VERIFICATION REPORT
GLOBAL CARBON B.V.

VERIFICATION OF THE
IMPROVEMENT OF THE ENERGY EFFICIENCY AT ENERGOMASHSPETSSTAL (EMSS), KRAMATORSK, UKRAINE

TWELFTH PERIODIC FOR THE FOURTH QUARTER OF 2011
(01/01/2012 - 30/06/2012)

REPORT NO. UKRAINE-VER/0618/2012
REVISION NO. 02

BUREAU VERITAS CERTIFICATION

Report No: UKRAINE-ver/0618/2012

VERIFICATION REPORT

Date of first issue:	Organizational unit:
28/09/2012	Bureau Veritas Certification Holding SAS
Client:	**Client ref.:**
Global Carbon B.V.	Lennard de Klerk

Summary:

Bureau Veritas Certification has made the 12th periodic verification of the "Improvement of the Energy efficiency at Energomashspetsstal (EMSS), Kramatorsk, Ukraine", JI Registration Reference Number 0104, project of Global Carbon B.V. located in Kramatorsk, Ukraine, and applying the 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 Corrective Actions Requests (CAR) and Clarification Request (CL) 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 without material misstatements, and the ERUs issued totalize 172 219 tonnes of CO_2 eq. for the monitoring period from 01/01/2012 to 30/06/2012.

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.:	Subject Group:	
UKRAINE-ver/0618/2012	JI	
Project title: "Improvement of the Energy efficiency at Energomashspetsstal (EMSS), Kramatorsk, Ukraine"		
Work carried out by: Team Leader : Kateryna Zinevych Team Member : Vladimir Kulish		
Work reviewed by: Ivan Sokolov - Internal Technical Reviewer Vera Skitina - Technical Specialist		
Work approved by: Ivan Sokolov – Climate Change Operational Manager		
Date of this revision: 05/11/2012	Rev. No.: 02	Number of pages: 29

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1 INTRODUCTION

Global Carbon B.V. has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project "Improvement of the Energy efficiency at Energomashspetsstal (EMSS), Kramatorsk, Ukraine" (hereafter called “the project”) at Kramatorsk, Ukraine, UNFCCC JI Reference Number 0104.

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 and 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 and/or corrective 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:

Kateryna Zinevych Bureau Veritas Certification	Team Leader, Climate Change Verifier

Vladimir Kulish
Bureau Veritas Certification Team member, Climate Change Verifier

This verification report was reviewed by:

Ivan Sokolov
Bureau Veritas Certification, Internal technical reviewer

Vera Skitina
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 Global Carbon B.V. and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), 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(s) 1.0 dated 31/07/2012, 2.0 dated 23/10/2012 and project as described in the determined PDD.

2.2 Follow-up Interviews

On 11/09/2012 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 EMSS and Global Carbon B.V. were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
Energomashspetsstal (EMSS)	Organizational structure. Responsibilities and authorities. Training of personnel. Quality management procedures and technology. Implementation of equipment (records). Metering equipment control. Metering record keeping system, database.
Consultant: Global Carbon B.V.	Baseline methodology. Monitoring plan. Monitoring report. Deviations from PDD.

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 AIE 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.

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 and Corrective 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 4 Corrective Action Requests and 5 Clarification request.

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

3.1 Remaining issues and FARs from previous verifications

No FARs were raised during previous verification.

3.2 Project approval by Parties involved (90-91)

The project has been approved by the Host Party (Ukraine) DFP at the determination stage.

Written project approval by the Netherlands has been issued by the DFP of that Party when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest (see References).

The abovementioned written approval is unconditional.

No outstanding issues were raised.

3.3 Project implementation (92-93)

The project activity consists of the energy efficiency measures at the premises of PJSC "Energomashspetsstal" (EMSS) through the implementation of four subprojects:

Subproject 1. Reconstruction of thermal and heating furnaces: There are thermal and heating furnaces in operation in different shops at the premises of EMSS. The main goal of this subproject is the reduction of the natural gas consumption for these furnaces by commissioning of new automated natural gas burners (which enables the required temperature inside of the furnace to be maintained) and by the implementation of new thermal insulation for the walls, front doors and roofs of the furnaces.

Subproject 2. Installation of a new vacuum system: The installation of a new vacuum system (vacuum degasser) for the vacuumed steel production. The old vacuum system used heat and electricity, the new reconstructed vacuum system uses only electricity.

Subproject 3. Installation of an arc ladle furnace: The installation of a new arc ladle furnace for the steel production. This means that the part of the process of the steel preparation will be undertaken in the ladle, from which the steel will be cast into the forms. As a result there is reduction of the electricity consumption.

Subproject 4. Modernization of press equipment: The replacement of an old pump system, serving the 15.000 tonne press, with a new more effective pump system. There are 24 old pumps (with 500 kW installed capacity each), which will be replaced by 11 new pumps (with 800 kW installed capacity each).

There are following sources of green-house gas emissions related to the proposed four subprojects:

- Emissions that are related to the direct fuel combustion in thermal and heating furnaces of EMSS. Fuel combustion will decrease after implementation of Subproject 1 "Reconstruction of thermal and heating furnaces".
- Indirect green-house gas emissions at the premises of Kramatorsk CHPP as result of fuel combustion for heat producing which was consumed at EMSS. Heat consumption at EMSS will decrease after implementation of Subproject 2 "Installation of a new vacuum system".
- Indirect green-house gas emission in the Ukrainian grid as a result of electricity producing which was consumed at EMSS. Electricity consumption will increase in result of Subproject 2 "Installation of a

new vacuum system" and decrease in result of Subproject 3 "Installation of an arc ladle furnace" and Subproject 4 "Modernization of press equipment".

Project was operational for the whole monitoring period, which is 01/01/2012-30/06/2012.

The project improved efficiency of use of natural gas, electricity and heat at the enterprise and thus leaded to decrease of harmful emissions. This project by reducing GHG emissions contributes towards a better environment and hence works towards social well-being for all. Project implementation will lead to improvement of ecological climate of the region, increase of payments to the budgets of all levels for social needs, prevention of reduction of working places and better working conditions at EMSS.

The identified areas of concern as to the compliance of the Project implementation, project participants responses and Bureau Veritas Certification's conclusions are described in Appendix A to this report (refer to CAR 01).

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

The JI specific approach is used for the monitoring of emission reductions in accordance with the "Guidance on criteria for baseline setting and monitoring".

The monitoring approach in the Monitoring Plan of the PDD version 3.9 requires monitoring and measurement of variables and parameters necessary to quantify the baseline emissions and project emissions in a conservative and transparent way. The same approach is applied in the revised Monitoring Plan revision 1.1 dated 31/12/2009[1] developed for the monitoring period that is not one year. The parameters that are determined to quantify the baseline and project emissions are presented in the Monitoring Report version 1.5 dated 31/12/2009[2].

According to the determined Monitoring Plan revision 1.1 project and baseline emissions and emission reductions are calculated on the annual basis for every subproject. In order to make monitoring process for the several months possible formulas for the calculations have been updated. Updates with comparison to the determined monitoring plan are presented in the Monitoring Report version 2.0 dated 12/04/2012. They were

[1] http://ji.unfccc.int/UserManagement/FileStorage/83Y40GEFMWDOBP79QRCT2LNS1JK6HV
[2] http://ji.unfccc.int/UserManagement/FileStorage/KSFAOBEZ8X9W1RG3IHC4L2N5Q0YMD6

positively determined, see Verification Report No: UKRAINE-ver/0470/2012 dated 10/05/2012.

Changes in the Monitoring Plan was determined as part of the verification process and submitted to the verifications report see section 5 “References” below.

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 taken into account, as appropriate.

Data sources used for calculating emission reductions 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.

The identified areas of concern as to the compliance of the monitoring plan with the monitoring methodology, project participants responses and Bureau Veritas Certification’s conclusions are described in Appendix A to this report (refer to CAR 02 and CAR 03).

3.5 Revision of monitoring plan/Determination of the changes from the determined PDD (99-100)

There are no deviations or revisions to the determined monitoring plan during this monitoring period.

The identified areas of concern as to the revision of monitoring plan, project participants responses and Bureau Veritas Certification’s conclusions are described in Appendix A to this report (refer to CL 01).

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.

Subproject 1. Reconstruction of thermal and heating furnaces

Reconstructed furnaces have the natural gas consumption meters with pressure and temperature meters. Information from consumption meters, pressure and temperature meters are transmitting through meter-loggers to the control and monitoring computer system**.**

All information about technological process is saved continuously. The archiving period for the log files is at least one year. Information that corresponds to the natural gas consumption in the monitoring period has been burned on CDs. These CDs are stored two years after last transaction Emission Reduction Units (ERUs) by the project.

Every half-finished product that processes through the furnaces has own unique certificate. This certificate reflects all operations performed on the product and the weight on the exit of every workshop. So, the weight of half-finished products that proceed through each furnace could be easily monitored. Information from the certificates is saved in the log books in order to simplify the monitoring process.

A report including natural gas consumption and weight of half finished products is generating on a monthly basis. The report is signing by Head of Energy Saving Department, Head of corresponding workshop and approved by Chief Engineer.

The natural gas meters are used in furnaces' control process. That is why any deviation/failure of the meters would be recognized immediately by disturbance of the heating process and reported to the workshop's head. As a result of disturbance furnace should be shut down for the checking procedure.

Subproject 2. Installation of a new vacuum system

Electricity that is consumed during the vacuum process is metered using dedicated meters for this system. Information from meters is passed to the control and monitoring computer system. The computer system records information about every vacuumization session, including melt passport (date and number), weight of steel and electricity consumption. The archiving period for the log files is at least one year. Information that corresponds to the electricity consumption in the monitoring period has been recorded on CDs. These CDs are stored two years after the last transfer of Emission Reduction Units (ERUs) by the project.

The steel to the vacuum degasser (VD) coming either from ladle furnace (LF) or from the electric arc furnace (EAF) in special ladle. Each ladle with liquid steel has unique melt certificate.

Subproject 3. Installation of an arc ladle furnace

Ladle furnace (LF) is a comprehensive solution for high quality steel melting installed at the Steel Making Shop (SMS). The main electricity consumers of the Steel Making Shop are powered by the following scheme.

Close Distribution Unit (CDU) #1, 2 are electricity powering points for the EAFs (EAF50 #1, EAF100 #3, EAF100 #5) and LF. CDUs are powered by Transformer (T1) and Autotransformers (AT1 and AT2). EAFs and LF could be powered from any of the Transformers or Autotransformers. Commercial electricity meters are installed on each of the Transformers and Autotransformer.

The data from electricity meters concerning electricity consumption is transmitted to the control and monitoring computer system continuously. The computer system records information about each melt process, including melt certificate. This certificate includes information about the date and number of melt, furnace where steel was melted, amount of electricity consumed during melting and weight of steel. The archiving period for the log files is at least one year. All melt certificates for the monitoring period have been recorded on CDs. These CDs are stored for two years after the last transfer of Emission Reduction Units (ERUs) by the project.

Subproject 4. Modernization of press equipment

Serving motors of the press pump station are powered from the 6kV line. Substation 110/6 kV has two transformers. Each transformer has a commercial electricity meter. There are some addition consumers on the 6kV line. All data concerning electricity consumption is transmitted to the control and monitoring computer system. The press has a special registry log book, where working time of press is logged, among other data.

The reporting procedures reflect the revised monitoring plan completely.

All parameters were determined as prescribed. The complete data is stored electronically and documented. The necessary procedures have been defined in internal procedures.

The audit team confirms that emission reduction calculations have been performed according to the Monitoring Plan.

The calibration and testing equipment used in the monitoring process is carried out by the organizations that the respective agreements are concluded with:

- GC “Donetsk Scientific-Production Center of Standardization Metrology and Certification”,
- National Science Center "Institute of Metrology"
- GC “Ukrmetrteststandart”
- GC “Kharkiv Regional Scientific Production Center of Standardization, Metrology and Certification”
- PC “MIKA”
- OJSC “Donetskoblgas”
- SPE “Ukrgasgeoavtomatika”

The repair, testing and calibration of the project equipment are carried out by specially trained plant personnel.

Some of the monitoring parameters that are used in the calculation of the baseline and project emissions are measured directly with the use of special equipment while others are estimated with the use of appropriate coefficients.

Concerning verification the calculation of emission reductions is based on internal data. The origin of those data was explicitly checked. Further on, entering and processing of those data in the monitoring workbook Excel sheet was checked, in which algorithms to compute the annual value of the emission reductions are predefined. All equations and algorithms used in the different workbook sheets were checked. Inspection of calibration and maintenance records for key equipment was performed for all relevant meters.

Necessary procedures have been defined in internal procedures and additional internal documents relevant for the determination of the various parameters on daily basis.

All data necessary for the CO_2 emission reductions calculation is collected in the Energy Saving Department. The head of the Energy Saving Department is making calculations on a monthly basis. The general supervision of the monitoring system is executed by the Deputy Chief Engineer.

All contracts for the equipment supplying include chapter describing personnel training. Training is provided by the equipment producers.

CO_2 emission reductions calculations are performed on the monthly basis by the head of the Energy Saving Department. All energy sources flows (such as electricity and natural gas) are logged on the server in the Energy Saving Department. Hence the head of Department checks the correctness of measurements by the indirect calculations.

The concept of materiality was verified and confirmed by the low level of uncertainty for measuring key parameters and further calculation of emission reductions that is stipulated by:

- applying the approved methodology and tools to it,
- manufacturer's passports and certificates for the project equipment,
- parameters defined for the materials and resources by their suppliers,
- accreditation certificates of the laboratories and metrological organizations involved in the project.

The function of the monitoring equipment, including its calibration status, is in order.

The evidence and records used for the monitoring are maintained in a traceable manner.

The data collection and management system for the project is in accordance with the monitoring plan.

The identified areas of concern as to data management, project participants response and BV Certification's conclusion are described in Appendix A Table 2 (refer to CAR 04 and CL 02 – CL 05).

3.7 Verification regarding programs of activities (102-110)

Not applicable.

4 VERIFICATION OPINION

Bureau Veritas Certification has performed twelfth periodic verification of the "Improvement of the Energy efficiency at Energomashspetsstal (EMSS), Kramatorsk, Ukraine" 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 Global Carbon B.V. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring Plan as per determined changes. 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 2.0 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 calculated without material misstatements. 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. Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: From 01/01/2012 to 30/06/2012

Baseline emissions	:	239 633	tonnes of CO_2 eq.
Project emissions	:	67 414	tonnes of CO_2 eq.
Emission Reductions	:	172 219	tonnes of CO_2 eq.

5 REFERENCES

Category 1 Documents:
Documents provided by Global Carbon B.V. that relate directly to the GHG components of the project.

/1/ Monitoring Report for the period from 01/01/2012 till 30/06/2012 version 1.0 dated 31/07/2012

/2/ Calculation of Emission Reductions – excel file "20120731_ER012_EMSS_1.0_en.xls", Version 1.0 of 31/07/2012

/3/ Monitoring Report for the period from 01/01/2012 till 30/06/2012 version 2.0 dated 23/10/2012

/4/ Calculation of Emission Reductions – excel file "20120731_ER012_EMSS_1.0_en.xls", Version 2.0 of 23/10/2012

/5/ Verification Report by Bureau Veritas Certification Holding SAS dated 16th of November 2009

/6/ Verification Report by Bureau Veritas Certification Holding SAS dated 31st of December 2009

/7/ Verification Report by Bureau Veritas Certification Holding SAS dated 30th of March 2010

/8/ Verification Report by Bureau Veritas Certification Holding SAS dated 29th of June 2010

/9/ Verification Report by Bureau Veritas Certification Holding SAS dated 27th of September 2010

/10/ Verification Report by Bureau Veritas Certification Holding SAS dated 28th of January 2011

/11/ Verification Report by Bureau Veritas Certification Holding SAS dated 11th of April 2011

/12/ Verification Report by Bureau Veritas Certification Holding SAS dated 03rd of June 2011

/13/ Verification Report by Bureau Veritas Certification Holding SAS dated 26th August 2011

/14/ Verification Report by Bureau Veritas Certification Holding SAS dated 14th February 2012

/15/ Verification Report by Bureau Veritas Certification Holding SAS dated 10th May 2012

/16/ Project Design Document, version 3.9 dated 31st of August 2009

/17/ Letter of Approval of National Ecological Investment Agency of Ukraine, #48/23/7 from 23/01/2009

/18/ Approval of Voluntary participation in a Joint Implementation project of Ministry of Economical Affairs in Netherlands #2009JI01, dated 3rd of March 2009

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

/1/ Logbook on electricity consumption by ladle furnace (LF) at Steel Making Shop (SMS) (OJSC "Energomashspetsstal" (EMSS); started 01/01/2011
/2/ Logbook on electricity consumption by VD (OJSC "Energomashspetsstal" (EMSS); started 01/07/2011
/3/ Logbook on gas consumption by furnaces 1, 2, 9, 10, 4, 17, 18 at thermal workshop, started 01/01/2008
/4/ Logbook on metal charge weight and gas consumption by furnaces 1, 2, 9, 10, 4, 17, 18, 16 at thermal workshop, started 01/01/2008
/5/ Logbook on gas consumption by upgraded heating furnaces, started 01/01/2012, finished 31/05/2012
/6/ Logbook on gas consumption by upgraded heating furnaces, started 01/06/2012
/7/ Logbook on gas consumption by upgraded thermal furnaces, started 01/07/2011
/8/ Calibration certificate # 2551 dated 21/06/2012, valid till 21/06/2013, on weighing machine ErMack-VK1rk-80, fabrication # KP 806148, issued by the Dnipropetrovsk Regional State Scientific and Technical Centre for Standardization, Metrology and Certification State Enterprise
/9/ Order-invoice # 06/02 dated 07/06/2012 (weighing machine ErMack-VK1rk-80, fabrication # KP 806148, inventory # 10371)
/10/ Calibration certificate # 2550 dated 21/06/2012, valid till 21/06/2013, on weighing machine ErMack-VK1rk-50, fabrication # KP 506149, issued by the Dnipropetrovsk Regional State Scientific and Technical Centre for Standardization, Metrology and Certification State Enterprise
/11/ Order-invoice # 06/01 dated 07/06/2012 (weighing machine ErMack-VK1rk-50, fabrication # KP 506149, inventory # 10372)
/12/ Passport on weighing machine ErMack-VK1rk-20, fabrication # KP 205122
/13/ Passport on weighing machine ErMack-VK1rk-10, fabrication # vk 0115047
/14/ Passport on weighing machine 01VKT-200M, fabrication # 222
/15/ Passport on meter-logger Ergomera-126, fabrication # 834, inventory # 20823
/16/ Passport on meter-logger Ergomera-126, fabrication # 800
/17/ Passport on meter-logger Ergomera-126, fabrication # 836, inventory # 20821
/18/ Passport on meter-logger Ergomera-126, fabrication # 867, inventory # 21049
/19/ Passport on meter-logger Ergomera-126, fabrication # 866, inventory # 21048

/20/ Passport on meter-logger Ergomera-126, fabrication # 837, inventory # 20822
/21/ Passport on meter-logger Ergomera-126, fabrication # 838
/22/ Passport on meter-logger Ergomera-126, fabrication # 864, inventory # 21050
/23/ Passport on meter-logger Ergomera-126, fabrication # 633, inventory # 72601/6
/24/ Passport on meter-logger Ergomera-126, fabrication # 770
/25/ Passport on meter-logger Ergomera-126, fabrication # 839
/26/ Order-invoice # 36 dated 12/03/2012 (meter-logger IRVIS-RS4-Pp, fabrication # 13346, inventory # 21104)
/27/ Gas consumption flow-chart from 01/06/2012 till 01/07/2012 (GDP-2)
/28/ Order # 3 dated 03.01.2012 on personnel training in 2012 (PJSC "Energomashspetsstal")
/29/ Protocol # 122 dated 31/05/2012 of commission session on health and safety knowledge testing
/30/ Report on PJSC "Energomashspetsstal" shops operation on GHGs reduction in June 2012
/31/ Report on NAS-15000ts unit operation in June 2012
/32/ Report on thermal shop furnace # 1 operation in June 2012
/33/ Report on thermal shop furnace # 2 operation in June 2012
/34/ Report on thermal shop furnace # 4 operation in June 2012
/35/ Report on thermal shop furnace # 9 operation in June 2012
/36/ Report on thermal shop furnace # 10 operation in June 2012
/37/ Report on thermal shop furnace # 17 operation in June 2012
/38/ Report on thermal shop furnace # 18 operation in June 2012
/39/ Report on heating furnaces operation in June 2012
/40/ Report on thermal furnaces operation in June 2012
/41/ Report on EAF-LF operation for June 2012
/42/ Report on vacuumator operation for June 2012 (EAF-50 # 1)
/43/ Report on vacuumator operation for June 2012 (EAF-100 # 5)
/44/ Report on PJSC "Energomashspetsstal" shops operation on GHGs reduction in May 2012
/45/ Report on NAS-15000ts unit operation in May 2012
/46/ Report on heating furnaces operation in May 2012
/47/ Protocol # 661 dated 16/07/2012 of commission session on appointing skill-categories to personnel
/48/ Protocol # 661 dated 16/07/2012 of commission session on appointing skill-categories to personnel
/49/ Protocol # 659 dated 16/07/2012 of commission session on conducting technical exam
/50/ Report on thermal shop furnace # 9 operation in May 2012
/51/ Report on thermal shop furnace # 18 operation in May 2012
/52/ Report on thermal shop furnace # 17 operation in May 2012
/53/ Report on thermal shop furnace # 10 operation in May 2012
/54/ Report on thermal shop furnace # 1 operation in May 2012

/55/ Report on thermal shop furnace # 2 operation in May 2012
/56/ Report on thermal shop furnace # 4 operation in May 2012
/57/ Report on EAF-LF operation for May 2012
/58/ Report on vacuumator operation for May 2012 (EAF-50 # 1)
/59/ Report on vacuumator operation for May 2012 (EAF-100 # 5)
/60/ Photo–meter-logger Ergomera-126, fabrication # 633, inventory # 72601/6
/61/ Photo–furnace # 6, inventory # 21375
/62/ Photo–meter-logger Ergomera-126, fabrication # 837
/63/ Photo–gas meter-logger IRVIS-RS4, fabrication # 13398, inventory # 21158
/64/ Photo–meter-logger Ergomera-126, fabrication # 836, inventory # 20821
/65/ Photo–meter-logger Ergomera-126, fabrication # 867, inventory # 21049
/66/ Photo–meter-logger Ergomera-126, fabrication # 866, inventory # 21048
/67/ Photo–meter-logger Ergomera-126, fabrication # 800
/68/ Photo–meter-logger Ergomera-126, fabrication # 834
/69/ Photo–meter-logger Ergomera-126, fabrication # 864, inventory # 21050
/70/ Photo–meter-logger Ergomera-126, fabrication # 864, inventory # 21050
/71/ Photo–furnace # 39, inventory # 21129
/72/ Photo–meter-logger Ergomera-126, fabrication # 839, inventory # 20889
/73/ Photo–meter-logger Ergomera-126, fabrication # 838, inventory # 20820
/74/ Photo–gas meter-logger IRVIS-RS4-Pp, fabrication # 13345
/75/ Photo–gas meter-logger IRVIS-RS4-Pp, fabrication # 13346
/76/ Photo–weighing machine ErMack VK1rk-50, fabrication # KP 506149
/77/ Statement dated 11/01/2012 on FPW-1 thermal furnace # 39
/78/ Statement dated 01/01/2012 on FPW-1 thermal furnace # 6
/79/ Report on PJSC “Energomashspetsstal” shops operation on GHGs reduction in April 2012
/80/ Report on NAS-15000ts unit operation in April 2012
/81/ Report on thermal shop furnace # 1 operation in April 2012
/82/ Report on thermal shop furnace # 2 operation in April 2012
/83/ Report on thermal shop furnace # 4 operation in April 2012
/84/ Report on thermal shop furnace # 9 operation in April 2012
/85/ Report on thermal shop furnace # 10 operation in April 2012
/86/ Report on thermal shop furnace # 17 operation in April 2012
/87/ Report on thermal shop furnace # 18 operation in April 2012
/88/ Report on heating furnaces operation in April 2012
/89/ Report on thermal furnaces operation in April 2012
/90/ Report on vacuumator operation for April 2012 (EAF-50 # 1)
/91/ Report on vacuumator operation for April 2012 (EAF-100 # 5)

/92/ Report on EAF-LF operation for April 2012
/93/ Inquiry # 27/1286 dated 09/07/2012 on fuel consumption by "Kramatorskteploenergo" OJSC in the 2nd quarter 2012
/94/ Inquiry # 27/787 dated 20/04/2012 on fuel consumption by "Kramatorskteploenergo" OJSC in the 1st quarter 2012
/95/ Letter # 04-28/473 dated 02/04/2012 on gas net calorific value, issued by "Kramatorsk administration of gas distribution and supplying with gas"
/96/ Report on PJSC "Energomashspetsstal" shops operation on GHGs reduction in March 2012
/97/ Report on thermal shop furnace # 1 operation in March 2012
/98/ Report on thermal shop furnace # 2 operation in March 2012
/99/ Report on thermal shop furnace # 4 operation in March 2012
/100/ Report on thermal shop furnace # 9 operation in March 2012
/101/ Report on thermal shop furnace # 10 operation in March 2012
/102/ Report on thermal shop furnace # 17 operation in March 2012
/103/ Report on thermal shop furnace # 18 operation in March 2012
/104/ Report on heating furnaces operation in March 2012
/105/ Report on thermal furnaces operation in April 2012
/106/ Report on NAS-15000ts unit operation in March 2012
/107/ Report on EAF-LF operation for March 2012
/108/ Report on vacuumator operation for March 2012 (EAF-50 # 1)
/109/ Report on PJSC "Energomashspetsstal" shops operation on GHGs reduction in February 2012
/110/ Report on thermal shop furnace # 1 operation in February 2012
/111/ Report on thermal shop furnace # 2 operation in February 2012
/112/ Report on thermal shop furnace # 4 operation in February 2012
/113/ Report on thermal shop furnace # 9 operation in February 2012
/114/ Report on thermal shop furnace # 10 operation in February 2012
/115/ Report on thermal shop furnace # 17 operation in February 2012
/116/ Report on thermal shop furnace # 18 operation in February 2012
/117/ Report on heating furnaces operation in February 2012
/118/ Report on thermal furnaces operation in February 2012
/119/ Report on NAS-15000ts unit operation in February 2012
/120/ Report on EAF-LF operation for February 2012
/121/ Report on vacuumator operation for February 2012 (EAF-50 # 1)
/122/ Report on vacuumator operation for February 2012 (EAF-100 # 5)
/123/ Report on PJSC "Energomashspetsstal" shops operation on GHGs reduction in January 2012
/124/ Report on heating furnaces operation in January 2011
/125/ Report on thermal furnaces operation in January 2011
/126/ Report on NAS-15000ts unit operation in January 2012
/127/ Report on EAF-LF operation for January 2012
/128/ Report on vacuumator operation for January 2012 (EAF-50 # 1)
/129/ Report on vacuumator operation for January 2012 (EAF-100 # 5)
/130/ Report on thermal shop furnace # 1 operation in January 2012
/131/ Report on thermal shop furnace # 2 operation in January 2012

/132/ Report on thermal shop furnace # 4 operation in January 2012
/133/ Report on thermal shop furnace # 9 operation in January 2012
/134/ Report on thermal shop furnace # 10 operation in January 2012
/135/ Report on thermal shop furnace # 17 operation in January 2012
/136/ Report on thermal shop furnace # 18 operation in January 2012
/137/ Accuracy control of meter-logger IRVIS-RS4-Pp, fabrication # 13345
/138/ Agreement # 36/612 dated 26/04/2012 between PC "MIKA" and PJSC "Energomashspetsstal" on providing services
/139/ Accuracy control of meter-logger IRVIS-RS4-PP, fabrication # 13346
/140/ Accuracy control of meter-logger IRVIS-RS4-PP, fabrication # 13398
/141/ Passport on electricity consumption meter SA3U-I670M, fabrication # 798599
/142/ Agreement # 35/12 dated 05/03/2012 between SPE "Ukrgasgeoavtomatika" and PJSC "Energomashspetsstal" on providing services

Persons interviewed:

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

PJSC "Energomashspetsstal"

/1/	Timoshenko V.	- Head of the energy saving department
/2/	Obanin O.	- Head of metrology supply bureau and document metrology examination of major metrologist department
/3/	Smirnov S.	- Chief metrologist
/4/	Polyachenko V.	- Head of the personnel training centre
/5/	Masyuk O.	- Deputy Chief Engineer
/6/	Bozhko V.	- Leading engineer of technical department on steel melting production
/7/	Garkusha O	- Head of the Steel Making workshop
/8/	Bondar M.	- Head of the Forge Press workshop
/9/	Timofeev Y.	- Engineer of forging press shop #1
/10/	Zubkov A.	- Chief Engineer
/11/	Chubar O.	- Head of the environmental safety department
/12/	Romanenko S.	- Head of the automation department

Global Carbon B.V.

/13/	Belskaya N.	- JI Consultant

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
Project approvals by Parties involved				
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 project has been approved by both NFPs. The Letters of Approval were presented to the verification team. Letters of Approval by both Parties were submitted to the secretariat on the final determination stage.	OK	OK
91	Are all the written project approvals by Parties involved unconditional?	Yes, all the written project approvals by Parties involved are unconditional.	OK	OK
Project implementation				
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 is implemented according to the PDD, with respect to which the determination was considered final, and included in the list presented at the UNFCCC JI unit. ***CAR 01*** In the monitoring report indicated that 11/01/2012 was commissioned furnace #39. This furnace is not included in the boundaries established deterministic PDD. Please make the appropriate adjustments.	CAR01	OK
93	What is the status of operation of the	Project has been operational for the whole monitoring	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	project during the monitoring period?	period: - starting date: 01/01/2012 at 00:00 - closing period: 30/06/2012 at 24:00.		
Compliance with monitoring plan				
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?	There are few deviations to the monitoring plan included in the determined PDD. Detailed descriptions of the deviations are given in the Monitoring Report 2.0 that has been finally verified. Revised monitoring plan has been submitted to the AIE during verification, which received a positive determination. ***CAR 02*** The monitoring plan changes were made which are not described in the monitoring report and don't correspond the deterministic PDD. Please make the appropriate adjustments.	CAR02	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 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?	Yes, for calculating the emission reductions, key factors, e.g. those listed in 23 (b) (i)-(vii) above, influencing the baseline emissions and the activity level of the project and the emissions or removals as well as risks associated with the project were taken into account, as appropriate.	OK	OK
95 (b)	Are data sources used for calculating emission reductions or enhancements of	Yes, data sources used for calculating emission reductions are clearly identified, reliable and	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	net removals clearly identified, reliable and transparent?	transparent.		
95 (c)	Are emission factors, including default 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?	Yes, emission factors, including default emission factors used for calculating the emission reductions or enhancements of net removals, are selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice.	OK	OK
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?	Yes, the calculation of emission reductions or enhancements of net removals are based on conservative assumptions and the most plausible scenarios in a transparent manner. ***CAR 03*** Please explain the deviation in the amount of emission reductions obtained in comparison with determined PDD.	CAR03	OK
Applicable to JI SSC projects only – section 96 – 98 not applicable				
Revision of monitoring plan				
Applicable only if monitoring plan is revised by project participant				
99 (a)	Did the project participants provide an appropriate justification for the proposed revision?	***CL 01*** Please explain the need to cross-checking and implementation of new formulas to calculate that. These formulas and the need for this test are not set to the determined PDD.	CL01	OK
99 (b)	Does the proposed revision improve the	Yes, the proposed revision improves the accuracy and	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	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?	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, which was already verified.		
Data management				
101 (a)	Is the implementation of data collection procedures in accordance with the monitoring plan, including the quality control and quality assurance procedures?	Yes, implementation of data collection procedures is in accordance with the monitoring plan, including the quality control and quality assurance procedures.	OK	OK
101 (b)	Is the function of the monitoring equipment, including its calibration status, in order?	Yes, the functions of monitoring equipment, including calibration status, are serviceable and in order. ***CL 02*** Please provide the act of equipment commissioning for the parameters NG 27 and NG 26 and calibration certificate of this device.	CL02	OK
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	Yes, the evidence and records used for the monitoring are maintained in a traceable manner. ***CL 03*** Please provide calibration certificate electricity meter #798599. ***CL 04*** Please provide evidence maitenence mesurement	CL03 CL04 CAR04 CL05	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		equipment. ***CAR 04*** In monitoring report a specific frequency of cross-checking and the staff responsible for this must be provided. ***CL 05*** Please provide date of calculation spreadsheet		
101 (d)	Is the data collection and management system for the project in accordance with the monitoring plan?	Yes, the data collection and management system for the project is in accordance with the monitoring plan. ***CAR 05*** Please correct monitoring duration in excel calculation spreadsheet	CAR05	OK
Verification regarding programmes of activities (additional elements for assessment) section 102 – 105 not applicable				
Applicable to sample-based approach only – section 106 – 110 not applicable				

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
CAR 01 In the monitoring report indicated that 11/01/2012 was commissioned furnace #39. This furnace is not included in the boundaries established deterministic PDD. Please make the appropriate adjustments.	92	The change during the project implementation constitutes modifying the order of furnaces reconstruction resulting in inclusion of furnaces not mentioned in the determined PDD into the energy efficiency program and postponing reconstruction of those furnaces from the list which have not been modernized yet. During the current monitoring period there were two furnaces was commissioned: heating furnace #06 and thermal furnace #39 at Forge Press Shop. Thermal furnace #39 was not originally mentioned in the determined PDD. This Annex 2 of MR contains a description and a justification of changes which occurred during implementation of the JI project as required by “Procedures Regarding Changes During Project Implementation”. Relevant clarifications have been made in MR. Please see revised MR (version 2.0).	Issue is closed.
CAR 02 The monitoring plan changes were made which are not described in the monitoring report and	94	The monitoring of baseline and project emissions and calculation of emission reductions will be performed using same	Issue is closed.

don't correspond the deterministic PDD. Please make the appropriate adjustments.		approaches and formulae as in the determined monitoring plan. The relevant changes in terms of monitoring equipment have been made in the monitoring plan. The detailed information gives in Tables 3,9,10 of MR. Relevant clarifications have been made in MR. Please see revised MR (version 2.0).	
CAR 03 Please explain the deviation in the amount of emission reductions obtained in comparison with determined PDD.	95 (d)	In the determined PDD all calculations were made taking into account the load factor of equipment equal to 80%. Also in "ER calculation and Cash Flow Analysis" project emission calculations were made taking into account the assumed Project specific NG consumption equal to 55% from Baseline specific NG consumption. Real Project specific NG consumption variation is about 9-35% from Baseline specific NG consumption. So real monitored NG consumption in project scenario is lower than in PDD and it leads to additional ERUs. In addition, the changes during the project implementation constitutes modifying the order of furnaces reconstruction resulting in inclusion of furnaces not mentioned in the determined PDD into the energy efficiency program and postponing reconstruction of those furnaces from the list which have not been modernized yet. So now 26 furnaces put into operation and 21 of them according	Issue is closed.

		to PDD. Thus ERs obtained during the current monitoring period (172 219 tCO_2e) are higher in comparison to the ones indicated in the determined PDD (119 103 tCO_2e).	
CL 01 Please explain the need to cross-checking and implementation of new formulas to calculate that. These formulas and the need for this test are not set to the determined PDD.	99 (a)	Every day the Energy Saving Department reports to the Chief Engineer about energy resources consumption by EMSS. That report is the result of analysing of the data logging on a dedicated server. In case of any meter failure, data discrepancy will be found within one day by cross-checking formulae. The meter will be substituted by working one. These formulae are necessary for improving accuracy and transparency of data for monitoring.	Issue is closed.
CL 02 Please provide the act of equipment commissioning for the parameters NG 27 and NG 26 and calibration certificate of this device.	101 (b)	According Ukrainian legislation act of equipment commissioning isn't required. Date of last calibration natural gas meters for heating furnace #06 in FPS is 18.08.2011. Date of last calibration natural gas meters for thermal furnace #39 in FPS 08.08.2011. Please see files "heating #06, FPS_Ergomera-126_837" and "thermal #39, FPS_Ergomera-126_864".	Issue is closed.
CL 03 Please provide calibration certificate electricity meter #798599.	101 (c)	Date of last calibration electricity meter for EAF100 #3 is 13.01.2012.	Issue is closed.

		Please see file “EAF100_3_EM_SA3U-I670M_798599_20120113”.	
CL 04 Please provide evidence maitenence mesurement equipment.	101 (c)	According agreements SPE “Ukrgasgeoavtomatika” and PC “MIKA” maintain mesurement equipment of PJSC “Energomashspetsstal” if it’s needed. Please see attached agreements.	Issue is closed.
CAR 04 In monitoring report a specific frequency of cross-checking and the staff responsible for this must be provided.	101 (c)	All energy sources flows (such as electricity and natural gas) are logged on the server in the Energy Saving Department. Hence the Head of Department V. Timoshenko checks the correctness of measurements by the indirect calculations. All data necessary for the CO_2 emission reductions calculation is collected in the Energy Saving Department. The head of the Energy Saving Department is making calculations on a monthly basis. The general supervision of the monitoring system is executed by the Deputy Chief Engineer A. Masyuk. Relevant clarifications have been made in MR. Please see revised MR (version 2.0).	Issue is closed.
CL 05 Please provide date of calculation spreadsheet	101 (d)	Relevant changes have been made in calculation spreadsheet. Please see revised calculation spreadsheet (version 2.0).	Issue is closed.