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TÜV Rheinland (China) Ltd. (TÜV Rheinland)

VERIFICATION REPORT

Verification of the Joint Implementation Large-scale Project ENERGY EFFICIENCY MEASURES AT THE "PUBLIC JOINT STOCK COMPANY AZOVSTAL IRON & STEEL WORKS"

ITL Project ID: UA1000223

Initial and first periodic verification:
01/04/2011 – 30/06/2012

Report No. 01 998 9105072272– VR3
Revision No. 02

Customer: Public Joint Stock Company Azovstal Iron & Steel Works

VERIFICATION REPORT

Date of first issue: 15/10/2012	Project No: 01 998 9105072272 ITL Project ID: UA1000223
Executor: TÜV Rheinland (China) Ltd. (TÜV Rheinland)	Organizational unit: TÜV Rheinland Ukraine Ltd. Technical Competence Center
Customer: Public Joint Stock Company Azovstal Iron & Steel Works	Client ref.: Alexey Shestopalov

Summary:

TÜV Rheinland (China) Ltd. (TÜV Rheinland) has performed the initial and first periodic verification of emission reductions generated by the JI LSC project Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works" (ITL Project ID UA1000223) for the period from 01/04/2011 till 30/06/2012.

The purpose of verification is to assess the reductions in anthropogenic emissions by sources or enhancements of anthropogenic removals by sinks generated by a JI LSC project and reported by the project participants through the monitoring report in accordance with paragraph 37 of the JI guidelines.

In our opinion, the emission reductions reported through the monitoring report, version 2.0 dated 07/11/2012 are fairly stated and are accurate and free of material errors, omissions, or misstatements.

During the monitoring period the project has been implemented in accordance with the project design document version 2.5 dated 14/06/2010.

The emission reductions were calculated correctly on the basis of the approved monitoring plan contained in the project design document version 2.5 dated 14/06/2010.

TÜV Rheinland (China) Ltd. (TÜV Rheinland) is able to verify that the emission reductions generated by the JI LSC project Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works" during the period from 01/04/2011 till 30/06/2012 amount to 1 946 386 tonnes of CO_2 equivalent.

Report No.: 01 998 9105072272 – VR3	Subject Group: JI
Project title: Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works"	
Work carried out by: Dr. Valery Yakubovsky – Team Leader, Technical Competence Center Director Ganna Zadnipriana – Auditor; Mr. Vyacheslav Gonchar - Technical Expert Dmytro Rakovich – Trainee	
Work verified by: Dr. Lixin Li – Technical Reviewer	
Verification Report approved by: Dr. Manfred Brinkmann – Accredited Independent Entity Operational Manager	

TÜV Rheinland (China) Ltd. (TÜV Rheinland)

Date of this revision:	Revision No.:	Number of pages:
08/11/2012	02	**41**

Abbreviations

CO_2	Carbon Dioxide
AIE	Accredited Independent Entity
ANE	Authorized national entity
BE	Baseline Emission
CAR	Corrective Action Request
CL	Clarification Request
DR	Document Review
EIA	Environmental Impact Assessment
ERU	Emission Reduction Unit
FAR	Forward Action Request
GHG	Greenhouse Gas
I	Interview
ITL	International Transaction Log
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
LoA	Letter of Approval
MoV	Means of Verification
MP	Monitoring Plan
OSV	On Site Visit
PDD	Project Design Document
PE	Project Emissions
t	tonne
SS	Stakeholders survey
UNFCCC	United Nations Framework Convention on Climate Change

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1 VERIFICATION OPINION

TÜV Rheinland (China) Ltd. (TÜV Rheinland) has performed the initial and first periodic verification of the emission reductions generated by the JI LSC project Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works" (ITL Project ID UA1000223) for the period from 01/04/2011 till 30/06/2012.

The project participants are responsible for the collection of data in accordance with the monitoring plan and the reporting of emission reductions generated by the project.

It is responsibility of TÜV Rheinland (China) Ltd. (TÜV Rheinland) to express an independent verification opinion - conclusion on the verified amount of emission reductions generated by the project and reported by the project participants through the monitoring report, version 2.0 dated 07/11/2012.

TÜV Rheinland (China) Ltd. (TÜV Rheinland) has assessed the monitoring report on the basis of the monitoring plan contained in the registered project design document version 2.5 dated 14/06/2010 and the monitoring report version 1.0 dated 17/09/2012.

The verification included the assessment of:

- project implementation in accordance with the project design document (PDD);
- compliance with the monitoring plan;
- calculation of emission reductions and expression of a conclusion with a reasonable level of assurance about whether the reported emission reductions data are accurate and free of material errors, omissions, or misstatements;
- quality and management of data and verification that reported emission reductions data is sufficiently supported by evidence.

TÜV Rheinland (China) Ltd. (TÜV Rheinland) verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. TÜV Rheinland (China) Ltd. (TÜV Rheinland) planned and performed the verification by obtaining evidence information and explanations that TÜV Rheinland (China) Ltd. (TÜV Rheinland) considers necessary to give reasonable assurance that reported emission reductions are fairly stated, accurate and free of material errors, omissions, or misstatements.

In TÜV Rheinland (China) Ltd. (TÜV Rheinland) opinion the emission reductions generated by the JI LSC project Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works" (ITL Project ID UA1000223) for the period from 01/04/2011 till 30/06/2012

are fairly stated, accurate and free of material errors, omissions, or misstatements in the monitoring report, version 2.0 dated 07/11/2012.

The GHG emission reductions were calculated correctly on the basis of the registered project design document version 2.5 dated 14/06/2010.

TÜV Rheinland (China) Ltd. (TÜV Rheinland) is able to verify that the emission reductions generated by the JI LSC project Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works" (ITL Project ID UA1000223) for the period from 01/04/2011 till 30/06/2012 amount 1 946 386 tonnes of CO_2 equivalent.

2 INTRODUCTION

Company Public Joint Stock Company Azovstal Iron & Steel Works has commissioned TÜV Rheinland (China) Ltd. (TÜV Rheinland) to carry out the verification of the JI LSC project Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works" (hereinafter "project") for the period from 01/04/2011 till 30/06/2012. This report contains the findings from the verification and conclusion on the verified amount of emission reductions.

2.1 Objective

The verification is the periodic independent review and ex post verification by an Accreditation Independent Entity (AIE) of the monitored reductions in GHG emissions that have occurred as a result of a Joint Implementation (JI) project activity during a defined verification period.

The purpose of the verification is to assess the reductions in anthropogenic emissions by sources or enhancements of anthropogenic removals by sinks generated by a JI project and reported by the project participants through the monitoring report in accordance with paragraph 37 of the JI guidelines.

The objective of this verification was to verify emission reductions generated by the JI LSC project Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works" for the period from 01/04/2011 till 30/06/2012.

TÜV Rheinland (China) Ltd. (TÜV Rheinland) is an Accredited Independent Entity by the Joint Implementation Supervisory Committee.

2.2 Scope

The scope of this verification is the assessment of:

- project implementation in accordance with the project design document (PDD);
- compliance with the monitoring plan, including the revision of the monitoring plan;
- calculation of emission reductions and expression of a conclusion with a reasonable level of assurance about whether the reported emission reduction data are accurate and free of material errors, omissions, or misstatements;
- quality and management of data and verification that reported emission reduction data is sufficiently supported by evidence.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions, forward action requests may provide input for corrective actions in order to provide for more accurate future monitoring and reporting.

2.3 JI LSC Project Description

The brief information regarding the LSC project activity is provided in table 1.

Table 1 – JI LSC project brief information

Project Parties involved:	1. Ukraine (Host party). 2. Switzerland
Title of the project:	Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works"
Type of JI activity:	Large-scale
ITL Project ID:	UA1000223
Baseline and monitoring methodology:	JI specific approach
Project entity participant:	Public Joint Stock Company "Azovstal Iron & Steel Works", 1 Leporsky str., Mariupol, Donetsk region, 87500, Ukraine
Other project participants:	Metinvest International SA, Metinvest International SA 2, 1201, Geneva, Switzerland
Location of the project:	Blast furnace department of Public Joint Stock Company "Azovstal Iron & Steel Works", 1 Leporsky str., Mariupol, Donetsk region, 87500, Ukraine
Crediting period of the project:	From 01/01/2008 to 31/12/2012
Period verified in this report:	From 01/04/2011 to 30/06/2012
Period verified in previous verification report:	From 01/06/2010 to 31/03/2011

The purpose of this project is to reduce emissions of greenhouse gases by reducing the specific coke consumption through an integrated energy efficiency program.
A detailed description of the program's measures is presented below:

1. **Modernization and reconstruction of the BFs**

Modernizations at the Blast Furnace Workshop (BFW) mainly include:

- Introduction of the brickwork of the furnace's stack and hearth made from composite refractory body (Si-SiC-Al_2O_3). This measure is directed at the 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.
- 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.
- Reconstruction of the BF2.

BF2 was initially constructed in 1934 with the pay-load volume 930 m^3. In the 1949 it was reconstructed with the pay-load volume of 1233 m^3 and work till the 1998 with the regular maintenances. In 1998 BF2 was mothballed. At the end of 2003 reconstruction of BF2 was started. Reconstruction includes the following engineering solutions:

a. Total dismantling of the existing BF2 including furnace's bed;
b. Construction of the BF with the pay-load volume of 1719 m^3;
c. Dismantling of the existing cast house with the construction of the new one;
d. Dismantling of the existing cowpers with the construction of the new ones;
e. 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.

2. Increasing the iron content in the 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, with coke and natural gas used 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", increase of iron content in the iron bearing materials on every 1% gives from 1% up to 1.4% of coke savings.

3. Decreasing the silicon content in the pig iron

The reduction of the silicon (Si) from the silica begins at 1450^{0}C and is processed as follows:

$SiO_2 + 2C = Si + 2CO – Q$

Therefore, reduction of the Si content will reduce coke required.

4. Decreasing the BFs idle times

Blast Furnaces 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, any measures focused on decreasing idle times will reduce the coke consumption.

Idle times at BFs are divided into the following categories:
1. Regular maintenances and preventive maintenances;
2. Major maintenances (I, II, III categories)
3. Operational idle times.

Proposed measure dealing with operational idle times that are divided into the following categories:
1. Technological idle times;
2. Mechanical equipment bugs fixing;
3. Electrical equipment bugs fixing.

So modernizations of BFs with the introduction of the modern automatic and control systems allow preventing strong fails/bugs of equipment by detection of the deviation from the normal operational conditions and reducing the time fixing.

5. Partial substitution of the limestone by lime.

Limestone that is charged into BF is calcinated through the reaction:

$CaCO_3 = CaO + CO_2$;

This reaction 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 will save coke that would be consumed for the calcination. Emission factor for the lime production will be taken into account in the calculation of emission reductions.

This will allow reducing of GHG emissions. The project is expected to generate 4 551 923 tonnes of CO_2 equivalent of emission reductions during the crediting period.

The project has been registered as Track 1 JI project with the PDD ver.2.5 dated 14th June 2010 (the PDD). The documentation on the project including the PDD, Approvals by the Parties Involved, Determination Report, Initial, First and Second Periodic Verification report is available at:

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

and

http://www.carbonunitsregistry.gov.ua/en/publication/content/869.htm

3 METHODOLOGY

The verification process has been carried out using internal procedures of TÜV Rheinland (China) Ltd. (TÜV Rheinland). In order to ensure transparency, a Verification protocol (Annex A to Verification report) was customized for the project, according to the Annex to "Joint Implementation Determination and Verification Manual", version 01. The Verification protocol shows, in a transparent manner, criteria (requirements) and results of verification.

The verification consists of the following three phases:

I) a desk review of the monitoring report including analysis of the compliance of the monitoring plan with the monitoring methodology;

II) follow-up interviews with project stakeholders including on site visit;

III) the resolution of outstanding issues and the issuance of the final verification report and opinion.

The following subsections outline each step in more detail.

3.1 Desk review

Project participants provided TÜV Rheinland (China) Ltd. (TÜV Rheinland) all the necessary documents for document review. The monitoring report version 1.0 dated 17/09/2012 was assessed as part of the verification. In addition, the project's Project Design Document version 2.5 dated 14/06/2010 and project's Determination Report No.UKRAINE/0112/2010 dated 21/06/2010 were also reviewed. Supporting documents, such as, acceptance certificates of coal products, electricity, work completion certificate, environmental impact assessments and expert opinions, etc. were available during on site visit.

The information and formulae provided in the monitoring report was compared with PDD and stated data sources.

To address TÜV Rheinland (China) Ltd. (TÜV Rheinland) corrective action and clarification requests, project participants revised the monitoring report and resubmitted it as version 2.0 dated 07/11/2012.

The verification findings presented in this report relate to the monitoring report version 2.0 dated 07/11/2012 and project as described in the PDD version 2.5 dated 14/06/2010.

The following tables outline the documentation reviewed during the verification. Documents provided by Public Joint Stock Company Azovstal Iron & Steel Works that relate directly to the components of the project are indicated in table 2. Background documents related to

the monitoring and/or methodologies employed in the monitoring or other reference documents are provided in table 3.

Table 2 – Category 1 Documents

No.	Title of the document
/1/	PDD. Project Development Document "Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works"", version 2.5 dated 14/06/2010 in Ukrainian.
/2/	Monitoring Report, version 1.0 dated 06/08/2012
/3/	Monitoring Report, version 2.0 dated 07/11/2012
/4/	GHG emission reduction calculation spreadsheet in Excel (20120731_MR004_Electrostal_ver1.1)
/5/	GHG emission reduction calculation spreadsheet in Excel (20120731_MR004_Electrostal_ver2.0)
/6/	"Joint implementation determination and verification manual", version 01, JISC.
/7/	"Guidance on criteria for baseline setting and monitoring", version 03, JISC.
/8/	Determination report #UKRAINE/0112/2010 Version 1.0 dated 04/06/2010
/9/	Letter of Approval by the Netherlands ref. 2010JI20 issued at 24 June 2010
/10/	Letter of Approval by the Ukraine ref. 1594/23/7 issued at 12 October 2010
/11/	Initial and First Periodic Verification Report #UKRAINE/0160/2010 Rev.02 dated 10/12/2010 (01/01/2008 – 31/05/2010)
/12/	Second Verification Report #UKRAINE-VER/0241/2011 Rev.02 dated 31/05/2011

Table 3 – Category 2 Documents

No.	Title of the document
/1/	Technical report on the work of the oxygen department for April 2011, approved on 04/05/2011, PJSC Azovstal Iron & Steel Works.
/2/	Technical report on the work of the oxygen department for July 2011, approved on 02/08/2011, PJSC Azovstal Iron & Steel Works.
/3/	Technical report on the work of the oxygen department for October 2011, approved on 02/11/2011, PJSC Azovstal Iron & Steel Works.
/4/	Technical report on the work of the oxygen department for January 2012, approved on 02/02/2012, PJSC Azovstal Iron & Steel Works.
/5/	Technical report on the work of the oxygen department for April 2012,

No.	Title of the document
	approved on 03/05/2012, PJSC Azovstal Iron & Steel Works.
/6/	Technical report on the work PEVS for April 2011, approved on 04/05/2011, PJSC Azovstal Iron & Steel Works.
/7/	Technical report on the work PEVS for July 2011, approved on 02/08/2011, PJSC Azovstal Iron & Steel Works.
/8/	Technical report on the work PEVS for October 2011, approved on 02/11/2011, PJSC Azovstal Iron & Steel Works.
/9/	Technical report on the work PEVS for January 2012, approved on 02/02/2012, PJSC Azovstal Iron & Steel Works.
/10/	Technical report on the work PEVS for April 2012, approved on 03/05/2012, PJSC Azovstal Iron & Steel Works.
/11/	Permit # 1412336900-25 on emissions of pollutants into the air from stationary sources issued to PJSC Azovstal Iron & Steel Works 30/03/2009.
/12/	Permit # 28.26 dated 17/06/2010 (adjustments from 28/02/2011) on waste disposal in 2011 issued to PJSC Azovstal Iron & Steel Works.
/13/	Permit # 28.26 dated 24/09/2010 (adjustments from 14/03/2011) on waste formation and disposal in 2011, owner of waste PJSC Azovstal Iron & Steel Works.
/14/	Permit # 28.02 dated 01/06/2011 on waste disposal in 2012 issued to PJSC Azovstal Iron & Steel Works.
/15/	Permit # 28.02 on waste formation and disposal in 2012, owner of waste PJSC Azovstal Iron & Steel Works.
/16/	Permit # Укр-Дон-3632 dated 17/06/2008 for special water use and norms of maximum permissible discharge of pollutants from wastewater, PJSC Azovstal Iron & Steel Works.
/17/	Permit # Укр-Дон-4876 dated 30/06/2011 for special water use, PJSC Azovstal Iron & Steel Works.
/18/	Technical report on the work of thermal power plant (TPP) for April 2011, approved on 04/05/2011, PJSC Azovstal Iron & Steel Works.
/19/	Technical report on the work of TPP for July 2011, approved on 02/08/2011, PJSC Azovstal Iron & Steel Works.
/20/	Technical report on the work of TPP for October 2011, approved on 02/11/2011, PJSC Azovstal Iron & Steel Works.
/21/	Technical report on the work of TPP for January 2012, approved on 02/02/2012, PJSC Azovstal Iron & Steel Works.
/22/	Technical report on the work of TPP for April 2012, approved on 03/05/2012, PJSC Azovstal Iron & Steel Works.
/23/	Photos of electricity meters.
/24/	Passport on Energia-9 power meter, serial # 25906

No.	Title of the document
/25/	Photos of carriage weights.
/26/	Passport on coke scales type 96B5, serial #5/1 dated 22/04/2009.
/27/	Passport on coke scales type VK1056-HC1, serial # 501 dated 17/04/2006.
/28/	Passport on coke scales type 96B5, serial #3/1 dated 08/08/2003.
/29/	Passport on coke scales type 96B5, serial #4/2 dated 12/08/2004.
/30/	Passport on coke scales type 96B5, serial #6/1 dated 29/09/2004.
/31/	Passport on coke scales type 20116ASV, serial #2 dated 14/07/2004.
/32/	Passport dated 29/02/2008 on coke scales type 20116ASV, serial #9.
/33/	Passport on electric carriage weighting machine type 115ЭВВ 20107ASV, serial #2 dated 29/08/2003.
/34/	Passport on carriage weighting machine type 20107ASV, serial #1 dated 01/09/2003.
/35/	Passport on carriage weighting machine type 20116ASV, serial #5 dated 10/11/2006.
/36/	Passport on carriage weighting machine type 20116ASV, inventory #11 dated 19/11/2010.
/37/	Passport on electric strain-gauge carriage weighting machine type VVT200-1-50, serial #1826 dated 14/09/2009.
/38/	Passport on electromechanical carriage weighting machine type VVT200-1-50, serial #1826 dated 24/06/2005.
/39/	Contract # 13/247/97то from 28/01/2011 on performance of metrological works (services) between the State enterprise "Donetsk Scientific-Production Center of Standardization, Metrology and Certification" and PJSC Azovstal Iron & Steel Works.
/40/	Contract # 13/180 from 02/02/2012 on performance of metrological works (services) between the State enterprise "Donetsk Scientific-Production Center of Standardization, Metrology and Certification" and PJSC Azovstal Iron & Steel Works.
/41/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for January 2012.
/42/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for October 2011.
/43/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for November 2011.
/44/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for December 2011.

No.	Title of the document
/45/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for February 2012.
/46/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for March 2012.
/47/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for April 2011.
/48/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for April 2012.
/49/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for May 2011.
/50/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for May 2012.
/51/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for June 2011.
/52/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for June 2012.
/53/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for July 2011.
/54/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for August 2011.
/55/	Passport of physical and chemical parameters of natural gas transmitted PJSC Mariupolhaz by GRS-1 Mariupol, Mariupol-2, Sahanka, Peremohy for September 2011.
/56/	Technical report on blast-furnace shop (Form #ДП-26) for January 2012, PJSC Azovstal Iron & Steel Works dated 14/02/2012.
/57/	Technical report on blast-furnace shop (Form #ДП-26) for February 2012, PJSC Azovstal Iron & Steel Works dated 15/03/2012.
/58/	Technical report on blast-furnace shop (Form #ДП-26) for March 2012, PJSC Azovstal Iron & Steel Works dated 06/04/2012.
/59/	Technical report on blast-furnace shop (Form #ДП-26) for April 2011, PJSC Azovstal Iron & Steel Works dated 12/05/2011.
/60/	Technical report on blast-furnace shop (Form #ДП-26) for April 2012, PJSC

No.	Title of the document
	Azovstal Iron & Steel Works dated 14.05.2012.
/61/	Technical report on blast-furnace shop (Form #ДП-26) for May 2011, PJSC Azovstal Iron & Steel Works dated 14/06/2011.
/62/	Technical report on blast-furnace shop (Form #ДП-26) for May 2012, PJSC Azovstal Iron & Steel Works dated 12/06/2012.
/63/	Technical report on blast-furnace shop (Form #ДП-26) for June 2011, PJSC Azovstal Iron & Steel Works dated 11/07/2011.
/64/	Technical report on blast-furnace shop (Form #ДП-26) for June 2012, PJSC Azovstal Iron & Steel Works dated 11/07/2012.
/65/	Technical report on blast-furnace shop (Form #ДП-26) for July 2011, PJSC Azovstal Iron & Steel Works dated 12/08/2011.
/66/	Technical report on blast-furnace shop (Form #ДП-26) for August 2011, PJSC Azovstal Iron & Steel Works dated 14/09/2011.
/67/	Technical report on blast-furnace shop (Form #ДП-26) for September 2011, PJSC Azovstal Iron & Steel Works dated 14/10/2011.
/68/	Technical report on blast-furnace shop (Form #ДП-26) for October 2011, PJSC Azovstal Iron & Steel Works dated 11/11/2011.
/69/	Technical report on blast-furnace shop (Form #ДП-26) for November 2011, PJSC Azovstal Iron & Steel Works від 12/12/2011.
/70/	Technical report on blast-furnace shop (Form #ДП-26) for December 2011, PJSC Azovstal Iron & Steel Works dated 12/01/2012.
/71/	Annex # 3.1 dated 01/10/2010 to the Contract on the electricity supply # 2 0042 000 from 01/12/2006. List of metering devices of electricity supplied to consumers and scheme for calculating the amount of supplied electricity to consumers PJSC Azovstal Iron & Steel Works.
/72/	Annex to the certificate of qualification from 28/12/2010 # 06544-5-3-54-CL. Certification sector of the metrological service PJSC Azovstal Iron & Steel Works on the right to conduct calibration of measuring equipment for their own needs during operation and release after repair.
/73/	Certificate # 16 on the metrological certification of measuring information channels, Saturn system, PJSC Azovstal Iron & Steel Works.
/74/	Certificate on attestation of metrological service PJSC Azovstal Iron & Steel Works, registration number #06544-5-3-54-КЛ, date of registration 28/12/2010.
/75/	Passport on primary transmitter type Metran, serial #260331.
/76/	Passport dated 05/01/1996 on primary transmitter type Metran, serial #358761.
/77/	Passport dated 03/08/2006 on primary transmitter type Saphir, serial #406191.
/78/	Passport dated 13/05/2003 on primary transmitter type Saphir, serial

No.	Title of the document
	#384695.
/79/	Passport on primary transmitter type Metran, serial #335384.
/80/	Passport dated 01/07/2003 on primary transmitter type Saphir, serial #602004.
/81/	Passport dated 01/07/2003 on primary transmitter type Saphir, serial #208008.
/82/	Passport dated 05/09/2003 on primary transmitter type Saphir, serial #205419.
/83/	Passport 04/05/2006 on primary transmitter type Metran, serial #275742.
/84/	Passport 10/08/2004 on primary transmitter type Saphir, serial #22580.
/85/	Passport 20/07/2004 on primary transmitter type Saphir, serial #12905.
/86/	Passport 06/05/2004 on primary transmitter type Saphir, serial #22904.
/87/	Passport 04/05/2006 on primary transmitter type Metran, serial #274317.
/88/	Passport 04/07/2010 on primary transmitter type Saphir, serial #400878.
/89/	Passport 16/05/2003 on primary transmitter type DM3583, serial #45275.
/90/	Passport 04/08/2010 on primary transmitter type DM, serial #48215.
/91/	Passport 20/08/2007 on primary transmitter type Metran, serial #187387.
/92/	Passport 15/05/2006 on primary transmitter type Yokogawa, serial #406007.
/93/	Passport 15/05/2006 on primary transmitter type Metran, serial #284050.
/94/	Passport 12/05/2008 on primary transmitter type Yokogawa, serial #20457.
/95/	Passport 02/02/2011 on primary transmitter type Yokogawa, serial #931192.
/96/	Passport 24/12/2010 on primary transmitter type Metran, serial #81913.

3.2 Interviews with project stakeholders

TÜV Rheinland (China) Ltd. (TÜV Rheinland) performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Interviewed representatives of Public Joint Stock Company Azovstal Iron & Steel Works are summarized in Table 4. The main topics of the interviews are summarized in Table 5.

Table 4 – Persons interviewed

Name	Organization and position	Topic of interview
Vladislav Antypov	Carbon projects Manager METINVEST HOLDING	Head of carbon projects department, monitoring of project performance
Alexey Shestopalov	Head of Investment Analysis Department	Project management, site visit

Roman Kyrsanov	Head of sintering and blast furnace production department	Operational reporting, logbooks
Volodymyr Strykov	Chief metrologist, head of metrology department	Monitoring equipment
Pavlo Dehtiariov	Automated production department project manager	Preparation of the shipping yard technical reports
Valentyn Sorokov	Optimisation production department specialist	Operational reporting, logbooks

Table 5 – Interview topics

No.	Date	Interviewed organization	Interview topics
/1/	04/10/2012	Public Joint Stock Company Azovstal Iron & Steel Works	· Baseline methodology · Reporting and calculation of emission reductions · QA/QC of the project · Project management · Monitoring plan · Revision of the monitoring plan · Monitoring report · Deviations from PDD · Organizational structure · Responsibilities and authorities · Monitoring equipment · Quality management procedures and technology · Roles and responsibilities for data collection and processing · Installation of equipment · Data logging, archiving, and reporting · Metering equipment control · Metering record keeping system, database · Training of personnel · Internal audits and check-ups

3.3 Resolution of Clarification, Corrective and Forward Action Requests

Where TÜV Rheinland (China) Ltd. (TÜV Rheinland), 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:

- Corrective action request (CAR), requesting the project participants to correct a mistake that is not in accordance with the monitoring plan;
- Clarification request (CL), requesting the project participants to provide additional information for the AIE to assess compliance with the monitoring plan;
- 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 of the project resulted in 17 Corrective action requests and 6 Clarification requests.

TÜV Rheinland (China) Ltd. (TÜV Rheinland) made an objective assessment as to whether the actions taken by the project participants and presented in the Table 1 (Annex A to Verification report) satisfactorily resolve the raised issues and concluded its findings of the verification.

3.4 Internal Technical Review

The verification report including the verification findings underwent a technical review before requesting the publication according to paragraph 37 of the JI guidelines. The technical review was performed by an internal technical reviewer qualified in accordance with TÜV Rheinland (China) Ltd. (TÜV Rheinland) qualification scheme for JI project determination and verification.

3.5 Verification team

The verification team consists of the following personnel indicated in Table 6 below.

Table 6 – Verification team

Name	Role
Dr. Manfred Brinkmann	Accredited Independent Entity Operational Manager
Dr. Lixin Li	Technical Reviewer
Dr. Valery Yakubovsky	Team Leader
Ganna Zadnipriana	Auditor
Mr. Vyacheslav Gonchar	Technical Expert
Dmytro Rakovich	Trainee

4 VERIFICATION FINDINGS

This section summarizes the findings from the verification of the emission reductions generated by the JI LSC project "Energy efficiency measures at the "Public Joint Stock Company Azovstal Iron & Steel Works"" (ITL Project ID UA1000223) for the period from 01/04/2011 till 30/06/2012.

4.1 Project approval by Parties involved

In accordance with paragraphs 90 - 91 of the DVM the assessment of this area focuses on whether at least one written project approval by a Party involved in the JI project, other than the host Party(ies), has been issued by the DFP of that Party. It also should be assessed whether the written project approvals are unconditional.

A written project approval by Ukraine (host Party) is available:
Letter of Approval by the Ukraine ref. 1594/23/7 issued at 12 October 2010
Written project approval by a Party involved in JI SSC project, other than the host Party was obtained:
Letter of Approval by the Netherlands ref. 2010JI20 issued at 24 June 2010

Written project approvals are available at:
http://ji.unfccc.int/JIITLProject/DB/SH8R5WAZQ92CWBIXEZPJMSGCVXT2KS/details and
http://www.carbonunitsregistry.gov.ua/en/publication/content/869.htm

The written project approvals mentioned above are unconditional. Identified problem areas for project approval, project participants' responses and conclusions of TÜV Rheinland (China) Ltd. (TÜV Rheinland) are described in Annex A to the Verification Report.

4.2 Project implementation

In accordance with paragraphs 92 - 93 of the DVM the assessment of this area focuses on whether the project has been implemented in accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website. The status of operation of the project during the monitoring period also should be assessed.

The project has been implemented in accordance with the PDD version 2.5 dated 14/06/2010 regarding which the determination has been deemed final. This LSC JI project is registered as Track 1 project. The description of this project is available in section 2.3. of this Verification report.

The emission reductions generated by the JI SSC project reported for the period from 01/04/2011 till 30/06/2012 amount to 1 946 386 tCO_2e.

The verification team of TÜV Rheinland (China) Ltd. (TÜV Rheinland) can confirm, through the on-site visit that all physical features of the proposed JI LSC project activity including data collecting and storage systems have been implemented, the project is completely operational and has been implemented as described in the registered PDD version 2.5 dated 14/06/2010.

Identified problem areas for project implementation, project participants' answers and conclusions of TÜV Rheinland (China) Ltd. (TÜV Rheinland) are described in Annex A to the Verification Report.

4.3 4.3 Compliance with monitoring plan

In accordance with paragraphs 94 - 98 of the DVM the assessment of this area focuses on whether 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.

The monitoring of the JI project occurred in accordance with the monitoring plan contained in the registered PDD 2.5 dated 14/06/2010. For calculating the emission reductions key factors influencing the baseline emissions as well as risks associated with the project were taken into account, as appropriate. For more detailed information, please, refer to the determined and registered PDD, version 2.5 dated 14/06/2010.

All data sources used for calculating emission reductions are indicated in table B.2.1 and B.2.3 of the Monitoring Report, version 2.0 dated 07/11/2012.

The emission factor used to calculate emission reductions are selected in accordance with the registered PDD version 2.5 dated 14/06/2010. The choice of this emission factor is appropriately justified in the PDD version 2.5 dated 14/06/2010 and in general accuracy and reasonableness are carefully balanced.

The calculation of emission reductions is done based on conservative assumptions and the most plausible scenarios in a transparent manner. The calculation of the baseline emissions is based on the JI specific approach in accordance with the registered PDD version 2.5 dated 14/06/2010.The calculation of emission reductions is done by subtracting the project emissions from the baseline emissions.

The detailed calculation of GHG emission reductions for chosen monitoring period (01/04/2011 – 30/06/2012) is provided in supporting documentation.

Identified problem areas for compliance with monitoring plan, project participants' answers and conclusions of TÜV Rheinland (China) Ltd. (TÜV Rheinland) are described in Annex A to the Verification Report.

4.4 Revision of monitoring plan

If the project participants submitted to the AIE a revised monitoring plan, in accordance with paragraphs 99 - 100 of the DVM the assessment of this area focuses on whether the correct and complete justification for the proposed revision is provided, and 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.

There was no revision to the monitoring plan. The monitoring of the JI LSC project occurred in accordance with the monitoring plan contained in the registered PDD, version 2.5 dated 14/06/2010.

Identified problem areas for compliance with monitoring plan, project participants' answers and conclusions of TÜV Rheinland (China) Ltd. (TÜV Rheinland) are described in Annex A to the Verification Report.

4.5 Data Management

In accordance with paragraph 101 of the DVM the assessment of this area focuses on the quality of the information using standard auditing techniques provided in the monitoring report by assessing whether the data and their sources are clearly identified, reliable and transparent.

Data collection procedure is carried out in accordance with the monitoring plan, including the quality control and quality assurance procedures and has been checked by the verification team on site visit. The monitoring plan is presented in section D of the registered PDD version 2.5 dated 14/06/2010. The data and their sources, provided in monitoring report, are clearly identified, reliable and transparent.

The evidence and records used for the monitoring are maintained in a traceable manner. Verification team got an access to all necessary data on monitoring system and emission reductions and received necessary evidence on site visit.

The data collection and management system for the project is in accordance with the monitoring plan as described in the registered PDD 2.5 dated 14/06/2010.

Identified problem areas for data management, project participants' answers and conclusions of TÜV Rheinland (China) Ltd. (TÜV Rheinland) are described in Annex A to the Verification Report.

4.6 Assessment of data and calculation of greenhouse gas emission reductions

The verification team of TÜV Rheinland (China) Ltd. (TÜV Rheinland) verified that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the pre-defined formulae from registered PDD version 2.5 dated 14/06/2010.

According to the Monitoring Report, version 2.0 dated 07/11/2012 and GHG emission reductions calculation spreadsheet in Excel format the emissions for the project scenario, emissions for the baseline scenario and emission reductions for chosen monitoring period (01/04/2011 – 30/06/2012) are provided in table 7 below.

Table 7 – Results for Emission Reductions for Monitoring Period

Monitoring Period:	**01/04/2011 – 30/06/2012**
Emissions for the project scenario:	13 594 295 tCO_2e
Emissions for the baseline scenario:	15 540 681 tCO_2e
Leakage:	0 tCO_2e
Emission reductions:	1 946 386 tCO_2e

4.7 Remaining issues, CARs from previous determination/verification

Not applicable.

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ANNEX A – VERIFICATION PROTOCOL

Table 1 – Requirements Checklist

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
1. Project approvals by Parties Involved				
1. 1. 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?	90	The project has been approved by the DFPs of the Parties Involved and documentation is available: 1) Letter of Approval by the Netherlands ref. 2010JI20 issued at 24 June 2010 2) Letter of Approval by the Ukraine ref. 1594/23/7 issued at 12 October 2010	OK	OK
1. 2. Are all the written project approvals by Parties involved unconditional?	91	All the written project approvals by Parties involved are unconditional.	OK	OK
2. Project implementation				
2.1. 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?	92	The project was implemented in accordance with the registered PDD. This JI project is registered as Track 1. Project information is available (See Section A.3 of this report). Implementation schedule is provided in section A.6.	OK	OK
2.2. What is the status of operation of the project during the monitoring period?	93	The project received a positive opinion by AIE and passed the final determination. Currently this project is at the stage of verification. During the monitoring period that covers time period between 01/04/2011 and 30/06/2012 the project was operating as planned. The verification team verified during the site visit that the project, being a Blast furnaces department of steelmaking facility, is operational and there is an evidence that it was operated during the whole monitoring period. However, not all the measures envisaged in the project activity had been implemented in	**CL 01**	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
		the monitoring period. **CL 01:** Please explain why implementation of fifth subproject by the project activity: replacement of limestone by lime almost was not realized in the monitoring period.		
3. Compliance with monitoring plan				
3.1. Did the monitoring occur in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final?	94	Yes, the monitoring performed in accordance with the monitoring plan included in the determined PDD. There were no deviations from this monitoring plan as well as no open issues since last verification.	OK	OK
3.2. For calculating the emission reductions or enhancements of net removals, were key factors, e.g. those listed in 23 (b) (i)-(vii) of DVM, 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?	95 (a)	Yes, all the key factors were taken into account for calculating the emission reductions or enhancements of net removals. For more detailed information, please, refer to Section B.2. of the determinated .PDD version 2.5 and invariable throughout the crediting period.		OK
3.3. Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	95 (b)	The monthly technical reports "Production of the Pig Iron of the Azovstal" have been identified as the data source for the following monitoring parameters: pig Iron production; consumption of coke, pellets, sinter, lime and limestone; blast production; oxygen consumption; natural gas consumption; electricity consumption. This data source is based on the existing reporting system of the company and is clearly identified, reliable and transparent. Data cross checking are made by responsible persons in the BFW, BOF and OHF. Description of each stage monitoring for each	**CAR 01** **CAR 02** **CAR 03** **CAR 04** **CAR 05**	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
		parameter is in section B of MR. **CAR 01:** Correct names of the equipment in Section B.1. and add the names of the monitoring equipment used during the reporting period. **CAR 02:** Please provide a clarification for the measured parameters (accessory). **CAR 03:** Provide information for obtaining the value NCV_{NG} of natural gas. **CAR 04:** Link to the value of emission factor for calcination of limestone process does not lead to the value specified in the MR. Provide an accurate source of data. **CAR 05:** Link to the value of emission factors for sinter production and pellets production does not lead to the value specified in the MR. Provide an accurate source of data. **CAR 06:** Provide a link to the data source for the emission factor from natural gas combustion and coke production.		
3.4. 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	95 (c)	Emission factors, including default emission factors, used for calculating the emission reductions or enhancements of net removals, are selected by carefully balancing accuracy and reasonableness, and the choice is appropriately	**CAR 07** **CAR 08** **CAR 09**	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
choice?		justified. The emission factors used to calculate emission reductions are selected in accordance with the registered PDD ver. 2.5 dated June 14, 2010 The choice of these emission factors is appropriately justified in the PDD ver. 2.5 and in general accuracy and reasonableness are carefully balanced. However, sources and references for emission factors should be updated to ensure greater transparency for its choice. Emission factor for global baseline emission factor for production of pig iron is referenced to the registered determinated PDD and corresponds with it. Emission factor for coke production; emission factor for the natural gas combustion; emission factor for the blast production; sinter production and pellets production are referenced to the IPCC Guidelines but the values are not traceable to the referenced source. **CAR 07:** Please provide a table with values and references to data sources taken by default that are used for calculating ERUs. **CAR 08:** Monitoring report stated that the applicable emission factor for electricity consumption for consumers who are classified as the 2nd Class, but indicated coefficient - 1.090 tCO2/kW refers to the 1st class consumers. Please correct the discrepancy.		

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
		CAR 09: Correct designation of coefficients in formulas according to the approved PDD version 2.5 dated June 14, 2010.		
3.5. Is the calculation of emission reductions or enhancements of net removals calculated based on conservative assumptions and the most plausible scenarios in a transparent manner?	95 (d)	The calculation of emission reductions is carried out based on conservative assumptions and the most plausible scenarios in a transparent manner. Project emissions are presented as the sum of the emissions values by components of the steel making process. The following sources of emissions can be observed during the BF operation: • Pig iron production; • Consumption of coke; • Consumption of pellets; • Consumption of sinter; • Consumption of lime; • Consumption of limestone; • Blast production; • Oxygen consumption; • Natural gas consumption; • Electricity consumption. The calculation of the baseline emissions is based on the JI specific approach in accordance with the registered PDD and relies on the baseline emission factor for pig iron production. This factor is applied to the pig iron production level which is assumed equal in both project and baseline scenario. Maximal technical capacity of BFW prior the project instead according to the	**CL 02** **CAR 10**	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
		determined PDD equals 430 000 t. Since there is no significant changes or adjustments of the initial data in monitoring period, update this coefficient is not needed. The calculation of emission reductions is carried out by subtracting the project emissions from the baseline emissions. **CL 02:** Please explain why there was a significant reduction in the consumption of natural gas and oxygen blast shop during the reporting period. At the same time, the consumption of other resources used by domain department and production of products remains more or less stable. **CAR 10:** Add the equality 1 ton of CO_2 and 1 t CO_2e		
4. Applicable to JI SSC projects only				
4.1. 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?	96	Not applicable	OK	OK
5. Revision of monitoring plan ***Applicable only if monitoring plan is revised by project participants***				
5.1. Did the project participants provide an	99 (a)	Not applicable	OK	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
appropriate justification for the proposed revision?				
5.2. 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?	99 (b)	Not applicable	OK	OK
6. Data management				
6.1. Is the implementation of data collection procedures in accordance with the monitoring plan, including the quality control and quality assurance procedures?	101 (a)	Data collection procedure is carried out in accordance with the monitoring plan, including the quality control and quality assurance procedures and was checked by the verification team on-site. However, it is not understandable the absence of organizations involved in monitoring and replacement procedures for measuring equipment. The monitoring plan is presented in the section D of the registered PDD ver.2.5. **CAR 11:** Provide information about the functions of PSC "Mariupolhaz" and include the state enterprise "Donetsk Scientific-Production Center of Standardization, Metrology and Certification" in the list of participating third-party organizations. **CL 03:** Please explain the procedure for replacing of the measuring equipment and related actions and documents that carried out during the replacement, and how reliability measurement and control of the data preserves. **CL 04:** Explain why Ukrainian Centre for	**CAR 11** **CL 03** **CL 04**	

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
		Standardization and Metrology was excluded from the list of third parties involved in the monitoring process and what work and functions were performed.		
6.2. Is the function of the monitoring equipment, including its calibration status, is in order?	101 (b)	The monitoring equipment employed by the project operates in accordance with the monitoring plan and in general is in order. The verification team verified that the reported metering devices are in fact installed and operational. The metering devices have appropriate documentation, such as passports and calibration certificates. Calibration was performed in accordance with the procedures of the Host Party and evidence of these calibrations was provided (calibration certificates and/or evidence of calibration in the passports of the devices). However, it was found that dates of the calibration equipment do not match those indicated in the MR. Also it was detected equipment involved in the monitoring process but not specified in the MR. Accuracy of the measuring equipment requires confirmation. **CAR 12:** Add to the list of equipment that is used for monitoring of project data: Wagon - weight 2330-2BB-200E/1СД, oxygen meter # 42421 and #264543 (TC #3 (CHP) and TC #6 (PEPS) and natural gas meter Yokogawa # 931198 on SE-6. Provide the necessary information about the characteristics and calibration of these devices to the relevant sections.	**CAR 12** **CAR 13** **CAR 14** **CAR 15** **CL 05** **CL 06**	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
		CAR 13: Provide correct and actual information on the type of equipment, serial number, plant number, accuracy and calibration for these numbers of counters: SC1, SC6, SC11, SC13, FM9, FM10, FM17, FM20, EL1, EL5. **CAR 14:** Please check the accuracy of meters of natural gas Yokogawa. According to interviews conducted during the site-visit all counters of this type has accuracy of 0.25%. **CAR 15:** According to interviews on site-visit it was found that the replacement of counters SC2 # 1826 and # 281 didn't occur, and these weights work simultaneously. Please correct the information on this equipment. **CL 05:** Explain if it is necessary to provide calibration of the whole measuring complex "Saturn", but not its individual components. **CL 06:** Please provide certificate (license) of metrological service PJSC "IC" Azovstal " to carry out calibration of measuring instruments listed in this report.		
6.3. Are the evidence and records used for the monitoring maintained in a traceable manner?	101 (c)	The evidence and records used for the monitoring are maintained in a traceable manner.	**OK**	OK
6.4. Is the data collection and management system for the project in accordance with the monitoring plan?	101 (d)	Implemented data collection and management system is in accordance with the monitoring plan, as described in the PDD determination of which is	**CAR 16** **CAR 17**	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
		considered to be final. **CAR 16:** Please provide numbers for all formulas in MR. **CAR 17:** According to Determination and Verification Manual, version 01, paragraph 36 - Data monitored and required for verification are to be kept for two years after the last transfer of ERUs for the project. Please correct the appropriate statement in the Monitoring Report (MR).		

DVM* - Joint Implementation Determination and Verification Manual, version 01

Table 2 - Resolution of CARs, CLs and FARs

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
1.	**CAR 01.**	Correct names of the equipment in Section B.1. and add the names of the monitoring equipment used during the reporting period.	95 (b)	Section B.1. was updated so as to avoid repeating of information in Section B.1.2. of Monitoring Report version 2.0 dated 07/11/2012.	**Issue is closed**
2.	**CAR 02.**	Please provide a clarification for the measured parameters (accessory).	95 (b)	Appliance of the measurement (blast furnace shop at Azovstal Plant) is specified in Monitoring Report version 2.0 dated 07/11/2012.	**Issue is closed**
3.	**CAR 03.**	Provide information for obtaining the value NCV_{NG} of natural gas.	95 (b)	Information was added to new version of MR. Please, see updated MR version 2.0	**Issue is closed**
4.	**CAR 04.**	Link to the value of emission factor for calcination of limestone process does not lead to the value specified in the MR. Provide an accurate source of data.	95 (b)	Information was updated in new version of MR. Please, see updated MR version 2.0.	**Issue is closed**
5.	**CAR 05.**	Link to the value of emission factors for sinter production and pellets production does not lead to the value specified in the MR. Provide an accurate source of data.	95 (b)	Links was added to new version of MR. Please, see updated MR version 2.0.	**Issue is closed**
6.	**CAR 06.**	Provide a link to the data source for the emission factor from natural gas combustion and coke production.	95 (b)	Link was added to new version of MR. Please, see updated MR version 2.0.	**Issue is closed**
7.	**CAR 07.**	Please provide a table with values and references to data sources taken	95 (c)	Table with values and references to the default data sources used for calculating	**Issue is closed**

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
		by default that are used for calculating ERUs.		ERUs are provided in Section B.2.1. List of fixed default values and estimated baseline factors. It was supplemented with the factors used to convert units of measurement and GHG emissions factors. Reference to them was removed from Section D of Monitoring Report version 2.0 dated 07/11/2012.	
8.	**CAR 08.**	Monitoring report stated that the applicable emission factor for electricity consumption for consumers who are classified as the 2nd Class, but indicated coefficient - 1.090 tCO2/kW refers to the 1st class consumers. Please correct the discrepancy.	95 (c)	PJSC "MK" Azovstal" is the 1st class electricity consumer, factor name was corrected in the Monitoring Report version 2.0 dtd. 07/11/2012. Annex to the contract for electricity supply has been provided as an evidence that PJSC "MK" Azovstal" is the 1st class electricity consumers .	**Issue is closed**
9.	**CAR 09.**	Correct designation of coefficients in formulas according to the approved PDD version 2.5 dated June 14, 2010.	95 (c)	Key factors in the formulas were aligned with PDD version 2.5 of June 14, 2010.	**Issue is closed**
10.	**CAR 10.**	Add the equality 1 ton of CO_2 and 1 t CO_2e	95 (d)	The equality was added to new version of MR. Please, see updated MR version 2.0.	**Issue is closed**
11.	**CAR 11.**	Provide information about the functions of PSC "Mariupolhaz" and include the state enterprise "Donetsk Scientific-Production Center of Standardization, Metrology and	101 (a)	PJSC "Mariupolhaz" carries out measuring of the net calorific value of natural gas and provides measurement results of Azovstal Plant in the form of Passports of physicochemical parameter of gas, which	**Issue is closed**

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
		Certification" in the list of participating third-party organizations.		is the primary source of data of this parameter. SE "Donetsk Scientific-Production Center of Standardization, Metrology and Certification" was included into the list of third-party in Monitoring Report version 2.0 dated 07/11/2012.	
12.	**CAR 12.**	Add to the list of equipment that is used for monitoring of project data: Wagon - weight 2330-2BB-200E/1СД, oxygen meter # 42421 and #264543 (TC #3 (CHP) and TC #6 (PEPS) and natural gas meter Yokogawa # 931198 on SE-6. Provide the necessary information about the characteristics and calibration of these devices to the relevant sections.	101 (b)	Information on wagon scales 2330-2VV-200E/1SD, oxygen meters #42421 and #264543 (TK#3 (CHP) and TK#6 (PEPS) and natural gas meter Yokogawa #931198 for BF-6 was provided in the relevant Sections of Monitoring Report version 2.0 dated 07/11/2012.	**Issue is closed**
13.	**CAR 13.**	Provide correct and actual information on the type of equipment, serial number, plant number, accuracy and calibration for these numbers of counters: SC1, SC6, SC11, SC13, FM9, FM10, FM17, FM20, EL1, EL5.	101 (b)	Information on the type of equipment, its serial number, factory number, accuracy and calibration for the meters under the following numbers: SC1, SC6, SC11, SC13, FM9, FM10, FM17, FM20, EL1, EL5 was revised in accordance with the passports of these measuring equipment in Monitoring Report version 2.0 dated 07/11/2012.	**Issue is closed**
14.	**CAR 14.**	Please check the accuracy of meters of natural gas Yokogawa. According	101 (b)	According to the passports of measuring devices Yokogawa, some of them have	**Issue is closed**

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
		to interviews conducted during the site-visit all counters of this type has accuracy of 0.25%.		0.5% accuracy level. Monitoring report presents information according to passports of flow meters.	
15.	**CAR 15.**	According to interviews on site-visit it was found that the replacement of counters SC2 # 1826 and # 281 didn't occur, and these weights work simultaneously. Please correct the information on this equipment.	101 (b)	Information was corrected in Monitoring Report version 2.0 dated 07/11/2012.	**Issue is closed**
16.	**CAR 16.**	Please provide numbers for all formulas in MR.	101 (d)	All formulas were numbered in the Monitoring Report version 2.0 dated 07/11/2012.	**Issue is closed**
17.	**CAR 17.**	According to Determination and Verification Manual, version 01, paragraph 36 - Data monitored and required for verification are to be kept for two years after the last transfer of ERUs for the project. Please correct the appropriate statement in the Monitoring Report (MR).	101 (d)	Statement on information storage term had been revised in Monitoring Report version 2.0 dated 07/11/2012.	**Issue is closed**
18.	**CL 01.**	Please explain why implementation of fifth subproject by the project activity: replacement of limestone by lime almost was not realized in the monitoring period.	93	Since the beginning of the project implementation the chemical properties of iron burden (sinter, pellets, ore) used for the production of pig iron have changed. Now the market contains a substance with the increased basicity due to which the need to add other components to create	**Issue is closed**

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
				the necessary basic environment (such as limestone or lime) significantly diminished or has disappeared. Selection of iron burden could reduce specific consumption of limestone from 60-70 kg/t at the beginning of the project, to 8.10 kg/t in the last monitoring period. Thus, given the current burden conditions, the fifth stage of the project activity, which is the replacement of limestone by lime, is not relevant already.	
19.	**CL 02.**	Please explain why there was a significant reduction in the consumption of natural gas and oxygen blast shop during the reporting period. At the same time, the consumption of other resources used by domain department and production of products remains more or less stable.	95 (d)	Specific consumption of natural gas and oxygen decreased by reducing the production of iron and partial increase of coke consumption. Specific consumption of other resources really remains more or less stable, namely electricity and iron burden. Specific coke consumption due to reduced consumption of natural gas has increased, but because both implemented a set of measures aimed at reducing of its use of specific coke consumption increase was not so significant.	**Issue is closed**
20.	**CL 03.**	Please explain the procedure for replacing of the measuring equipment and related actions and documents that carried out during the replacement, and how reliability measurement and control of the data	101 (a)	Substitution procedure is performed as follows: 1. Dismantling of broken measuring devices (FTA) with making the Certificate of unserviceability.	**Issue is closed**

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
		preserves.		2. Calibration of the new FTA with compiling his passport and calibration protocol. 3. Instrumentation shop keeps the passport of broken FTA in the archives; CHP: Passport of new FTA is stitched to the passport of decommissioned FTA. 4. In the journal of the FTA the replacement of specifying the date of issue of the new replacement FTA is recorded. 5. Installation of the FTA on the object. Detecting of broken FTA and its replacement for working one is being performed for a maximum of three days, and more and faster because most involved in monitoring FTA are connected to automated process control and accounting system, which allows for rapid detection of the problem. During the replacement FTA figures are taken equally to the average of the previous three days, which checks the data on the total consumption value not regarding net consumption by other units.	
21.	**CL 04.**	Explain why Ukrainian Centre for Standardization and Metrology was	101 (a)	Ukrainian Centre for Standardization and Metrology is a general name for	**Issue is closed**

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
		excluded from the list of third parties involved in the monitoring process and what work and functions were performed.		organizations that conduct state certification of FTA. Its name is specified in Monitoring report version 2.0 dated 07/11/2012: SE "Donetsk Scientific-Production Center of Standardization, Metrology and Certification".	
22.	**CL 05.**	Explain if it is necessary to provide calibration of the whole measuring complex "Saturn", but not its individual components.	101 (b)	"Saturn" System is a non-commercial, so is to undergo metrological certification by the metrological service of PJSC "IC" Azovstal" in accordance with MI 2002-89 "Information-measuring systems. Organization and procedure of metrological certification". Certificate on attestation was provided as supporting documentation.	**Issue is closed**
23.	**CL 06.**	Please provide certificate (license) of metrological service PJSC "IC" Azovstal " to carry out calibration of measuring instruments listed in this report.	101 (b)	Copies of certificates on the right for calibration number 06544-5-3-54-KL dated 12/28/10 and a copy of the Appendix to Certificate provided with a list of areas of certification are provided as Supporting documentation.	**Issue is closed**