TÜV Rheinland (China) Ltd. (TÜV Rheinland)

VERIFICATION REPORT

Verification of the Joint Implementation Large-scale Project UTILIZATION OF COAL MINE METHANE AT THE COAL MINE NAMED AFTER M.P. BARAKOV OF JSC "KRASNODONCOAL"

ITL Project ID: UA1000420

Initial and first periodic verification:
01/01/2008 – 30/09/2012

Report No. 01 998 9105065096 – VR1
Revision No. 02

Customer: Global Carbon B.V.

VERIFICATION REPORT

Date of first issue: 11/09/2012	Project No: 01 998 9105065096 ITL Project ID: UA1000420
Executor: TÜV Rheinland (China) Ltd. (TÜV Rheinland)	Organizational unit: TÜV Rheinland Ukraine Ltd. Technical Competence Center
Customer: Global Carbon B.V.	Client ref.: Anna Vilde

Summary:

TÜV Rheinland (China) Ltd. (TÜV Rheinland) has performed the initial and first periodic verification of emission reductions generated by the JI LSC project Utilization of coal mine methane at the coal mine named after M.P. Barakov of JSC "Krasnodoncoal" (ITL Project ID UA1000420) for the period from 01/01/2008 till 30/09/2012.

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 3.0 dated 15/11/2012 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 3.5 dated 23/11/2011.

The emission reductions were calculated correctly on the basis of the approved monitoring plan contained in the project design document version 3.5 dated 23/11/2011.

TÜV Rheinland (China) Ltd. (TÜV Rheinland) is able to verify that the emission reductions generated by the JI LSC project Utilization of coal mine methane at the coal mine named after M.P. Barakov of JSC "Krasnodoncoal" during the period from 01/01/2008 till 30/09/2012 amount to 284 494 tonnes of CO_2 equivalent.

Report No.: 01 998 9105065096 – VR1	Subject Group: JI
Project title: Utilization of coal mine methane at the coal mine named after M.P. Barakov of JSC "Krasnodoncoal"	
Work carried out by: Dr. Valery Yakubovsky – Team Leader, Technical Competence Center Director; Dr. Boris Bokiy – Technical Expert; Ganna Zadnipriana – Auditor; Dmytro Rakovich – Trainee.	☒ No distribution without permission from the Client or responsible organizational unit
Work verified by: Dr. Lixin Li – Technical Reviewer; Mr. Limin Yuan – TR Technical Expert	☐ Limited distribution
Verification Report approved by: Dr. Manfred Brinkmann – Accredited Independent Entity Operational manager	☐ Unrestricted distribution

TÜV Rheinland (China) Ltd. (TÜV Rheinland)

Date of this revision:	Revision No.:	Number of pages:
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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 Utilization of coal mine methane at the coal mine named after M.P. Barakov of JSC "Krasnodoncoal" (ITL Project ID UA1000420) for the period from 01/01/2008 till 30/09/2012.

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 3.0 dated 15/11/2012.

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 3.5 dated 23/11/2011 and the monitoring report version 1.0 dated 28/02/2012.

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 Utilization of coal mine methane at the coal mine named after M.P. Barakov of JSC "Krasnodoncoal" (ITL Project ID UA1000420) for the period from 01/01/2008 till 30/09/2012 are fairly stated, accurate and free of

material errors, omissions, or misstatements in the monitoring report, version 3.0 dated 15/11/2012.

The GHG emission reductions were calculated correctly on the basis of the registered project design document version 3.5 dated 23/11/2011.

TÜV Rheinland (China) Ltd. (TÜV Rheinland) is able to verify that the emission reductions generated by the JI LSC project Utilization of coal mine methane at the coal mine named after M.P. Barakov of JSC "Krasnodoncoal" (ITL Project ID UA1000420) for the period from 01/01/2008 till 30/09/2012 amount 284 494 tonnes of CO_2 equivalent.

2 INTRODUCTION

Company Global Carbon B.V. has commissioned TÜV Rheinland (China) Ltd. (TÜV Rheinland) to carry out the verification of the JI LSC project Utilization of coal mine methane at the coal mine named after M.P. Barakov of JSC "Krasnodoncoal" (hereinafter "project") for the period from 01/01/2008 till 30/09/2012. 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 Utilization of coal mine methane at the coal mine named after M.P. Barakov of JSC "Krasnodoncoal" for the period from 01/01/2008 till 30/09/2012.

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. Netherlands
Title of the project:	Utilization of coal mine methane at the coal mine named after M.P. Barakov of JSC "Krasnodoncoal"
Type of JI activity:	Large-scale
ITL Project ID:	UA1000420
Baseline and monitoring methodology:	JI specific approach
Project entity participant:	PJSC "Krasnodon Coal Company", 5 Komsomolska str., Krasnodon, Luhansk region, 94440, Ukraine
Other project participants:	Global Carbon B.V., Graadt van Roggenweg 328, Building D, 3531 AH Utrecht,The Netherlands
Location of the project:	Premises of coal mine named after M.P. Barakov of JSC "Krasnodoncoal", Luhansk region
Crediting period of the project:	From 01/01/2004 to 31/12/2025
Period verified in this report:	From 01/01/2008 to 30/09/2012
Period verified in previous verification report:	N/A

Coal mine named after M.P. Barakov (further referred to as Barakov Mine or the Mine) in order to reduce GHG emissions and other negative environmental impacts of the Mine the coal mine methane (CMM) utilization project was implemented. The project scenario is combustion of CMM to generate thermal energy and venting the remaining CMM into the atmosphere. The proposed project of CMM utilization consists of installation of methane-burners at old coal fired boilers and installation of new gas fired boiler. In order to meet the above objectives, the mine degasification system was modernized, gas preparation station was

installed and boiler house was reconstructed to allow the combustion of gases extracted by methane drainage techniques. Modernized mine degasification system removes the gas from coal-bearing strata during mining.
The methane containing gases are extracted through a pipeline installed in the main shaft. If not utilized, they are normally released with no destruction into the atmosphere through a stand installed at degasification facility.

The main project objectives were:

- to cut GHG emissions by capturing CMM previously released into the atmosphere from the Mine's degasification system; to utilize it for thermal energy generation to cover the heating demand of the Mine;
- to avoid GHG emissions due to natural gas combustion for the purpose of heat generation which would have happened in the absence of the project activity.

As a result of the project GHG emissions are reduced by decreasing the amount of CMM vented into the atmosphere and avoiding natural gas combustion for heat generation which would happen otherwise.
This will allow reducing of GHG emissions. The project is expected to generate 1 569 052 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.3.5 dated 23rd November 2011 (the PDD). The documentation on the project including the PDD, Approvals by the Parties Involved and Determination Report are available at:

http://ji.unfccc.int/JIITLProject/DB/224UEYY5LIRBI6SHM3R47UWCQA8EGC/details
and at http://www.carbonunitsregistry.gov.ua/ua/261.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 28/02/2012 was assessed as part of the verification. In addition, the project's Project Design Document version 3.5 dated 23/11/2011 and project's Determination Report No. 01 998 9105065096 – DR (Version 2.0) dated 12/12/2011 were also reviewed. Supporting documents, such as, 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 3.0 dated 15/11/2012.

The verification findings presented in this report relate to the monitoring report version 3.0 dated 15/11/2012 and project as described in the PDD version 3.5 dated 23/11/2011.

The following tables outline the documentation reviewed during the verification. Documents provided by Global Carbon B.V. 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 "Utilization of coal mine methane at the coal mine named after M.P. Barakov of JSC "Krasnodoncoal"", version 3.5 dated 23/11/2011 in Ukrainian.
/2/	Monitoring Report, version 1.0 dated 06/08/2012
/3/	Monitoring Report, version 1.1 dated 25/08/2012
/4/	Monitoring Report, version 3.0 dated 15/11/2012
/5/	GHG emission reduction calculation spreadsheet in Excel (20120427_MR001_Barakova_ver 2.0_en)
/6/	GHG emission reduction calculation spreadsheet in Excel (20121024_MR001_Barakova_2.2)
/7/	"Joint implementation determination and verification manual", version 01, JISC.
/8/	"Guidance on criteria for baseline setting and monitoring", version 03, JISC.
/9/	Determination report #01 998 9105065096 - DR (Version 2.0) dated 12/12/2011
/10/	Letter of Approval by the Netherlands ref. 2010JI45 issued on 06 December 2011
/11/	Letter of Approval by Ukraine ref. 2587/23/7 issued at 14 September 2012

Table 3 – Category 2 Documents

No.	Title of the document
/1/	Quality certificate on the boiler # 9368 DKVR 6,5 – 13 (E -6,5-14) manufacturing dated 17/09/2009
/2/	Passport on the boiler # 8010 KVTG – 10 – 150
/3/	Quality certificate on the boiler # 8010 KVGT – 10 – 150 installation (2010)
/4/	Quality certificate on the boiler # 5246 DKVR 6,5 – 13 (E -6,5-14) manufacturing (2001)
/5/	Design works on installation and repair of the boiler DKVR 6,5 - 13
/6/	Repair acceptance certificate of the boiler as of November 2002
/7/	Quality certificate on the boiler # 2983 DKVR 6,5 – 13 (E -6,5-14) manufacturing (1964)
/8/	Quality certificate on the boiler installation assembled at Duvanna-Pivdenna Mine
/9/	Quality certificate on the boiler # 4596 DKVR 6,5 – 13 (E -6,5-14) manufacturing dated March 1974
/10/	Write-off certificate for the boiler # 4596 DKVR 6,5 – 13 (E -6,5-14) in 2002

No.	Title of the document
/11/	Statement on fuel consumption for Barakova Mine boiler house needs over the period from 2004 to 2009
/12/	Statement # 4/1/20-351 on fuel consumption for Barakova Mine boiler house needs 2012 dated 16/10/2012
/13/	Passport on the gas analyzer GP2301 # 7144
/14/	Passport on the gas analyzer GP2301 # 8908
/15/	Permit on hazardous works continuation #1614.11.30-29.52.3 dated 26th of April, 2011
/16/	Technical report on examination, setup and testing of Barakova Mine degasification station equipment dated 06/07/2006
/17/	Technical report on examination, setup and testing of Barakova Mine degasification station equipment dated 10/06/2007
/18/	Technical report on examination, setup and testing of Barakova Mine degasification station equipment dated 03/08/2008
/19/	Technical report on examination, setup and testing of Barakova Mine degasification station equipment dated 21/08/2009
/20/	Technical report on examination, setup and testing of Barakova Mine degasification station equipment dated 16/07/2010
/21/	Technical report on examination, setup and testing of electric equipment, automation and control schemes, measuring-and-recording apparatus of Barakova Mine degasification station dated 12/08/2011
/22/	Technical report on examination, setup and testing of electric equipment, automation and control schemes, measuring-and-recording apparatus of Barakova Mine degasification station dated 12/07/2012
/23/	Statement on CMM consumption on annual basis from 2010 to 2012
/24/	Logbook for the period of from 20th to 22th of June, 2010
/25/	Logbook for the period of from 15th to 17th of February, 2010
/26/	Logbook for April, 2011
/27/	Register records on gas and methane supply to the boiler house from 03/2011 to 04/2011
/28/	Instruction. Procedures of data on methane collection at Barakova Mine
/29/	Estimated uncertainty assessment document. Calculation of the relative error of measurement of the amount of methane combusted in the boiler house
/30/	Letter from Barakova Mine to PJSC "Krasnodoncoal" regarding to the amount of coal and gas consumed over the period from 2004 to 2009
/31/	Agreement # 3 on the Mine reconstruction dated 29th of January, 2002
/32/	Statements on payment for environmental pollution with methane emissions

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 Global Carbon B.V. and Barakov mine are summarized in Table 4. The main topics of the interviews are summarized in Table 5.

Table 4 – Persons interviewed

	Name	Organization	Title
/1/	Anna Vilde	Global Carbon B.V., Project Developer	Project management, site visit
/2/	Gelezniak Sergei	PJSC "Krasnodon coal company"	Technical expert
/3/	Ustenenkov Sergei	Barakov mine, acting of main engineer	Operational reporting, logbooks, plant visit
/4/	Dorin Victor	Barakov mine, director assistant of capital construction	Finance activity
/5/	Ulesko Andrej	Barakov mine, Master Mechanic	Technical reporting
/6/	Belova Ludmila	Barakov mine, Boiler House Engineer	Technical support
/7/	Pereguda Vitalij	Barakov mine, head of PRTB section	Technical support
/8/	Glushko Jurij	Barakov mine, lead engineer of OOC	Technical reporting of methane-gas distraction

Table 5 – Interview topics

No.	Date	Interviewed organization	Interview topics
/1/	31/08/2012	Global Carbon B.V.	· 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
/2/	31/08/2012	Mine named after M.P. Barakov	· Organizational structure · Responsibilities and authorities · Monitoring equipment · Quality management

No.	Date	Interviewed organization	Interview topics
			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 14 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. Valery Yakubovsky	Team Leader
Dr. Boris Bokiy	Technical Expert
Mr. Limin Yuan	TR Technical Expert
Dr. Lixin Li	Technical Reviewer
Ganna Zadnipriana	Auditor
Mr. Dmitry Rakovich	Trainee

4 VERIFICATION FINDINGS

This section summarizes the findings from the verification of the emission reductions generated by the JI project "Utilization of coal mine methane at the coal mine named after M.P. Barakov of JSC "Krasnodoncoal"" (ITL Project ID UA1000420) for the period from 01/01/2008 till 30/09/2012.

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 Ukraine ref. 2587/23/7 issued at 14 September 2012
Written project approval by a Party involved in JI project, other than the host Party was obtained:
Letter of Approval by the Netherlands ref. 2010JI45 issued at 06 December 2011.

Written project approvals are available at:

http://ji.unfccc.int/JIITLProject/DB/224UEYY5LIRBI6SHM3R47UWCQA8EGC/details
and at http://www.carbonunitsregistry.gov.ua/ua/261.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 3.5 dated 23/11/2011 regarding which the determination has been deemed final. This 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 project reported for the period from 01/01/2008 till 30/09/2012 amount to 284 494 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 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 3.5 dated 23/11/2011.

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 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 3.5 dated 23/11/2011.
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 3.5 dated 23/11/2011.

All data sources used for calculating emission reductions are indicated in table B.2.1 and B.2.3 of the Monitoring Report, version 3.0 dated 15/11/2012.

The emission factor used to calculate emission reductions are selected in accordance with the registered PDD version 3.5 dated 23/11/2011. The choice of this emission factor is appropriately justified in the PDD version 3.5 dated 23/11/2011 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 3.5 dated 23/11/2011.

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 (01/01/2008 – 30/09/2012) 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 project occurred in accordance with the monitoring plan contained in the registered PDD, version 3.5 dated 23/11/2011.

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 3.5 dated 23/11/2011. 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 3.5 dated 23/11/2011.

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 3.5 dated 23/11/2011.

According to the Monitoring Report, version 3.0 dated 15/11/2012 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 (01/01/2008 – 30/09/2012) are provided in table 7 below.

Table 7 – Results for Emission Reductions for Monitoring Period

Monitoring Period:	**01/01/2008 – 30/09/2012**
Emissions for the project scenario:	43 738 tCO_2e
Emissions for the baseline scenario:	328 232 tCO_2e
Leakage:	0 tCO_2e
Emission reductions:	284 494 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. 2010JI45 issued at 06 December 2011 2) Letter of Approval by the Ukraine ref. 2587/23/7 issued at 14 September 2012 **CAR 01:** Please provide information about written project approvals from the Parties involved in Section A.6. of the MR.	**CAR 01**	OK
1. 2. Are all the written project approvals by Parties involved unconditional?	91	All the written project approvals by Parties involved are unconditional. The coal mine named after M.P. Barakov of JSC "Krasnodoncoal" and Global Carbon B.V. legal entities authorized by the designated focal points of the Parties Involved to participate in the JI project.	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 has been 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 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	OK	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
		project is at the stage of verification. During the monitoring period that covers time period between the 01/01/2008 and 30/09/2012 the project operated as planned. The verification team has verified during the site visit that the project, being a boiler house and degasification station operated by Barokov mine, is operational and evidence exists that it has operated during the whole 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 occurred 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 and registered PDD version 3.5.	OK	OK
3.3. Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	95 (b)	Special log at degasification station have been identified as the data source for the following monitoring parameters: concentration of CH_4 in the CMM gas mixture and volume of the CMM gas mixture. This parameters are summed up for calculation of value of coal mine methane, sent tj the boilers. The log books at Boiler House and Coal Loader Complex are used for registration of coal	**CAR 02** **CL 01**	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
		consumption. This data source is based on the existing reporting system of the company and is clearly identified, reliable and transparent. However, during verification site-visit became evidence that the data of the monitoring report submitted by the project participants has some deviation of values from the initial reports of departments responsible for information collection. All data source is based on the commercial metering system of the company and is clearly identified, reliable and transparent. **CAR 02:** Please add Gas Analyzer to the Table 7 as equipment used for monitoring of CH_4 in CMM. **CL 01:** Explain how the amount of coal combusted in project scenario can be calculated by using only size of the bunker.		
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 choice?	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 appropriately justified of the choice. The emission factors used to calculate emission reductions are selected in accordance with the registered PDD ver. 3.5. The choice of these emission factors is	**CAR 03** **CAR 04** **CL 02**	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
		appropriately justified in the PDD ver. 3.5 and in general accuracy and reasonableness are carefully balanced. However, sources and references for emission factors should be updated to ensure greater transparency for their choice. **CAR 03:** Net energy efficiently of gas boiler is not the same as coal boiler. Update the value of net energy efficiently of coal boiler in accordance to the "Tool to determine the baseline efficiency of thermal or electric energy generation systems" **CAR 04:** Please provide the links for data source of all parameters. **CL 02:** Whether there were cases of methane emissions into the atmosphere at the boiler station during the reporting period.		
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 done 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 coal fired process. However, the formula which marked as Equation D.2.2. in the monitoring report should be updated in accordance with the PDD in order to remove error in the equation. The calculation of the baseline emissions is based on the JI specific approach in accordance with the registered PDD and rests on the global	**CAR 05** **CAR 06** **CAR 07** **CAR 08**	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
		Worming Potential of Methane. This factor is applied to the steel production level which is assumed equal in both project and baseline scenario. 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 done by subtracting the project emissions from the baseline emissions. **CAR 05:** Please add information on how uncertainties have been taken into account during baseline setting and what conservative assumptions have been used. **CAR 06:** Please provide the equitation using for calculation of parameter coal mine methane, sent to the boiler. **CAR 07:** Please correct the formula D.2.2. in accordance of PDD. **CAR 08:** The formula number from PDD for equitation of Total emission reduction is absent.		
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?	96	Not applicable	OK	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
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?				
5. Revision of monitoring plan ***Applicable only if monitoring plan is revised by project participants***				
5.1. Did the project participants provide an appropriate justification for the proposed revision?	99 (a)	Not applicable	OK	OK
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 has been checked by the verification team on-site. The monitoring plan is presented in the section D of the registered PDD ver.2.0. **CAR 09:** Please add information on how concentration of CH_4 collected and registered. **CAR 10:** If for calculation of coal amount any of measurement instruments weren't used. Please correct the method of obtaining the value.	**CAR 09** **CAR 10**	
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 has functioned in accordance with the	**CAR 11** **CAR 12**	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
		monitoring plan and in general is in order. The verification team has 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 has been performed in accordance with the procedures of the Host Party and evidence of these calibrations has been provided (calibration certificates and/or evidence of calibration in the passports of the devices). It has been verified that the calibration did occur at the correct calibration intervals for all metering devices. **CAR 11:** Please provide correct information of measuring instrument names (#2304, #8449) and links for data source. **CAR 12:** Please add information about commissioning Day/month/year of measuring equipment to tables 3 of the MR. **CL 03:** Please explain the calibration process of measuring equipment and related documents. **CL 04:** Please provide the agreement between Mine and SD "Department of Installation, Uninstallation and Repair of Mining Equipment" (SD DIURME) on calibration of the Gas Analyzers and Gas flow meters. Please submit the license of SD DIURME for calibration work.	**CL 03** **CL 04**	
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	**CAR 13** **CL 05**	OK

CHECKLIST QUESTION	DVM* paragraph	Draft Conclusion	Action requested to project participants	Final Conclusion
		are maintained in a traceable manner. **CAR 13:** Please demonstrate that the assumed methane density was calculated using conservative actual conditions (pressure and temperature) at the flow meter. **CL 05:** If there any other measuring devises that using for crosscheck. On site-visit was found that some flow-meter was installed at boiler station.		
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 version 3.5 determination of which is considered to be final. **CAR 14:** Correct the Figure 1: Data collection shame. **CL 06:** The maximum acceptable period for the flow meter absence is 3 days (Section C.4), but for this procedure Degasification Station has two flow meters and two gas analyzer.	**CAR 14** **CL 06**	OK

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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.**	Please provide information about written project approvals from the Parties involved in Section A.6. of the MR.	90	The project has been endorsed by Ukraine. The Letter of Endorsement was issued by National Environment Investment Agency of Ukraine on 27th of December 2010 with reference number 2257/23/7. Letter of Approval 2011JI45 by Ministry of Economic Affairs, Agriculture and Innovation of the Netherlands was received on 6th of December 2011. The Letter of Approval by the Host Party No. 2587/23/7 was issued on 14.09.2012. The copies of the listed documents were provided to AIE.	**Issue is closed**
2.	**CAR 02.**	Please add Gas Analyzer to the Table 7 as equipment used for monitoring of CH_4 in CMM.	95 (b)	Gas Analyzer as equipment used for monitoring of CH_4 in degasification gases is described in tables 3, 4 and 5. Concentration of CH_4 in degasification gases does not belong to monitored parameters in accordance with the determined monitoring plan.	**Issue is closed**
3.	**CAR 03.**	Net energy efficiently of gas boiler is not the same as coal boiler. Update the value of net energy efficiently of coal boiler in accordance to the "Tool to determine the baseline efficiency of thermal or electric energy generation systems"	95 (c)	In accordance with the determined monitoring plan the only energy efficiency value is used for heat generation boiler. The value was fixed ex ante and is not included to the list of parameters that are monitored, therefore, it was not changed to maintain consistency with the determined monitoring plan.	**Issue is closed**

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
4.	**CAR 04.**	Please provide the links for data source of all parameters.	95 (c)	Data sources of all parameters are indicated in tables 6, 7 and 8 in the MR version 3.0.	**Issue is closed**
5.	**CAR 05.**	Please add information on how uncertainties have been taken into account during baseline setting and what conservative assumptions have been used.	95 (d)	**The following information was added to MR version 3.0:** **"Uncertainties and safeguarding conservativeness** The main baseline emission source is release of methane into the atmosphere (90% of emissions of CO_2e) with the rest of emissions resulted from baseline production of heat energy. The key parameter for calculation of emission reductions is quantity of methane which was to be vented, but instead was utilized in the boiler house for heat generation under the project scenario. Because there is no adjustment to standard temperature and pressure during CMM measurement by the flow meter, quantity of CMM at working conditions was used for emission reduction calculations. Conservativeness of such approach was checked by calculating the volume of CMM at standard conditions by applying ideal gas law and using data obtained at working conditions measured by the Mine. The result obtained has shown that volume of CMM combusted in boilers is higher at	**Issue is closed**

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
				STP. However, it was decided to base calculations at measured values to maintain conservativeness and accuracy of the results. It is also conservative to use efficiency of methane destruction/oxidation in heat plant for calculation. 2006 IPCC Guidelines assume 100% oxidation; however, it was decided to apply 1996 IPCC approach regarding the long period of time that the Mine's boilers have been in operation. It is also assumed that the CMM would be available by the end of operation period of the Mine and that the Mine's output levels in baseline scenario would be the same as in the project scenario. ERUs are only claimed for the CMM which was actually utilized and which substituted the thermal energy that would otherwise be produced by burning natural gas. Application of such an approach to ERUs calculation guarantees that they were not earned for decreases in activity levels outside the project activity or due to force majeure. Uncertainties were taken into account by calculating combined relative error of measuring CMM send to the boilers. In order to reduce uncertainties to the extent	

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
				possible, default values in accordance with internationally approved data sources were used." (please, see Annex 2 to the determined PDD for more detail).	
6.	**CAR 06.**	Please provide the equitation using for calculation of parameter coal mine methane, sent to the boiler.	95 (d)	The formula used for calculation of CMM sent to the boiler was added to MR version 3.0.	**Issue is closed**
7.	**CAR 07.**	Please correct the formula D.2.2. in accordance of PDD.	95 (d)	Formula D.2.2. was corrected in accordance with the determined PDD the MR version 3.0.	**Issue is closed**
8.	**CAR 08.**	The formula number from PDD for equitation of Total emission reduction is absent.	95 (d)	This formula does not have number in accordance with the determined PDD.	**Issue is closed**
9.	**CAR 09.**	Please add information on how concentration of CH_4 collected and registered.	101 (a)	**The following information was added to MR version 3.0:** "Flow rate of degasified gases is measured by the flow meters and concentration of CH_4 in degasification gases is measured by gas analyzers. There are two sets of such equipment installed at degasification station. Their readings are filled in journal of Degasification station and are used for calculating CMM sent to the boilers in accordance with the monitoring plan. The recalculation of the volume of degasification gases to 100% CH_4 content is performed each two hours by the operators of	**Issue is closed**

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
				degasification station. Time of CMM supply to boiler house is registered by operators of the degasification station using clocks. Data are filled in another special log registering time of CMM supply to the boiler house and calculated volume of the CMM supplied to the boiler house".	
10.	**CAR 10.**	If for calculation of coal amount any of measurement instruments weren't used. Please correct the method of obtaining the value.	101 (a)	In accordance with the determined monitoring plan method of obtaining data on coal consumption by the boiler house is measurement and calculation. By measurement it was determined that full bunker contains 30 tonnes of coal. In the monitoring process quantity of coal consumed is calculated by multiplying number of emptied bunkers by 30 tonnes and subtracting the remaining in the bunker estimated quantity of coal.	**Issue is closed**
11.	**CAR 11.**	Please provide correct information of measuring instrument names (#2304, #8449) and links for data source.	101 (b)	Information of measuring instrument names (#2304, #8449) was added to **MR version 3.0 in accordance with Technical Reports of** SD "Department of Installation, Uninstallation and Repair of Mining Equipment" (SD DIURME).	**Issue is closed**
12.	**CAR 12.**	Please add information about commissioning Day/month/year of measuring equipment to tables 3 of the	101 (b)	Information on commissioning dates of measuring equipment is currently unavailable because their original passports	**Issue is closed**

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
		MR.		were destroyed by fire in 1994. Please, see the Letter from the Mine provided as a supporting document.	
13.	**CAR 13.**	Please demonstrate that the assumed methane density was calculated using conservative actual conditions (pressure and temperature) at the flow meter.	101 (c)	Methane density is used in accordance with the determined monitoring plan where this parameter was fixed ex ante. The value applied is the value at t=293.15 K and p=101.325 kPa, which is the closest standard value to the working conditions of the degasification station.	**Issue is closed**
14.	**CAR 14.**	Correct the Figure 1: Data collection shame.	101 (d)	The Figure 1: Data collection shame was corrected in the MR version 3.0.	**Issue is closed**
15.	**CL 01.**	Explain how the amount of coal combusted in project scenario can be calculated by using only size of the bunker.	95 (b)	The size of the bunker is 30 tonnes, it is filled with coal by transport line from Coal Loader Complex. Quantity of coal combusted is determined by the number of bunkers which were emptied. In case when some coal is left in bunker its mass is determined by the fraction of bunker volume that it fills. So that the quantity of coal combusted is determined by multiplying number of times that the bunker was emptied by the size of the bunker and substracting the estimated mass of the coal remaining in the bunker.	**Issue is closed**
16.	**CL 02.**	Whether there were cases of methane emissions into the atmosphere at the	95 (c)	There were no cases of methane emissions into the atmosphere at the boiler station	**Issue is closed**

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
		boiler station during the reporting period.		during the reporting period except those described in the PDD: release of CMM during short period of time (up to 5 minutes) taken to firing the boiler when CMM reaches the boiler house before burner is turned on and in emergency situations. This emission source was considered negligible in accordance with the determined PDD.	
17.	**CL 03.**	Please explain the calibration process of measuring equipment and related documents.	101 (b)	In accordance with safety rules and standard "Coal Mine Degasification. Requirements to the system and degasification schemes" measuring equipment has to be calibrated annually with issuance of specialized reports. During the calibration procedure the checking organization compares the readings of the measuring equipment with standard values of the checking equipment (gas with known CH_4 concentration, gas of known volume etc.) and records the error of the equipment. If the error falls within accuracy class of the equipment, than it is allowed for use for another year.	**Issue is closed**
18.	**CL 04.**	Please provide the agreement between Mine and SD "Department of Installation, Uninstallation and Repair of Mining Equipment" (SD DIURME) on calibration of the Gas Analyzers and Gas flow meters. Please submit the	101 (b)	Copies of the agreement between Mine and SD "Department of Installation, Uninstallation and Repair of Mining Equipment" (SD DIURME) on calibration of the Gas Analyzers and Gas flow meters and license of SD DIURME for calibration	**Issue is closed**

No.	Type of request	Observation	Ref. to checklist question in table 1	Summary of project owner response	Verification team conclusion
		license of SD DIURME for calibration work.		work was provided.	
19.	**CL 05.**	If there any other measuring devises that using for crosscheck. On site-visit was found that some flow-meter was installed at boiler station.	101 (c)	There is a gas flow meter that was installed in the boiler house, but it was never operational due to law purity and high water content of the degasification gases which was the reason for its continuous break-ups. Thus, this meter is not used for neither monitoring nor for cross-checking. Quantity of coal combusted is cross checked with log books of Coal Loader Complex which supplies the coal to the boiler house.	**Issue is closed**
20.	**CL 06.**	The maximum acceptable period for the flow meter absence is 3 days (Section C.4), but for this procedure Degasification Station has two flow meters and two gas analyzer.	101 (d)	Information in section C.4 was corrected in the MR version 3.0. The degasification station of the Mine has to sets of metering equipment consisting of gas flow meter and gas analyzer. One working set is always left as reserve one and is used if the other set of metering equipment breaks. In case of absence of the both of them due to their calibration or repair, which is highly unlikely, the average readings for the previous three days are to be recorded. The maximum acceptable period for the flow meter absence is 3 days.	**Issue is closed**