (CAR), requesting the project participants to correct a mistake that is not in accordance with the monitoring plan;
- (b) Clarification request (CL), requesting the project participants to provide additional information for the Verification Team to assess compliance with the monitoring plan;
- (c) Forward action request (FAR), informing the project participants of an issue, relating to the monitoring that needs to be reviewed during the next verification period.

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

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

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



The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in 12 Corrective Action Requests, 06 Clarification Requests, and 0 Forward Action Requests.

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

### **3.1 Remaining issues and FARs from previous verifications**

There are no FARs from previous verification.

### **3.2 Project approval by Parties involved (90-91)**

Written project approval by Host Party has been issued by The National Environmental Investment Agency of Ukraine (#365/23/7 dated 16.04.2010). Letter of Approval by Netherlands Ministry of Economic Affairs #2010JI02 has been issued 03/03/2010 when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest. The abovementioned written approval is unconditional.

### **3.3 Project implementation (92-93)**

The project "Rehabilitation of the District Heating System in Luhansk City" was initiated in 2006 to rehabilitate Luhansk City's district heating system including boiler and distribution network equipment replacement and rehabilitation, and installation of combined heat and power production plants (CHP) as well as frequency controllers. Project includes 135 boiler-houses with 344 boilers and 269 km of heat distributing networks that are managed by LCME "Teplocomunenergo".

The project employs the increase in fuel consumption efficiency to reduce greenhouse gas emissions relative to current practice. Reduction of fuel consumption is based on increase of the boiler efficiencies, reduction of heat losses in networks and CHP and frequency controllers installation. The following activities will ensure fuel saving:

- Replacement of old boilers by the new highly efficient boilers;
- Switching of load from boiler-houses with obsolete equipment to modern equipped boiler houses;
- Switching of boiler-houses from coal to natural gas;
- Improving of the network organization;
- Application of the pre-insulated pipes;
- Installation of combined heat and power production units;
- Replacement of heat exchangers;
- Installation of heat pump station;
- Installation of frequency controllers at electric drives of draught-blowing equipment and hot water pumps motors.

The actual operation of the proposed project is described in table below:



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Implemented energy saving measures	Volume of performed works (number of boilers, length of network replacement, etc.)		
	2003-2010	2011	Total
Reconstruction of boiler	154	58	212
Replacement of boiler's convection part	21		21
Replacement of boiler's ceiling screens	6		6
Replacement of boiler's screen tubes	4		4
Replacement of boiler's heating surface	1		1
Switching boiler to water-heating mode	2		2
Reconstruction of setting	19		19
Replacement of boiler's burners	49	6	55
Installation of automatic system for boilers	26	5	31
Switching of boiler-houses' load to the more effective ones	10		10
<b>Replacement of boilers:</b>			
KSVa-3G	3		3
AOGV-100	3	1	4
KOLVI-500	2		2
KOLVI - 1000 - 2,6 MW	2		2
Vitomax 200 LW- 40 MW	4		4
MH120 EKO "Bernard" - 360 kW	2		2
IVAR Superac 290 2F - 600 KW	2		2
MH120 EKO "Bernard" - 420 kW	4		4
«Super Rac-2F-345»	6		6
KTN-50	2		2
KTN-100	2		2
KOLVI-550		2	2
Building of boiler-house	1	1	2
Replacement of tank-accumulators	1		1
Heat exchangers replacement	7	21	28
Pumps replacement	2		2
Frequency controllers installation	12		12
Replacement of capacitors	7		7
Reconstruction of chemical water treatment (CWT)	7		7
Reconstruction of filters	7		7
Network rehabilitation with pre-insulated pipes, m	84476	1017	85493
Network rehabilitation with usual pipes, m	87070	9346	96416





### **3.4 Compliance of the monitoring plan with the monitoring methodology (94-98)**

The monitoring occurred in accordance with the revised monitoring plan which complies with the monitoring methodology established in the determined PDD.

For calculating the emission reductions, key factors, such as the values of gas, coal, electricity consumption, influencing the baseline emissions 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 emission reductions, such as electrical and gas meters, wheelbarrows and pails (for coal measurement) are clearly identified, reliable and transparent.

Emission factors, including default emission factors, are selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice.

The calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner.

### **3.5 Revision of monitoring plan (99-100)**

The project participants provided an appropriate justification for the proposed revision which consists of the changes that are described below.

The newly developed officially approved valid country-specific values of parameter 16 “Carbon emission factor” were used for calculations:

For all types of fuels – according to the “National inventory report of Ukraine for 1990 – 2009”, instead of the data from table provided in Annex C of the Operational Guidelines for Project Design Documents of Joint Implementation Projects [Volume 1: General guidelines; Version 2.2, The Netherlands, 2003].

For electricity generation and consumption in Ukraine – the values according to the Order of the National Environmental Investment Agency of Ukraine #75 dated 12.05.2011., instead of using the ex-ante data from Table 8 “Emission Factors for the Ukrainian grid 2006-2012” of Annex 2 “Standardized Emission Factors for the Ukrainian Electricity Grid” to “Ukraine - Assessment of new calculation of CEF”, verified by TUV SUD Industrie Service GmbH 17.08.2007, with adding these parameters CEF<sub>c</sub> and CEF<sub>g</sub> to the Monitoring plan.

The proposed revision improves the accuracy and/or applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans.



### 3.6 Data management (101)

The data and their sources, provided in monitoring report, are clearly identified, reliable and transparent. The implementation of data collection procedures is in accordance with the monitoring plan, including the quality control and quality assurance procedures.

The function of the monitoring equipment, including its calibration status, is in order. Measurement equipment calibration was carried out by SE "Luhanskstandartmetrologiya" and "Bartosh AP".

Daily outside temperature values are taken by dispatcher of LCME "Teplocomunenergo" from Luhansk Regional Hydrometeorology Center every day of heating period. Luhansk Regional Hydrometeorology Center sends the Report every month for every day of heating period.

The evidence and records used for the monitoring are maintained in a traceable manner. Most of boiler-houses equipped with automatic corrector for temperature and pressure. Gas consumption registered automatically. Beside this operator of a boiler-house registers the instrument readings in the paper journal "Journal of registration of boiler-house's operation parameters" every day. At the boiler-houses that are not equipped with gas volume correctors (at present about 2% of the total number of boiler-houses), operator of a boiler house every 2 hours registers parameters of natural gas (temperature and pressure) in the paper journal "Journal of registration of boiler-house's operation parameters".

These parameters are used to bring gas consumption to standard conditions. Every day operators transfer values of gas consumption to dispatcher of the regional branch of the LCME "Teplocomunenergo" by phone. Monthly they transfer the paper report. Regional branches transfer data to Production-Technical Department (PTD) of the LCME "Teplocomunenergo" where they are stored and used for payments with energy sources suppliers.

The director of the LCME "Teplocomunenergo", Mr. Oleksiy Rusakov, appointed the responsible person, Mr. Yuriy Negrey, for the implementation and management of the monitoring process at the LCME "Teplocomunenergo". Mr. Yuriy Negrey is responsible for supervising of data collection, measurements, calibration, data recording and storage.

Dr. Dmytro Paderno, Deputy director of Institute of the Engineering Ecology, is responsible for baseline and monitoring JI project specific approach development.

Ms. Kateryna Korinchuk, Scientific researcher of the Institute of Engineering Ecology, is responsible for data processing.

### 3.7 Verification regarding programmes of activities (102-110)

Not applicable.



#### 4 VERIFICATION OPINION

Bureau Veritas Certification has performed 4<sup>th</sup> periodic verification of the the “Rehabilitation of the District Heating System in Luhansk City” project in Ukraine, which applies JI specific approach. The verification 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 verification consisted of the following three phases: i) desk review of the monitoring report against 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 verification report and opinion.

The management of LCME “Teplocomunenergo” is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out as per determined changes to the Monitoring Plan made during the current verification. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, is the responsibility of the management of the project.

Bureau Veritas Certification verified the Project Monitoring Report version 02 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as per determined changes. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions.

Bureau Veritas Certification can confirm that the GHG emission reduction is accurately calculated and is free of material errors, omissions, or misstatements. Our opinion relates to the project’s GHG emissions and resulting GHG emissions reductions reported and related to the approved project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm, with a reasonable level of assurance, the following statement:

Reporting period: From 01/01/2011 to 31/12/2011

Baseline emissions	: 377280	tonnes of CO2 equivalent.
Project emissions	: 313335	tonnes of CO2 equivalent.
Emission Reductions (Year 2011)	: 63945	tonnes of CO2 equivalent.

Deviation of the actual emissions reductions from estimated in the registered PDD took place.

According to the results of the Monitoring Report for the project “Rehabilitation of the District Heating System in Luhansk City” for 2011, the actual achieved GHG emission reductions are less than it was indicated as prognostic estimation in the PDD (121853,4 tonnes CO2 equivalents stated in PDD and 63945 tonnes CO2 equivalents stated in MR



for period 01/01/2011 to 31/12/2011) The main reasons of the difference between the prognosis estimation of emission reductions in the PDD and the actual emission reductions in the Monitoring Report are:

- 1) Deviation from time-table of project implementation, in particular delaying of implementation of CHP units and HPS unit.
- 2) Application of the principally different approaches and algorithms for prognostic estimation of GHG emission reductions in the PDD and for calculation of the actually achieved GHG emission reductions in the Monitoring Report (both approaches are described in details in the PDD), in particular impossibility of taking into account in the PDD of the actual conditions in reported period.
- 3) Application in course of calculations in the Monitoring Report for 2011 of the values of the carbon emission factors for fuels according to the valid “National inventory report of Ukraine for 1990 – 2009”, which for the used fuels (natural gas and coal) are somewhat less than values used in the PDD according to the Operational Guidelines for Project Design Documents of Joint Implementation Projects [Volume 1: General guidelines; Version 2.2, The Netherlands, 2003].



## 5 REFERENCES

### Category 1 Documents:

Documents provided by LCME “Teplocomunenergo” that relate directly to the GHG components of the project.

- /1/ Project Design Document “Rehabilitation of the district heating system in Luhansk City” version 06 dated December 11, 2009
- /2/ Monitoring Report “Rehabilitation of the District Heating System in Luhansk City” version 1.0 dated 26/04/2012
- /3/ Monitoring Report “Rehabilitation of the District Heating System in Luhansk City” version 2.0 dated 22/05/2012
- /4/ Letter of Approval of Netherlands Ministry of Economic Affairs #2010Jl02, dated 03/03/2010
- /5/ Letter of Approval of National Environmental Agency of Ukraine #365/23/7, dated 16/04/2010
- /6/ ERU’s calculation model Exel file “Annex\_2-5\_MR4\_Lug-2011\_v02”
- /7/ ERU’s calculation model Exel file “Annex\_2-5\_MR4\_Lug-2011\_v01”
- /8/ “National inventory report of Ukraine for 1990 – 2009”

### Category 2 Documents:

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

- /1/ Technical committee decision dated 18/01/2010
- /2/ Order # 162 dated 21/05/2010
- /3/ Order # 85 dated 25/03/2011
- /4/ Outlet data for the monitoring report 2011
- /5/ Gas quality certificate for December 2011
- /6/ Gas quality certificate for November 2011
- /7/ Gas quality certificate for October 2011
- /8/ Gas quality certificate for September 2011
- /9/ Gas quality certificate for August 2011
- /10/ Gas quality certificate for July 2011
- /11/ Gas quality certificate for June 2011
- /12/ Gas quality certificate for May 2011
- /13/ Gas quality certificate for April 2011
- /14/ Gas quality certificate for March 2011
- /15/ Gas quality certificate for February 2011
- /16/ Gas quality certificate for January 2011
- /17/ Coal quality certificate # 237 dated 17/03/2011
- /18/ Analysis result # 237 dated 17/03/2011
- /19/ Coal quality certificate # 737 dated 24/08/2011
- /20/ Analysis result # 737 dated 24/08/2011
- /21/ Analysis result # 847 dated 22/09/2011
- /22/ Coal quality certificate # 847 dated 22/09/2011
- /23/ Inquiry on average temperature for December 2011



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- /24/ Inquiry on average temperature for November 2011
- /25/ Inquiry on average temperature for October 2011
- /26/ Inquiry on average temperature for April 2011
- /27/ Inquiry on average temperature for March 2011
- /28/ Inquiry on average temperature for February 2011
- /29/ Inquiry on average temperature for January 2011
- /30/ Luhansk Hydrometeorological Centre note on monthly average temperature for period from 15/04/2011 till 15/10/2011
- /31/ Data on sum of finished recalculations for 2011
- /32/ Luhansk administrative committee decision dated 13/04/2011 about the end of heating season
- /33/ Luhansk administrative committee decision dated 19/09/2011 about the start of heating season
- /34/ Agreement dated # 158 dated 01/01/2010 on central water supply system service
- /35/ Agreement dated # 326 dated 01/01/2010 on central water supply system service
- /36/ Agreement dated 05/01/2010 on metrological service
- /37/ Agreement # 1384 on inert materials allocation
- /38/ Agreement # 457 on waste burial at landfill
- /39/ Agreement # 683.888.686 dated 08/02/2011
- /40/ List of gas meters and their calibration
- /41/ List of electric meters and their calibration
- /42/ Agreement on electric energy supply
- /43/ Technical agreement # 112 dated 30/09/2011 on gas measurement sequence
- /44/ Technical agreement # 202 dated 30/09/2011 on gas measurement sequence
- /45/ Agreement # 202 dated 30/09/2011 on gas supply
- /46/ Appendix to agreement # 202 dated 30/09/2011
- /47/ Agreement # 112 dated 30/09/2011 on gas supply
- /48/ Agreement # 06/11-847 dated 30/08/2011 on gas supply
- /49/ Appendix # 1 to agreement # 06/11-847 dated 30/08/2011 on gas supply
- /50/ Photo — boiler serial # 34225
- /51/ Photo — electric meter type Меркүрій 230, serial # 06289514
- /52/ Photo — electric meter type Меркүрій 230, serial # 06289515
- /53/ Photo — heat meter
- /54/ Photo — gas meter type Күрүк - 01
- /55/ Photo — gas point serial # 36302
- /56/ Photo — gas consumption log book
- /57/ Photo — electric meter serial # 779995
- /58/ Photo — gas meter serial # 37744
- /59/ Photo — flame control panel for gas burner # 7
- /60/ Photo — flame control panel for gas burner # 8
- /61/ Photo — flame control panel for gas burner # 5
- /62/ Photo — flame control panel for gas burner # 6
- /63/ Photo — flame control panel for gas burner # 3
- /64/ Photo — flame control panel for gas burner # 4
- /65/ Photo — flame control panel for gas burner # 1



- /66/ Photo — flame control panel for gas burner # 2
- /67/ Photo — pressure meter serial # 2754/10
- /68/ Photo — heat exchanger
- /69/ Photo — electric meter serial # 155660
- /70/ Photo — electric meter serial # 778485
- /71/ Photo — electric meter serial # 346548
- /72/ Certificate on high qualification to pass calibration procedure (given to Andriy Ulchenko)
- /73/ Inquiry on connected load for 2011
- /74/ Agreement on supply # 450/1/03-06 dated 13/03/2006
- /75/ Report on fuel, electrical energy and heat energy usage for 2011

**Persons interviewed:**

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

- /1/ Yuriy Negrey - Chief engineer of LCME “Teplocomunenergo”
- /2/ Eleonora Bachurina - Senior engineer of technical development group of industrial safety department of LCME “Teplocomunenergo”
- /3/ Andriy Ulchenko - Chief of Metrology department of LCME “Teplocomunenergo”
- /4/ Kateryna Korinchuk - Scientific researcher of the Institute of Engineering Ecology, Ltd
- /5/ Logvin Valeryi - Engineer of the Institute of Engineering Ecology, Ltd



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## APPENDIX A: VERIFICATION PROTOCOL

## BUREAU VERITAS CERTIFICATION HOLDING SAS

## VERIFICATION PROTOCOL

Check list for verification, according to the JOINT IMPLEMENTATION DETERMINATION AND VERIFICATION MANUAL (Version 01)

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
<b>Project approvals by Parties involved</b>				
90	Has the DFPs of at least one Party involved, other than the host Party, issued a written project approval when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest?	The written approvals of the project from Netherlands and Ukraine (host party) have been issued by the designated focal points of these Parties in accordance with the paragraph 38 of the JI Guidelines.	OK	OK
91	Are all the written project approvals by Parties involved unconditional?	All written project approvals are unconditional	OK	OK
<b>Project implementation</b>				
92	Has the project been implemented in accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	The project has been implemented in accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website.	CL01 CAR01	OK





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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		CL01 Please clarify the difference of equipment implementation schedule in PDD and that in MR. CAR01 Please make segmentation for pipes (Table 3) that were installed in 2011		
93	What is the status of operation of the project during the monitoring period?	The project equipment was in work during the monitoring period. CAR02 Please add information if some monitoring equipment has been broken during the monitoring period.	CAR02	OK
<b>Compliance with monitoring plan</b>				
94	Did the monitoring occur in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	The monitoring occurred in accordance with the PDD regarding which the determination has been deemed final with some changes presented in the revised monitoring plan which was positively determined in course of the current verification (for the further to p. 8 of this protocol) CAR03 Reference # 4 does not work, please make appropriate amendments to it.	CAR03	OK
95 (a)	For calculating the emission reductions or enhancements of net removals, were key factors, e.g. those listed in 23 (b) (i)-(vii) above, influencing the baseline	For calculating the emission reductions, key factors, influencing the baseline emissions and the activity level of the project and the emissions as well as risks associated with the project were	CL02 CL03 CL04 CAR04	OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	emissions or net removals and the activity level of the project and the emissions or removals as well as risks associated with the project taken into account, as appropriate?	<p>taken into account.</p> <p>CL 02 It is stated in PDD that recalculating factor for average load during heating period is determined for each boiler-house on historical base. Please make your point clear about “historical base” and calculation methodology for this value.</p> <p>CL03 Formula # 26 contains the overall efficiency of the hot water supply system. Please provide it value and reference (methodology) that clearly justifies this magnitude.</p> <p>CL04 Please explain the value (32,96 MJ/m<sup>3</sup>) of average calorific value of a fuel at Kotsubynskogo, 14 that is different from all rest in base line year CAR04</p> <p>Please correct description of CEF for electricity consumption in Excel file (Annex_3). The value is not for “reducing” electricity consumption in Ukraine</p>		
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	All data sources used for calculating emission reduction are clearly identified, reliable and transparent.	OK	OK
95 (c)	Are emission factors, including default	Yes, the emission factors, including default	OK	OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	emission factors, if used for calculating the emission reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice?	emission factors, used for calculating the emission reductions, are selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice		
95 (d)	Is the calculation of emission reductions or enhancements of net removals based on conservative assumptions and the most plausible scenarios in a transparent manner?	<p>The calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner.</p> <p>CAR05 It is stated in Excel spread sheet that the amount of consumed gas is 139250,05 ths m3. Thus, emission due to fuel consumption for heating and hot water supply service by a boiler-house in the reported year is : <math>139250,05 \cdot 0,0554 \cdot 33,19 = 256042,7</math> tCO<sub>2</sub>, but MR contains another value</p> <p>CAR 06 The measurement units in formula 17 are inconsistent. Please make appropriate amendments</p> <p>CAR07 Please justify the negative values of emission redaction in excel calculation spreadsheet to MR</p> <p>CAR08 Please provide data from natural gas suppliers or independent chemical analyses for average</p>	<p>CAR05 CAR06 CAR07 CAR08 CAR09 CL05</p>	OK



BUREAU  
VERITAS

## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>annual gas calorific value of natural gas CAR09 Please provide analogous information for average annual calorific value of coal CL05 It is undisputed that the first and the third reasons explain the deviation of emission reduction in 2011. However it is not clear what semantic content has second reason. Please clarify what principally different approaches and algorithms of GHG emission reduction were used in PDD and MR. Explain your position taking into account the presence of the same methodology through the monitoring period.</p>		
<b>Applicable to JI SSC projects only</b>				
96	Is the relevant threshold to be classified as JI SSC project not exceeded during the monitoring period on an annual average basis? If the threshold is exceeded, is the maximum emission reduction level estimated in the PDD for the JI SSC project or the bundle for the monitoring period determined?	Not applicable	Not applicable	Not applicable
<b>Applicable to bundled JI SSC projects only</b>				
97 (a)	Has the composition of the bundle not changed from that is stated in F-JI-	Not applicable	Not applicable	Not applicable



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	SSCBUNDLE?			
97 (b)	If the determination was conducted on the basis of an overall monitoring plan, have the project participants submitted a common monitoring report?	Not applicable	Not applicable	Not applicable
98	If the monitoring is based on a monitoring plan that provides for overlapping monitoring periods, are the monitoring periods per component of the project clearly specified in the monitoring report? Do the monitoring periods not overlap with those for which verifications were already deemed final in the past?	Not applicable	Not applicable	Not applicable
<b>Revision of monitoring plan</b>				
<b>Applicable only if monitoring plan is revised by project participant</b>				
99 (a)	Did the project participants provide an appropriate justification for the proposed revision?	The project participants have provided an appropriate justification for the proposed revision.	OK	OK
99 (b)	Does the proposed revision improve the accuracy and/or applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans?	In accordance with the GUIDANCE ON CRITERIA FOR BASELINE SETTING AND MONITORING version 03 paragraphs 36 and 41, the project participants improved the monitoring process and its results by applying country-specific values of carbon emission factor for natural gas and coal in conformity with "National inventory report of	OK	OK



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		Ukraine for 1990 – 2009” instead of the data from table provided in IPCC 1996 Guidelines for National Greenhouse Gas Inventories		
<b>Data management</b>				
101 (a)	Is the implementation of data collection procedures in accordance with the monitoring plan, including the quality control and quality assurance procedures?	The implementation of data collection procedures is in accordance with the monitoring plan, including the quality control and quality assurance procedures CL06 Please clarify full how will be conducted monitoring in case when monitoring equipment is broken due to some reasons	CL06	OK
101 (b)	Is the function of the monitoring equipment, including its calibration status, in order?	The function of the monitoring equipment, including its calibration status is in order CAR10 Please provide full naming of monitoring equipment in the MR	CAR10	OK
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	The evidence and records used for the monitoring are in a traceable manner. CAR 11 There are some coil boilers that work in Luhansk, thus section B should contain information not only about gas registration but also about coal consumption and its registration CAR12 Please correct description of heated area	CAR11 CAR12	OK



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		(parameter) in table (Annex 1 Data). The value 5960.72 ths $m^2$ is for all boiler-houses not for every.		
101 (d)	Is the data collection and management system for the project in accordance with the monitoring plan?	The data collection and management system for the project is in accordance with the monitoring	OK	OK
<b>Verification regarding programmes of activities (additional elements for assessment)</b>				
102	Is any JPA that has not been added to the JI PoA not verified?	Not applicable	Not applicable	Not applicable
103	Is the verification based on the monitoring reports of all JPAs to be verified?	Not applicable	Not applicable	Not applicable
103	Does the verification ensure the accuracy and conservativeness of the emission reductions or enhancements of removals generated by each JPA?	Not applicable	Not applicable	Not applicable
104	Does the monitoring period not overlap with previous monitoring periods?	Not applicable	Not applicable	Not applicable
105	If the AIE learns of an erroneously included JPA, has the AIE informed the JISC of its findings in writing?	Not applicable	Not applicable	Not applicable
<b>Applicable to sample-based approach only</b>				
106	Does the sampling plan prepared by the AIE: (a) Describe its sample selection, taking into account that:	Not applicable	Not applicable	Not applicable



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	(i) For each verification that uses a sample-based approach, the sample selection shall be sufficiently representative of the JPAs in the JI PoA such extrapolation to all JPAs identified for that verification is reasonable, taking into account differences among the characteristics of JPAs, such as: <ul style="list-style-type: none"> <li>– The types of JPAs;</li> <li>– The complexity of the applicable technologies and/or measures used;</li> <li>– The geographical location of each JPA;</li> <li>– The amounts of expected emission reductions of the JPAs being verified;</li> <li>– The number of JPAs for which emission reductions are being verified;</li> <li>– The length of monitoring periods of the JPAs being verified; and</li> <li>– The samples selected for prior verifications, if any?</li> </ul>			
107	Is the sampling plan ready for publication through the secretariat	Not applicable	Not applicable	Not applicable





## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	along with the verification report and supporting documentation?			
108	Has the AIE made site inspections of at least the square root of the number of total JPAs, rounded to the upper whole number? If the AIE makes no site inspections or fewer site inspections than the square root of the number of total JPAs, rounded to the upper whole number, then does the AIE provide a reasonable explanation and justification?	Not applicable	Not applicable	Not applicable
109	Is the sampling plan available for submission to the secretariat for the JISC ex ante assessment? (Optional)	Not applicable	Not applicable	Not applicable
110	If the AIE learns of a fraudulently included JPA, a fraudulently monitored JPA or an inflated number of emission reductions claimed in a JI PoA, has the AIE informed the JISC of the fraud in writing?	Not applicable	Not applicable	Not applicable



## VERIFICATION REPORT

**Table 2 Resolution of Corrective Action and Clarification Requests**

Draft report clarification and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
CL01 Please clarify the difference of equipment implementation schedule in PDD and that in MR.	92	Implementation of boiler houses rehabilitation and network rehabilitation are realized mainly according to project plan with some deviations from time-table. In several cases replacement of different (from planed before) diameters of network pipes takes place. Installation of frequency controllers is not finished yet. Implementation of CHP units and HPS unit is delayed due to lack of financing (see Section A.6 of MR).	The issue is closed
CAR01 Please make segmentation for pipes (Table 3) that were installed in 2011	92	Segmentation is made in MR version 02.	The issue is closed



## VERIFICATION REPORT

<p>CAR02 Please add information if some monitoring equipment has been broken and repaired during the monitoring period.</p>	93	<p>No monitoring equipment has been broken and repaired during the monitoring period. All the monitoring equipment has been in work during the monitoring period.</p> <p>This information is added in MR version 02 (Section A.6).</p>	Necessary information is added. The issue is closed
<p>CAR03 Reference # 4 does not work, please make appropriate amendments to it.</p>	94	Appropriate amendments are made in MR version 02.	The reference is corrected. The issue is closed
<p>CL 02 It is stated in PDD that recalculating factor for average load during heating period is determined for each boiler-house on historical base. Please make your point clear about "historical base" and calculation methodology for this value.</p>	95 (a)	<p>This parameter is calculated taking into account actual outside, normative inside and minimal outside temperatures (see calculation method provided within description of parameter 17). The minimal outside temperature for Luhansk city as well as for all regions in Ukraine have been determined on historical base and are set in KTM 204 Ukraine 244-94.</p>	The justification is clearly described in KTM 204 Ukraine 244-94. The issue is closed



## VERIFICATION REPORT

<p>CL03 Formula # 26 contains the overall efficiency of the hot water supply system. Please provide it value and reference (methodology) that clearly justifies this magnitude.</p>	95 (a)	<p>The value of overall efficiency of the hot water supply system is not used for GHG emissions calculations. Formula # 26, as well as formulae 27-29, is used for demonstration of necessity and way of determination of the averaged adjustment factor for hot water supply service (see formula 30).</p>	The issue is closed
<p>CL04 Please explain the value (32,96 MJ/m<sup>3</sup>) of average calorific value of a fuel at Kotsubynskogo, 14 that is different from all rest in base line year</p>	95 (a)	<p>The value 32,96 MJ/m<sup>3</sup> of averaged net calorific value of the natural gas corresponds to 2009 year (see comment in Annex 2), since the base year for boiler-house Kotsubynskogo, 14 is 2009.</p>	<p>The explanation is provided. The issue is closed</p>
<p>CAR04 Please correct description of CEF for electricity consumption in Excel file (Annex _3). The value is not for “reducing” electricity consumption in Ukraine</p>	95 (a)	<p>The description of CEF in Annex 3 corresponds to description of parameter 16.3 in MR (see list of parameters in table B.2.1 and Annex 1) and in PDD (sections B.1, D.1.1). This description of CEF was used in all previous MRs.</p> <p>The new name of this parameter appeared in the Orders of NEIAU in 2011. This is reflected in MR version 02.</p>	The issue is closed



## VERIFICATION REPORT

<p>CAR05 It is stated in Excel spread sheet that the amount of consumed gas is 139250,05 ths m<sup>3</sup>. Thus, emission due to fuel consumption for heating and hot water supply service by a boiler-house in the reported year is : <math>139250,05 \cdot 0,0554 \cdot 33,19 = 256042,7</math> tCO<sub>2</sub>, but MR contains another value</p>	95(d)	<p>Calculation of sums is corrected in MR version 02.</p> <p>The amount of gas consumed is 139250,05 ths m<sup>3</sup>, the amount of coal consumed is 318,69 t, thus emission due to fuel consumption for heating and hot water supply service by boiler-houses in the reported year is:  <math>139250,05 \cdot 0,0554 \cdot 33,19 + 318,69 \cdot 0,0928 \cdot 17,79 = 256568,82</math> tCO<sub>2</sub>.</p>	The issue is closed
<p>CAR 06 The measurement units in formula 17 are inconsistent. Please make appropriate amendments</p>	95(d)	Appropriate amendments are made in MR version 02.	The issue is closed
<p>CAR07 Please justify the negative values of emission reduction in Excel calculation spreadsheet to MR</p>	95(d)	<p>The negative values of amounts of ERUs show that actual efficiency of some boiler-houses in reported year, with taking into account the actual external conditions (weather conditions, connected load, etc.) was lower then in base year even despite of implementation of energy saving measures.</p> <p>Also, some boiler-houses may deliver excess (more than normative) heat.</p>	The issue is closed



## VERIFICATION REPORT

<p>CAR08 Please provide data from natural gas suppliers or independent chemical analyses for average annual gas calorific value of natural gas</p>	95(d)	Data is provided.	The data was provided. The issue is closed
<p>CAR09 Please provide analogous information for average annual calorific value of coal</p>	95(d)	Data is provided.	The issue is closed
<p>CL05 It is undisputed that the first and the third reasons explain the deviation of emission reduction in 2011. However it is not clear what semantic content has second reason. Please clarify what principally different approaches and algorithms of GHG emission reduction calculation were used in PDD and MR. Explain your position taking into account the presence of the same methodology through the monitoring period.</p>	95(d)	<p>The determined JI project specific approach described in PDD envisages two principally different algorithms for calculation of GHG emission reductions.</p> <p>For emission reductions calculation in PDD the prognostic estimation approach has been used (see Section D.1.4 of PDD), and for emission reductions calculation in MR the approach described in Section D.1.1 of PDD and Section A.5.2 of MR is used.</p>	The issue is closed



VERIFICATION REPORT

<p>CL06 Please clarify how will be conducted monitoring in case when monitoring equipment is broken due to some reasons</p>	<p>101 (a)</p>	<p>When monitoring equipment doesn't work due to breakage or other, electricity consumption is calculated according to "Rules of using of electric power" (confirmed by the Order of National commission for electricity regulatory of Ukraine No. 28 dated 31.07.1996 [<a href="http://zakon2.rada.gov.ua/laws/show/z0417-96">http://zakon2.rada.gov.ua/laws/show/z0417-96</a>]) taking into account electricity consumption of previous or forward month and unaccounting period; gas consumption is calculated according to Contract with gas supplying company Luhanskmiskgas taking into account nominal capacity and operational unaccounting period of installed equipment. These methods are used for commercial accounting.</p>	<p>The explanation was provided. The issue is closed</p>
<p>CAR10 Please provide full naming of monitoring equipment in the MR</p>	<p>101 (b)</p>	<p>Appropriate amendments are made in MR version 02 (see Tables 4 and 5).</p>	<p>The issue is closed</p>



## VERIFICATION REPORT

<p>CAR11 There are some coil boilers that work in Luhansk, thus section B should contain information not only about gas registration but also about coal consumption and its registration.</p>	101 (c)	Information about coal consumption registration is added to Section B in MR version 02.	The issue is closed
<p>CAR12 Please correct description of heated area (parameter) in table (Annex 1 Data). The value 5960.72 ths <math>m^2</math> is for all boiler-houses not for every.</p>	101 (c)	The value 5960.72 ths $m^2$ is total value of heated area in monitoring period for all boiler-houses included into the project. As it provided in description of parameter 6, the detailed data of heated area for every boiler-house, that are taking into account for emission reductions calculation, are presented in Annex 2.	The issue is closed