



VERIFICATION REPORT GLOBAL CARBON BV

VERIFICATION OF THE USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVVI RIH CEMENT, UKRAINE

(SECOND PERIODIC FOR 2008-2009)

REPORT No. UKRAINE ver/0114/2010/1
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BUREAU VERITAS CERTIFICATION



VERIFICATION REPORT

Date of first issue: 16.10.2010	Organizational unit: Bureau Veritas Certification Holding
Client: Global Carbon BV	Client's representative: Lennard de Klerk

Summary:

Bureau Veritas Certification has made the 2nd periodic verification of the "Usage of alternative raw materials at Kryvyi Rih Cement, Ukraine", JI Registration Reference Number 0194, project of Global Carbon BV located in Kryvyi Rih, Ukraine, and applying the JI specific approach, on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

The verification scope is defined as a periodic independent review and ex post determination by the Accredited Entity of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

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

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in approved project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reduction is calculated without material misstatements, and the ERUs issued totalize 197093 tons of CO₂eq for the monitoring period.

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

Report No: UKRAINE-ver/0114/2010/1	Subject Group: JI	
Project title: «Usage of alternative raw materials at Kryvyi Rih Cement, Ukraine»		
Work was carried out by: Ivan Sokolov – Team Leader, climate change lead verifier Flavio Gomes – Team Member, climate change verifier Kateryna Zinevych – Team Member, climate change verifier		
Work was verified by: Leonid Yaskin – Internal Technical Reviewer		
Work approved by: Flavio Gomes – Operational Manager		
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Abbreviations

AIE	Accredited Independent Entity
CAR	Corrective Action Request
CL	Clarification Request
CO₂	Carbon Dioxide
ERU	Emission Reduction Unit
FAR	Forward Action Request
GHG	Green House Gas(es)
GDP	Gas Distribution Post
JI	Joint Implementation
JISC	Joint Implementation Supervisory Committee
MoV	Means of Verification
MP	Monitoring Plan
OJSC	Open Joint-Stock Company
PCF	Prototype Carbon Fund
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change



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1 INTRODUCTION

Global Carbon BV has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project "Usage of alternative raw materials at Kryvyi Rih Cement, Ukraine" (hereafter called "the project") at Kryvyi Rih, Ukraine, UNFCCC JI Reference Number 0194.

This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

Verification is the periodic independent review and ex post determination by the Accredited Independent Entity of the monitored reductions in GHG emissions during defined verification period.

The objective of verification can be divided in Initial Verification and Periodic Verification.

UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

1.2 Scope

The verification scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The verification is not meant to provide any consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 Verification Team

The verification team consists of the following personnel:

Ivan Sokolov
Bureau Veritas Certification Team Leader, Climate Change Lead Verifier

Flavio Gomes



Bureau Veritas Certification Climate Change Lead Verifier

Kateryna Zinevych
Bureau Veritas Certification Climate Change Verifier

Leonid Yaskin
Bureau Veritas Certification Internal Technical Reviewer

2 METHODOLOGY

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a verification protocol was customized for the project, according to the version 01.1 of the Joint Implementation Determination and Verification Manual, issued by the Joint Implementation Supervisory Committee at its 19 meeting on 04/12/2009. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes details and clarifies the requirements a JI project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

The completed determination protocol is enclosed in Appendix A to this report.

2.1 Review of Documents

The Monitoring Report (MR) submitted by Global Carbon BV and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), Guidance on criteria for baseline setting and monitoring, Host party criteria, Kyoto Protocol, Clarifications on Verification Requirements to be Checked by an Accredited Independent Entity were reviewed.

The verification findings presented in this report relate to the Monitoring Report version(s) 1.0 dated 5th of April 2010 and project as described in the determined PDD. In response to AIE's Corrective Action and Clarification



Requests MR developer has issued new version of of the Monitoring Report version 2.0 dated 1st of October 2010.

2.2 Follow-up Interviews

On 27/04/2010 Bureau Veritas Certification performed (on-site) interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of EMSS and Global Carbon BV were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
PJSC HeidelbergCement Ukraine	Organizational structure. Responsibilities and authorities. Training of personnel. Quality management procedures and technology. Implementation of equipment (records). Metering equipment control. Metering record keeping system, database.
Consultant: Global Carbon BV	Baseline methodology. Monitoring plan. Monitoring

2.3 Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission reduction calculation.

If the Verification Team, in assessing the monitoring report and supporting documents, identifies issues that need to be corrected, clarified or improved with regard to the monitoring requirements, it should raise these issues and inform the project participants of these issues in the form of:

(a) Corrective action request (CAR), requesting the project participants to correct a mistake that is not in accordance with the monitoring plan;



(b) Clarification request (CL), requesting the project participants to provide additional information for the AIE to assess compliance with the monitoring plan;

(c) Forward action request (FAR), informing the project participants of an issue, relating to the monitoring that needs to be reviewed during the next verification period.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.

3 VERIFICATION CONCLUSIONS

In the following sections, the conclusions of the verification are stated.

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in 3 Corrective Action Requests and 2 Clarification Requests.

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

The project is implemented as stated in the PDD version 2.0. dated 20th of August 2010, which was approved by both NFPs, determined by AIE and registered on JISC.

3.1 Project approval by Parties involved (90-91)

Written project approvals by the Netherlands and Germany have been issued by the NFPs of those Parties when submitting the determination report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest.

The abovementioned written approval is unconditional.

3.2 Project implementation (92-93)



The project is aimed at significant decrease of the emissions originating from calcination of raw materials in the clinker kiln at PJSC HeidelbergCement Ukraine (formerly Kryvyi Rih Cement plant). Emissions from calcination can be decreased by addition of alternative raw materials (AMC) which do not contain carbonates. Such alternative materials are metallurgical slag of different types, ashes generated at power plants that use coal fuel.

Kryvyi Rih cement is the major cement producers in Central Ukraine. The plant is owned by HeidelbergCement, one of the world's leading producers of building materials. Kryvyi Rih Cement was built in 1952 and fully modernized in 1983. Since the modernization the plant uses dry production process – one rotary kiln with calciner and multistage cyclone system capable to produce approximately 1.0 to 1.1mln ton of clinker annually.

It was planned to increase step by step over 2 to 3 years the share of AMC in the raw material mix to approximately 20% by mass from the level of about 4% which was achieved before the project start in 2004. This level is taken for the baseline. To adopt such high proportion of AMC the composition of raw materials had been adjusted by increasing the number of components to keep the clinker chemical composition and quality within the required limits.

Conventional raw materials for clinker manufacturing are limestone and clay with addition of small amounts of correcting additives (ferrous oxide).

As stated in the plan, from 2004 blast furnace slag was being added into raw material mix, thus partially replacing the natural raw materials. The actual annual amount of slag added since the beginning of the project is presented in Table 1. The slag is being added into the raw mix, prior to raw mills, and mixed/milled together with other raw materials (limestone, clay, additives) prior to entering the clinker kiln. The slag being originated from blast furnace process had already passed the treatment at high temperature and does not contain calcium and magnesium carbonates. Therefore, during thermal processing in clinker kiln at high temperature it does not decarbonizes with emission of CO₂ like natural raw materials do. The more slag in the raw mill, the less CO₂ is emitted during burning of materials in the kiln (emission from calcinations).

The project implementation started within planned time schedule. The actually achieved proportion of slag addition is presented in a table below:

Year	Slag addition percentage achieved
2004	11.51
2005	18.03
2006	20.62
2007	16.67
2008	18.4
2009	20.4

Table 1: Status of project implementation during 2004 -2009

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

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

For calculating the emission reductions or enhancements of net removals, key factors, influencing the baseline emissions or net removals and the activity level of the project and the emissions or removals as well as risks associated with the project were taken into account, as appropriate.

Data sources used for calculating emission reductions or enhancements of net removals are clearly identified, reliable and transparent.

Emission factors, including default emission factors, are selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice.

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

3.4 Revision of monitoring plan (99-100)

Monitored amount of emissions reduction differs from the one expected in PDD for the respective period stated in A.4. as shown in a table 2 below:

Year	2008	2009
ERs in MR001 in tones of CO ₂ equiv.	107 973	89 120
ERs in determined PDD in tones of CO ₂ equiv.	104 388	123 199

Table 2: Monitored amount of ER and expected in PDD for 2008-2009

The difference is explained by i) increase of calculation accuracy by using of more accurate (e.g. weighted average instead of annual average) initial data collected for MR versus those at PDD stage and taking into account small emissions sources which at the stage of PDD calculations preparation were neglected as minor or not material ones; ii) changes in clinker production volume: actual ones versus estimates in PDD.

There are no other deviations to the determined PDD.

3.5 Data management (101)

The Monitoring Plan was not revised and does not deviate from the one determined in the PDD version 2.0.

Fuel consumption

Cement plant has 1 kiln, which is operation for the whole year except for overhaul/maintenance shutdowns. The fuel during monitoring period stated in A.4. of the MR version 2.0 was natural gas. Gas consumption is constantly monitored by the two gas flow meters – one for the kiln burner and the second one for calciner of the kiln.

Some of the materials added into the kiln require drying prior to be mixed and put into the kiln. Such materials are slags used to partially substitute the natural raw materials. The drying of them is conducted in drying drums using NG as fuel. Fuel consumption for drying of raw materials and AMC is measured by four identical gas meters. All the data collected, transferred to the monitoring system and stored. Responsible for data collection and storage is within the energy department.

The NCV of NG has been monitored by the fuel certificates issued by the gas supplier which have been regularly requested by cement plant on



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monthly basis.

Power consumption

Metering of power consumed for raw mill preparation and handling, operation of the kiln, including the auxiliaries is organized by 23 power meters (See table 3). All the data metered are transferred to the monitoring system and stored. Responsible for data collection and storage is within the energy department.

CaO and MgO contents

CaO and MgO contents in clinker are being periodically (daily) measured by chemical test at plant laboratory as a part of quality assurance procedure. Data are stored and archived. Non-carbonated CaO and MgO contents in raw meal are calculated at chemical laboratory on monthly basis using the result of chemical tests of all AMC added during the period and amounts of each types of AMC.

Raw mill consumption

RM consumption is measured constantly by weight meters (see Table 4) and daily sum data are collected and stored by kiln department in daily reports. Based on daily data, monthly and annual reports are produced and stored.

Clinker production

Clinker production is calculated based on constant metering of raw mill volume and chemical composition of RM (moisture and chemical composition measured by on-line x-ray spectrometer). Daily sum of clinker produced volumes are included in kiln department daily reports. Based on daily data, monthly and annual reports are produced.

CKD volume

The annual volume of CKD leaving the kiln system is obtained by regular testing (4 times a year) of dust contents in kiln exhaust gases after the dedusting units. The data are collected and included in the state reporting form 2-TP "Air pollution".



In the PDD version 2.0 the amount of emission reduction units in the period of 2008-2009 is stated as 227587 t CO₂e while in the Monitoring Report version 1.0 the amount of ERU's for the period of 2008-2009 is 197092 t CO₂e.

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

According to the Article 10 paragraph 1 of the Ukrainian Law "On Metrology and Metrological Activity" measurement results can be used in case if appropriate characteristics of errors and uncertainty are known. Characteristics of errors are presented in the passports of the equipment. The level of uncertainty is considered as low which is why it can be neglected in the calculations.

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

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

Roles and responsibilities

The general management of the monitoring team is implemented by the Deputy Technical Director for safety and environment through coordinating activities. On-site day-to-day (operational) management is implemented by the heads of corresponding units.

The data on fuel consumption by kiln and by RM drying drums, as well as the electricity consumption of RM and kiln are collected in the department of chief energy engineer and then transferred to the department of Deputy technical director for safety and environment.

The data of contents of CaO and MgO in clinker, AMC are collected in the plant laboratory and supplied to the department of chief technologist. The



data on raw mill consumption, clinker production, are collected in the department of chief technologist and together with the data from plant laboratory are supplied to the department of Deputy technical director for safety and environment.

Reporting procedures in place are approved by plant instructions which include, among others, daily collection and reporting of RM consumption, clinker and cement production, slag usage as raw material, fuels and power usage. Based on this a regular daily report is produced which includes, besides abovementioned, the calculated specific kiln fuel consumption, specific power consumption per ton of cement, chemical composition of RM, clinker and cement.

All data necessary for the CO₂ emission reductions calculation is collected in the department of Deputy technical director for safety and environment. The calculation of emissions reduction are made on a yearly basis.

For this monitoring period the names of the personnel involved is as follows:

- Executive director of Kryvy Rih cement plant : Olexiy Turyvnyi;
- Deputy technical director for safety and environment: Lyudmila Rudneva;
- Chief technologist; Andriy Perekhrest;
- Chief energy officer: Valery Thorenko;
- Head of laboratory: Natalya Kravchenko.

Internal audits and control measures:

The flows of materials (raw meal consumption, clinker production, cement production, slag consumption and other) are additionally audited by conducting of monthly inventarisation. This would allow for regular cross checking of values. All energy flows (electricity and NG) are logged on the server at Energy department.

Internally, the CO₂ emissions calculations are being performed regularly on the annual basis as a part of "CO₂ Protocol", a commonly used reporting tool in world cement industry.



For the purpose of monitoring of emissions reductions in a JI project JI0194 a calculations are made in accordance with the Monitoring plan in PDD.

Troubleshooting procedures

In accordance with standard cement producer practice the department of chief technologist prepares a daily report which includes: cement production, clinker production, RM consumption, consumption of kiln and auxiliary fuels, consumption of electricity, specific consumption of fuel per ton of clinker (Kiln Efficiency), specific consumption of electricity per ton of cement produced, CaO and MgO contents and other data.

In case of a failure of any meter, the latter is being replaced by an operational one. The consumption during meter failure period will be calculated using cross checking method.

3.6 Verification regarding programmes of activities (102-110)

Not applicable.

4 VERIFICATION OPINION

Bureau Veritas Certification has performed 2nd periodic verification of the “Usage of alternative raw materials at Kryvyi Rih Cement, Ukraine” Project in Ukraine, which applies JI specific approach. The verification was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The verification consisted of the following three phases: i) desk review of the project design and the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of Global Carbon BV is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring and Verification Plan indicated in the final PDD version 2.0. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission



reductions from the project, is the responsibility of the management of the project.

Bureau Veritas Certification verified the Project Monitoring Report version 2.0 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as planned and described in approved project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions.

Bureau Veritas Certification can confirm that the GHG emission reduction is calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the approved project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: From 01/01/2008 to 31/12/2009

Baseline emissions:	1461982	t CO2 equivalents.
Project emissions:	1264889	t CO2 equivalents.
Emission Reductions:	197093	t CO2 equivalents.

5 REFERENCES

Category 1 Documents:

Principal documents related directly to the project registration

- /1/ Project Design Document, version 2.0 dated 20th of August 2010
- /2/ Monitoring Report version 1.0 dated 4th of April 2010
- /3/ Monitoring Report version 2.0 dated 10th of October 2010
- /4/ Determination Report by the Bureau Veritas Certification Holding SAS, dated 30 of December 2009
- /5/ Letter of Approval from the Netherland 2009JI12 issued by SenterNovem 30.10.2010
- /6/ Letter of Approval from Germany issued by Federal Environment Agency; German Emission Trading Authority 19. 01.2010
- /7/ Letter of Approval from Ukraine 1106/23/7 issued by National Environmental Investment Agency of Ukraine 26.07.2010

Category 2 Documents:



Background documents related to the project and/or methodology.

- /1/ Documents checked during the verification onsite are presented in Appendix B

Persons interviewed:

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

- /1/ Vasyl Tarelko – Head Technical Engineer
- /2/ Lyudmyla Rudneva – Deputy Chief Engineer in ecology
- /3/ Nina Kravchenko – Head of the Laboratory
- /4/ Margarita Isayeva – specialist in ISO: 9001,14001 implementation
- /5/ Andriy Perekhrest – Head Technologist
- /6/ Gallina Turivna – Head of the Training Departement
- /7/ Yuriy Fedichenko – Master of the Division
- /8/ Alexander Fomin – Master of the Network and Substantion Division
- /9/ Tatyana Glushchuk – Engineer of the Head Energetics Departement
- /10/ Lyubov Lesko – Head Metrologist
- /11/ Alexey Doimik – Senior JI Consultant Global Carbon BV

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VERIFICATION PROTOCOL “USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVYI RIH CEMENT, UKRAINE”

Check list for verification, according to the JOINT IMPLEMENTATION DETERMINATION AND VERIFICATION MANUAL (Version 01)

DVM Paragraph	Check Item	Initial finding	Action requested to project participants	Review of project Participants' action	Conclusion
Project approvals by Parties involved					
90	Has the DFPs of at least one Party involved, other than the host Party, issued a written project approval when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest?	The project has been approved by both NFPs. The Letters of Approval were presented to the verification team. Letters of Approval by both Parties were submitted to the supervisory committee on the final determination stage.	N/a	N/a	OK
91	Are all the written project approvals by Parties involved unconditional?	Yes, all the written project approvals by Parties involved are unconditional.	N/a	N/a	OK
Project implementation					
92	Has the project been implemented in accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	The project has been implemented in accordance with the PDD with no deviations. Though there are some			OK



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DVM Paragraph	Check Item	Initial finding	Action requested to project participants	Review of project Participants' action	Conclusion
		<p>issues that should be improved.</p> <p><u>Corrective Action request (CAR) 1</u> Please correct serial numbers for electricity meter #22 and #23 in the Table 3 in the MR version 2.0.</p> <p><u>Corrective Action Request (CAR) 2</u> Please provide appropriate calibration interval for the gas meters installed before 2007.</p> <p><u>Clarification Request (CL) 1</u> Please clarify the difference between the emission reductions achieved and the ones described in PDD.</p>	<p>CAR1: serial numbers have been corrected in MR001 ver2.0 dated 1 October 2010</p> <p>CAR2: calibration intervals for the gas meters installed before 2007 (2 years) has been included in section B.1.3 MR001 ver2.0 dated 1 October 2010</p> <p>CL1: The difference has been clarified in the MR001 ver2.0 dated 1 October 2010 in the section A.7. Intended deviations and revisions to the registered PDD</p>	<p>The update was checked. Issue is closed.</p> <p>The update was checked. Issue is closed.</p> <p>The update was checked. Issue is closed.</p>	
93	What is the status of operation of the project during the monitoring period?	Project has been operational for the whole monitoring period, which is	N/a	N/a	OK



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DVM Paragraph	Check Item	Initial finding	Action requested to project participants	Review of project Participants' action	Conclusion
		01.01.2008 – 31.12.2009.			
Compliance with monitoring plan					
94	Did the monitoring occur in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	Yes, monitoring occurs 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. <u>Clarification Request (CL) 2</u> Please provide reporting procedures in the MR. <u>Corrective Action Request (CAR) 3</u> In the MR version 1.0 there are two parameters, which are not presented in the determined PDD (EF_{NG} , emission factor of the NG burning process, D_{BSI} is the	CL2: reporting procedures concerning monitoring activities has been further described in section C.1.1 of the MR001 ver2.0 dated 1 October 2010 CAR3: EF_{NG} is mentioned in PDD as $EF_{CO2,i}$. During the monitoring period only natural gas (NG) was used as fuel. Corrections were made in Tables 6-7,9 if the MR. Explanations provided in footnote 2 and in the text.	The update was checked. Issue is closed. The update was checked. Issue is closed.	OK



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DVM Paragraph	Check Item	Initial finding	Action requested to project participants	Review of project Participants' action	Conclusion
		cement kiln dust calcination rate). Please clarify and correct.	D _{BSI} is the cement kiln dust (CKD) calcination rate. Emissions due to calcinations of discarded CKD were considered as a minor source of emissions in PDD and therefore were not used in calculation of emissions in the baseline and the project scenario. In the MR, however the emissions due to calcinations of CKD was assessed and included into the calculations of emissions, though they are small (<1%, see Tables 12 and 13 of MR) in order to increase the accuracy of calculations.		
95 (a)	For calculating the emission reductions or enhancements of net removals, were key factors, e.g. those listed in 23 (b) (i)-(vii) above, influencing the baseline emissions or net removals and the activity level of the project and the emissions or removals as well as risks associated with the project taken into account, as appropriate?	Yes, for calculating the emission reductions or enhancements of net removals, key factors, e.g. those listed in 23 (b) (i)-(vii) above, influencing the baseline emissions or net removals and	N/a	N/a	OK



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DVM Paragraph	Check Item	Initial finding	Action requested to project participants	Review of project Participants' action	Conclusion
		the activity level of the project and the emissions or removals as well as risks associated with the project were taken into account, as appropriate.			
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	Yes, data sources used for calculating emission reductions or enhancements of net removals are clearly identified, reliable and transparent	N/a	N/a	OK
95 (c)	Are emission factors, including default emission factors, if used for calculating the emission reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice?	Yes, emission factors, including default emission factors, if 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	N/a	N/a	OK
Applicable to JI SSC projects only					



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DVM Paragraph	Check Item	Initial finding	Action requested to project participants	Review of project Participants' action	Conclusion
96	Is the relevant threshold to be classified as JI SSC project not exceeded during the monitoring period on an annual average basis? If the threshold is exceeded, is the maximum emission reduction level estimated in the PDD for the JI SSC project or the bundle for the monitoring period determined?	N/a	N/a	N/a	N/a
Applicable to bundled JI SSC projects only					
97 (a)	Has the composition of the bundle not changed from that is stated in F-JI-SSCBUNDLE?	N/a	N/a	N/a	N/a
97 (b)	If the determination was conducted on the basis of an overall monitoring plan, have the project participants submitted a common monitoring report?	N/a	N/a	N/a	N/a
98	If the monitoring is based on a monitoring plan that provides for overlapping monitoring periods, are the monitoring periods per component of the project clearly specified in the monitoring report? Do the monitoring periods not overlap with those for which verifications were already deemed final in the past?	N/a	N/a	N/a	N/a
Revision of monitoring plan					
Applicable only if monitoring plan is revised by project participant					
99 (a)	Did the project participants provide an appropriate justification for the proposed revision?	N/a	N/a	N/a	N/a
99 (b)	Does the proposed revision improve the	N/a	N/a	N/a	N/a



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DVM Paragraph	Check Item	Initial finding	Action requested to project participants	Review of project Participants' action	Conclusion
	accuracy and/or applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans?				
Data management					
101 (a)	Is the implementation of data collection procedures in accordance with the monitoring plan, including the quality control and quality assurance procedures?	N/a	N/a	N/a	N/a
101 (b)	Is the function of the monitoring equipment, including its calibration status, is in order?	N/a	N/a	N/a	N/a
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	N/a	N/a	N/a	N/a
101 (d)	Is the data collection and management system for the project in accordance with the monitoring plan?	N/a	N/a	N/a	N/a
Verification regarding programs of activities (additional elements for assessment)					
102	Is any JPA that has not been added to the JI PoA not verified?	N/a	N/a	N/a	N/a
103	Is the verification based on the monitoring reports of all JPAs to be verified?	N/a	N/a	N/a	N/a
103	Does the verification ensure the accuracy and conservativeness of the emission reductions or enhancements of removals generated by each JPA?	N/a	N/a	N/a	N/a
104	Does the monitoring period not overlap with previous monitoring periods?	N/a	N/a	N/a	N/a
105	If the AIE learns of an erroneously included	N/a	N/a	N/a	N/a



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DVM Paragraph	Check Item	Initial finding	Action requested to project participants	Review of project Participants' action	Conclusion
	JPA, has the AIE informed the JISC of its findings in writing?				
Applicable to sample-based approach only					
106	<p>Does the sampling plan prepared by the AIE:</p> <p>(a) Describe its sample selection, taking into account that:</p> <p>(i) For each verification that uses a sample-based approach, the sample selection shall be sufficiently representative of the JPAs in the JI PoA such extrapolation to all JPAs identified for that verification is reasonable, taking into account differences among the characteristics of JPAs, such as:</p> <ul style="list-style-type: none"> - The types of JPAs; - The complexity of the applicable technologies and/or measures used; - The geographical location of each JPA; - The amounts of expected emission reductions of the JPAs being verified; - The number of JPAs for which emission reductions are being verified; - The length of monitoring periods of the JPAs being verified; and - The samples selected for prior verifications, if any? 	N/a	N/a	N/a	N/a
107	Is the sampling plan ready for publication through the secretariat along with the verification report and supporting documentation?	N/a	N/a	N/a	N/a
108	Has the AIE made site inspections of at least	N/a	N/a	N/a	N/a



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DVM Paragraph	Check Item	Initial finding	Action requested to project participants	Review of project Participants' action	Conclusion
	the square root of the number of total JPAs, rounded to the upper whole number? If the AIE makes no site inspections or fewer site inspections than the square root of the number of total JPAs, rounded to the upper whole number, then does the AIE provide a reasonable explanation and justification?				
109	Is the sampling plan available for submission to the secretariat for the JISC.s ex ante assessment? (Optional)	N/a	N/a	N/a	N/a
110	If the AIE learns of a fraudulently included JPA, a fraudulently monitored JPA or an inflated number of emission reductions claimed in a JI PoA, has the AIE informed the JISC of the fraud in writing?	N/a	N/a	N/a	N/a

**APPENDIX B: DOCUMENTS CHECKED DURING VERIFICATION**

1. Attestation certificate #ПЄ 0061/2008. Issued 24.11.2008, valid to 24.11.2011.
2. Attestation certificate #ПЄ 0047/2005. Issued 23.11.2005, valid to 23.11.2008.
3. Accreditation certificate #ПЭ 0068/2002. Issued 07.11.2002, valid to 06.11.2005.
4. Cements and materials of cement production. Methods of chemical analysis. GOST 5382-91.
5. Summary journal of chemical analysis. Started from January 2004.
6. Summary journal of chemical analysis. Started from January 2005.
7. Summary journal of chemical analysis. Started from 3 January 2006.
8. Summary journal of chemical analysis. Started from 2 January 2007.
9. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090927. Verification date: 09.01.2004.
10. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090909. Verification date: 09.01.2004.
11. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090893. Verification date: 09.01.2004.
12. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090951. Verification date: 09.01.2004.
13. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090965. Verification date: 09.01.2004.
14. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090943. Verification date: 09.01.2004.
15. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090925. Verification date: 09.01.2004.
16. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090947. Verification date: 09.01.2004.
17. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090917. Verification date: 09.01.2004.
18. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090933. Verification date: 09.01.2004.
19. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090962. Verification date: 09.01.2004.



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20. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090920. Verification date: 09.01.2004.
21. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090896. Verification date: 09.01.2004.
22. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090954. Verification date: 09.01.2004.
23. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090906. Verification date: 09.01.2004.
24. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090974. Verification date: 09.01.2004.
25. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090938. Verification date: 09.01.2004.
26. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090930. Verification date: 09.01.2004.
27. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090976. Verification date: 09.01.2004.
28. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090950. Verification date: 09.01.2004.
29. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090914. Verification date: 09.01.2004.
30. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090923. Verification date: 09.01.2004.
31. Certificate of acceptance and packaging. Electricity meter Euro Alfa. Type of meter EA 05R2-B-4. Ser. #01090963. Verification date: 09.01.2004.
32. Passport for flow rate meter (variable drop). The date of the passport: 9.06.1997.
33. Journal of power consumption in production areas. Started from: 1 January 2004, 31 December 2004.
34. Electricity consumption at the plant for January 2004.
35. Electricity consumption at the plant for two months 2004.
36. Electricity consumption at the plant for 1 quarter of 2004.
37. Electricity consumption at the plant for four months in 2004.
38. Electricity consumption at the plant for five months in 2004.
39. Electricity consumption at the plant for the first six months in 2004.
40. Electricity consumption at the plant for seven months in 2004.
41. Electricity consumption at the plant for eight months in 2004.



42. Electricity consumption at the plant for nine months in 2004.
43. Electricity consumption at the plant for ten months in 2004.
44. Electricity consumption at the plant for eleven months in 2004.
45. Electricity consumption at the plant in 2004.
46. Journal of power consumption in production areas. Started from: 1 January 2005, 31 December 2005.
47. Electricity consumption at OJSC "KRC" for 12 months in 2005.
48. Electricity consumption at OJSC "KRC" for 4 quarter in 2005.
49. Electricity consumption at OJSC "KRC" for 11 months in 2005.
50. Electricity consumption at OJSC "KRC" for 10 months in 2005.
51. Electricity consumption at OJSC "KRC" for 9 months in 2005.
52. Electricity consumption at OJSC "KRC" for 3 quarter in 2005.
53. Electricity consumption at OJSC "KRC" for 8 months in 2005.
54. Electricity consumption at OJSC "KRC" for 7 months in 2005.
55. Electricity consumption at OJSC "KRC" for the first six months in 2005.
56. Electricity consumption at the plant for 2 quarter in 2005.
57. Electricity consumption at the plant for 6 months in 2005.
58. Electricity consumption at OJSC "KRC" for 5 months in 2005.
59. Electricity consumption at the plant for 4 months in 2005.
60. Electricity consumption at the plant for 1 quarter in 2005.
61. Electricity consumption at OJSC "KRC" for 2 months in 2005.
62. Journal of power consumption in production areas. Started from: 1 January 2006, 31 December 2006.
63. Electricity consumption at OJSC "KRC" for 2 months in 2006.
64. Electricity consumption at OJSC "KRC" for 1 quarter in 2006.
65. Electricity consumption at OJSC "KRC" for 4 months in 2006.
66. Electricity consumption at OJSC "KRC" for 2 quarter in 2006.
67. Electricity consumption at OJSC "KRC" for 5 months in 2006.
68. Electricity consumption at OJSC "KRC" for 6 months in 2006.



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69. Electricity consumption at OJSC "KRC" for 7 months in 2006.
70. Electricity consumption at OJSC "KRC" for 8 months in 2006.
71. Electricity consumption at OJSC "KRC" for 9 months in 2006.
72. Electricity consumption at OJSC "KRC" for 10 months in 2006.
73. Electricity consumption at OJSC "KRC" for 11 months in 2006.
74. Electricity consumption at OJSC "KRC" for 12 months in 2006.
75. Electricity consumption at OJSC "KRC" for 4 quarter in 2006.
76. Journal of power consumption in production areas. Started from: 1 January 2007, 31 December 2007.
77. Electricity consumption at OJSC "KRC" for 12 months in 2007.
78. Electricity consumption at OJSC "KRC" for 11 months in 2007.
79. Electricity consumption at OJSC "KRC" for 10 months in 2007.
80. Electricity consumption at OJSC "KRC" for 9 months in 2007.
81. Electricity consumption at OJSC "KRC" for 3 quarter in 2006.
82. Electricity consumption at OJSC "KRC" for 8 months in 2007.
83. Electricity consumption at OJSC "KRC" for 7 months in 2007.
84. Electricity consumption at OJSC "KRC" for the first six months in 2007.
85. Electricity consumption at OJSC "KRC" for the first six months in 2007.
86. Electricity consumption at OJSC "KRC" for 5 months in 2007.
87. Electricity consumption at OJSC "KRC" for 4 months in 2007.
88. Electricity consumption at OJSC "KRC" for 1 quarter in 2007.
89. Electricity consumption at OJSC "KRC" for 2 months in 2007.
90. Verification schedule for flow rate meter in production areas and other departments in 2005 by month 2005.
91. Flow rate meter. Ser. #№26DS6600031172.
92. Journal of daily gas accounting in production areas and other departments at OJSC "KRC". Started from: 01.01.2004 to 30.12.2004.
93. Journal of the dynamics of natural gas bill (tonnes of fuel equivalent) accounting in production areas and other departments at OJSC "KRC". Started from: 01.01.2004 to 30.12.2004.



94. Report on fuel consumption in production areas and other departments at OJSC "KRC".
95. Fuel distribution at shops at OJSC "KRC" for January 2004.
96. Journal of daily gas accounting in production areas and other departments at OJSC "KRC". Started from: 01.01.2005 to 30.12.2005.
97. Journal of the dynamics of natural gas (tonnes of fuel equivalent) bill in production areas and other departments at OJSC "KRC". Started from: 01.01.2005 to 30.12.2005.
98. Journal of the dynamics of natural gas bill (Gj) in production areas and other departments at OJSC "KRC". Started from: 01.01.2005 to 30.12.2005.
99. Report on fuel consumption in production areas and other departments at OJSC "KRC". 2005.
100. Fuel consumption in production areas and other departments at OJSC "KRC" for January 2005.
101. Journal of the dynamics of natural gas (tonnes of fuel equivalent) bill in production areas and other departments at OJSC "KRC". Started from: 01.01.2006 to 30.12.2006.
102. Journal of daily gas accounting in production areas and other departments at OJSC "KRC". Started from: 01.01.2005 to 30.12.2005.
103. Fuel consumption in production areas and other departments at OJSC "KRC" .2006.
104. Journal of daily gas accounting in production areas and other departments at OJSC "KRC". Started from: 01.01.2007 to 30.12.2007.
105. Journal of the dynamics of natural gas (tonnes of fuel equivalent) bill in production areas and other departments at OJSC "KRC". Started from: 01.01.2007 to 30.12.2007.
106. Fuel consumption in production areas and other departments at OJSC "KRC". 2007.
107. Fuel consumption in production areas and other departments at OJSC "KRC" for January 2007.
108. Certificate of physical and chemical parameters of natural gas. 01.06.05 - 30.06.05.
109. Certificate of physical and chemical parameters of natural gas. December 2007.
110. Certificate of physical and chemical parameters of natural gas. July 2007.
111. Calculation of natural gas calorie content for January 2006 at OJSC "KRC".
112. Photo. Pressure controller. Ser. #6404031063.



113. Photo. Gas volume computer. Universal.
114. Photo. Pressure controller. Ser. #6404031068.
115. Photo. Meter. Ser. #6404031068.
116. Photo. Smoke exhauster #3.
117. Photo. Smoke exhauster #4.
118. Photo. Тп-17. Тр-Р#1.
119. Photo. Airmover of raw mill #2.
120. Photo. ТП-13. ТР-Р #2.
121. Photo. Limit exhauster.
122. Photo. ТП-14. ТР-Р #2.
123. Photo. The main drive of furnace.
124. Photo. Aspiration exhauster #81.
125. Photo of meter. Type 265 DS FCKA4A1.Ser. #265D660031172.
126. Photo. Schematic diagram of raw mill #2.
127. Daily tour report for 30 April 2006 on works of department "Clinker and raw materials burning".
128. Daily tour report for 29 April 2006 on works of department "Clinker and raw materials burning".
129. Daily tour report for 24 April 2006 on works of department "Clinker and raw materials burning".
130. Seminar sschedule "Mineralogy and Cement Chemistry".
131. Order № 621 on the organization of seminar conducting 22.10.2007.
132. Order № 458 on the organization of consultation workshop.
133. List of control production laboratory workers for paticipating in consultation on "X-ray fluorescent analysis. Analysis of chemical composition on the x-ray spectrometers ARL-9800, ARL EDVANT'X, ARL Optim'X" LLC "TermoTechno".
134. Order #792 dated 06.11.2009 on the organization of seminar conducting.
135. List of participants of the seminar on coal mills operation (aspects of coal combustion) dated 10.11.09.
136. Preventing maximum CO content and Explosions in the clinker production lines. 25.10.2007.



137. Quality of slag and fly ash for clinker and cement. Seminar "Alternative raw materials". September 2008.
138. Quality Seminar Ukraine October 2007. Geology and mineralogy of raw materials.
139. Opinion #168 on the state ecological expertise of the working project "The use of technogenic materials as components of raw mix". OJSC "KRC".
140. OJSC "KRC". Use of technogenic materials as components of raw mix. Working project. Volume II. Environmental impact assessment. Book 2. Explanatory note. Book 2. Arch. #95-0332.OBOC.ПЗ.
141. Resolution № 123011 for emissions of pollutants into the air by stationary sources. Date of issue: 22.02.2000.
142. Instruction #4-4004-8-2 dated 24.12.2004 for head of OJSC "Kryvyi Rig Cement Mining Plant".
143. Letter of approval of changes to working plan for 2007-2008 on emissions of pollutants into the air.
144. Permit #1211036400-352 on emissions of pollutants into the air by stationary sources. Validity term: from 30.12.2008 to 30.12.2013.
145. Summary table of emissions of pollutants by stationary sources OJSC "KRC" for 2005.
146. Summary table to report in the form 2-ТП (air) for 2006.
147. Summary table of emissions of pollutants by stationary sources OJSC "KRC" for 2007.
148. Certificate for quality management system #UA2.040.1077 dated 4.03.2004. Valid to 3.03.2009.
149. Certificate of implementation and application of quality management system at OJSC "KRC".
150. Memorandum on the internal audit conducting.
151. Report on the internal audit conducting. Verification date: 17.02.04.
152. Memorandum on the internal audit. 27.01.2005.
153. Schedule of internal audits of quality management system OJSC "KRC" for 2006 dated 13.01.2006.
154. Plan of internal audit of quality management system dated 19.01.07.
155. Report on the internal audit conducting. 30.01.2006.
156. Summary table of emissions by stationary sources OJSC "KRC" for 2004.
157. Certificate for quality management system #UA2.040.03821-09 dated 29.03.2004. Valid to 18.05.2014.



- 158. Certificate for quality management system #UA2.040.03781-09 dated 14.09.2009. Valid to 29.01.2011.
- 159. Certificate on environmental management system #UA2.040.02201-06 dated 25.12.2006. Valid to 29.01.2011.