



# VERIFICATION REPORT

## INSTITUTE FOR ENVIRONMENT AND ENERGY CONSERVATION

### VERIFICATION OF THE REVAMPING OF SINTERING AND BLAST-FURNACE PRODUCTION AT OJSC “ALCHEVSK IRON AND STEEL WORKS”

FOR THE PERIOD 01/10/2012 – 31/12/2012

REPORT No. UKRAINE-VER/0918/2013

REVISION No. 01

BUREAU VERITAS CERTIFICATION




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**VERIFICATION REPORT**


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Client:	Client ref.:
Institute for Environment and Energy Conservation	Vasyl Vovchak

**Summary:**

Bureau Veritas Certification has made the periodic verification of the JI project "Revamping of sintering and blast-furnace production at OJSC "Alchevsk Iron and Steel Works", UA1000262, project of Institute for Environment and Energy Conservation located in Alchevsk, Lugansk oblast, 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 (CL, CAR and FAR), presented in Appendix A.

In summary, Bureau Veritas Certification confirms that the project is implemented as per determined changes that took place while verification of the monitoring period 01/01/2011 - 30/06/2011 and approved project design documents. 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 790 297 tonnes of CO<sub>2</sub> equivalent for the monitoring period 01/10/2012 – 31/12/2012.

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/0918/2013	JI	
Project title:		
"Revamping of sintering and blast-furnace production at OJSC "Alchevsk Iron and Steel Works"		
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Ivan Sokolov - Internal Technical Reviewer Vyacheslav Yeriomin – Technical Specialist	<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organizational unit	
Work approved by:		
Ivan Sokolov - Operational Manager	<input type="checkbox"/> Limited distribution	
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## Abbreviations

AIE	Accredited Independent Entity
BFG	Blast Furnace Gas
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CHP	Combined Heat and Power
CL	Clarification Request
CO <sub>2</sub>	Carbon Dioxide
COG	Coke Oven Gas
AISW	PJSC “Alchevsk Iron and Steel Works”
DFP	Designated Focal Point
DVM	Determination and Verification Manual
EIA	Environmental Impact Assessment
ERU	Emission Reduction Unit
GHG	Green House Gas(es)
GWP	Global Warming Potential
I	Interview
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
MP	Monitoring Plan
MoV	Means of Verification
NGO	Non Government Organization
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change



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## 1 INTRODUCTION

Institute for Environment and Energy Conservation has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project “Revamping of sintering and blast-furnace production at OJSC “Alchevsk Iron and Steel Works” (hereafter called “the project”) at Alchevsk, Lugansk oblast, 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

Verification scope is defined as an independent and objective review and ex post determination by the Independent Accredited Entity (AIE) of the monitored reductions in GHG emissions. The verification is based on the submitted monitoring report and the determined project design document (PDD) including the project’s baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The 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 Lead Verifier

Olena Manziuk

Bureau Veritas Certification Team Member, Climate Change Lead Verifier

Igor Alekseenko

Bureau Veritas Certification, Technical specialist

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 for Environment and Energy Conservation 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 1 dated 22/02/2013, the Monitoring Report version 2 dated 29/03/2013, and project as described in the determined PDD of the final version.

## **2.2 Follow-up Interviews**

On 06/11/2012 Bureau Veritas Certification performed on-site interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of PJSC “Alchevsk Iron and Steel Works” (according to the documentation checked, 16/05/2011 PJSC “Alchevsk Iron and Steel Works” was established by changing the name of juridical person OJSC “Alchevsk Iron and Steel Works” to PJSC “Alchevsk Iron and Steel Works”) and Institute for Environment and Energy Conservation were interviewed (see References). The main topics of the interviews are summarized in Table 1.

**Table 1 Interview topics**

Interviewed organization	Interview topics
PJSC "Alchevsk Iron and Steel Works"	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 IT management Training of personnel Quality management procedures and technology Internal audits and check-ups
Institute for Environment and Energy Conservation	Baseline methodology Monitoring plan Monitoring report

### 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 one Corrective Action Request and two Clarification 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 were no remaining issues and Forward Action Requests from the previous verification.

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

Written project approval was received from the Netherlands DFP (Declaration of Approval 2011JI14 on the JI project “Revamping of sintering and blast-furnace production at OJSC “Alchevsk Iron and Steel Works” issued by Ministry of Economic Affairs, Agriculture and Innovation dated 10/05/2011).



The abovementioned written approval is unconditional.

Also, Letter of Approval (LoA #1155/23/7 dated 11/05/2011) on the JI project "Revamping of sintering and blast-furnace production at OJSC "Alchevsk Iron and Steel Works" was issued by National Environmental Investment Agency of Ukraine that is National Focal Point of Host Party (Ukraine).

### 3.3 Project implementation (92-93)

The implementation status of the project:

- installation of pulverized coal injection (PCI) facility at BF # 1 (implementation of this measure was started in October 2006 and was completed in May 2009);
- installation of PCI facility at BF # 5 (implementation of this measure was started in October 2006 and was completed in August 2009);
- installation of PCI facilities at BFs # 3 and # 4 (implementation of this measure was started in October 2006, and will be completed in the first quarter of 2014 at BF # 3 and in the first quarter of 2013 at BF # 4);
- renewal and reconstruction of BF # 1 (implementation of this measure was started in the first half of 2004 and BF#1 was commissioned on 16th of May 2007);
- renewal and reconstruction of BF # 5 (implementation of this measure was started in 2006 and such measure was implemented during the first quarter of 2012. Majority of renewal and reconstruction measures at BF # 5 were connected to ensuring the PCI facility to work at full capacity and installation of system that injects nitrogen into the interbell space of BF instead of steam. The nitrogen injection system was implemented in March 2012 in compliance with the statement dated 25/09/2012);
- reconstruction of the oxygen unit # 4 (implementation of this measure was started in 2004 and was completed in December 2005);
- installation of oxygen units # 7 (implementation of this measure was started in 2007 and was completed in 2008);
- installation of oxygen units # 8 (implementation of this measure was started in 2007 and was completed in 2009);
- construction of BF # 2 (implementation of this measure was started in 2007 and was not completed during the monitoring period. For the present time construction of BF # 2 is delayed because of adverse market situation and lack of financing. Construction of BF # 2 will be continued after improvement of market situation and availability of funding. According to the project implementation schedule stated in the Project



Design Document (PDD), commissioning of the measure is expected in the year 2015);

- construction of new sinter plant (implementation of this measure was started in 2006 and was not completed during the monitoring period. According to the project implementation schedule in the PDD, commissioning of the sinter plant is expected in the year 2016);
- construction of new lime kilns #5 and #6 (implementation of this measure was started in 2005. New lime kiln #5 was operating in starting-up mode from December 2011 till February 2012 and was commissioned in February 2012 in compliance with the statement dated 29/02/2012. New lime kiln #6 is operating in starting-up mode from May 2012 till December 2012. And that lime kiln was commissioned within the reporting period 01/10/2012 – 31/12/2012. Based on the statement of registration committee on commissioning, it was implemented on 26/12/2012.

The identified areas of concern as to Project implementation, project participants response and BV Certification's conclusion are described in Appendix A (refer CAR01 and CL01).

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

The monitoring occurred 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 and in accordance with the revisions to the monitoring plan determined during the verification of the first half-year of 2011.

For calculating the emission reductions, key indicators, constants and variables such as total pig iron output, quantity of each fuel used in making pig iron, emission factor for fuel consumption, electricity consumed in producing pig iron, emission factor for electricity consumption, quantity of fuel used in sintering process, electricity consumed in sintering process, quantity of reducing agents, emission factor of each reducing agent, quantity of each other input in pig iron production, emission factor of each other input, quantity of fuel used for balance of process needs, and electricity consumed for balance of process needs, 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.

Monitoring report for the JI project (the monitoring period from 01/10/2012 to 31/12/2012) is already using specific values of carbon dioxide emission factors for fuel based on specific carbon content or calorific value of fuel. Emission factors from consumption of coal (anthracite), limestone and dolomite and for production of coke and iron pellets are based on IPCC data due to the fact that national data are not officially approved by the national designated entity. As soon as they are approved, the corresponding changes will be incorporated into the monitoring reports.

Taking into account that the project boundary of the JI project “Installation of a new waste heat recovery system at Alchevsk Coke Plant, Ukraine” (UA1000130 - registered under Track 1) includes blast-furnaces of AISW with respect to particular volumes of consumed dry blast-furnace coke, the CO<sub>2</sub> emission reductions that were generated during the period of 01/10/2012 – 31/12/2012 due to component three (3) of mentioned above JI project were attributed to the leakages of GHG’s.

Project line emissions were calculated as the result of multiplying the total volume of dry blast-furnace coke consumed in the blast-furnaces of AISW during the period of 01/10/2012 – 31/12/2012 by CO<sub>2</sub> emission factor for coke.

Baseline emissions due to component three (3) were calculated based on such initial data as: volumes of consumed dry blast-furnace coke in the blast-furnaces of AISW and coke quality indicators (M<sub>10</sub>, M<sub>25</sub>, M<sub>80</sub>) for wet-quenched and dry-quenched blast-furnace coke during the period of 01/10/2012 – 31/12/2012. JI specific approach, which is applied for calculation of baseline emissions due to component three (3), is demonstrated in the PDD of JI project “Installation of a new waste heat recovery system at Alchevsk Coke Plant, Ukraine”.

Leakages of GHG emissions were calculated by subtracting total project line emissions generated by the JI project “Installation of a new waste heat recovery system at Alchevsk Coke Plant, Ukraine” from the baseline emissions that were generated by the component three (3) of the mentioned above project during fourth quarter reporting period.



After that, leakages of GHG emissions were subtracted from the total volume of emission reductions associated with this project during this monitoring period.

Leakages during the fourth quarter of 2012 are equal 32 495 tonnes CO<sub>2</sub> equivalent.

Mentioned above volume of leakages is based on actual data which can be proved by initial data from AISW and Alchevsk Coke Plant. The Excel-file with calculation of leakages, together with initial data from AISW and Alchevsk Coke Plant, was provided to the verification team in order to verify the mentioned above amount of leakages generated under this project.

Furthermore, volume of leakages that estimated for the regarded monitoring period is in accordance with emission reductions generated by the component three (3) stated in Verification Report No. UKRAINE-ver/0670/2012 dated 21/02/2013 for the JI project "Installation of a new waste heat recovery system at Alchevsk Coke Plant, Ukraine" (the reporting monitoring period 01/10/2012 – 31/12/2012).

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

The difference between the value of emission reductions that were actually generated during the fourth quarter of 2012 and emission reduction estimated in the registered PDD is caused by the following reasons: the better improvement of raw materials quality that are used in pig iron production process, in particular, of its fraction content, hardness, abrasion, ash content, sulphur content as well as the level of impurities, iron content etc. and better technological improvements of pig iron production (melting) process than it was previously expected in the registered PDD; market influence on the replacement of coke by coal; implementation of energy efficiency measures which are described in registered PDD and ascribed to project boundaries, etc.

The identified areas of concern as to Compliance of the monitoring plan with the monitoring methodology, project participants response and BV Certification's conclusion are described in Appendix A (refer to CL02).



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

No additional revisions to the monitoring plan have occurred through the monitoring period 01/10/2012 – 31/12/2012.

Revisions to the monitoring plan were finally determined during the verification of the first half-year of 2011.

### **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 PDD and revised monitoring plan, including the quality control and quality assurance procedures. These procedures are mentioned in the section “References” of this report.

The monitoring of JI project indicators at AISW was realized on regular basis where the system of data collection on FER consumption was being used. The data needed for the monitoring of the project were collected during the process of normal equipment use. The production facilities of the plant were equipped with the measuring devices such as scales, meters and gas, water, steam, electricity consumption meters. The monitoring of the project formed an organic part of routine monitoring of manufacturing process. This allowed receiving data regarding the project continuously.

The Chief Metrological Specialist of the AISW was in charge for maintenance of the facilities and monitoring equipment as well as for their accuracy required by Regulation PP 229-9-056-863/02-2005 of “Metrological services of the metallurgical mills” and by “Guiding Metrological Instructions”. In case of defect, discovered in the monitoring equipment, the actions of the staff were determined in Guiding Metrological Instructions. The measurements were conducted constantly in automatic regime.

The data required to be monitored under the proposed JI project was routinely collected within the normal operations of the AISW. Together with this data collection was an integral part of routine monitoring. Data was compiled in (i) day-to-day records, (ii) quarterly records, and (iii) annual records. Data were collected in the electronic database of



PJSC “Alchevsk Iron and Steel Works” and in printed documents. All records were finally stored in Planning Department.

According to the order # 95 dated 01/02/2012 on appointment of responsible persons for the monitoring of JI Projects under the Kyoto Protocol and also on the period of monitoring data storage at the plant, the data that are required to be monitored are kept during whole crediting period and for two years after the last transfer of emission reduction units (ERUs) under the project.

The revised monitoring plan that was finally determined in the verification report for the first half-year of 2011 was implemented by different specialists of the AISW under supervision of Chief Energy Specialist and managed by Director General of the Plant.

The measurement results were being used by the Chief power-engineering specialist department, by the services and technical staff of the Steel Mill. They were reflected in the technological instructions of production processes regime and also in the “Guiding Metrological Instructions” revised versions. The monitoring data reports and calculations were under the competence of the Chief power-engineering specialist assistant in accordance to the interior orders of the Steel Mill.

All main production shops and specialists of the plant were involved in preparation of monitoring report under coordination of Chief Energy Specialist.

With the project equipment introduction the workers of AISW have the opportunity to update their working skills, stimulated by the theoretical and practical trainings and studies to operate the project equipment that is implemented under the project at the Steel Mill. Thus during this monitoring period, the direction of AISW has organized staff professional training at sinter plant and blast-furnace shop under the programs of AISW staff professional training. Inquiry №021/53 dated 22/02/2013 on PJSC “Alchevsk Iron and Steel Works” personnel trainings in the IV quarter 2012 was provided to the verification team to justify the training performance.

AISW used the accredited system of quality regulation according to the requirements of the ISO 9001 standard. In order to ensure the appropriate quality management system implementation the internal audits are conducted at the plant on monthly basis based on the AISW order # 864



of 27/12/2010. The department of quality management is responsible for the internal audit implementation at the plant and for the storage of the Reports on the results of the audits.

During this monitoring period (namely on 17/10/2012), planned internal audit on compliance to the standard of ISO 9001:2008 Quality Management System was conducted at power plant of AISW. Report on conducted internal audit №50 dated 29/10/2012 was revised by the verifiers.

The Guiding Metrological Instructions were developed in accordance with ISO 9001. They secured required level of accuracy by using monitoring equipment and by the possibility to crosscheck the data adequacy.

Monitoring equipment met the regulatory requirements of Ukraine regarding accuracy and measurement error. All the equipment used for monitoring purposes, were in line with national legislative requirements and standards and also with ISO 9001 standard. The accuracy of devices was guaranteed by the manufacturers; the error was calculated and confirmed by device certificates. All monitoring equipment was covered by the detailed verification (calibration) plan. The verification process was under strict control. All measuring equipment was included in the verification schedule and verified with established periodicity. According to the schedule of verification, all devices were in satisfactory condition. The documented instructions to operate the facilities were stored at the working places.

The standard ISO 14001 Environmental management systems has been implemented and certified at AISW. The standard determines the procedures related to collection and archiving of data on environmental impacts within activity of the plant and, accordingly, the proposed project activity.

Also, the standard BS OHSAS 18001:2007 Occupational Health and Safety Management Systems was implemented at AISW in the scope of production of cast iron, steel, cast and rolled slabs, steel plate and bar section. The standard helps the plant to manage and control its occupational health and safety risks and to improve its occupational health and safety performance.

During this monitoring period, internal audits on compliance to the standard of ISO 14001:2004 Environmental Management Systems and on





compliance to the standard of BS OHSAS 18001:2007 Occupational Health and Safety Management Systems were not conducted. These internal audits are conducted on the annual basis.

The monitoring procedures were quite comprehensible, because they had already been used at AISW for measuring input and output production parameters, and also for receiving data on level of FER and raw-materials consumption. The most effective accessible methods were used for the error minimization. Generally the error level was low for all parameters (varied between 0,5% and 2%) that were subjected to the monitoring. The uncertainty level for each parameter monitored is demonstrated in Section D.2. "Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored" of the PDD and can be confirmed by the relevant passports for each monitoring equipment. Thus, the measurements uncertainty level corresponded with technologies, used in the production process, and was taken into the account when the data were taken from devices.

As a fact, equipment replacement was fixed and justified with documented evidences. On 30/01/2013 natural gas consumption meter serial #295314 was replaced by natural gas consumption meter serial #715344 and that was confirmed by the information note for chief metrology engineer of AISW # 050/32 dated 30/01/2013 on the equipment removal. The replacement of mentioned equipment is not within the reporting monitoring period 01/10/2012 -31/12/2012. That information is important and is to be taken into consideration during next verification process.

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 PDD and the revision of the monitoring plan determined during the verification of first half-year of 2011.

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

Not applicable.



## 4 VERIFICATION OPINION

Bureau Veritas Certification has performed the periodic verification of the JI project “Revamping of sintering and blast-furnace production at OJSC “Alchevsk Iron and Steel Works” 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 PJSC “Alchevsk Iron and Steel Works” 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 revised Monitoring Plan determined during the verification of first half-year of 2011. 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 dated 29/03/2013 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as per determined changes that took place while verification of the monitoring period 01/01/2011-30/06/2011 as well as planned and described in approved project design documents. 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 01/10/2012 to 31/12/2012

Baseline emissions	:	3 146 681	tonnes CO <sub>2</sub> equivalent
Project emissions	:	2 323 889	tonnes CO <sub>2</sub> equivalent
Leakages	:	32 495	tonnes CO <sub>2</sub> equivalent
Emission Reductions	:	790 297	tonnes CO <sub>2</sub> equivalent

For the monitoring period (01/10/2012 – 31/12/2012), total amount of emission reductions is 790 297 tonnes CO<sub>2</sub> equivalent.

Project emissions and baseline emissions which are stated above are rounded by monitoring report developers to the whole figure and are based on calculations which are demonstrated in excel file attached to the monitoring report.



## 5 REFERENCES

### Category 1 Documents:

Documents provided by the Institute for Environment and Energy Conservation that relate directly to the GHG components of the project.

- /1/ Project Design Document of the JI project “Revamping of sintering and blast-furnace production at OJSC “Alchevsk Iron and Steel Works”, version 4 dated 14/04/2011
- /2/ Decree of Cabinet of Ministers of Ukraine # 206, dated 22/02/2006
- /3/ Monitoring Report of the JI project “Revamping of sintering and blast-furnace production at OJSC “Alchevsk Iron and Steel Works” (4th quarter 2012), version 1 dated 22/02/2013
- /4/ Monitoring Report of the JI project “Revamping of sintering and blast-furnace production at OJSC “Alchevsk Iron and Steel Works” (4th quarter 2012), version 2 dated 29/03/2013
- /5/ Excel calculation spreadsheet “ER calculation\_RS&BFP\_4\_2012”
- /6/ Verification Report “Revamping of sintering and blast-furnace production of OJSC “Alchevsk Iron and Steel Works” (01/01/2011 – 30/06/2011), version 03 of 25/09/2011
- /7/ Monitoring Report “Revamping of sintering and blast-furnace production at OJSC “Alchevsk Iron and Steel Works” (01/01/2011-30/06/2011), version 2 of 14/09/2011 (with the revised monitoring plan included in the monitoring plan)
- /8/ Verification Report No. UKRAINE-ver/0719/2012 of the JI project “Revamping of sintering and blast-furnace production at OJSC “Alchevsk Iron and Steel Works” for the 3<sup>rd</sup> quarter 2012 dated 26/11/2012 issued by BVC
- /9/ Letter of Endorsement № 1806/23/7 on the JI project “Revamping of sintering and blast-furnace production at OJSC “Alchevsk Iron and Steel Works” dated November, 09, 2010 issued by National Environmental Investment Agency of Ukraine
- /10/ Declaration of Approval 2011JI14 on the JI project “Revamping of sintering and blast-furnace production at OJSC “Alchevsk Iron and Steel Works” issued by Ministry of Economic Affairs, Agriculture and Innovation dated 10/05/2011
- /11/ Letter of Approval # 1155/23/7 on the JI project “Revamping of sintering and blast-furnace production at OJSC “Alchevsk Iron and Steel Works” issued by National Environmental Investment Agency of Ukraine dated 11/05/2011
- /12/ Verification Report No. UKRAINE-ver/0670/2012 dated 21/02/2013



of the JI project “Installation of a new waste heat recovery system at Alchevsk Coke Plant, Ukraine” for the monitoring period 01/10/2012 – 31/12/2012

**Category 2 Documents:**

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

- /1/ Statement dated 26/12/2012 of registration committee on commissioning of finished by construction object
- /2/ Report # 50 dated 29/10/2012 on internal audit
- /3/ Plan dated 08/10/2012 of scheduled internal audit
- /4/ Report on fuel, heat and electricity consumption for 2012 (Form 11-MTP)
- /5/ Technical report of Networks and Substations Shop for December 2012
- /6/ Passport # 34 on car scales, fabrication # 1. Last calibration date – 07.12.2012
- /7/ Passport on natural gas flow-meter, fabrication # 22526 (05900228). Last calibration date–15.01.2013
- /8/ Passport on natural gas flow-meter, fabrication # 93038. Last calibration date–01.02.2013
- /9/ Passport on flow-meter, fabrication # 295314. Last calibration date–12.11.2012
- /10/ Passport on flow-meter, fabrication # 715344. Last calibration date–01.02.2013
- /11/ Passport on flow-meter, fabrication # 05900228 (22526). Last calibration date–15.01.2013
- /12/ Information note #050/32 dated 30/01/2013 on device dismantling due to orifice replacement and conservation (device # 295314 was replaced by device # 715344)
- /13/ Content of carbon in blast-furnace coke at coke-oven battery # 10-6ic
- /14/ Parameters of coke quality for October-December 2012
- /15/ Letter # 020.05.04 dated 15/01/2013 of technical department on pulverized coal and slag yield at PJSC “Alchevsk Iron and Steel Works” in 2012
- /16/ Technical reports for October, November, December 2012
- /17/ Inquiry №021/53 dated 22/02/2013 on PJSC “Alchevsk Iron and Steel Works” personnel trainings in the IV quarter 2012
- /18/ Report on environmental protection for 2012 (Form 2-TΠ air)
- /19/ Balance sheet on electricity consumption for October, November, December 2012



## VERIFICATION REPORT

- /20/ Report on coke interchangeable controller by PJSC "Alchevskkoks" OP-3 Technical Control Department. Logbook started 01/10/2012; finished 31/10/2012
- /21/ Report on coke interchangeable controller by PJSC "Alchevskkoks" OP-3 Technical Control Department. Logbook started 01/11/2012; finished 30/11/2012
- /22/ Report on coke interchangeable controller by PJSC "Alchevskkoks" OP-3 Technical Control Department. Logbook started 01/12/2012; finished 31/12/2012
- /23/ Glossary of JI terms, version 03, JISC
- /24/ Guidance on Criteria for Baseline Setting and Monitoring, version 03, JISC
- /25/ JISC "Clarification regarding the public availability of documents under the verification procedure under the Joint Implementation Supervisory Committee", version 03
- /26/ Passport for natural gas consumption meter Метран ser. #000225, last calibration date: 14/08/2012
- /27/ Passport for natural gas consumption meter Диск-250 ser. #10334, last calibration date: 14/08/2012
- /28/ Passport for natural gas consumption meter Диск-250 ser. #52206, last calibration date: 28/08/2012
- /29/ Passport for natural gas consumption meter Метран ser. #162527, last calibration date: 07/08/2012
- /30/ Passport for natural gas consumption meter Сафир ser. #09942204, last calibration date: 29/08/2012
- /31/ Passport for scales for weighting coke, coal, limestone and pellets 2315BB-150Э/2СД, #15. Last calibration date: 12/09/2012
- /32/ Passport for scales for weighting coke, coal, limestone and pellets 2361BB-80Э/1Д, #61. Last calibration date: 12/09/2012
- /33/ Electricity supply meter LZQM #64840. Last calibration date: 23/08/2012
- /34/ Electricity supply meter LZQM #64869. Last calibration date: 23/08/2012
- /35/ Electricity supply meter LZQM #66698. Last calibration date: 01/08/2012
- /36/ Electricity supply meter LZQM #72174. Last calibration date: 13/08/2012

**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/ A. Bondarenko - deputy chief of Sinter plant at PJSC "AISW";
- /2/ N. Krasnonis – chief of environmental protection department at PJSC "AISW";
- /3/ T. Zaporozhets – metrology engineer of control measurement equipments and apparatus shop at PJSC "AISW";
- /4/ S. Sbitniev - deputy chief of the technical department at PJSC "AISW";
- /5/ V. Pavlonikov - chief of the technical department at PJSC "AISW";
- /6/ O. Stepanenko - chief of staff training department at PJSC "AISW";
- /7/ L. Iaroshenko – engineer on metrology of central weighting economy at PJSC "AISW";
- /8/ A. Tymoshenko - deputy chief of the central weighting economy at PJSC "AISW";
- /9/ O. Kaiuda – chief of team of electricity and technical laboratory at PJSC "AISW";
- /10/ G. Bremze - contractor of PJSC "AISW";
- /11/ V. Ivliev - deputy chief power engineer at PJSC "AISW";
- /12/ A. Yermolayeva – specialist of the Institute for Environment and Energy Conservation Ltd.



## APPENDIX A: VERIFICATION PROTOCOL

**Table 1 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 DFP of Netherlands has issued a written project approval for the project (Ministry of Economic Affairs, reference: 2011JI14 of 10/05/2011). Letter of Approval for the JI project "Revamping of sintering and blast-furnace production at OJSC "Alchevsk Iron and Steel Works" was also issued by the Host Party (Ukraine). Namely, the LoA # 1155/23/7 dated 11/05/2011).	OK	OK
91	Are all the written project approvals by Parties involved unconditional?	All the written project approvals by Parties involved are unconditional.	OK	OK





## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
<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?	<p>The project has been implemented in accordance with the PDD of the final version listed on the UNFCCC JI website and according to the revised monitoring plan determined within the verification for half-year of 2011.</p> <p><b>Corrective Action Request 01 (CAR01).</b> Provided documented evidence (the document #021/53) that justifies training performance at PJSC "AISW" within the fourth quarter 2012 is dated 22/02/2013. Please revise details on training that described in the monitoring report and make amendments.</p>	CAR01	OK
93	What is the status of operation of the project during the monitoring period?	<p>The Monitoring Report provides the list of project activities including their implementation status.</p> <p>During the current reporting period</p>		OK



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>additional lime kiln #6 was commissioned. That is justified by the statement of PJSC "AISW" dated 26/12/2012. The lime kiln #6 was operating in starting-up mode from May 2012 till December 2012.</p> <p><b>Clarification Request 01 (CL01).</b> Please clarify whether measures implemented during the regarded monitoring period (i.e., the fourth quarter of 2012) influence the amount of emission reduction that was achieved.</p>	CL01	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 occurs in accordance with the revised monitoring plan deemed final within the verification for the first half-year of 2011.	OK	OK



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## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
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?	For calculating the emission reductions, key factors were taken into account.	OK	OK
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	Data sources used for calculating emission reductions are identified in the Monitoring Report.	OK	OK
95 (c)	Are emission factors, including default emission factors, if used for calculating the emission	Emission factors that used for emission reduction calculation are selected by carefully balancing accuracy and	OK	OK



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice?	reasonableness. Based on Order # 75 issued by National Environmental Investment Agency of Ukraine, the most recent value of CO <sub>2</sub> emission factor for electricity consumption was used during emission reductions calculation.		
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?	The calculation of emission reductions is based on conservative assumptions. And as a result of documents revision, all data connected with estimation of emission reduction is prevented through the Monitoring report and excel spreadsheet with calculation.  <b>Clarification Request 02 (CL02).</b> Please clarify the algorithm of calculation of calorific value of natural gas and provide it in the relevant excel calculation spreadsheet.	CL02	OK



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## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
<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	N/A	N/A
<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-SSCBUNDLE?	Not applicable	N/A	N/A
97 (b)	If the determination was conducted on the basis of an overall monitoring plan, have the project participants	Not applicable	N/A	N/A



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	submitted a common monitoring report?			
98	<p>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?</p> <p>Do the monitoring periods not overlap with those for which verifications were already deemed final in the past?</p>	Not applicable	N/A	N/A
<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?	No revisions to the monitoring plan are occurred during this monitoring period (i.e., the period from 01/10/2012 to 31/12/2012). Thus, that section is not applicable.	N/A	N/A



BUREAU  
VERITAS

## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
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?	Not applicable	N/A	N/A
<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?	Procedures of data collection are implemented in compliance with the revised monitoring plan that was determined during the verification of the 01/01/2011 – 30/06/2011 period. System of data collection on FER consumption and production level is used. Also, measuring equipment is involved in the JI project, such as scales, gas meters, water meters, steam meters, electricity consumption meters. Monitoring data of	OK	OK



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>the project is monitored continuously due to specific monitoring system and measurement equipment. Also, please, see section 9 of the monitoring report of final version.</p>		
101 (b)	Is the function of the monitoring equipment, including its calibration status, is in order?	<p>All monitoring equipment has calibration. It is calibrated with periodic frequency (passport and other documents of equipment state the calibration frequency for every device) according to the national regulations. During site visit verification team received and reviewed passports and calibration certificates of some measurement equipment on a spot-check basis.</p>	OK	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 maintained in a traceable manner.	OK	OK





## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
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 in accordance with the revised monitoring plan that was determined in the frame of the verification report for the monitoring period 01/01/2011 – 30/06/2011. Implementation of monitoring system was checked through site visit, and concluded that monitoring system is completely in accordance with the monitoring plan.	OK	OK
<b>Verification regarding programs of activities (additional elements for assessment)</b>				
102	Is any JPA that has not been added to the JI PoA not verified?	Not applicable	N/A	N/A
103	Is the verification based on the monitoring reports of all JPAs to be verified?	Not applicable	N/A	N/A
103	Does the verification ensure the accuracy and conservativeness	Not applicable	N/A	N/A



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	of the emission reductions or enhancements of removals generated by each JPA?			
104	Does the monitoring period not overlap with previous monitoring periods?	Not applicable	N/A	N/A
105	If the AIE learns of an erroneously included JPA, has the AIE informed the JISC of its findings in writing?	Not applicable	N/A	N/A
<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: (i) For each verification that uses a sample-based approach, the sample selection	Not applicable	N/A	N/A



VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	<p>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:</p> <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</li> </ul>			



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	verified; and – The samples selected for prior verifications, if any?			
107	Is the sampling plan ready for publication through the secretariat along with the verification report and supporting documentation?	Not applicable	N/A	N/A
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	N/A	N/A



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
109	Is the sampling plan available for submission to the secretariat for the JISC.s ex ante assessment? (Optional)	Not applicable	N/A	N/A
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	N/A	N/A

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

Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
<b>Corrective Action Request 01 (CAR01).</b> Provided documented	Table 1, 92	Necessary amendments are now made in the modified	Information was revised and corrected in



## VERIFICATION REPORT

Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
evidence (the document #021/53) that justifies training performance at PJSC "AISW" within the fourth quarter 2012 is dated 22/02/2013. Please revise details on training that described in the monitoring report and make amendments.		monitoring report.	compliance with documented evidence. Issue is closed.
<b>Clarification Request 01 (CL01).</b> Please clarify whether measures implemented during the regarded monitoring period (i.e., the fourth quarter of 2012) influence the amount of emission reduction that was achieved.	Table 1, 93	Measures implemented during the fourth quarter of 2012 are connected with gradual improvement of technological process of pig iron production, including the better improvement of raw materials quality and its fraction content, hardness, abrasion, ash content, sulphur content as well as the level of impurities, iron content etc. All implemented measures under the project activity have influence on the amount of	Based on the clarification, issue is closed.



## VERIFICATION REPORT

Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
		emission reduction, and are under the control of the project participant.	
<b>Clarification Request 02 (CL02).</b> Please clarify the algorithm of calculation of calorific value of natural gas and provide it in the relevant excel calculation spreadsheet.	Table 1, 95 (d)	Calorific value of natural gas is measured on regular basis by AISW. Necessary explanation on calculation of calorific value of natural gas is now provided in the modified excel calculation spreadsheet.	Detailed clarification was provided in excel calculation spreadsheet. Hence, issue is closed.