



# DETERMINATION REPORT «OJSC HEIDELBERGCEMENT UKRAINE»

## DETERMINATION OF THE USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVYI RIH CEMENT, UKRAINE

REPORT No. UKRAINE-0027/2008

REVISION No. 02

BUREAU VERITAS CERTIFICATION



# DETERMINATION REPORT

Date of first issue: 11/11/2009	Organizational unit: Bureau Veritas Certification Holding SAS
Client: OJSC Heidelbergcement Ukraine	Client ref.: Lyudmila Rudneva

**Summary:**  
Bureau Veritas Certification has made the determination of the “Usage of Alternative Raw materials at Kryvyi Rih Cement, Ukraine” project of OJSC Heidelbergcement Ukraine located in City of Kryvyi Rih, Ukraine 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 determination scope is defined as an independent and objective review of the project design document, the project’s baseline study, monitoring plan and other relevant documents, 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 determination report and opinion. The overall determination, from Contract Review to Determination Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the determination process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in Appendix A. Taking into account this output, the project proponent revised its project design document.

In summary, it is Bureau Veritas Certification’s opinion that the project correctly applies the JI specific approach based on ACM0015 version 02 and meets the relevant UNFCCC requirements for the JI and the relevant host country criteria.

Report No.: UKRAINE- 0027/2008	Subject Group: JI
Project title: Usage of Alternative Raw materials at Kryvyi Rih Cement, Ukraine	
Work carried out by: Ivan Sokolov – Climate Change Lead verifier  Kateryna Zinevych – Climate Change Verifier	
Work signed by:  Flavio Gomes – Global Product Manager	
Work verified by: Leonid Yaskin 	
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**Indexing terms**

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## Abbreviations

ACBFS	Air-Cooled Blast Furnace Slag
AMC	Alternative Raw Material
AIE	Accredited Independent Entity
BFS	Blast Furnace Slag
CAR	Corrective Action Request
GBFC	Granulated Blast Furnace Slag
JI	Joint Implementation
EAFS	Electric Arc Furnace Slag
ERU	Emission Reduction Unit
CL	Clarification Request
CO <sub>2</sub>	Carbon Dioxide
GHG	Green House Gas(es)
I	Interview
IETA	International Emissions Trading Association
MoV	Means of Verification
NGO	Non Government Organization
PCF	Prototype Carbon Fund
PDD	Project Design Document
TPP	Thermal Power Plants
UNFCCC	United Nations Framework Convention for Climate Change




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## 1 INTRODUCTION

OJSC Heidelbergcement Ukraine has commissioned Bureau Veritas Certification to determine its JI project "Usage of Alternative Raw materials at Kryvyi Rih Cement, Ukraine" (hereafter called "the project") at the City of Kryvyi Rih, Ukraine. The PDD was developed and presented by Global Carbon.

This report summarizes the findings of the determination 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

The determination serves as project design verification and is a requirement of all projects. The determination is an independent third party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are determined in order to confirm that the project design, as documented, is sound and reasonable, and meets the stated requirements and identified criteria. Determination is a requirement for all JI projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reduction units (ERUs).

UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Executive Board, as well as the host country criteria.

### 1.2 Scope

The determination 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 determination 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 design.

### 1.3 GHG Project Description

Cement production is a highly energy intensive process that generates significant emissions of greenhouse gases, in particular CO<sub>2</sub>. There are three main sources of CO<sub>2</sub> emissions in the cement production process. The first source is fossil fuel combustion and the second source is the chemical decomposition of the limestone into calcium oxide and carbon



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dioxide. The third source, being smaller as to compare with the first two, is the grid emissions due to electricity consumption of plants motor drives (e.g. kiln rotation, pumping, fans) and other power consumers.

The project is aimed at significant decrease of the emissions originating from calcinations of raw materials in the clinker kiln at Kryvvi Rih Cement plant in Ukraine. Emissions from calcinations 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.

Kryvvi Rih cement is the major cement producers in Central Ukraine. The plant is owned by HeidelbergCement, one of the worlds leading producers of building materials. Kryvvi 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 as further described in Section B. to adopt such high proportion of AMC the composition of raw materials would be adjusted by increasing the number of components to keep the clinker chemical composition and quality within the required limits. The decision to implement the project was taken during 2002 to 2003 and respective preparatory steps were taken as described further in section A.4. of the PDD version 1.4.1.

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 annual amount of slag added since the beginning of the project is presented in Supporting Document 5 (see 6 Refernces). 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 has 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 CO<sub>2</sub> like natural raw materials do. The more slag in the raw mill, the less CO<sub>2</sub> is emitted during burning of materials in the kiln.

Cement is one of the major constructions materials around the world. Production of cement is a highly energy intensive process and as a result its production contributes a significant share of world CO<sub>2</sub> emissions.

The project is aimed at reduction of CO<sub>2</sub> released during calcinations or decarbonisation of raw materials in the kiln at high temperature.



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It was foreseen to increase alternative raw materials that do not contain carbonates (AMC) share in raw mix entering the kiln from some 4% to some 20 % during the period of 2004 to 2007 and maintain this share in the future. The proportion of AMC would be increased gradually over several years to adopt the process in order to keep required clinker quality and composition.

AMC used in the project is mainly granulated blast furnace slag, some air cooled blast furnace slag and bottom ash from power plants.

Before project implementation, only traditional raw materials (limestone, clay, corrective additives) were used.

#### **1.4 Determination team**

The determination team consists of the following personnel:

Ivan Sokolov

Bureau Veritas Certification Team Leader, Climate Change Verifier

Kateryna Zinevych

Bureau Veritas Certification Climate Change Verifier

Leonid Yaskin

Bureau Veritas Certification, Internal reviewer

## **2 METHODOLOGY**

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

In order to ensure transparency, a determination protocol was customized for the project, according to the Determination and Verification Manual (IETA/PCF). The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from determining the identified criteria. The determination protocol serves the following purposes:

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

The determination protocol consists of five tables. The different columns in these tables are described in Figure 1.

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



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<b>Determination Protocol Table 1: Mandatory Requirements</b>			
<b>Requirement</b>	<b>Reference</b>	<b>Conclusion</b>	<b>Cross reference</b>
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided ( <b>OK</b> ), a <b>Corrective Action Request (CAR)</b> or a <b>Clarification Request (CL)</b> of risk or non-compliance with stated requirements. The CAR's and CL's are numbered and presented to the client in the Determination Report.	Used to refer to the relevant protocol questions in Tables 2, 3 and 4 to show how the specific requirement is determined. This is to ensure a transparent determination process.

<b>Determination Protocol Table 2: Requirements checklist</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organized in several sections. Each section is then further subdivided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided ( <b>OK</b> ), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question. (See below). <b>Clarification Request (CL)</b> is used when the determination team has identified a need for further clarification.

<b>Determination Protocol Table 3: Baseline and Monitoring Methodologies</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
The various requirements of baseline and monitoring methodologies should be met. The checklist is organized in several sections. Each section is then further subdivided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided ( <b>OK</b> ), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question. (See below). <b>Clarification Request (CL)</b> is used when the determination team has identified a need for further clarification.

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Determination Protocol Table 4: Legal requirements				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The national legal requirements the project must meet.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question. (See below). <b>Clarification Request (CL)</b> is used when the determination team has identified a need for further clarification.

Determination Protocol Table 5: Resolution of Corrective Action and Clarification Requests			
Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Determination conclusion
If the conclusions from the Determination are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Tables 2, 3 and 4 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the determination team should be summarized in this section.	This section should summarize the determination team's responses and final conclusions. The conclusions should also be included in Tables 2, 3 and 4, under "Final Conclusion".

**Figure 1 Determination protocol tables**

## 2.1 Review of Documents

The Project Design Document (PDD) 0.3 dated 11<sup>th</sup> of December 2008 submitted by Global Carbon BV and additional background documents related to the project design and baseline, i.e. country Law, Guidelines for Completing the Project Design Document (JI-PDD), Approved methodology, Kyoto Protocol, Clarifications on Determination Requirements to be Checked by a Accredited Independent Entity were reviewed.

First version 0.3 of the PDD was verified before uploading, it was corrected by PPs and transformed to the version 1.0 dated 20.03.09 uploaded on the UNFCCC website from 12.09.09 till 11.10.09.

To address Bureau Veritas Certification corrective action and clarification requests Global Carbon BV revised the PDD version 1.0 and resubmitted it on 28/09/2009 as version 1.3.



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After the procedure of Internal Technical Review in order to meet the requested changes the PDD has been updated to the version 1.4.1 dated 29<sup>th</sup> of December 2009.

The determination findings presented in this report relate to the project as described in the PDD version 1.4.1 dated 29<sup>th</sup> of December 2009.

## 2.2 Follow-up Interviews

On 12/05/2009 Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of OJSC Heidelbergcement Ukraine were interviewed (see References). The main topics of the interviews are summarized in Table 1.

**Table 1 Interview topics**

Interviewed organization	Interview topics
OJSC Heidelbergcement Ukraine, Global Carbon BV	<ul style="list-style-type: none"> <li>➤ Additionality of the project,</li> <li>➤ Emission factor of the project,</li> <li>➤ EIA and its approval,</li> <li>➤ Project design,</li> <li>➤ Consulting process for stakeholder's comments ,</li> <li>➤ Approval status by the host country,</li> <li>➤ Applicability of methodology,</li> <li>➤ Monitoring Plan,</li> <li>➤ QA issues,</li> <li>➤ Baseline calculations.</li> </ul>

## 2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the determination 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 project design.

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

## 3 DETERMINATION FINDINGS

In the following sections, the findings of the determination are stated. The determination findings for each determination subject are presented as follows:



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- 1) The findings from the desk review of the original project design documents and the findings from interviews during the follow up visit are summarized. A more detailed record of these findings can be found in the Determination Protocol in Appendix A.
- 2) Where Bureau Veritas Certification had identified issues that needed clarification or that represented a risk to the fulfillment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Determination Protocol in Appendix A. The determination of the Project resulted in 16 Corrective Action Requests and 6 Clarification Requests.
- 3) The conclusions for determination subject are presented.

### 3.1 Project Design

The project is expected to be in line with host-country specific JI requirements because it is aimed at significant decrease of the emissions originating from calcinations of raw materials.

The Project Scenario is considered additional in comparison to the baseline scenario, and therefore eligible to receive Emissions Reductions Units (ERUs) under the JI, based on an analysis, presented by the PDD, of investment, technological and other barriers, and prevailing practice.

The project design is sound and the geographical (the City of Kryvyi Rih, Ukraine) and temporal boundaries of the project are clearly defined.

Additional revenue from JI has been taken into account from the very beginning of the project development activities. The following documents were available for the JI determination team providing evidence:

1. Project Idea Note was prepared in 2003 and presented to the Ukrainian Ministry of Environment (MoE);
2. On the 15 of January 2004 the MoE had issued a Letter of Endorsement #273/21-7 supporting the project at Kryvyi Rih Cement

#### Corrective Action Request (CAR) 1

Please provide brief description of the baseline scenario in the section A.2.

#### Response

The text in PDD section A.2. has been amended: It was planned to increase 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. This level is taken as the baseline as further described in Section B.



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Conclusion of the determination team

Issue is closed.

Corrective Action Request (CAR) 2

Please include into section A.2. Brief summary of the JI project history.

Response

Additional sentence has been added in section A.2. to briefly describe the JI project history:

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 annual amount of slag added since the beginning of the project is presented in Supporting Document 5 (SD5). 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 has 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 CO<sub>2</sub> like natural raw materials do. The more slag in the raw mill, the less CO<sub>2</sub> is emitted during burning of materials in the kiln.

Conclusion of the determination team

Issue is closed.

Corrective Action Request (CAR) 3

Annex 1 of the PDD version 1.0 contains one empty table. Please fill or delete it.

Response

The empty table has been deleted from Annex 1 as requested.

Conclusion of the determination team

Issue is closed.

Corrective Action Request (CAR) 4

It is not mentioned in the PDD version 1.0 weather project makes provisions for meeting training and maintenance needs. Pleas provide and include into new revision of PDD information on training.

Response

Additional sentence has been added in section A.4.2 to explain how the training/maintenance provision will be fulfilled: New equipment that will be installed for the project, including the sophisticated process control and measurement devices will require additional training for the operational personnel. Heidelberg cement, being an owner of Kryvyi Rih has



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substantial experience in operating and maintaining such equipment, will provide the necessary training.

Conclusion of the determination team

Issue is closed.

Corrective Action Request (CAR) 5

It is not stated how anthropogenic GHG emission reductions are to be achieved in the particular section A.4.3.1. Please provide appropriate information.

Response

An explanation of how anthropogenic GHG emissions are to be achieved is added in section A.4.3: The objective of the proposed project is to partially replace the natural raw materials used for clinker manufacturing by slag. Slag being de-carbonated material allows the reduction in carbon emissions due to calcinations of raw materials containing calcium and magnesium carbonates into the kiln at high temperature. The project anticipates a usage of about 20% of slag in the raw mix which would replace the natural raw materials like limestone and clay.

Conclusion of the determination team

Issue is closed.

Corrective Action request (CAR) 6

The estimation of annual average reductions over the crediting period is not provided in the Tables 2 and 4 in the Section A.4.3.1. of the PDD version 1.0.

Response

Estimated annual values of emission reductions have been added to Tables 2 and 4 in the Section A.4.3.1

Conclusion of the determination team

Issue is closed.

Corrective Action Request (CAR) 7

There is no evidence of written project approvals by the Parties involved.

Response

Approvals from all the parties involved have been received. LoA from the Netherland # 2009JI12 was issued by SenterNovem 30.10.2010. Letter of Approval from Germany was issued by Federal Environment Agency; German Emission Trading Authority 19. 01.2010. Letter of Approval from Ukraine 1106/23/7 was issued by National Environmental Investment Agency of Ukraine 26.07.2010.



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Conclusion of the determination team

Issue is closed.

### 3.2 Baseline and Additionality

The "Usage of Alternative Raw materials at Kryvyi Rih Cement, Ukraine" project partially uses the approved consolidated baseline methodology 0015 "Consolidated baseline and monitoring methodology for project activities using alternative raw materials that do not contain carbonates for clinker production in cement kilns"(ACM0015 version 02).

Any baseline for a JI project should be set in accordance with the "Guidance on criteria for baseline setting and monitoring". In accordance with this Guidance the project participants may use approved CDM methodologies or can establish a baseline in accordance with appendix B of the JI guidelines using selected elements or combinations approved CDM baseline and monitoring methodologies as appropriate.

For the cement industry for projects related to usage of alternative raw materials the existing CDM "Approved consolidated baseline and monitoring methodology" ACM0015 version 02 was partially used. This methodology is applicable to project activities that use alternative raw materials that do not contain carbonates (AMC) in cement kilns for the production of clinker. The AMC partially or fully substitutes raw materials that contain calcium and/or magnesium carbonates (e.g. limestone) and that would otherwise be used in the kiln. This methodology is applicable under the following additional conditions:

- Use of alternative materials shall increase neither the capacity of clinker production nor the lifetime of the equipment;
- The methodology is applicable to existing as well as to greenfield plants;
- Type and quality of produced clinker remain the same in both baseline and project case;
- Alternative raw materials have been never used in the manufacturing facility prior to the implementation of the project activity;
- The quantity of AMC available shall be at least 1.5 times the quantity required for meeting the demand of all existing users, (...).
- There is sufficient historical information about the clinker manufacturing facility, the raw materials used and energy performance of the kiln.

This methodology is not applicable for the following activities:

- Energy efficiency initiatives for improvements in process equipment (...)



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- Fuel switching

The proposed project activity has several parameters which deviate from requirements of ACM0015 and therefore do not allow full application of ACM0015:

- Kryvyi Rih cement plant was using the AMC prior to project activity start, however to a small extent (less than 4%)

Due to the difference mentioned above, the ACM0015 was used only partially.

The alternatives considered for determination of the baseline scenario in the context of the project activity include seven different scenarios of plant development.

The possible alternative baseline scenarios are the following:

- (a) Slag usage of 0%;
- (b) Air cooled slag usage of 4%;
- (c) Air cooled slag usage of 20%;
- (d) Granulated slag usage of 4% (continuation of the current practice);
- (e) Granulated slag usage of 20% (proposed project activity);
- (f) Addition of 4% of GBFC/ACBFC mixture;
- (g) Addition of 20% of GBFC/ACBFC mixture.

The baseline options considered do not include those options that:

- do not comply with legal and regulatory requirements; or
- depend on key resources such as fuels, materials or technology that are not available at the project site.

The most economically attractive alternative among the alternatives mentioned above has been selected as the baseline scenario, since such alternative is not expected to face any prohibitive barriers that could have prevented it from being taken up as the project activity. Alternatives (a) and (d) are the remaining realistic and credible alternatives. The Alternative (d) has the lowest emissions and, in accordance with the methodology, is identified as the most conservative baseline scenario.

#### Corrective Action Request (CAR) 8

The latest version of the ACM0015 methodology is version 02 and the one used in the project is 01. Please clarify and provide the appropriate correction.

#### Response

Latest version of the ACM0015 methodology is version 02 is used and the corrections have been introduced in PDD.



Conclusion of the determination team

Issue is closed.

Corrective Action Request (CAR) 9

Please provide appropriate reference to all the literature and numbers/factors, coefficients used in the PDD.

Response

Appropriate references to literature sources, numbers and factors are now provided in the PDD.

Conclusion of the determination team

Issue is closed.

Corrective Action Request (CAR) 10

The latest version of "Tool for the demonstration and assessment of additionality" is 05.2 while the project uses version 05. Please provide necessary update.

Response

Latest version of "Tool for the demonstration and assessment of additionality" 05.2 has been used in PDD version..

Conclusion of the determination team

Issue is closed.

Corrective Action Request (CAR) 11

Please change the format of the date of the baseline setting to the given format (DD/MM/YYYY).

Response

Date format has been corrected in PDD.

Conclusion of the determination team

Issue is closed.

Clarification Request (CL) 1

Please describe why the barriers do not prevent Alternative 4 in a more transparent way.

Response

Alternative 4, which constitute an addition of about 4% of GBFS. During several years prior to the project start in 2004, the plant conducted experiments to add small amounts of slag (up to 4%) in order to determine the best suiting raw mix composition and to study how slag admission



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affected the kiln operation. It was found that slag in such small proportions does not seriously affect the kiln operation, on the condition that the selection of raw mix composition is done properly. However, the addition of higher amounts of slag would affect the kiln operation (clogging of raw mix in the cyclone system prior to the kiln entrance). Thus, barriers identified do not prevent Alternative 4.

Conclusion of the determination team

Issue is closed.

Clarification Request (CL) 2

Please divide step 4 under sub-steps 4a and 4b under step 4.

Response

Step 4 has been split into two sub-steps.

Conclusion of the determination team

Issue is closed.

Clarification Request (CL) 3

Please provide the summary of national policies and circumstances relevant to the baseline of the proposed project activity.

Response

There is no Ukrainian law or regulation in force that requires cement plants to use alternative raw materials, including slag as partial substitute of raw materials for clinker manufacturing.

Conclusion of the determination team

Issue is closed.

Clarification Request (CL) 4

Please clarify the project's spatial (geographical) boundaries in the section B.3 of the PDD.

Response

Project spatial boundaries are clarified in section B.3.

Conclusion of the determination team

Issue is closed.

Corrective Action Request (CAR) 12

Please provide the project's operational lifetime in years and months.

Response



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Project operational lifetime has been provided in section C.2 of PDD version 1.4.1. It is expected to be operational for at least 19 years and 228 months.

#### Conclusion of the determination team

Issue is closed.

#### Corrective Action Request (CAR) 13

Please provide the length of the crediting period specified in years and months.

#### Response

Lengths of crediting period is provided in section C.3 of the PDD version 1.4.1

#### Conclusion of the determination team

Issue is closed.

### **3.3 Monitoring Plan**

The Project partially uses the approved consolidated monitoring methodology 0015 (ACM0015, version 02). Refer discussions on the validity of the methodology at section 3.2 above.

The baseline emissions are established in the following way:

1. The baseline emission of the kiln fuel is based on a three years average kiln efficiency and the carbon emission factor of the (or mix of) fuel used in the project scenario. This approach is identical to the approach used in the project JI0001 "Switch from wet-to-dry process at Podilsky Cement" which determination was made final;
2. Similarly to the approach used in the project JI0001, baseline setting of AMC percentage, CaO and MgO contents in the raw mill and clinker;
3. Clinker and raw mill volume were set in a similar way to ACM0015;
4. The baseline emissions of the grid are established using the Ukrainian standardized grid factor as mentioned in Annex 2;

#### Assumptions:

- The emissions at the quarry would remain the same. Actually, substitution of quarried raw materials by AMC would lead to fewer raw materials quarried. Not taking this reduction into account is conservative;
- The technical life time of the existing kiln extends to at least the end of the crediting period;

General remarks:



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- Social indicators such as number of people employed, safety record, training records, etc, were checked onsite;
- Environmental indicators such as dust emissions, NO<sub>x</sub>, or SO<sub>x</sub> were checked onsite;

For the greenhouse gas emissions only the CO<sub>2</sub> emissions are taken into account. Cement kilns normally have a CH<sub>4</sub> emission of 0.06 g/kg of clinker and N<sub>2</sub>O emissions of 0.001 g/kg of clinker compared with more than 650 g CO<sub>2</sub> / kg of clinker. Omitting these two emissions for a cement kiln is conservative, because they contribute to less than 0.01% of the total emissions, far below the confidence level for the CO<sub>2</sub> data calculations. This is confirmed in the VDZ Environmental Report 2001 (English) and 2004 (German). The CH<sub>4</sub> and N<sub>2</sub>O emission reductions will not be claimed. This is conservative.

Corrective Action Request (CAR) 14

Please correct the formula on the p.31 of the PDD version 0.3 according to the ACM0015 ver.02.

Response

Formula has been corrected in PDD ver.1.4.1

Conclusion of the determination team

Issue is closed.

Corrective Action Request (CAR) 15

Please provide reference to the relevant host party regulations.

Response

References has been provided to the relevant host party regulations in PDD.

Conclusion of the determination team

Issue is closed.

Clarification Request (CL) 5

Please clarify why slag transportation is not considered as leakage.

Response

PDD version 1.3. has been updated with the requested information to the version 1.4.1

Conclusion of the determination team

Issue is closed.

Clarification Request (CL) 6



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Please fill in all the rows in the table D.2. and add estimation of the uncertainty level as high/medium/low.

#### Response

Estimation of uncertainty level in the Table D.2. in a high/medium/low/format have been added.

#### Conclusion of the determination team

Issue is closed.

### 3.4 Calculation of GHG Emissions

As per ACM0015 version 02, the baseline emission sources considered are:

- emissions from calcinations of calcium carbonate and magnesium carbonate contained in the raw materials during burning in the clinker kiln (tCO<sub>2</sub>)
- emissions due to kiln fuel combustion (tCO<sub>2</sub>)
- emissions due to discarded dust from kiln bypass and kiln exhaust de-dusting system (tCO<sub>2</sub>)
- emissions due to additional fuel consumption for raw materials or fuel preparation, (tCO<sub>2</sub>)
- emissions due to grid electricity consumption (tCO<sub>2</sub>)

As required under ACM0015 version 02, the baseline emissions are calculated by

$$BE_y = BE_{Calc} + BE_{FC} + BE_{Dust} + BE_{dry} + BE_{EL\_grid}$$

Where:

BE<sub>y</sub> is the baseline emissions for the year y (tCO<sub>2</sub>)

BE<sub>Calc</sub> is the baseline CO<sub>2</sub> emissions from calcinations of calcium carbonate and magnesium carbonate contained in the raw materials during burning in the clinker kiln (tCO<sub>2</sub>)

BE<sub>FC</sub> is the baseline emissions due to kiln fuel combustion (tCO<sub>2</sub>)

BE<sub>Dust</sub> is the baseline emissions due to discarded dust from kiln bypass and kiln exhaust de-dusting system (tCO<sub>2</sub>)

BE<sub>dry</sub> is the baseline emissions due to additional fuel consumption for raw materials or fuel preparation, (tCO<sub>2</sub>)

BE<sub>EL\_grid</sub> is the baseline emissions due to grid electricity consumption (tCO<sub>2</sub>)

The detailed algorithms are described later under sections E of the PDD version 1.4.1.

As described in ACM0015 version 02, the project emissions are:



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- emission due to raw mill calcination in year y (tCO<sub>2</sub>)
- emission from combustion of kiln fuels in year y (tCO<sub>2</sub>)
- emission due to discarded dust from kiln bypass and dedusting units in year y (tCO<sub>2</sub>)
- emission due to fuel consumption for raw meal drying and fuel preparation in year y (tCO<sub>2</sub>)
- emission due consumption of grid electricity for clinker production y (tCO<sub>2</sub>)

As required under ACM0015 version 02, the project emissions are calculated by

$$PE_y = PE_{calc,y} + PE_{Fuel\_kiln,y} + PE_{dust,y} + PE_{dry,y} + PE_{EL\_grid,y}$$

Where:

PE <sub>y</sub>	Project emission in year y, (tCO <sub>2</sub> )
PE <sub>calc,y</sub>	Project emission due to raw mill calcination in year y (tCO <sub>2</sub> )
PE <sub>Fuel_kiln,y</sub>	Project emission from combustion of kiln fuels in year y (tCO <sub>2</sub> )
PE <sub>dust,y</sub>	Project emission due to discarded dust from kiln bypass and dedusting units in year y (tCO <sub>2</sub> )
PE <sub>dry,y</sub>	Project emission due to fuel consumption for raw meal drying and fuel preparation in year y (tCO <sub>2</sub> )
PE <sub>EL_grid,y</sub>	Project emission due consumption of grid electricity for clinker production y (tCO <sub>2</sub> )

With reference to this methodology, project does not lead to any leakage.

The estimated annual average of approximately 119 436 tCO<sub>2</sub>e over the crediting period of emission reduction represents a reasonable estimation using the assumptions given by the project.

#### Corrective Action Request (CAR) 16

Please double-check all the calculations and numbers in the SD 6.

#### Response

All calculations were double-checked and corrections were introduced in calculation sheets in SD6.

#### Conclusion of the determination team

Issue is closed.

### **3.5 Environmental Impacts**

Cement production has certain impact on the local environment. In Ukraine emission levels in industry are regulated by emission permits



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issued by regional offices of the Ministry for Environmental Protection on the individual basis for every enterprise that has significant impact on the environment. The current levels of the emissions of the main pollutants (dust, sulphur oxides and nitrogen oxides), are in compliance with the requirements of the plant's emission permits.

Types of atmospheric emissions (as described in the emission permit) and relevant measurement techniques are presented below.

The project foresees usage of different types of metallurgical slag being in most cases a waste product for metallurgy. Usage of such AMC does not directly influence the plant emissions.

Starting slag addition requires fulfilling the separate assessment of environmental impact.

Such assessment was completed in 2005 by the Special Design & Engineering Bureau "Cement" (Kharkiv, Ukraine) and has received positive decision of the State Authority on Environmental Protection in Dnipropetrovs'k Region (# 168, 12 July 2006) and of the Dnipropetrovs'k Regional Sanitary Epidemic Station (# 140, 14 March 2006) (see 6 References).

According to the OVNS, the project will not be harmful to the environment of Kryvyi Rih, and therefore will not have negative transboundary effects.

### **Dust**

Dust, emitted from cement production processes, is not a toxic substance but is considered a nuisance. The main sources of dust from cement production are the raw materials mill, the kiln, clinker coolers and cement mills. Dust emissions from Kryvyi Rih Cement are monitored on a regular basis in compliance with norms and regulations in force.

Dust concentration in the exhaust gases is determined on the basis of changes in filter weight measured in a flow of a dust-laden gas for certain period of time. Dust is sampled by gravimetric method in accordance with the national "Methodology of dust concentration measurement in dust-laden process gases". Accuracy of the measurement is within +/-15%. Testing (calibration) of measurement equipment used to measure dust emissions is carried out by independent company contracted by Kryvyi Rih Cement to conduct environmental measurements by an independent state body (State Organization for Standardization, Metrology and Certification).

Dust emissions are expected not to be influenced by the slag addition project.

### **Nitrogen and sulphur oxides**

NO<sub>x</sub> is formed due to the inevitable oxidation reaction of the atmospheric nitrogen at high temperatures in the cement kiln. It is expected that after project commissioning the emissions will stay within the requirements of



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the Ukrainian legislation and within the range of the Best Available Technology\* levels of IPPC.

SOx emissions in cement production originate mainly from raw material and also from coal with sulphur content combustion. The sulphur content in the raw materials used at Kryvyi Rih Cement is insignificant and SOx emissions are not observed and should not increase after the implementation of the project. However, the gas analyzing equipment used for measurements will allow monitoring the gaseous emissions of sulphur oxide in case they will appear.

#### Clarification Request (CL) 7

Please clarify the information on transboundary environmental effects.

#### Response

According to the OVNS, the project will not be harmful to the environment of Kryvyi Rih, and therefore will not have negative transboundary effects.

#### Conclusion of the determination team

Issue is closed.

### **3.6 Comments by Local Stakeholders**

Jl projects are not required to go through a (local) stakeholders' consultation. Addition of different types of slag into the raw materials from clinker manufacturing would not affect plant emissions.

### **4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS**

According to the modalities for the Determination of Jl projects, the AIE shall make publicly available the project design document and receive, within 30 days, comments from Parties, stakeholders and UNFCCC accredited non-governmental organizations and make them publicly available.

Bureau Veritas Certification published the project documents on the UNFCCC Jl website (<http://Jl.unfccc.int>) on 12/09/2009 and invited comments within 11/10/2009 by Parties (Jl Reference #0194), stakeholders and non-governmental organizations.

Comments were not received.

### **5 DETERMINATION OPINION**

Bureau Veritas Certification has performed a determination of the "Usage of Alternative Raw Materials at Kryvyi Rih Cement, Ukraine" Project in Ukraine. The determination was performed on the basis of UNFCCC

\* IPPC Reference Document on Best Available Techniques in the Cement and Lime Manufacturing Industries, December 2001



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criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

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

Project participant/s used the latest tool for demonstration of the additionality. In line with this tool, the PDD provides analysis of technological and other barriers to determine that the project activity itself is not the baseline scenario.

By by addition of alternative raw materials, the project is likely to result in reductions of GHG emissions from calcination. An analysis of the technological barriers demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented and maintained as designed, the project is likely to achieve the estimated amount of emission reductions.

The review of the project design documentation (version 1.4.1) and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the JI and the relevant host country criteria.

The determination is based on the information made available to us and the engagement conditions detailed in this report.

## 6 REFERENCES

### Category 1 Documents:

Documents provided by Global Carbon BV that relate directly to the GHG components of the project.

- /1/ PDD version 0.3 dated 11<sup>th</sup> of December 2008
- /2/ PDD version 1.0 dated 20<sup>th</sup> of March 2009
- /3/ PDD version 1.3 dated 28<sup>th</sup> of September 2009
- /4/ PDD version 1.4 dated 25<sup>th</sup> of November 2009
- /5/ PDD version 1.4.1 dated 29<sup>th</sup> of December 2009



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- /6/ PDD version 2.0 dated 20<sup>th</sup> of August 2010
- /7/ Letter of Endorsement #273/21-7 dated 15<sup>th</sup> January 2004
- /8/ Environmental Impact assessment developed by JSC "Specialnoe proektno-konstruktorskoe bureau "Cement", Kharkiv, 2005.
- /9/ Guidelines for Users of the Joint Implementation Project Design Document Form/Version 04, JISC.
- /10/ Glossary of JI terms/Version 01, JISC.
- /11/ Guidance on criteria for baseline setting and monitoring. Version 01. JISC.
- /12/ Tool for the demonstration and assessment of additionality. Version 05.2. EB 39, Annex 10.
- /13/ JISC "Clarification regarding the public availability of documents under the verification procedure under the Joint Implementation Supervisory Committee." Version 02.
- /14/ 2006 IPCC Guidelines for National Greenhouse Inventories, v.2, Energy.
- /15/ Operational Guidelines for Project Design Documents of Joint Implementation Projects. Volume 1. General Guidelines. Version 2.3. Ministry of Economic Affairs of the Netherlands. May 2004.
- /16/ Letter of Approval from the Netherland 2009JI12 issued by SenterNovem 30.10.2010
- /17/ Letter of Approval from Germany issued by Federal Environment Agency; German Emission Trading Authority 19. 01.2010
- /18/ 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 design and/or methodologies employed in the design or other reference documents.

- /1/ Annex 4. Bottom ash composition in 2007
- /2/ Annex 5. Slag price record.
- /3/ Supporting Document 1. Articles on clogging
- /4/ Supporting Document 2. Impact of slag addition on dry kiln operation
- /5/ Supporting Document 3. DniproCement data.
- /6/ Supporting Document 4. Raw mill composition.
- /7/ Supporting Document 5. Slag addition record.
- /8/ Supporting Document 6. Emission reductions calculations spreadsheet.
- /9/ OJSC "Kryvyi Rih Cement" journal of operational control of chemical composition of raw mixture from 16/12/2008
- /10/ OJSC "Kryvyi Rih Cement" journal of operational control of klinker burning quality from 5/06/2008 to 25/08/2008



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- /11/ OJSC "Kryvyi Rih Cement" consolidated journal of chemical analysis from January 2005
- /12/ Photo - Swing-tipping device BPC-134
- /13/ Photo - ASYS, Full Stream Analyzer FSA
- /14/ Photo - Rawmill #1
- /15/ Map of requirements to raw materials input, supplements. Map of requirements to raw materials preparation, supplements dated 22/04/2009
- /16/ Map of requirements to semi-processed materials dated 22/04/2009
- /17/ Map of requirements to ПЦ II/A-Ш-400 cement, ПЦ II/Б-Ш-400 cement, СС ШПЦ 400-Д60 cement
- /18/ Map of the operational control. Raw materials drying. Supplements drying. Raw meal preparation. Clinker burning. Cement milling П 2-26.00-Л red. 3/30.03.2009
- /19/ Photo - X-Ray Periodic Chart for Wavelength-Dispersive XRE. Thermo ARL
- /20/ Photo - Scheme: Raw mixture proportioning
- /21/ Photo - Scheme: Rawmill #2
- /22/ Service note: Raw mixture composition
- /23/ OJSC "Kryvyi Rih Cement" operator milling journal from 30/01/2009
- /24/ OJSC "Kryvyi Rih Cement" journal of rotary kiln machinist from 10/04/2009
- /25/ Photo - Scheme: Raw meal feeding to kiln
- /26/ Photo - Scheme: Clinker refrigerator
- /27/ Disk - Alternative Raw Materials Workshop Kryvyi Ri- +h, 16-17.09.2008
- /28/ Schedule of the seminar "Alternative fuels and raw materials" 16-17/09/2008, Kryvyi Rih, Ukraine
- /29/ Usage of slag as clinker raw material. Alternative raw materials workshop, September 16/17, 2008, Kryvyi Rih, Ukraine
- /30/ OJSC "Kryvyi Rih Cement" journal of operational control of chemical composition of raw mixture from 16/10/2008 to 16/12/2008
- /31/ OJSC "Kryvyi Rih Cement" journal of operational control of chemical composition of raw mixture from 18/12/2007 to 1/01/2008
- /32/ OJSC "Kryvyi Rih Cement" journal of operational control of clinker burning quality from 19/07/2007 to 12/08/2007
- /33/ OJSC "Kryvyi Rih Cement" journal of operational control of clinker burning quality from 7-8/04/2007
- /34/ Certificate valid from 24/11/2008 to 24/11/2011
- /35/ Quality objectives of Kryvyi Rih plant of OJSC "HeidelbergCement Ukraine" for



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- /36/ OJSC "HeidelbergCement Ukraine" Environmental management policy
- /37/ OJSC "Kryvyi Rih Cement" consolidated journal of chemical analysis from 04/01/2009
- /38/ Technology scheme of cement production by OJSC "HeidelbergCement Ukraine", Kryvyi Rih
- /39/ Letter of State Department of Ecology and Natural Resources in Dnipropetrovska region for the chairman of OJSC "Kryvyi Rih Cement" Panchenko A.V. on the opinion of the environmental impact assessment №4-1044-7-1 dated 12/07/2006.
- /40/ The opinion #168 of environmental impact assessment of the working project "Utilization of technogenic materials as components of raw mixture" OJSC "Kryvyi Rih Cement".
- /41/ Working project "Utilization of technogenic materials as components of raw mixture" OJSC "Kryvyi Rih Cement". Volume II. Environmental impact assessment. Book 2. Explanatory note. Arch.№95-0332.OBOC.ПЗ.
- /42/ Act of Kryvyi Rih regional state environmental inspection on verification of compliance with the requirements of the environmental legislation.c
- /43/ Certificate №ПЄ 0061/2008 on attestation of production control laboratory of OJSC "HaidelbergCement Ukraine" issued by SOE "Kryvyi Rih Research and Production Centre of Standartization, Metrology and Certification" dated 24/11/2008.
- /44/ Annex to certificate №ПЄ 0061/2008 on attestation of production control laboratory of OJSC "HaidelbergCement Ukraine" dated 24/11/2008. 3 pages.
- /45/ Authorization on production control laboratory quality of OJSC "Kryvyi Rih Cement Ukraine" dated 03/11/2008.
- /46/ Regulations of production control laboratory of OJSC "Kryvyi Rih Cement Ukraine" dated 03/11/2008.
- /47/ Annex A "The management and structural scheme of production control laboratory" to Regulations of laboratory or production control of OJSC "Kryvyi Rih Cement Ukraine" dated 03/11/2008.
- /48/ Passport of production control laboratory of OJSC "Kryvyi Rih Cement Ukraine" dated 03/11/2008.
- /49/ Information on availability of premises and their condition.
- /50/ Information on specialists engaged in metrological work.
- /51/ Information on availability of institutional, regulatory and methodical documents.
- /52/ Information on availability and conditions of testing and auxiliary equipment.



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- /53/ Information on availability and conditions of working places.
- /54/ Information on objects of measurements, methods of measurement, measuring devices and standard connections and properties of substances and materials which are used during measurements.
- /55/ Information on availability and conditions of measuring devices and methods of measurement.
- /56/ Information on availability and conditions of standard connections and properties of substances and materials which are used during measurements, and/or during controlling of performance of measuring devices.
- /57/ ТККТП Clinker burning. Cement. TP 00292923.-1.1-2009. 00292923.ТККТП.00019.
- /58/ Control of materials input. Cement. TP 00292923.-1.1-2009. 292923.ТККТП.00022.
- /59/ ТККТП Raw mixture preparation. TP 00292923.-1.1-2009. 3.ТККТП.00018.
- /60/ List of the equipment used in the project in the raw mill#1, #2, dosators and aspiration process
- /61/ Act of the inventory of the finished product, semi-finished product and raw materials dated 1<sup>st</sup> April 2009
- /62/ Information on the work of the OJSC Heidelbergcement Ukraine dated 16<sup>th</sup> April 2009
- /63/ Order #541 on the conducting the seminars "Alternative raw materials" and "Calibration and performance of the x-ray spectrum equipment" dated 15.09.2008
- /64/ List of the persons attending the seminar "Alternative raw materials" 16.09.08 – 17.09.08
- /65/ List of the persons attending the seminar "Calibration and performance of the x-ray spectrum equipment" 17.09.08-18.09.08

**Persons interviewed:**

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

- /1/ Belous Vladislav – Chief Engineer on Environment, OJSC Heidelbergcement Ukraine
- /2/ Doumik Alexey – Senior Consultant, Global Carbon BV
- /3/ Turivniy Alexey – Plant Manager, OJSC Heidelbergcement Ukraine
- /4/ Perehrest Andriy – Head Technologist, OJSC Heidelbergcement Ukraine
- /5/ Kravchenko Nina – Head of the Laboratory, OJSC Heidelbergcement Ukraine

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## APPENDIX A: COMPANY JI PROJECT DETERMINATION PROTOCOL

## JI PROJECT DETERMINATION PROTOCOL

Table 1 Mandatory Requirements for Joint Implementation (JI) Projects

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
1. The project shall have the approval of the Parties involved	Kyoto Protocol Article 6.1 (a)	Letters of approval will be issued by the Parties involved upon submission of Determination Report with CARs and CLs clarified except CAR8. Remaining CAR8 will be closed after the issuance of the LoA by the Parties involved.	Table 2, Section A.5
2. Emission reductions, or an enhancement of removal by sinks, shall be additional to any that would otherwise occur	Kyoto Protocol Article 6.1 (b)	OK	Table 2, Section B
3. The sponsor Party shall not acquire emission reduction units if it is not in compliance with its obligations under Articles 5 & 7	Kyoto Protocol Article 6.1 (c)	Article 5 requires "...Annex I Parties to having in place, no later than 2007, national systems for the estimation of greenhouse gas emissions by sources and removals by sinks." Article 7 requires "... Annex I	



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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
		<p>Parties to submit annual greenhouse gas inventories, as well as national communications, at regular intervals, both including supplementary information to demonstrate compliance with the Protocol".</p> <p>The Netherlands has submitted its Initial Report on 21 December 2006 (<a href="http://unfccc.int/national_reports/initial_reports_under_the_kyoto_protocol/items/3765.php">http://unfccc.int/national_reports/initial_reports_under_the_kyoto_protocol/items/3765.php</a>).</p>	
<p>4. The acquisition of emission reduction units shall be supplemental to domestic actions for the purpose of meeting commitments under Article 3</p>	<p>Kyoto Protocol Article 6.1 (d)</p>	<p>OK</p>	
<p>5. Parties participating in JI shall designate national focal points for approving JI projects and have in place national guidelines and procedures for the approval of JI projects</p>	<p>Marrakech Accords, JI Modalities, §20</p>	<p>Both countries have designated their Focal Points. National guidelines and procedures for approving JI projects have been published.</p> <p>Contact data in Ukraine:.</p> <p><b>National Environmental</b></p>	



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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
		<p><b>Investment Agency of Ukraine</b>            35 Urytsky Str., Kyiv, P.O. 03035            Phone: +380 44 594 91 11            Fax: +380 44 5949115            Email: <a href="mailto:info.neia@gmail.com">info.neia@gmail.com</a></p> <p>National guidelines and procedures for the approval of JI projects are available (<a href="http://www.neia.gov.ua">www.neia.gov.ua</a>)</p> <p>Contact data in the Netherlands:</p> <p><b>Ministry of Economic Affairs</b>            Catharijnesingel 59            P.O. Box 8242            3503 RE Utrecht            Netherlands            Phone: +31 30 239 3413            Email: <a href="mailto:d.de.haan@senternovem.nl">d.de.haan@senternovem.nl</a></p> <p>National guidelines and</p>	



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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
		procedures for the approving JI projects are available ( <a href="http://ji.unfccc.int/UserManagement/FileStorage/XQ0CYFTBQDSELQJSZUKHKRMANMD6QD">http://ji.unfccc.int/UserManagement/FileStorage/XQ0CYFTBQDSELQJSZUKHKRMANMD6QD</a> )	
6. The host Party shall be a Party to the Kyoto Protocol	Marrakech Accords, JI Modalities, §21(a)/24	The Ukraine is a Party (Annex I Party) to the Kyoto Protocol and has ratified the Kyoto Protocol at April 12th, 2004.	
7. The host Party's assigned amount shall have been calculated and recorded in accordance with the modalities for the accounting of assigned amounts	Marrakech Accords, JI Modalities, §21(b)/24	In the Initial Report submitted by Ukraine on 29. Dec. 2006 the AAUs are quantified with: $925\ 362\ 174.39 \times 5 = 4\ 626\ 810\ 872\ \text{tCO}_2\text{-e}$	
8. The host Party shall have in place a national registry in accordance with Article 7, paragraph 4	Marrakech Accords, JI Modalities, §21(d)/24	The designed system of the national registry has been described in the Initial Report mentioned above	
9. Project participants shall submit to the independent entity a project design document that contains all information needed for the determination	Marrakech Accords, JI Modalities, §31	OK	
10. The project design document shall be made publicly available and Parties, stakeholders and UNFCCC	Marrakech Accords,	The PDD was made publicly available through UNFCCC	



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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
accredited observers shall be invited to, within 30 days, provide comments	JI Modalities, §32	website. From 12.09.09 till 11.10.09.	
11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, in accordance with procedures as determined by the host Party shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out	Marrakech Accords, JI Modalities, §33(d)	OK	Table 2, Section F
12. The baseline for a JI project shall be the scenario that reasonably represents the GHG emissions or removal by sources that would occur in absence of the proposed project	Marrakech Accords, JI Modalities, Appendix B	OK	Table 2, Section B
13. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Marrakech Accords, JI Modalities, Appendix B	OK	Table 2, Section B
14. The baseline methodology shall exclude to earn ERUs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, JI Modalities, Appendix B	OK	Table 2, Section B
15. The project shall have an appropriate monitoring plan	Marrakech Accords, JI Modalities, §33(c)	OK	Table 2, Section D



## DETERMINATION REPORT "USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVYI RIH CEMENT, UKRAINE"

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference to this protocol
16. Are project participants authorized by a Party involved	JISC "Modalities of communication of Project Participants with the JISC" Version 01, Clause A.3	See CAR8. Conclusion is pending until Letters of Approval authorizing the project participants by Parties involved will be issued.	Table 2, Section A

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>A. General Description of the project</b>					
<b>A.1 Title of the project</b>					
A.1.1. Is the title of the project presented?		DR	The title of the project is indicated correctly. See section A.1.	OK	OK
A.1.2. Is the current version number of the document presented?		DR	The current version of the project of the project is indicated. See section A.1.	OK	OK
A.1.3. Is the date when the document was completed presented?		DR	The date of the project is presented. See section A.1.	OK	OK
<b>A.2. Description of the project</b>					
A.2.1. Is the purpose of the project included?		DR	The project is aimed at significant decrease of the emissions originating from calcination of raw materials in the clinker kiln at Kryvyi Rih Cement plant in Ukraine.	OK	OK



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CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
<p>A.2.2. Is it explained how the proposed project reduces greenhouse gas emissions?</p>		<p>DR</p>	<p>Cement production is a highly intensive process that generates significant emissions of greenhouse gases, in particular CO<sub>2</sub>. There are three main sources of CO<sub>2</sub> emissions in the cement production process. The first source is fossil fuel combustion and the second source is the chemical decomposition of the limestone into calcium oxide and carbon dioxide. The third source, being smaller as to compare with the first two, is the grid emissions due to electricity consumption of plants motor drives (e.g. kiln rotation, pumping, fans) and other power consumers.</p> <p>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.</p> <p>It was planned to increase the share of AMC in the raw material mix to some 20% by mass. To adopt such high proportion of AMC the composition of raw materials would be adjusted by increasing the number of components to keep the clinker</p>		<p>OK</p>



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			<p>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).</p> <p><u>Corrective Action Request (CAR) 1</u> Please provide brief description of the baseline scenario in the section A.2.</p> <p><u>Corrective Action Request (CAR) 2</u> Please include into section A.2. brief summary of the JI project history.</p>	CAR1	
				CAR 2	
<b>A.3. Project participants</b>					
A.3.1. Are project participants and Party(ies) involved in the project listed?		DR	Project participants and parties involved are listed in the Table 2 section A.3. of PDD version 0.3.	OK	OK
A.3.2. Are project participants authorized by a Party involved?		DR	Project participants are authorized by the Parties involved.	OK	OK
A.3.3. The data of the project participants are presented in tabular format?		DR	Project participants and parties involved are listed in the Table 2 section A.3. of PDD version 0.3.	OK	OK
A.3.4. Is contact information provided in annex 1 of the PDD?		DR	Yes, the information is provided in Annex 1 of the PDD version 1.2.	OK	OK
A.3.5. Is it indicated, if it is the case, if the Party involved		DR	None of the provided Parties involved is	CAR 3	OK



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CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
is a host Party?			indicated as a host Party. <u>Corrective Action Request (CAR) 3</u> Annex 1 of the PDD version 0.3 contains one empty table. Please fill or delete it.		
<b>A.4. Technical description of the project</b>					
<b>A.4.1. Location of the project activity</b>					
A.4.1.1. Host Party(ies)		DR	Ukraine is a host party.	OK	OK
A.4.1.2. Region/State/Province etc.		DR	Dnipropetrovsk oblast.	OK	OK
A.4.1.3. City/Town/Community etc.		DR	City of Kryvyi Rih	OK	OK
A.4.1.4. Detail of the physical location, including information allowing the unique identification of the project. (This section should not exceed one page)		DR	All the information is provided in English according to the template and does not exceed one page.	OK	OK
<b>A.4.2. Technology(ies) to be employed, or measures, operations or actions to be implemented by the project</b>					
A.4.2.1. Does the project design engineering reflect current good practices?		DR	The project design engineering reflects the explanation of the technology to be employed, cement production itself and current good practices.	OK	OK
A.4.2.2. Does the project use state of the art technology or would the technology result in a		DR	The project uses state of the art technology since first of all most of the Ukrainian	OK	OK



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significantly better performance than any commonly used technologies in the host country?			cement plants use wet kilns in the cement production while Kryvyi Rih Cement already has dry kiln production system. At the same time the project aims to implement new raw material composition – 15-20% addition of granulated blast furnace slag (GBFS) into raw material. See also section B.2.		
A.4.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?		DR	The project technology is not likely to be substituted by other or more efficient technology within the project period.	OK	OK
A.4.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?		DR	Since the project activity is supposed to be the implementation of new technology the extensive initial training and maintenance efforts in order to work as presumed is required.	OK	OK
A.4.2.5. Does the project make provisions for meeting training and maintenance needs?		DR	<u>Corrective Action Request (CAR) 4</u> It is not mentioned in the PDD version 0.3 wether project makes provisions for meeting training and maintenance needs. Pleas provide and include into new revision of PDD informtion on training.	CAR4	OK
A.4.3. Brief explanation of how the anthropogenic emissions of greenhouse gases by sources are to be reduced by the proposed JI project, including why the emission reductions would not occur in the absence of the proposed project, taking into					



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CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
<b>account national and/or sectoral policies and circumstances</b>					
A.4.3.1. Is it stated how anthropogenic GHG emission reductions are to be achieved? (This section should not exceed one page)		DR	<u>Corrective Action Request (CAR)5</u> It is not stated how anthropogenic GHG emission reductions are to be achieved in the particular section A.4.3.1. Please provide appropriate information.	CAR5	OK
A.4.3.2. Is it provided the estimation of emission reductions over the crediting period?		DR	The estimation of emission reductions over the crediting period is provided in the Table 3 in the Section A.4.3.1. of the PDD version 0.3.	OK	OK
A.4.3.3. Is it provided the estimated annual reduction for the chosen credit period in tCO <sub>2</sub> e?		DR	<u>Corrective Action Request (CAR)6</u> The estimation of annual average reductions over the crediting period is not provided in the Tables 2 and 4 in the Section A.4.3.1. of the PDD version 0.3.	CAR6	OK
A.4.3.4. Are the data from questions A.4.3.2 to A.4.3.4 above presented in tabular format?		DR	Yes, see the section A.4.3.2.	OK	OK
<b>A.5. Project approval by the Parties involved</b>					
A.5.1. Are written project approvals by the Parties involved attached?		DR	After finishing of project determination procedure, the PDD and Determination Report will be submitted to National Environmental Investments Agency of Ukraine for receiving the Host Country Letter of Approval.		-



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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p><u>Corrective Action Request (CAR) 7</u></p> <p>There is no evidence of written project approvals by the Parties involved</p>	CAR7	
<b>B. Baseline</b>					
<b>B.1. Description and justification of the baseline chosen</b>					
B.1.1. Is the chosen baseline described?		DR	“Production of clinker adding 4% of granulated slag” is accepted as the baseline scenario. The chosen baseline is properly described. See section B.1.	OK	OK
B.1.2. Is it justified the choice of the applicable baseline for the project category?		DR	The choice of the applicable baseline scenario is justified with the help of describing existing alternatives and proving the barriers which do not prevent the chosen baseline scenario only.	OK	OK
B.1.3. Is it described how the methodology is applied in the context of the project?		DR	Any baseline for a JI project should be set in accordance with the “Guidance on criteria for baseline setting and monitoring”. In accordance with this Guidance the project participants may use approved CDM methodologies or can establish a baseline in accordance with appendix B of the JI guidelines using selected elements or combinations approved CDM baseline and monitoring methodologies as		OK



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CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
<p>B.1.4. Are the basic assumptions of the baseline methodology in the context of the project activity presented (See Annex 2)?</p> <p>B.1.5. Is all literature and sources clearly referenced?</p>	<p>DR</p> <p>DR</p>	<p></p> <p></p>	<p>appropriate.</p> <p>For the cement industry for projects related to usage of alternative ram materials the existing CDM "Approved consolidated baseline and monitoring methodology" ACM0015 version 01 can be partially used. Considering the applicability of this methodology, which is fully described, it was used partially in this project.</p> <p><u>Corrective Action Request 8</u></p> <p>The latest version of the ACM0015 methodology is version 02and the one used in the project is 01. Please clarify and provide the appropriate correction.</p> <p>The basic assumptions of the baseline methodology in the context of the project are presented in the section B.1. of the PDD version 0.3.</p> <p><u>Corrective Action Request (CAR) 9</u></p> <p>Please provide appropriate reference to all the literature and numbers/factors, coefficients used in the PDD.</p>	<p>CAR8</p> <p>OK</p> <p>CAR9</p>	<p></p> <p>OK</p> <p>OK</p>
<p><b>B.2. Description of how the anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the JI project</b></p>					



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B.2.1. Is the proposed project activity additional?		DR	<p>The "Tool for the demonstration and assessment of additionality (version 05)" is applied to prove that the anthropogenic emissions are reduced below those that would have occurred in the absence of the JI project. According to application of this tool the project is considered to be additional.</p> <p>All the alternatives to the project are clearly described in the section B.1.</p> <p>Barrier analysis has been chosen to prove the additionality. The barriers to the project activity are:</p> <ul style="list-style-type: none"> <li>• the possibility of AMC price increase which could make the usage of AMC not profitable.</li> <li>• Difficulties and disturbances in kiln system operation.</li> <li>• Increase of repair frequency and cost due to the faster wear of equipment because of the slag physical structure.</li> <li>• Implementation of the project would require using six components which would require</li> </ul>		OK



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			<p>implementing on-line monitoring of raw mill and clinker chemical composition in order to maintain required clinker quality.</p> <p>Altogether barrier and common practice analysis show that project activity is not feasible though is additional.</p> <p><u>Clarification Request (CL) 1</u></p> <p>Please describe why the barriers do not prevent Alternative 4 in a more transparent way.</p> <p><u>Corrective Action Request (CAR) 10</u></p> <p>The latest version of "Tool for the demonstration and assessment of additionality" is 05.2 while the project uses version 05. Please provide necessary update.</p> <p><u>Clarification Request (CL) 2</u></p> <p>Please divide step 4 under sub-steps 4a and 4b under step 4.</p>	<p>CL1</p> <p>CAR10</p> <p>CL2</p>	
B.2.2. Is the baseline scenario described?		DR	See Section B.1. of the PDD version 0.3.	OK	OK
B.2.3. Is the project scenario described?		DR	The project scenario is clearly described and compared to the baseline one with the	OK	OK



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CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
			help of the "Tool for the demonstration and assessment of additionality (version 05)".		
B.2.4. Is an analysis showing why the emissions in the baseline scenario would likely exceed the emissions in the project scenario included?		DR	The section B.2. of the PDD version 1.2. contains an analysis that shows why the emissions in the baseline scenario would likely exceed the emissions in the project scenario.	OK	OK
B.2.5. Is it demonstrated that the project activity itself is not a likely baseline scenario?		DR	It is clearly demonstrated that the project activity itself is not a likely baseline scenario. The project activity is addition of from 4% to 20% AMC (GBFS, ACBFS and bottom ash) while the baseline scenario is addition of 4% just GBFS. Barrier analysis was used in order to choose baseline scenario.	OK	OK
B.2.6. Are national policies and circumstances relevant to the baseline of the proposed project activity summarized?		DR	<u>Clarification Request (CL) 3</u> Please provide the summary of national policies and circumstances relevant to the baseline of the proposed project activity.	CL3	OK
<b>B.3. Description of how the definition of the project boundary is applied to the project activity</b>					
B.3.1. Are the project's spatial (geographical) boundaries clearly defined?		DR	<u>Clarification Request (CL) 4</u> Please clarify the project's spatial (geographical) boundaries in the section B.3 of the PDD.	CL4	OK



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<b>B.4. Further baseline information, including the date of baseline setting and the name(s) of the person(s)/entity(ies) setting the baseline</b>					
B.4.1. Is the date of the baseline setting presented (in DD/MM/YYYY)?		DR	<u>Corrective Action Request (CAR) 11</u> Please change the format of the date of the baseline setting to the given format (DD/MM/YYYY)	CAR11	OK
B.4.2. Is the contact information provided?		DR	The contact information is provided in the Annex 1 of the PDD version 0.3.	OK	OK
B.4.3. Is the person/entity also a project participant listed in Annex 1 of PDD?		DR	The entity is the project participant listed in Annex 1 of the PDD version 0.3.	OK	OK
<b>C. Duration of the project and crediting period</b>					
<b>C.1. Starting date of the project</b>					
C.1.1. Is the project's starting date clearly defined?		DR	The project's starting date is clearly defined in the section C.1. of the PDD version 0.3.	OK	OK
<b>C.2. Expected operational lifetime of the project</b>					
C.2.1. Is the project's operational lifetime clearly defined in years and months?		DR	<u>Corrective Action Request (CAR) 12</u> Please provide the project's operational lifetime in years months.	CAR12	OK
<b>C.3. Length of the crediting period</b>					
C.3.1. Is the length of the crediting period specified in years and months?		DR	<u>Corrective Action Request (CAR) 13</u>	CAR13	OK



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CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
			Please provide the length of the crediting period specified in years and months.		
<b>D. Monitoring Plan</b>					
<b>D.1. Description of monitoring plan chosen</b>					
D.1.1. Is the monitoring plan defined?		DR	As elaborated in the section B.3, the project activity only affects the emissions related to the kiln fuel, calcination the electricity consumption of the raw milling, the kilns. For the purpose of establishing the baseline emissions and to monitor the project emissions, only these emissions will be monitored. The monitoring plan as well as the assumptions are defined in the section D.1. of the PDD version 0.3.	OK	OK
D.1.2. Option 1 – Monitoring of the emissions in the project scenario and the baseline scenario.		DR	Refer to item D.1.1.	OK	OK
D.1.3. Data to be collected in order to monitor emissions from the project, and how these data will be archived.		DR	Data to be collected in order to monitor emissions from the project are presented in the Table D.1.1.1. in the PDD version 0.3. This data will be archived both in electronic and paper way.	OK	OK
D.1.4. Description of the formulae used to estimate project emissions (for each gas, source etc.; emissions in units of CO2 equivalent).		DR	See Section D.1.1.2. of the PDD version 0.3.	OK	OK



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CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
D.1.5. Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and archived.		DR	Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary are presented in the Table D.1.1.3. in the PDD version 1.4.1 This data will be archived both in electronic and paper way.	OK	OK
D.1.6. Description of the formulae used to estimate baseline emissions (for each gas, source etc,; emissions in units of CO2 equivalent).		DR	See Section D.1.1.4. of the PDD version 1.4.1 <u>Corrective Action Request (CAR) 14</u> Please correct the formula on the p.31 of the PDD version 1.4 according to the ACM0015 ver.02	CAR14	OK
D.1.7. Option 2 – Direct monitoring of emissions reductions from the project (values should be consistent with those in section E)		DR	Not applicable. See section D.1.2.	OK	OK
D.1.8. Data to be collected in order to monitor emission reductions from the project, and how these data will be archived.		DR	Not applicable. See section D.1.2.1	OK	OK
D.1.9. Description of the formulae used to calculate emission reductions from the project (for each gas, source etc,; emissions/emission reductions in units of CO2 equivalent).		DR	Not applicable. See section D.1.2.2	OK	OK
D.1.10. If applicable, please describe the data and information that will be collected in order to monitor		DR	<u>Clarification Request (CL) 5</u> Please clarify why slag transportation is not	CL5	OK



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CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
leakage effects of the project.			considered as leakage.		
D.1.11. Description of the formulae used to estimate leakage (for each gas, source etc.; emissions in units of CO2 equivalent).		DR	Not applicable. See section D.1.3.2	OK	OK
D.1.12. Description of the formulae used to estimate emission reductions for the project (for each gas, source etc.; emissions in units of CO2 equivalent).		DR	See section D.1.4. of the PDD version 1.4.1.	OK	OK
D.1.13. Is information on the collection and archiving of information on the environmental impacts of the project provided?		DR, I	The information on the collection and archiving of information on the environmental impacts of the project is provided in the section D.1.5 of the PDD version 1.4.1	OK	OK
D.1.14. Is reference to the relevant host Party regulation(s) provided?		DR, I	The reference to the relevant host Party regulations is not provided. <u>Corrective Action Request (CAR) 15</u> Please provide reference to the relevant host party regulations.	CAR15	OK
D.1.15. If not applicable, is it stated so?		DR, I	See section D.1.13 Table 2 of this protocol.	OK	OK
<b>D.2. Qualitative control (QC) and quality assurance (QA) procedures undertaken for data monitored</b>					
D.2.1. Are there quality control and quality assurance procedures to be used in the monitoring of the measured data established?		DR	See section D.2. of the PDD version 1.4.1 <u>Clarification Request (CL) 6</u> Please fill in all the rows in the table D.2.	CL6	OK



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			and add estimation of the uncertainty level as high/medium/low.		
<b>D.3. Please describe of the operational and management structure that the project operator will apply in implementing the monitoring plan</b>					
D.3.1. Is it described briefly the operational and management structure that the project participants(s) will implement in order to monitor emission reduction and any leakage effects generated by the project		DR	The operational and management structure that the project participants implemented in order to monitor emission reduction and any leakage effects generated by the project is described in the section D.3. of the PDD version 1.4.1	OK	OK
<b>D.4. Name of person(s)/entity(ies) establishing the monitoring plan</b>					
D.4.1. Is the contact information provided?		DR	The contact information is provided in the Annex 1 of the PDD version 1.4.1	OK	OK
D.4.2. Is the person/entity also a project participant listed in Annex 1 of PDD?		DR	The entity is the project participant listed in Annex 1 of the PDD version 1.4.1	OK	OK
<b>E. Estimation of greenhouse gases emission reductions</b>					
<b>E.1. Estimated project emissions</b>					
E.1.1. Are described formulae used to estimate anthropogenic emissions by source of GHGs due to the project?		DR	The formulae used to estimate project emissions is described in the section D.1.1.2 of the PDD version 1.4.1. The calculation of GHG project emissions is presented in the section E.1 of the PDD version 1.4.1	OK	OK



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CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
E.1.2. Is there a description of calculation of GHG project emissions in accordance with the formula specified in for the applicable project category?			All the calculations are provided in the Supporting Document 6.		OK
	DR		<u>Corrective Action Request (CAR) 16</u>	CAR16	
			Please double-check all the calculations and numbers in the SD 6.		
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?			Conservative assumptions have been used to calculate project GHG emissions.	OK	OK
<b>E.2. Estimated leakage</b>					
E.2.1. Are described the formulae used to estimate leakage due to the project activity where required?			Not applicable. See section D.1.3. of the PDD version 1.4.1	OK	OK
E.2.2. Is there a description of calculation of leakage in accordance with the formula specified in for the applicable project category?			See section E.2. of the PDD version 1.4.1	OK	OK
E.2.3. Have conservative assumptions been used to calculate leakage?			Not applicable	OK	OK
<b>E.3. The sum of E.1 and E.2.</b>					
E.3.1. Does the sum of E.1. and E.2. represent the small-scale project activity emissions?			It is a large scale project	OK	OK
<b>E.4. Estimated baseline emissions</b>					
E.4.1. Are described the formulae used to estimate the anthropogenic emissions by source of GHGs in the baseline using the baseline methodology for the applicable project category?			The formulae used to estimate project emissions is described in the section D.1.1.4 of the PDD version 1.4.1 The calculation of GHG project emissions is	OK	OK



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CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
E.4.2. Is there a description of calculation of GHG baseline emissions in accordance with the formula specified in for the applicable project category?		DR	presented in the section E.4 of the PDD version 1.4.1 All the calculations are provided in the Supporting Document 6. See CAR 17.	-	-
E.4.3. Have conservative assumptions been used to calculate baseline GHG emissions?		DR	Not applicable	OK	OK
<b>E.5. Difference between E.4. and E.3. representing the emission reductions of the project</b>					
E.5.1. Does the difference between E.4. and E.3. represent the emission reductions due to the project during a given period?		DR	Difference between E.4. and E.3. represents the emission reductions due to the project during a given period. See CAR17	-	-
<b>E.6. Table providing values obtained when applying formulae above</b>					
E.6.1. Is there a table providing values of total CO <sub>2</sub> abated?		DR	See section E.6. of the PDD version 1.4.1	OK	OK
<b>F. Environmental Impacts</b>					
<b>F.1. Documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party</b>					
F.1.1. Has an analysis of the environmental impacts of the project been sufficiently described?		DR, I	The analysis of the environmental impacts of the project been sufficiently described in	OK	OK



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CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
			the section F.1. of the PDD version 1.4.1		
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is and EIA approved?		DR, I	According to Ukrainian legislation, an Environmental Impact Assessment (EIA), as a part of the project design documents, has been done for the proposed project and approved by local authority (seen onsite).	OK	OK
F.1.3. Are the requirements of the National Focal Point being met?		DR, I	The National Focal Point issued letter of endorsement.  Letter of approval need to be received (see CAR8).	-	-
F.1.4. Will the project create any adverse environmental effects?		DR, I	Analysis of Environmental Impact Assessment (EIA) shows that introduction of the CHP will not have any adverse environmental effects.	OK	OK
F.1.5. Are transboundary environmental considered in the analysis?		DR, I	<u>Clarification Request (CL) 7</u> Please clarify the information on transboundary environmental effects.	CL7	OK
F.1.6. Have identified environmental impacts been addressed in the project design?		DR, I	See section F.1.1. of this protocol.	OK	OK
<b>G. Stakeholders' comments</b>					
<b>G.1. Information on stakeholders' comments on the project, as appropriate</b>					
G.1.1. Is there a list of stakeholders from whom		DR	Not applicable	OK	OK



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comments on the project have been received?					
G.1.2. The nature of comments is provided?		DR	Not applicable	OK	OK
G.1.3. Has due account been taken of any stakeholder comments received?		DR	Not applicable	OK	OK

Table 3 Baseline and Monitoring Methodologies: Own format

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>1. Baseline Methodology</b>					
<b>1. 1. General</b>					
1.1.1. Does the baseline cover emissions from all gases, sectors and source categories listed in Annex A, and anthropogenic removals by sinks, within the project boundary?		DR I	Section B.3 of the PDD establishes project boundaries.	OK	OK
1.1.2. Is baseline established on a project-specific basis and/or using a multi-project emission factor?		DR I	A multi-project emission factor is used for baseline establishing.	OK	OK
1.1.3 Is baseline established in a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors?		DR I	The baseline is established in a transparent manner. Choice of approach was described, assumptions, methodologies, parameters, data sources are clearly indicated (Sections B.1. and B.2. of the PDD)	OK	OK
1.1.4 Is baseline established taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector?		DR	Applicable local laws and regulations are taken into account. Economic situation in the project sector is taken into account (Sections B.1. and B.2. of the PDD)	OK	OK
1.1.5 Is baseline established in such a way that ERUs cannot be earned for decreases in activity levels outside the project activity or due to <i>force majeure</i> ?		DR I	Baseline does not envisage earning ERUs for activity level decrease outside the project or due to <i>force majeure</i> .	OK	OK



## DETERMINATION REPORT "USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVYI RIH CEMENT, UKRAINE"

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
1.1.6 Is baseline established taking account of uncertainties and using conservative assumptions?		DR I	Uncertainties and conservative assumptions are taken into account (Section B of the PDD)	OK	OK
<b>1.2. Additionality</b>					
1.2.1. Was the additionality of the project activity demonstrated and assessed?		DR	Project is additional on the basis of justification and assessment.	OK	OK
<b>2. Monitoring Methodology</b>					
<b>2.1. Monitoring plan</b>					
2.1.1. Is a monitoring plan included?		DR I	Yes, monitoring plan is included.	OK	OK
2.1.2. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimating or measuring anthropogenic emissions by sources and/or anthropogenic removals by sinks of greenhouse gases occurring within the project boundary during the crediting period?		DR I	Monitoring plan provides for the collection and archiving of all relevant data necessary for estimating or measuring anthropogenic emissions by sources of greenhouse gases occurring within the project boundary during the crediting period (see section D.1.1.1. of the PDD).	OK	OK
2.1.3. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining the baseline of anthropogenic emissions by sources and/or anthropogenic removals by sinks of greenhouse gases within the project boundary during the crediting period?		DR I	Monitoring plan provides for the collection and archiving of all relevant data necessary for determining the baseline of anthropogenic emissions by sources of greenhouse gases within the project boundary during the crediting period (see section D.1.1.3. of the PDD).	OK	OK
2.1.4. Does the monitoring plan provide for the identification of all potential sources of, and the collection and archiving of data on increased anthropogenic emissions by sources and/or reduced anthropogenic removals by sinks of greenhouse gases outside the project boundary that are significant and reasonably attributable to the project during the crediting period?		DR	Increase of anthropogenic emissions outside the project boundary that are significant and reasonably attributable to the project during the crediting period is not anticipated.	OK	OK



## DETERMINATION REPORT "USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVYI RIH CEMENT, UKRAINE"

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
2.1.5. Does the project boundary encompass all anthropogenic emissions by sources and/or removals by sinks of greenhouse gases under the control of the project participants that are significant and reasonably attributable to the JI project?		DR	Significant anthropogenic emissions by sources and/or removals by sinks of greenhouse gases under the control of the project participants are not envisaged by the project. Validated onsite.	OK	OK
2.1.6. Does the monitoring plan provide for the collection and archiving of information on environmental impacts, in accordance with procedures as required by the host Party, where applicable?		DR	No adverse environmental impacts are foreseen. Validated onsite.	OK	OK
2.1.7. Does the monitoring plan provide for quality assurance and control procedures for the monitoring process?		DR	Quality assurance is planned, see section D.2. of the PDD, that was validated onsite.	OK	OK
2.1.8. Does the monitoring plan provide for procedures for the periodic calculation of the reductions of anthropogenic emissions by sources and/or enhancements of anthropogenic removals by sinks by the proposed JI project, and for leakage effects, if any?		DR I	The monitoring plan provides formulae for the periodic calculation of the reductions of anthropogenic emissions (see section D.1.1.2.). Leakage is not applicable.	OK	OK
2.1.9. Does the monitoring plan provide for documentation of all steps involved in the calculations?		DR I	The monitoring plan provides for documentation of all steps involved in the calculations. See Supporting Document 6.	OK	OK
<b>2.2. Quality Control (QC) and Quality Assurance (QA) Procedures</b>					
2.2.1. Did all measurements use calibrated measurement equipment that is regularly checked for its functioning?		DR I	In all measurements calibrated measurement equipment is used and it is regularly checked for its functioning.	OK	OK
2.2.2 Is frequency of monitoring the parameters defined?		DR I	Frequency of monitoring the parameters is defined.	OK	OK



## DETERMINATION REPORT "USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVYI RIH CEMENT, UKRAINE"

**Table 4 Legal requirements**

CHECKLIST QUESTION	Ref.	MoV *	COMMENTS	Draft Concl	Final Concl
<b>1. Legal requirements</b>					
1.1. Is the project activity environmentally licensed by the competent authority?		DR, I	Yes, the project is licensed by the competent authority. This was checked on-site.	OK	OK
1.2. Are there conditions of the environmental permit? In case of yes, are they already being met?		DR, I	Environmental permits are presented, please see section 1.1. table 4.	OK	OK
1.3. Is the project in line with relevant legislation and plans in the host country?		DR, I	Yes, the project is in line with legislation of the host Party	OK	OK

**Table 5 Resolution of Corrective Action and Clarification Requests**

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 2, 3 and 4	Summary of project owner response	Determination team conclusion
<u>Corrective Action Request (CAR) 1</u> Please provide brief description of the baseline scenario in the section A.2.	A.2.2.	The text in PDD section A.2. has been ammended: It was planned to increase 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. This level is taken as the baseline as further described in Section B.	Issue is closed.
<u>Corrective Action Request (CAR) 2</u> Please include into section A.2. brief summary of the JI project history.	A.2.2.	Additional sentence has been added in section A.2. to briefly describe the JI project history: 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 annual amount of slag added since the beginning of the project is presented in Supporting Document 5 (SD5). 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 has already passed the treatment at	Issue is closed.



## DETERMINATION REPORT "USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVYI RIH CEMENT, UKRAINE"

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 2, 3 and 4	Summary of project owner response	Determination team conclusion
		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 CO <sub>2</sub> like natural raw materials do. The more slag in the raw mill, the less CO <sub>2</sub> is emitted during burning of materials in the kiln.	
<u>Corrective Action Request (CAR) 3</u> Annex 1 of the PDD version 0.3 contains one empty table. Please fill or delete it.	A.3.5.	The empty table has been deleted from Annex 1 as requested.	Issue is closed.
<u>Corrective Action Request (CAR) 4</u> It is not mentioned in the PDD version 0.3 whether project makes provisions for meeting training and maintenance needs. Please provide and include into new revision of PDD information on training.	A.4.2.5.	Additional sentence has been added in section A.4.2 to explain how the training/maintenance provision will be fulfilled: New equipment that will be installed for the project, including the sophisticated process control and measurement devices will require additional training for the operational personnel. Heidelberg cement, being an owner of Kryvyi Rih has substantial experience in operating and maintaining such equipment, will provide the necessary training.	Issue is closed.



## DETERMINATION REPORT "USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVYI RIH CEMENT, UKRAINE"

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 2, 3 and 4	Summary of project owner response	Determination team conclusion
<p><u>Corrective Action Request (CAR)5</u></p> <p>It is not stated how anthropogenic GHG emission reductions are to be achieved in the particular section A.4.3.1. Please provide appropriate information.</p>	A.4.3.1	<p>An explanation of how anthropogenic GHG emissions are to be achieved is added in section A.4.3: The objective of the proposed project is to partially replace the natural raw materials used for clinker manufacturing by slag. Slag being de-carbonated material allows the reduction in carbon emissions due to calcinations of raw materials containing calcium and magnesium carbonates into the kiln at high temperature. The project anticipates a usage of about 20% of slag in the raw mix which would replace the natural raw materials like limestone and clay.</p>	Issue is closed.
<p><u>Corrective Action request (CAR)6</u></p> <p>The estimation of annual average reductions over the crediting period is not provided in the Tables 2 and 4 in the Section A.4.3.1. of the PDD version 0.3.</p>	A.4.3.3	<p>Estimated annual values of emission reductions have been added to Tables 2 and 4 in the Section A.4.3.1</p>	Issue is closed.
<p><u>Corrective Action Request (CAR) 7</u></p> <p>There is no evidence of written project approvals by the Parties involved</p>	A.5.1.	<p>Approvals from all the parties involved have been received. LoA from the Netherland # 2009JI12 was issued by SenterNovem 30.10.2010. Letter of Approval from Germany</p>	Issue is closed.



## DETERMINATION REPORT "USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVYI RIH CEMENT, UKRAINE"

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 2, 3 and 4	Summary of project owner response	Determination team conclusion
		was issued by Federal Environment Agency; German Emission Trading Authority 19.01.2010. Letter of Approval from Ukraine 1106/23/7 was issued by National Environmental Investment Agency of Ukraine 26.07.2010.	
<u>Corrective Action Request (CAR) 8</u> The latest version of the ACM0015 methodology is version 02 and the one used in the project is 01. Please clarify and provide the appropriate correction.	B.1.3.	Latest version of the ACM0015 methodology is version 02 is used and the corrections have been introduced in PDD.	Issue is closed.
<u>Corrective Action Request (CAR) 9</u> Please provide appropriate reference to all the literature and numbers/factors, coefficients used in the PDD.	B.1.5.	Appropriate references to literature sources, numbers and factors are now provided in the PDD.	Issue is closed.
<u>Corrective Action Request (CAR) 10</u> The latest version of "Tool for the demonstration and assessment of additionality" is 05.2 while the project uses version 05. Please provide necessary update.	B.2.1.	Latest version of "Tool for the demonstration and assessment of additionality" 05.2 has been used in PDD version..	Issue is closed.
<u>Corrective Action Request (CAR) 11</u> Please change the format of the date of the	B.4.1.	Date format has been corrected in PDD.	Issue is closed.



## DETERMINATION REPORT "USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVYI RIH CEMENT, UKRAINE"

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 2, 3 and 4	Summary of project owner response	Determination team conclusion
baseline setting to the given format (DD/MM/YYYY)			
<u>Corrective Action Request (CAR) 12</u> Please provide the project's operational lifetime in years months.	C.2.1.	Project operational lifetime has been provided in section C.2 of PDD ver. It is expected to be operational for at least 19 years and 228 months.	Issue is closed.
<u>Corrective Action Request (CAR) 13</u> Please provide the length of the crediting period specified in years and months.	C.3.1.	Lengths of crediting period is provided in section C.3 of the PDD ver.1.3.	Issue is closed.
<u>Corrective Action Request (CAR) 14</u> Please correct the formula on the p.31 of the PDD version 0.3 according to the ACM0015 ver.02	D.1.6.	Formula has been corrected in PDD ver.1.3.	Issue is closed.
<u>Corrective Action Request (CAR) 15</u> Please provide reference to the relevant host party regulations.	D.1.14.	References has been provided to the relevant host party regulations in PDD.	Issue is closed.
<u>Corrective Action Request (CAR) 16</u> Please double-check all the calculations and numbers in the SD 6.	E.1.2.	All calculations were double-checked and corrections were introduced in calculation sheets in SD6.	Issue is closed.
<u>Clarification Request (CL) 1</u> Please describe why the barriers do not	B.2.1.	Alternative 4, which constitute an addition of about 4% of GBFS.	Issue is closed.



## DETERMINATION REPORT "USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVYI RIH CEMENT, UKRAINE"

Draft report clarifications and corrective action requests by determination team	Ref. to checklist question in tables 2, 3 and 4	Summary of project owner response	Determination team conclusion
prevent Alternative 4 in a more transparent way.		During several years prior to the project start in 2004, the plant conducted experiments to add small amounts of slag (up to 4%) in order to determine the best suiting raw mix composition and to study how slag admission affected the kiln operation. It was found that slag in such small proportions does not seriously affect the kiln operation, on the condition that the selection of raw mix composition is done properly. However, the addition of higher amounts of slag would affect the kiln operation (clogging of raw mix in the cyclone system prior to the kiln entrance). Thus, barriers identified do not prevent Alternative 4.	
<u>Clarification Request (CL) 2</u> Please divide step 4 under sub-steps 4a and 4b under step 4.	B.2.1.	Step 4 has been split into two sub-steps.	Issue is closed.
<u>Clarification Request (CL) 3</u> Please provide the summary of national policies and circumstances relevant to the baseline of the proposed project activity.	B.2.6.	There is no Ukrainian law or regulation in force that requires cement plants to use alternative raw materials, including slag as partial substitute of raw materials for clinker manufacturing.	Issue is closed.
<u>Clarification Request (CL) 4</u>	B.3.1.	Project spatial boundaries are clarified in	Issue is closed.



## DETERMINATION REPORT "USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVYI RIH CEMENT, UKRAINE"

<b>Draft report clarifications and corrective action requests by determination team</b>	<b>Ref. to checklist question in tables 2, 3 and 4</b>	<b>Summary of project owner response</b>	<b>Determination team conclusion</b>
Please clarify the project's spatial (geographical) boundaries in the section B.3 of the PDD.		section B.3.	
<u>Clarification Request (CL) 5</u> Please clarify why slag transportation is not considered as leakage.	D.1.3.	PDD version 1.4.1 has been updated with the requested information	Issue is closed.
<u>Clarification Request (CL) 6</u> Please fill in all the rows in the table D.2. and add estimation of the uncertainty level as high/medium/low.	D.2.1.	Estimation of uncertainty level in the Table D.2. in a high/medium/low/format have been added	Issue is closed.
<u>Clarification Request (CL) 7</u> Please clarify the information on transboundary environmental effects.	F.1.6.	According to the OVNS, the project will not be harmful to the environment of Kryvyi Rih, and therefore will not have negative transboundary effects.	Issue is closed.



## APPENDIX B: DETERMINATION TEAM

The determination team consists of the following personnel:

### **Ivan G. Sokolov, Dr.Sci (biology, microbiology)**

Bureau Veritas Certification Lead Verifier

Bureau Veritas Ukraine Head of the HSE department.

He has over 25 years of experience in Research Institute in the field of biochemistry, biotechnology, and microbiology. He is a Lead auditor of Bureau Veritas Certification for Environment Management System (IRCA registered), Quality Management System (IRCA registered), Occupational Health and Safety Management System, and Food Safety Management System. He performed over 130 audits since 1999. Also he is Lead Tutor of the IRCA registered ISO 14000 EMS Lead Auditor Training Course, and Lead Tutor of the IRCA registered ISO 9000 QMS Lead Auditor Training Course. He has undergone intensive training on Clean Development Mechanism /Joint Implementation and he is involved in the validation of 26 JI projects.

### **Kateryna Zinevych, M.Sci. (environmental science)**

Verifier

Bureau Veritas Ukraine HSE Department manager.

Kateryna Zinevych has graduated from National University of Kyiv-Mohyla Academy with the Master Degree in Environmental Science. She has experience at working in a professional position (analytics) involving the exercise of judgment, problem solving and communication with other professional and managerial personnel as well as customers and other interested parties at analytical centre "Dergzovnishinform" and "Bureau Veritas Ukraine" LLC. She has successfully completed IRCA registered Lead Auditor Training Course for Environment Management Systems and Quality Management Systems. She has successfully completed Climate Change



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DETERMINATION REPORT "USAGE OF ALTERNATIVE RAW MATERIALS AT KRYVYI RIH CEMENT, UKRAINE"

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Verifier Training Course and she is involved in the determination/verification of 21 JI projects within different sectoral scopes.

**Leonid Yaskin, PhD (thermal engineering)**

Internal Technical Reviewer, Lead Verifier

Bureau Veritas Certification Rus General Director- Lead Auditor, Lead Tutor, Verifier

He has over 30 years of experience in heat and power R&D, engineering, and management, environmental science and investment analysis of projects. He worked in Krzhizhanovsky Power Engineering Institute, All-Russian Teploelectroproject Institute, JSC Energoperspectiva. He worked for 8 years on behalf of European Commission as a monitor of Technical Assistance Projects. He is a Lead auditor of Bureau Veritas Certification for Quality Management Systems (IRCA registered), Environmental Management System (IRCA registered), Occupational Health and Safety Management System (IRCA registered). He performed over 250 audits since 2002. Also he is a Lead Tutor of the IRCA registered ISO 14000 EMS Lead Auditor Training Course, and a Lead Tutor of the IRCA registered OHSAS 18001 Lead Auditor Training Course. He is an Assuror of Social Reports. He has undergone intensive training on Clean Development Mechanism /Joint Implementation and was/is involved in the determination of over 40 JI projects.