



BUREAU
VERITAS

VERIFICATION REPORT

GLOBAL CARBON B.V.

VERIFICATION OF THE ENERGY EFFICIENCY MEASURES AT THE "PUBLIC JOINT STOCK COMPANY AZOVSTAL IRON & STEEL WORKS"

(FOR THE PERIOD 01/06/2010 - 31/03/2011)

BUREAU VERITAS CERTIFICATION
REPORT No. UKRAINE-VER/0241/2011

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VERIFICATION REPORT "ENERGY EFFICIENCY MEASURES AT THE "PUBLIC JOINT STOCK COMPANY AZOVSTAL IRON & STEEL WORKS"

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Client: Global Carbon B.V.	Client ref.: Lennard de Klerk

Summary:
 Bureau Veritas Certification has made the 2nd periodic verification for the period from 01 June 2010 to 31 March 2011 of the "Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works" project of Global Carbon B.V. located in the city of Mariupol, Donetsk region, 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 project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

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

In summary, Bureau Veritas Certification confirms that the project is implemented as per determined changes. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reduction is calculated accurately and without material errors, omissions, or misstatements, and the ERUs issued totalize 1529850 tons of CO₂eq for the monitoring period from 01/06/2010 to 31/03/2011.

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

Report No.: UKRAINE-ver/0241/2011	Subject Group: JI
Project title: Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works"	
Work carried out by: Igor Kachan - Team Leader, Lead Verifier Vera Skitina - Team Member, Lead Verifier	
Work reviewed by: Ivan Sokolov - Internal Technical Reviewer Igor Alekseyenko - Technical specialist	
Work approved by: Flavio Gomes - Operational Manager	
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Abbreviations

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AIE	Accredited Independent Entity
BF	Blast Furnace
BOF	Basic Oxygen Furnaces Workshop
BVCH	Bureau Veritas Certification Holding SAS
BFW	Blast Furnace Workshop
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEOD	Chief Energy Officer Department
CHP	Combined Heat and Power Plant
CL	Clarification Request
CO ₂	Carbon Dioxide
ERU	Emission Reduction Unit
EIA	Environmental Impact Assessment
FAR	Forward Action Request
GHG	Green House Gas(es)
JI	Joint Implementation
JISC	JI Supervisory Committee
MP	Monitoring Plan
MR	Monitoring Report
OHF	Open Hearth Furnaces Workshop
PDD	Project Design Document
SMEW	Control and Metering Equipment Workshop
UNFCCC	United Nations Framework Convention on Climate Change



1 INTRODUCTION

Global Carbon B.V. has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project "Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works" (hereafter called "the project") located in the city of Mariupol, Donetsk region, 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.

The verification covers the period from 1st June 2010 to 31th March 2011.

1.1 Objective

Verification is the periodic independent review and ex post determination by the Accredited Independent Entity (AIE) 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 Accredited Independent Entity of the monitored reductions in GHG emissions. The verification is based on the submitted monitoring report, the determined project design document including the project's baseline study, revised 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:

Igor Kachan

Bureau Veritas Certification, Team Leader, Climate Change Lead Verifier

Vera Skitina

Bureau Veritas Certification, Team Member, Climate Change Lead Verifier

This verification report was reviewed by:

Ivan Sokolov

Bureau Veritas Certification, Internal Technical Reviewer

Igor Alekseyenko

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, baseline, and monitoring plan, 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 1.0 of 18 April 2011, version 2.0 of 12 May 2011, version 3.0 of 16 May 2011, revised Monitoring Plan and project as described in the determined PDD.

2.2 Follow-up Interviews

On 20/04/2011 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 Global Carbon B.V. and Public Joint Stock Company Azovstal Iron & Steel Works were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
Public Joint Stock Company Azovstal Iron & 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
Consultant: Global Carbon B.V.	Baseline methodology Monitoring plan Revision to the 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, Corrective and Forward Action Requests are documented in the Verification Protocol in Appendix A. The verification of the Project resulted in 19 Corrective Action Requests and 06 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

During previous periodic verification conducted by Bureau Veritas Certification one Forward Action Request was issued:



FAR01: Please, submit any documented instruction which indicates that the data monitored and required for verification are to be kept for two years after the crediting period as per *Jl determination and verification manual*.

The Corrective Action Request 17 has been raised by the Bureau Veritas Certification verification team in order to clarify how FAR have been addressed.

As a response to FAR01 the project participants provided internal Order regulating storage of data monitored and required for verification. The Order approved by Public Joint Stock Company Azovstal Iron & Steel Works was submitted to the verification team. Thus, FAR01 has been resolved on the basis of documentation provided.

3.2 Project approval by Parties involved (90-91)

The project was approved by the host Party, Ukraine, which is confirmed by the Letter of Approval #1594/23/7 issued by National Environmental Investment Agency of Ukraine on 12/10/2010. The written project approval by the Netherlands, the other Party involved, 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 (Letter of Approval issued by NL Agency, Ministry of Economic Affairs of Netherlands #2010JI20 dated 24/06/2010). The abovementioned written approvals are unconditional.

3.3 Project implementation (92-93)

The project aims to reduce the amount of CHG emissions by reducing the specific coke consumption through an integrated energy efficiency program. The project consists of several components or measures.

Modernization and reconstruction of the BFs

Modernizations at the BFW mainly include:

1. Introduction of the brickwork of the furnace's stack and hearth made from composite refractory body (Si-SiC-Al₂O₃). This measure is directed to decrease of the heat losses from the hearth, adjustment of the heat balance of the furnace and coke savings as a consequence. In addition introduction of the new brickwork's materials will prolong lifetime of the furnace in comparison with regular materials used in Ukraine.

2. Introduction of the automatic control systems in order to control and manage:

- Tuyere failure;
- Natural gas flow distribution over the tuyeres;
- Temperature field over the surface of charging materials;
- Cooling of the furnace's stack;



- Heat load at heat exchangers at hearth;
 - Charging process.
3. Reconstruction of the BF2. Reconstruction of BF2 was started at the end of 2003. It includes the following engineering solutions:
- Total dismantling of the existing BF2 including furnace's bed;
 - Construction of the BF with the pay-load volume of 1719m³;
 - Dismantling of the existing cast house with the construction of the new one;
 - Dismantling of the existing cowpers with the construction of the new ones;
 - Construction of the new facilities such as:
 - Electrical equipment of the charging system;
 - Air cooling station of the hearth bottom;
 - Suction cleaning system of the cast house's emissions;
 - Gas-treating system of the charging unit emission.

The schedule of the modernizations is shown in the table below.

	Start of activities	Commissioning date
Modernization of BF6	06/02/2003	11/06/2003
Reconstruction of BF2	12/12/2003	20/04/2006
Modernization of BF3	21/01/2008	10/04/2008

Increasing of iron content the in iron-ore materials

BFs at Azovstal are charged with sinter, pellets, and iron ore as iron-ore materials. The average iron content is about 54-55%. This means that in order to produce one ton of pig iron almost two tons of iron-ore material needs to be charged into BF and melted, using coke and natural gas as a fuel. The objective of this measure is to increase iron content up to 60%. This measure allows the same amount of pig iron to be produced by using less of the raw material, hence, reducing the consumption of coke per ton of iron. According to the "Pig Iron production. Technological Instruction", increasing of iron content in the iron bearing materials on every 1% gives from 1% up to 1.4% of coke savings. The emission reductions of the proposed JI project calculating based on overall reduction of coke consumption, so this measure is not monitored separately. The actual average iron content in the iron ore in the monitoring period was 57.67%.

Decreasing the silicon content in the pig iron

Reduction of Si content in the pig iron leads to reduction of coke consumption. According to the "Pig Iron production. Technological Instruction", reduction of the silicon content on every 0.1% gives 1.2% of coke savings. Similar to the previous measure ERUs due to this particular measure is not monitored separately. The silicon content in pig iron was reduced to 0.66% versus 0.75% planned in the determined PDD. Thus this measure was overfulfilled in comparison with the value envisaged in the PDD.

Decreasing the BF's idle times

Blast Furnace's are in continuous operation, only interrupted for maintenance. Any idle time requires that the BF's hearth is kept at a high temperature, which is achieved by burning coke. Therefore, implementation of any measures focused on decreasing idle times reduces coke consumption.

Modernization of BFs with the introduction of the modern automatic and controlling systems allowed preventing strong fails/bugs of equipment by detection of the deviation from the normal operational conditions and reducing the time fixing.

According to the "Pig Iron production. Technological Instruction", decreasing of the idle times on every 1% gives 0.5% of coke savings. Similar to the previous measure, ERUs due to this particular measure is not monitoring separately. It was planned to reduce idle times from 5% to 2%. In the monitoring period average idle time was 2.67%.

Partial substitution of limestone by lime.

The reaction of limestone calcination in the BF requires heat. The same reaction takes place in the special kilns for the lime production using regular coal as a fuel. Therefore, charging lime in the BF saves coke that would be consumed for the calcination. According to the "Pig Iron production. Technological Instruction", decreasing of the limestone and lime on every 10kg/t gives 0.5% and 0.4% of coke savings correspondingly. During the monitoring period lime was not used for 5 month, which made average lime consumption during the period rather low: 12 kg/t versus 70 kg/t planned in PDD. This is only 18% substitution of limestone by lime. This decreased the amount of ERUs attributable to the present sub-project which was taken into account through monitoring the consumption of both lime and limestone.

The verification team has detected that the amount of ERUs recorded in the monitoring period differs from the predicted amount (stated in the determined and registered PDD). The explanation of this discrepancy has been provided by the project participants.

The baseline emissions are based on the amount of iron produced and fixed ex-ante emission factor according to the registered PDD. At the same time the emissions under the project depend on the same amount of iron produced and variable emission factor in the project (ex-post calculated emission factor).

ERUs estimation was based on pessimistic forecast for pig iron production in 2010-2011. The actual production in the monitoring period was 25% higher compared to the expected level.

The second reason for GHG emission reductions increasing is the decreasing of specific consumption of coke and decreasing of project emission factor as a result. Due to the implementation of the project activity aimed at coke saving, the emission factor calculated ex-post for the monitoring period was found to have smaller value. In the determined

PDD the value applied for 2010 and 2011 was 2.529, while calculation of actual emission factor of the project yielded a result of 2.379 as average for the monitoring period, which is 6% lower.

Taking into account the abovementioned, the difference between the predicted and actual volumes of ERUs generated within the framework of the approved project was observed.

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

The monitoring occurred in accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website

<http://ji.unfccc.int/JIITLProject/DB/SH8R5WAZQ92CWBIXEZPJMSGCVXT2KS/details>.

For calculating the emission reductions, all 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.

The locations of monitoring points are clearly identified in the Figure 1 of the MR and completely correspond to the ones prospected in the determined PDD.

Pig iron production. Liquid pig iron from each BF are weighted on two scales depending on workshop it will proceed later on. The results of weighting are automatically submitted to the Automatic Control System of BFW. Based on the daily aggregated data WEB reports "Production of the Pig Iron" are generated. Those reports are checked by and signed by responsible persons Data cross checking are made by responsible persons in the BFW, BOF and OHF.

Consumption of coke, pellets, sinter, lime and limestone. Information from scale car after every charging session is automatically submitted to the Automatic Control System of BFW. Data is checked on the daily basis by stockyard's foreman. Based on the daily aggregated data WEB reports "Production of the Pig Iron" are generated. The reports are checked by and signed by responsible persons

Blast production. Blast production is metered at each turbo compressor on the daily basis and checked by senior foreman of Control and Metering Equipment Workshop. Based on the daily aggregated data WEB reports "Production of the Pig Iron" are generated. Those reports are checked by and signed by responsible persons. Monthly report is generated based on the daily data by economists of CHPs and economist of Chief Energy Officer Department (CEOD).

Oxygen consumption at BFW. Oxygen consumption is metered at each turbo compressor on the daily basis and checked by senior foreman of SMEW and by economist of Oxygen Workshop. Based on the daily aggregated data WEB reports "Production of the Pig Iron" are generated.



The reports are checked by and signing by responsible persons. Monthly report is generated based on the daily data by economist of Oxygen Workshop, and economist of CEOD.

Natural gas consumption at BFW. Natural gas consumption at BFW is metered by especially dedicated software/hardware package "Saturn". Daily and monthly reports are generated automatically. Data correctness is checked by foreman of SMEW. Based on the daily aggregated data WEB reports "Production of the Pig Iron" are generated. Those reports are checked by and signed by responsible persons.

Electricity consumption at BFW. Electricity consumption is metered by electricity meters installed at substations. Based on the daily aggregated data WEB reports "Production of the Pig Iron" are generated. Those reports are checked by and signed by responsible persons.

The abovementioned reports are uploaded to the SAP system by accountants. Information is stored till the end of the crediting period plus two years.

Data sources used for calculating emission reductions such as appropriately calibrated measuring equipment passports, the study of standardized emission factors for the Ukrainian electricity grid, sectoral standards, IPCC guidelines, laboratory analysis, are clearly identified, reliable and transparent. Emission factors, including default emission factors, are selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice.

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

3.5 Revision of monitoring plan (99-100)

In the course of considered monitoring period (01/06/2010 – 31/03/2011) the original monitoring plan described in the registered PDD version 2.5 of 14/06/2010 was modified by the project participants. The project participants submitted for determination the Revised Monitoring Plan (included in the Monitoring Report, section A.8) which was reviewed by BVC during current verification. The final version of the Revised Monitoring Plan contains the descriptions of all changes introduced and appropriate justification for these changes. The modifications are determined as described below.

The emission factors for consumption of electricity from Ukrainian power grid in 2010 and 2011 were changed from 0.896 CO₂/MWh to 1.093 tCO₂/MWh and 1.090 tCO₂/MWh respectively. These new emission factors were approved for ERUs calculations for JI projects in Ukraine by the Ukrainian DFP (The Orders of National Environment Investment Agency No43 from 28.03.2011 and No75 from 12.05.2011). The new estimations of emission factors for 2010 and 2011 rely on the latest available data



across entire Ukrainian power grid and represent the best knowledge on emissions of GHGs. According to the Revised Monitoring Plan, in contrast to the PDD, the emission factor will be monitored during the Monitoring Report preparation.

Maximal technical capacity of BFW prior the project implementation was used instead of actual volume of pig-iron production. ERUs are only claimed for that volume of iron, which Azovstal was able to produce under the baseline scenario without capacity increase due to implementation of the JI project. This volume is introduced to monitoring plan as parameter "pig iron maximal technical capacity" and equals to designed capacity of BFW prior to the project start. When actual pig iron production exceeds maximal technical capacity the value, the last one was used for emission reduction calculation. The same approach is supposed to be applied for emission reductions calculation in future monitoring periods.

Based on above mentioned, BVC can conclude that the proposed revision of the monitoring plan improves the accuracy and applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans.

3.6 Data management (101)

All internal operational data required for ERU calculation are collected by Azovstal as a part of routine operations. The data and their sources, provided in the monitoring report, are clearly identified, reliable and transparent. The implementation of data collection procedures is in accordance with the monitoring plan, including the quality control and quality assurance procedures. The monitoring approach requires monitoring and measurement of all the variables and parameters necessary to quantify the baseline emissions and project emissions in a conservative and transparent way. Internal and external data are obtained according to the determined PDD and the monitoring plan included in the MR.

The function of the monitoring equipment, including its calibration status, is in order. All monitoring equipment used for monitoring purposes is in compliance with national legislative requirements and standards; this ensures that uncertainties are accounted in data collected.

All necessary records on project monitoring parameters are appropriately maintained, stored and archived. The record management system includes paper as well as electronic records maintained by the departments. Monthly and yearly summary reports are prepared for every parameter. The implementation of data collection procedures is in accordance with PDD, including the quality control and quality assurance procedures.



The evidence and records used for the monitoring are maintained in a traceable manner. The verification team checked the transfer of monitored data, correctness of the formulae versus the PDD as well as calculations of emission reductions. No inaccuracies in calculations were detected by the verifiers.

The Monitoring Report provides sufficient information on the assigning roles, responsibilities and authorities for implementation and maintenance of monitoring procedures including control of data. The verification team confirms effectiveness of the existing management and operational systems and found them eligible for reliable project monitoring.

3.7 Verification regarding programmes of activities (102-110)

Not applicable.

4 VERIFICATION OPINION

Bureau Veritas Certification has performed the 2nd periodic verification for the period from 01 June 2010 to 31 March 2011 of the "Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works" project in Ukraine. 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 monitoring reports, 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 Public Joint Stock Company "Azovstal Iron & 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 project as described in the determined and registered PDD and Revised Monitoring Plan. The development and maintenance of records and reporting procedures are 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 3.0, for the reporting period from 01/06/2010 to 31/03/2011 as indicated below. Bureau Veritas Certification confirms that the project is implemented as per determined changes. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions.



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

Emission Reductions for the period from 01/06/2010 to 31/12/2010:
1122385 tCO₂ equivalents

Emission Reductions for the period from 01/01/2011 to 31/03/2010):
407465 tCO₂ equivalents

For the reporting period from 01/06/2010 to 31/03/2010

Baseline emissions	:	11366607 t CO ₂ equivalents
Project emissions	:	9836757 t CO ₂ equivalents
Emission Reductions:		1529850 t CO ₂ equivalents

5 REFERENCES

Category 1 Documents:

Documents provided by the project participants that relate directly to the GHG components of the project.

- /1/ Project Design Document "Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works", version 2.5 dated 14/06/2010
- /2/ Verification Report by Bureau Veritas Certification Holding SAS № UKRAINE /0160/2010 "Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works", dated 10/12/2010
- /3/ Monitoring Report "Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works", version 1.0 dated 18/04/2011
- /4/ Monitoring Report "Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works", version 2.0 dated 12/05/2011
- /5/ Monitoring Report "Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works", version 3.0 dated 16/05/2011
- /6/ Calculation of Emission Reductions – excel file "20110418_MR002_Azovstal_ver1.0_en"
- /7/ Calculation of Emission Reductions – excel file "20110516_MR002_Azovstal_ver2.0_en"

Category 2 Documents:

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

- /1/ Attestation certificate dated 02/07/2010, valid till 02/07/2015, registration #06544-5-3-84-ВЛ
- /2/ Calculation of ERUs monitored and predicted in the PDD – excel file "20110505_Azovstal_difference PDD and MR002"
- /3/ Passport of natural gas physical and chemical parameters for June 2010
- /4/ Passport of natural gas physical and chemical parameters for July 2010
- /5/ Passport of natural gas physical and chemical parameters for August 2010
- /6/ Passport of natural gas physical and chemical parameters for September 2010
- /7/ Technical report on blast-furnace shop (Form #ДП-26) for January 2011 dated 14/02/2011
- /8/ Technical report on blast-furnace shop (Form #ДП-26) for February



- 2011 dated 14/03/2011
- /9/ Technical report on blast-furnace shop (Form #ДП-26) for June 2010 dated 14/07/2010
 - /10/ Technical report on blast-furnace shop (Form #ДП-26) for July 2010 dated 12/08/2010
 - /11/ Technical report on blast-furnace shop (Form #ДП-26) for August 2010 dated 14/09/2010
 - /12/ Technical report on blast-furnace shop (Form #ДП-26) for September 2010 dated 14/10/2010
 - /13/ Technical report on blast-furnace shop (Form #ДП-26) for October 2010 dated 12/11/2010
 - /14/ Technical report on blast-furnace shop (Form #ДП-26) for November 2010 dated 14/12/2010
 - /15/ Technical report on blast-furnace shop (Form #ДП-26) for December 2010 dated 14/01/2011
 - /16/ Technical report on blast-furnace shop (Form #ДП-26) for March 2011 dated 14/04/2011
 - /17/ Passport dated 22/04/2009 on coke scales type 96B5, serial #5/1
 - /18/ Passport dated 29/08/2003 on electric carriage weighting machine type 115ЭBB 20107ASV, serial #2
 - /19/ Passport dated 01/09/2003 on carriage weighting machine type 20107ASV, serial #1
 - /20/ Passport dated 10/11/2006 on carriage weighting machine type 20116ASV, serial #5
 - /21/ Passport dated 19/11/2010 on carriage weighting machine type 20116ASV, inventory #11
 - /22/ Passport dated 14/09/2009 on electric strain-gauge carriage weighting machine type VVT200-1-50, serial #1826
 - /23/ Passport dated 24/06/2005 on electromechanical carriage weighting machine type VVT200-1-50, serial #1826
 - /24/ Passport on primary transmitter type Metran, serial #260331
 - /25/ Passport dated 05/01/1996 on primary transmitter type Metran, serial #358761
 - /26/ Passport dated 03/08/2006 on primary transmitter type Saphir, serial #406191
 - /27/ Passport dated 13/05/2003 on primary transmitter type Saphir, serial #384695
 - /28/ Passport on primary transmitter type Metran, serial #335384
 - /29/ Passport dated 01/07/2003 on primary transmitter type Saphir, serial #602004
 - /30/ Passport dated 01/07/2003 on primary transmitter type Saphir, serial #208008
 - /31/ Passport dated 05/09/2003 on primary transmitter type Saphir, serial #205419



- /32/ Passport dated 17/04/2006 on coke scales type VK1056-HC1, serial #501
- /33/ Passport dated 08/08/2003 on coke scales type 96B5, serial #3/1
- /34/ Passport dated 12/08/2004 on coke scales type 96B5, serial #4/2
- /35/ Passport dated 29/09/2004 on coke scales type 96B5, serial #6/1
- /36/ Passport dated 14/07/2004 on coke scales type 20116ASV, serial #2
- /37/ Passport dated 29/02/2008 on coke scales type 20116ASV, serial #9
- /38/ Passport 04/05/2006 on primary transmitter type Metran, serial #275742
- /39/ Passport 10/08/2004 on primary transmitter type Saphir, serial #22580
- /40/ Passport 20/07/2004 on primary transmitter type Saphir, serial #12905
- /41/ Passport 06/05/2004 on primary transmitter type Saphir, serial #22904
- /42/ Passport 04/05/2006 on primary transmitter type Metran, serial #274317
- /43/ Passport 04/07/2010 on primary transmitter type Saphir, serial #400878
- /44/ Passport 16/05/2003 on primary transmitter type DM3583, serial #45275
- /45/ Passport 04/08/2010 on primary transmitter type DM, serial #48215
- /46/ Passport 20/08/2007 on primary transmitter type Metran, serial #187387
- /47/ Passport 15/05/2006 on primary transmitter type Yokogawa, serial #406007
- /48/ Passport 15/05/2006 on primary transmitter type Metran, serial #284050
- /49/ Passport 12/05/2008 on primary transmitter type Yokogawa, serial #20457
- /50/ Passport 02/02/2011 on primary transmitter type Yokogawa, serial #931192
- /51/ Passport 24/12/2010 on primary transmitter type Metran, serial #81913
- /52/ Operation manual ПЭС1.043.007.ПО. Energy resources record keeping system on the basis of software/hardware package "Saturn"
- /53/ Energy resources record keeping system on the basis of software/hardware package "Saturn"
- /54/ Passport of natural gas physical and chemical parameters for October 2010
- /55/ Passport of natural gas physical and chemical parameters for November 2010



- /56/ Passport of natural gas physical and chemical parameters for December 2010
- /57/ Passport of natural gas physical and chemical parameters for January 2011
- /58/ Passport of natural gas physical and chemical parameters for February 2011
- /59/ Report dated 02/04/2011 on gas distribution at Azovstal plant gas workshop for March 2011
- /60/ Report dated 02/02/2011 on gas distribution at Azovstal plant gas workshop for January 2011
- /61/ Report dated 04/01/2011 on gas distribution at Azovstal plant gas workshop for December 2010
- /62/ Report dated 02/12/2010 on gas distribution at Azovstal plant gas workshop for November 2010
- /63/ Report dated 02/11/2010 on gas distribution at Azovstal plant gas workshop for October 2010
- /64/ Report dated 04/10/2010 on gas distribution at Azovstal plant gas workshop for September 2010
- /65/ Report dated 02/09/2010 on gas distribution at Azovstal plant gas workshop for August 2010
- /66/ Report dated 03/08/2010 on gas distribution at Azovstal plant gas workshop for July 2010
- /67/ Report dated 02/07/2010 on gas distribution at Azovstal plant gas workshop for June 2010
- /68/ Photo – Primary transmitter type Saphir, serial #602004
- /69/ Passport of natural gas physical and chemical parameters for March 2011
- /70/ Passport on Energia-9 power meter, serial #25906
- /71/ Note on skip coke consumption (based on the technical department data) for the period from 01/06/2010 till 31/03/2011

Persons interviewed:

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

- /1/ Oleksii Shestopalov – Head of investment analysis department
- /2/ Roman Kyrsanov – Head of sintering and blast furnace production department
- /3/ Volodymyr Strykov - Chief metrologist, head of metrology department
- /4/ Pavlo Dehtiariov – Automated production department project manager
- /5/ Valentyn Sorokov - Optimisation production department specialist
- /6/ Anna Vilde - developer representative, JI Consultant, Global Carbon BV

APPENDIX A: 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?	CAR01 The information concerning project approval is missing in the MR. Please, add the appropriate information to the MR. CAR02 The JI registration number JI 0223 (indicated on the page 2 of the MR) is irrelevant for the project. Please, indicate correct project ID for the project.	CAR01 CAR02	OK OK
91	Are all the written project approvals by Parties involved unconditional?	Conclusion is pending a response to CAR01 above.	Pending	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?	CAR03 The actual (stated in the MR) and estimated (stated in the PDD) amount of ERUs differ significantly. Please, add a comparison of the values to the MR and provide justification of the difference.	CAR03	OK
93	What is the status of operation of	CAR04	CAR04	OK



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	the project during the monitoring period?	<p>The actual status of the project operation must be included in the MR. Please, also provide information concerning quantitative characteristics of the measures implemented.</p> <p>CAR05 It was revealed during site visit that turbo compressor #2, CHP1 (ТВД) is being renovated since October 2010. However, this information is absent in the MR. Please, add the appropriate information to the MR and indicate how this influenced the project operation.</p> <p>CAR06 One of the measures stipulated by the project is partial substitution of the limestone by lime. However, it was detected during site visit that this measure was not being implemented since January 2011. Please, add the appropriate information to the MR and indicate how this influenced the project operation and ERUs achievement.</p>	CAR05 CAR05 CAR06	OK OK OK
Compliance with monitoring plan				
94	Did the monitoring occur in	CAR07	CAR07	OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	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?	In the description of the data variables (section B.2.2 of the MR) it is stated that data are determined for "year y". However, all the parameters are calculated on monthly basis. Please, correct.		
95 (a)	For calculating the emission reductions or enhancements of net removals, were key factors, 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?	CL01 It was detected during site visit that the certificate on natural gas physiochemical characteristics (for March 2011) was not yet provided by the gas supplier company to Azovstal. Please, clarify which value was used for ERUs calculation for March 2011). Please, provide documented evidence.	CL01	OK
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	CAR08 Please, provide complete reference where the source IPCC is mentioned in the section D of the MR. CAR09 Clear and traceable references must be stated (instead of "PDD") as source of data for each of the fixed parameters included in the section B.1.2. of the MR.	CAR08 CAR09	OK OK

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
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?	<p>CAR10 The original monitoring plan provides the fixed ex-ante value of emission factor for Ukrainian grid (see page 58 of the PDD version 2.5, dated 14/06/2010). While in the ERUs calculations another value of emission factor was used. Please, correct the calculations in accordance with the Monitoring Plan.</p> <p>CAR11 Annex 2 "Standardised baseline emission factor for Ukrainian power grid" is indicated in on the page 1 of the MR. However, Annex 2 there is no Annex 2 in the MR. Please, make corresponding corrections.</p>	<p>CAR10 CAR11</p>	<p>OK OK</p>
95 (d)	Is the calculation of emission reductions or enhancements of net removals based on conservative assumptions and the most plausible scenarios in a transparent manner?	<p>CL02 The following statement is indicated in the section B.2.1. List of fixed default values and ex-ante baseline factors for the Net calorific value of the natural gas for the base period: "8095 for 2008-2009 years; 8111 for January, March and April 2010; 8085 for February 2010 and 8087 for May 2010"</p>	<p>CL02 CL03</p>	<p>OK OK</p>

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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>At the same time, the base period is indicates to be 2001-2003 as per the determined PDD version 2.5, dated 14/06/2010. Please, clarify.</p> <p>CL03 Please, submit documented evidence to confirm that all coke used during the monitoring period at Azovstal Iron & Steel Works was produced in Ukraine.</p>		
Applicable to JI SSC projects only				
96	<p>Is the relevant threshold to be classified as JI SSC project not exceeded during the monitoring period on an annual average basis?</p> <p>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?</p>	N/A	N/A	N/A
Applicable to bundled JI SSC projects only				
97 (a)	Has the composition of the bundle not changed from that is stated in F-JI-SSCBUNDLE?	N/A	N/A	N/A



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
97 (b)	If the determination was conducted on the basis of an overall monitoring plan, have the project participants submitted a common monitoring report?	N/A	N/A	N/A
98	If the monitoring is based on a monitoring plan that provides for overlapping monitoring periods, are the monitoring periods per component of the project clearly specified in the monitoring report? Do the monitoring periods not overlap with those for which verifications were already deemed final in the past?	N/A	N/A	N/A
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?	N/A	N/A	N/A
99 (b)	Does the proposed revision improve the accuracy and/or applicability of information	N/A	N/A	N/A



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans?			
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?	The implementation of data collection procedures are in accordance with the monitoring plan included in the determined PDD. The verification team confirms effectiveness of existing management and operational systems and found them eligible for reliable project monitoring.	OK	OK
101 (b)	Is the function of the monitoring equipment, including its calibration status, is in order?	<p>CAR12 Please, provide correct and actual information concerning names of the equipment indicates in the section B.1. of the MR (#2 and #4).</p> <p>CAR13 Please, provide correct and actual information concerning type of the equipment, serial number, date of installation and calibration for the following IDs of meters (pages 11-14):</p>	<p>CAR12 CAR13 CAR14 CAR15 CAR16 CL04</p>	<p>OK OK OK OK OK OK</p>



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>SC2, SC7, SC9, SC10, SC11, SC12, SC13, FM4, FM8, FM13, FM16, EL11</p> <p>CAR14 Some of the meters were displaced by the new ones within the monitoring period. Please, add this information to the MR and indicate this equipment in the section B.1.2.</p> <p>CAR15 The totals of emission and ERs indicated on the pages 30, 34 are not equal to the sum of the each monthly value of the monitoring period. The emissions must also be consistent with the ones stated in the Excel calculation spreadsheet.</p> <p>CAR16 Some inconsistency was indicated on the page 29-30, 33-34 for the sub-periods length for the project, baseline emission and ERs. Please, correct.</p> <p>CL04 The Ukrainian Centre for Standardization and Metrology is indicated as the third party involved. Please, clarify which activity this organization is responsible</p>		



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	for. CAR17 FAR was issued during the determination process: “Please, provide documented instruction which indicates that the data monitored and required for verification are to be kept for two years after the crediting period as per <i>Jl determination and verification manual, v.01</i> ”. Please, clarify in the MR how FAR has been addressed and provide the documented evidence. CAR18 Please, reflect in the MR the quality control/quality assurance procedures for “Saturn” and SAP/R3 electronic systems involved in the monitoring. CAR19 The pig iron production without incremental capacity instead of actual pig iron production was used for ERUs calculation for some months. This information must be included in the MR. The justification of this parameter must be also stated in the MR.	CAR17 CAR18 CAR19	OK OK OK



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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?	CL05 MR indicates (page 8, SECTION B. Key monitoring activities according to the monitoring plan for the monitoring period stated in A.4., page 24, B.3 Data processing and archiving) that WEB reports are "signed by responsible person". Please, clarify how the electronic reports can be signed. CL06 The abbreviations are indicated on the Page 24 of the MR: PCS and PSC. Please, provide interpretation for these shortenings.	CL05 CL06	OK OK
Verification regarding programs of activities (additional elements for assessment)				
102	Is any JPA that has not been added to the JI PoA not verified?	N/A	N/A	N/A
103	Is the verification based on the monitoring reports of all JPAs to be verified?	N/A	N/A	N/A
103	Does the verification ensure the accuracy and conservativeness of the emission reductions or enhancements of removals generated by each JPA?	N/A	N/A	N/A



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
104	Does the monitoring period not overlap with previous monitoring periods?	N/A	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?	N/A	N/A	N/A
Applicable to sample-based approach only				
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 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: - The types of JPAs;	N/A	N/A	N/A



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	<ul style="list-style-type: none"> - The complexity of the applicable technologies and/or measures used; - The geographical location of each JPA; - The amounts of expected emission reductions of the JPAs being verified; - The number of JPAs for which emission reductions are being verified; - The length of monitoring periods of the JPAs being 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?	N/A	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	N/A	N/A	N/A



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DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	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?			
109	Is the sampling plan available for submission to the secretariat for the JISC.s ex ante assessment? (Optional)	N/A	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?	N/A	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
CAR01 The information concerning project approval is missing in the MR. Please, add the appropriate information to the MR.	Item 90	The project was approved by the Host Party when the Letter of Approval by Ukrainian National Investment Agency No 1594/23/7 from 12.10.2010 was issued. Approval by the Netherlands is reflected in the Letter of Approval 2010JI20 issued by Ministry of Economic Affairs of the Netherlands on 24.06.2010. The information about project approval was added to the MR version 2.0 (page 7).	The issue is closed based on due corrections made in the MR.
CAR02 The JI registration number JI 0223 (indicated on the page 2 of the MR) is irrelevant for the project. Please, indicate correct project ID for the project.	Item 90	The correct project ID is UA1000223. Please, refer to http://ji.unfccc.int/JIITLProject/DB/SH8R5WAZQ92CWBIXEZIPJMSGCVXT2KS/details . The relevant changes were made in the MR version 2.0 (page 2).	The issue is closed based on appropriate information and corrections provided.
CAR03 The actual (stated in the MR) and estimated (stated in the	Item 92	Estimated amount of ERUs was based on pessimistic forecast for pig iron production in 2010-2011. Actual	The updated MR and Excel file containing detailed calculation



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<p>PDD) amount of ERUs differ significantly. Please, add a comparison of the values to the MR and provide justification of the difference.</p>		<p>production in the monitoring period was 25% higher compared to the expected level. The other reason for the difference between expected and actual amounts of ERUs was successful implementation of the planned sub-projects (see answer to CAR 4 for more details), which lowered the project emission factor per tonne of pig iron produced. Thus, in PDD the value applied for 2010 and 2011 is 2.529, while calculation of actual emission factor of the project yielded a result of 2,379 as average for the monitoring period, which is 6% lower.</p> <p>This comparison was added to the MR version 2.0 (page 6). Detailed calculation file comparing estimated and actual values of pig iron production and emission factors was provided to AIE.</p>	<p>were reviewed. The issue is closed based on the information provided.</p>
<p>CAR04 The actual status of the project operation must be included in the MR. Please, also provide information concerning quantitative characteristics of the measures implemented.</p>	<p>Item 92</p>	<p>The quantitative data reflecting the progress in implementation of each sub-project was added to the MR version 2.0 (page 7). Particularly: <i>Sub-project 1. Modernization and reconstruction of the BFs.</i> Activity was completed. The goal was achieved for 100%.</p>	<p>The updated MR was reviewed and found appropriate with regards to the required corrections. The issue is closed.</p>



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		<p><i>Sub-project 2. Increasing the iron content in the iron-ore materials.</i> It was planned to increase iron content in iron ore from 54-55% to 60%. Actual average iron content in the iron ore in the monitoring period was 57.67%. The goal was achieved for 60.17%.</p> <p><i>Sub-project 3. Decreasing the silicon content in the pig iron.</i> Silicon content in pig iron was decreased to 0.66% versus 0.75% planned in PDD. The goal was achieved for 136%.</p> <p><i>Sub-project 4. Decreasing the BF's idle times.</i> It was planned to decrease idle times from 5% to 2%. In the monitoring period average idle time was 2.67%. The goal was achieved for 78%.</p> <p><i>Sub-project 5. Partial substitution of the limestone by lime.</i> It was planned to use 70 kg of lime per tonne of pig-iron produced. In the monitoring period average lime consumption was 12 kg/t. The goal was achieved for 18%. Substitution of limestone by lime is lower than expected in PDD, the reasons are explained in the answer to CAR 6.</p>	
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<p>CAR05 It was revealed during site visit that turbo compressor #2, CHP1 (ТВД) is being renovated since October 2010. However, this information is absent in the MR. Please, add the appropriate information to the MR and indicate how this influenced the project operation.</p>	Item 92	It is true fact that turbo compressor #2 at CHP1 I being renovated and was no in operation since October 2010. This was indicated in MR version 2.0 (footnote on page13). This do not influence the project as the necessary amount of blast is still supplied to the blast furnace with the load being distributed between the other turbo compressors, operation of which is monitored.	CAR is closed on the basis of required information provided and corrections made in the MR.
<p>CAR06 One of the measures stipulated by the project is partial substitution of the limestone by lime. However, it was detected during site visit that this measure was not being implemented since January 2011. Please, add the appropriate information to the MR and indicate how this influenced the project operation and ERUs achievement.</p>	Item 92	During the monitoring period lime was not used for 5 month, which made average lime consumption during the period rather low: 12 kg/t versus 70 kg/t planned in PDD. This is only 18% substitution of limestone by lime. The reasons for that are technological and economical. Due to the high demand for Azovstal pig iron the blast furnaces of the Plant are working on maximum capacities. At this level of production in case of the use of lime big share of it is blown away with blast-furnace dust, which demands adding more of lime to ensure the proper pig iron production process. Given the fact that lime is more expensive than limestone adding lime	The issue is closed based on the clarifications provided.



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		becomes unaffordable to the Plant which is why its consumption is reduced. This decreases the amount of ERUs generated by implementation of the sub-project 5 which is taken into account through monitoring the consumption of both lime and limestone.	
CAR07 In the description of the data variables (section B.2.2 of the MR) it is stated that data are determined for "year y". However, all the parameters are calculated on monthly basis. Please, correct.	Item 94	"Year y" was corrected to "month y" in the description of the data variables in MR version 2.0 (pages 21-24).	MR was checked. The issue is closed.
CAR08 Please, provide complete reference where the source IPCC is mentioned in the section D of the MR.	Item 95 (b)	Complete reference to IPCC sources was throughout the MR version 2.0.	MR was checked. The issue is closed.
CAR09 Clear and traceable references must be stated (instead of "PDD") as source of data for each of the fixed parameters included in the section B.1.2. of the MR.	Item 95 (b)	Response #1 Fixed parameters included to section B.1.2. of the MR were calculated based on Azovstal Technical Reports The calculation method and primary data for it were checked during determination process which ended with positive	Conclusion on response #1: Please, indicate in the MR a complete reference to PDD (including version and number of page).



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		<p>conclusion. Reference to PDD as a source of information is considered to be transparent and accurate implying the use of already proved data.</p> <p>Response #2: Versions and page numbers were added to references to the determined PDD in MR version 3.0 (pages 7 (footnote), 18-20).</p>	<p>Conclusion on response #2: MR was checked. The issue is closed.</p>
<p>CAR10 The original monitoring plan provides the fixed ex-ante value of emission factor for Ukrainian grid (see page 58 of the PDD version 2.5, dated 14/06/2010). While in the ERUs calculations another value of emission factor was used. Please, correct the calculations in accordance with the Monitoring Plan.</p>	Item 95 (c)	<p>Response #1: The other emission factor which has been used is the one which has been approved by Ukrainian DFP for obligatory use in ERUs calculations by the Order of National Environment Investment Agency No 43 from 23.03.2011. The emission factor was calculated and approved after the Monitoring Plan was determined. This is a deviation from the Monitoring Plan, the information of which was added to section A.8 of the MR version 2.0 (page 7).</p> <p>Response #2: Description and justification of the proposed deviations from the determined monitoring plan were added to the MR</p>	<p>Conclusion on response #1: In accordance with DVM, if any deviations from the original monitoring plan occurred, they must be described and appropriately justified.</p> <p>In the revised monitoring plan, please, list all the revisions, provide the justification of all proposed revisions to the monitoring plan and confirm</p>



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		<p>version 3.0 (pages 7-8). It was confirmed that proposed revision improves the accuracy of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans. During the verification process Ukrainian DFP approved emission factor for Ukrainian grid for 2011. Please see Order of National Environment Investment Agency No 75 from 12.05.2011. Emission reductions for the monitoring period were recalculated accordingly, please see the updated calculation file and MR version 3.0 (pages 30-35).</p>	<p>whether the proposed revision improves the accuracy and/or applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans. Please, note that emission factor used is applicable only for 2010 and can not be used to calculate ERUs for 2011. Conclusion on response #2: The revisions to the Monitoring Plan were checked. The issue is closed based on due corrections</p>
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			made in the MR.
<p>CAR11 Annex 2 "Standardised baseline emission factor for Ukrainian power grid" is indicated in on the page 1 of the MR. However, Annex 2 there is no Annex 2 in the MR. Please, make corresponding corrections.</p>	Item 95 (c)	The indication of Annex 2 was removed from page 1 of MR version 2.0 as the "Standardised baseline emission factor for Ukrainian power grid" is no longer applicable for the project. Please, see answer to CAR 10 for more details.	The issue is closed.
<p>CAR12 Please, provide correct and actual information concerning names of the equipment indicates in the section B.1. of the MR (#2 and #4).</p>	Item 101 (b)	<p>Response #1: The information concerning names of the equipment indicated in the section B.1. was corrected according to actual passports. Corrections were made in MR version 2.0 (page 11).</p> <p>Response #2: Corrected in the MR version 3.0.</p>	<p>Conclusion on response #1: The required corrections are still not made.</p> <p>Conclusion on response #2: MR was checked. The issue is closed.</p>
<p>CAR13 Please, provide correct and actual information concerning type of the equipment, serial number, date of installation and calibration for the following IDs of meters (pages 11-14): SC2, SC7, SC9, SC10, SC11, SC12, SC13, FM4, FM8, FM13, FM16, EL11</p>	Item 101 (b)	<p>The information concerning type of the equipment, serial number, date of installation and calibration for the following IDs of meters (pages 11-14): SC2, SC7, SC9, SC10, SC11, SC12, SC13, FM4, FM8, FM13, FM16, EL11 was corrected according to actual passports. Corrections were made in MR version 2.0 (pages 12-13).</p>	Corrections were checked. The issue is closed.



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<p>CAR14 Some of the meters were displaced by the new ones within the monitoring period. Please, add this information to the MR and indicate this equipment in the section B.1.2.</p>	<p>Item 101 (b)</p>	<p>The information concerning displacement of the equipment indicated in the section B.1.2 was corrected according to actual passports. Corrections were made in MR version 2.0 (pages 14-15).</p>	<p>MR was checked. The issue is closed.</p>
<p>CAR15 The totals of emission and ERs indicated on the pages 30, 34 are not equal to the sum of the each monthly value of the monitoring period. The emissions must also be consistent with the ones stated in the Excel calculation spreadsheet.</p>	<p>Item 101 (b)</p>	<p>The totals of emission and ERs indicated on the pages 30, 34 were updated according to the Excel calculation spreadsheet.</p>	<p>The issue is closed based on due corrections made in the MR.</p>
<p>CAR16 Some inconsistency was indicated on the page 29-30, 33-34 for the sub-periods length for the project, baseline emission and ERs. Please, correct.</p>	<p>Item 101 (b)</p>	<p>Year 2010 was corrected to 2011 for the last three month of the monitoring period. Changes were made in MR version 2.0 (pages 30, 33 and 34).</p>	<p>The issue is closed based on due corrections made in the MR.</p>
<p>CAR17 FAR was issued during the determination process: "Please, provide documented instruction which indicates that the data</p>	<p>Item 101 (c)</p>	<p>Response #1: The FAR has been addressed by issuing Azovstal internal Order regulating storage of data monitored and required</p>	<p>Conclusion on response #1: Please, submit the approved Order on data</p>



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<p>monitored and required for verification are to be kept for two years after the crediting period as per <i>Jl determination and verification manual, v.01</i>. Please, clarify in the MR how FAR has been addressed and provide the documented evidence.</p>		<p>for verification and stating that it is to be stored till 31st of December 2014. The Order is under internal approval process of the Plant, draft of the Order was provided to AIE. Response #2: Copy of the approved Order on data storage was provided to the AIE.</p>	<p>storage. Conclusion on response #2: The document was checked. The issue is closed.</p>
<p>CAR18 Please, reflect in the MR the quality control/quality assurance procedures for “Saturn” and SAP/R3 electronic systems involved in the monitoring.</p>	<p>Item 101 (c)</p>	<p>Quality of data stored in “Saturn” and SAP/R3 systems are ensured by periodic calibration of the meters readings of which are primary source of information. Information on quality assurance/control of data is provided in MR, it was checked by AIE during desktop review and site visit. The only occasion under which data stored in “Saturn” and SAP/R3 systems can be affected or distorted is the switch off of the computers or external attack on the system. To ensure continuous operation of the system reserve servers and back-up systems are used. Power supply of all the hardware is secured by connection to independent power sources. Since the time of commissioning of both of the systems none of the operation stops as well as</p>	<p>CAR is closed based on the information provided and corresponding correction made in the MR.</p>



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		external attacks happened. This information was added to MR version 2.0 (page 26).	
CAR19 The pig iron production without incremental capacity instead of actual pig iron production was used for ERUs calculation for some months. This information must be included in the MR. The justification of this parameter must be also stated in the MR.	Item 101 (c)	Response #1: A deviation from the determined monitoring plan was made because of the fact that actual iron production by Azovstal exceeded the possible technical capacity without reconstruction of BF2, i.e. the possible level under the baseline scenario. In order to maintain conservativeness, emission reductions are only claimed for that volume of iron, which Azovstal was able to produce without JI project. This volume is introduced to monitoring plan as parameter "pig iron maximal technical capacity" and equals to design capacity of BFW prior to the project start according to the determined PDD version 2.5 which is divided by number of month in the year yielding result of 430 000 t. When actual pig iron production exceeds maximal technical capacity the value of the last one is used for emission reduction calculation. The resulting data line in the calculation file is named "pig iron production without incremental	Conclusion on response #1: In accordance with DVM, if any deviations from the original monitoring plan occurred, they must be described and appropriately justified. In the revised monitoring plan, please, list all the revisions, provide the justification of all proposed revisions to the monitoring plan and confirm whether the proposed revision improves the accuracy and/or applicability of information collected



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		<p>capacity”. This information was added to MR version 2.0 (pages 7, 19 and 30). Response #2: Description and justification of the proposed deviations from the determined monitoring plan were added to the MR version 3.0 (pages 7-8). It was confirmed that proposed revision improves the accuracy of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans.</p>	<p>compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans. Conclusion on response #2: The revisions made in the Monitoring Plan were checked. The issue is closed based on due corrections made in the MR.</p>
<p>CL01 It was detected during site visit that the certificate on natural gas physiochemical characteristics (for March 2011) was not yet provided by the gas supplier company to Azovstal. Please, clarify which value was used for ERUs calculation for March 2011). Please, provide</p>	<p>Item 95 (a)</p>	<p>Response #1: The hard-copy of Certificate on natural gas physiochemical characteristics for March 2011 arrived three weeks later, however, the monthly average values used for ERUs calculation for March 2011 were received from the natural gas supplier earlier via telephone. Response #2: Please, note that the scanned copy of</p>	<p>Conclusion on response #1: The certificate provides NCV values for the period 01/03/2011-24/03/2011. Please, provide NCV data for 25/03/2011-31/03/2011. Conclusion on</p>



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documented evidence.		the Certificate has two pages. NCV data for 25/03/2011-31/03/2011 are on the second page of the file.	response #2: The issue is closed based on the information provided.
CL02 The following statement is indicated in the section B.2.1. List of fixed default values and ex-ante baseline factors for the Net calorific value of the natural gas for the base period: "8095 for 2008-2009 years; 8111 for January, March and April 2010; 8085 for February 2010 and 8087 for May 2010" At the same time, the base period is indicates to be 2001-2003 as per the determined PDD version 2.5, dated 14/06/2010. Please, clarify.	Item 95 (d)	This mistake was corrected in MR version 2.0 (page 17). Natural gas NCV value of 33.494 GJ/1000 m ³ is a fixed parameter which was used for calculation of Baseline emission factor of iron production justified in the determined PDD version 2.5, dated 14/06/2010.	The updated MR was reviewed and found appropriate with regards to the required corrections. The issue is closed.
CL03 Please, submit documented evidence to confirm that all coke used during the monitoring period at Azovstal Iron & Steel Works was produced in Ukraine.	Item 95 (d)	The Certificate stating that 100% of the consumed coke originated from Ukraine was provided to the AIE.	The issue is closed based on the information provided in the Certificate.
CL04	Item 101	Ukrainian Centre for Standardization and	The issue is closed.



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<p>The Ukrainian Centre for Standardization and Metrology is indicated as the third party involved. Please, clarify which activity this organization is responsible for.</p>	(b)	<p>Metrology is involved in calibration of commercial meters readings of which are used for the purposes of correct billing and payment for the recourses consumed by the Plant e.g. natural gas and electricity.</p>	
<p>CL05 MR indicates (page 8, SECTION B. Key monitoring activities according to the monitoring plan for the monitoring period stated in A.4., page 24, B.3 Data processing and archiving) that WEB reports are "signed by responsible person". Please, clarify how the electronic reports can be signed.</p>	Item 101 (d)	<p>WEB reports are printed out and the hard copy is then signed up by the responsible person, sent for use by other departments and then archived.</p>	The issue is closed.
<p>CL06 The abbreviations are indicated on the page 24 of the MR: PCS and PSC. Please, provide interpretation for these shortening.</p>	Item 101 (d)	<p>The abbreviation PCS stands for "Process Control System", while PSC is a misprint which was corrected in the MR version 2.0 (page 24).</p>	MR was checked. The issue is closed.