


F-CDM-REG

 <p align="center">CDM Project Activity Registration and Validation Report Form <i>(By submitting this form, designated operational entity confirms that the proposed CDM project activity meets all validation and registration requirements and thereby requests its registration)</i></p>	
Section 1: Request for registration	
Name of the designated operational entity (DOE) submitting this form	SGS United Kingdom Ltd.
Title of the proposed CDM project activity (Section A.2 of the attached CDM-PDD) submitted for registration	Use of blast furnace slag in the production of blended cement at Votorantim Cimentos.
Project participants (Name(s))	Votorantim Cimentos (Brazil) Ecoinvest Carbon Brasil Ltda (Brazil)
Sector in which project activity falls	Scope number 4 – manufacturing industries.
Is the proposed project activity a small-scale activity?	Yes / No
Section 2: Validation report	
List of documents to be attached to this validation report (please check mark):	
<ul style="list-style-type: none"> ✓ The CDM-PDD of the project activity ✓ An explanation by the submitting designated operational entity of how it has taken due account of comments on validation requirements received, in accordance with the CDM modalities and procedures, from Parties, stakeholders and UNFCCC accredited non-governmental organizations; □ The written approval of voluntary participation from the designated national authority of each Party involved, including confirmation by the host Party that the project activity assists it in achieving sustainable development: ✓ Other documents, including any validation protocol used in the validation <ul style="list-style-type: none"> ✓ List of documents attached clearly referenced ✓ List of persons interviewed by DOE validation team during the validation process ✓ Copies of documents reviewed during validation visit. ✓ Information on when and how the above validation report is made publicly available. □ Banking information on the payment of the non-reimbursable registration fee □ A statement signed by all project participants stipulating the modalities of communicating with the Executive Board and the secretariat in particular with regard to instructions regarding allocations of CERs at issuance 	

Executive Summary and Introduction, including

- **Description of the proposed CDM project activity**
- **Scope of validation process (include all documentation that has been reviewed and name persons that have been interviewed as part of the validation, as applicable)**
- **DOE Validation team (list of all persons involved in the validation, describing functions assumed in the validation)**

Description of the proposed CDM project activity

This report summarizes the results of the validation of the project, performed on the basis of UNFCCC criteria. The validation has been performed as a desk review of the project documents presented by Votorantim Cimentos and a site visit to Votorantim Cimentos mills located in Votorantim and Salto de Pirapora, São Paulo, Brazil, where staff from the company and its consultant were interviewed.

The project activity encompasses six cement manufacturing plants located in the Southeast region of Brazil:

- Itaú de Minas (Itaú de Minas, Minas Gerais State);
- Santa Helena (Votorantim, São Paulo);
- Salto de Pirapora (Salto de Pirapora, São Paulo);
- Cubatão (Cubatão, São Paulo);
- Volta Redonda (Volta Redonda, Rio de Janeiro);
- Rio Negro (Cantagalo, Rio de Janeiro).

The purpose of the project activity is the use of blast furnace slag, an alternative raw material, as substitute of clinker in the manufacturing of cement at Votorantim Cimentos. The blast furnace slag is a residue of pig iron production similar to sand, that has properties near to clinker and that can be used, under certain conditions, as clinker substitute. With the substitution of clinker, greenhouse gases emissions are reduced because of the decrease of emissions in the calcination of limestone and due to the reduction of fossil fuels consumption in the kiln. The project involved retrofitting of existing facilities and installations of new ones in the transport, preparation, storage and feeding of blast furnace slag.

Total amount of emission reductions for the first crediting period is therefore 1,718,597 tCO₂

Baseline Scenario:

In the baseline scenario, the cement would be produced with a higher share of clinker, instead of the use of blast furnace slag.

With-project scenario:

The project activity is the increase of blast furnace slag share in the production of cement, resulting in the reduction of the amount of clinker per tonne of blended cement and corresponding emissions reductions.

Leakage:

Leakage is considered according to ACM0005 (version 3).

Emissions due to fuel use for the transport of raw materials and fuels from offsite locations to the project plant are likely to decrease due to the implementation of the project. Following ACM0005, in order to keep emissions reductions conservative, this change is not included.

Emissions due to fuel use for the transport of additives from offsite locations to the project plant are likely to increase. These emissions are accounted as leakage, using the equations defined in the methodology.

Another possible leakage is due to the diversion of additives from existing uses. As the slag used is

surplus, it is expected that this source of leakage will not affect calculations.

The estimated leakage for the first crediting period is -18,981 tCO₂.

Environmental and social impacts:

The project is not expected to result in negative environmental and social impacts.

The project activity was implemented in six cement plants located in three different states. It was verified during the document review and on site that each plant has its own environmental license issued by the corresponding state environmental agency. For all cases, no special requirements, as well as no environmental impact assessments (EIA/RIMA) of the project activity, were requested by the environmental agencies.

Positive (direct and indirect) impacts were identified as a project activity contribution:

- the reduction of energy consumption in the cement manufacture chain;
- the increase of blast furnace slag use reduces energy demand in cement manufacture and mining of limestone and also helps in the conservation of non-renewable reserves of limestone;
- the reduction of fossil fuel consumption can result in the reduction of local air pollution;
- the reduction of limestone mining activities, resulting in local environmental benefits, such as, mitigation of local air pollution, reduction of biodiversity loss, and soil and landscaping conservation at mining sites;
- helping to mitigate problems related to the final disposal of slag, an industrial residue.

Additionally, it was stated by the project proponents that the incomes from the CDM will indirectly support Votorantim Cimentos in keeping and improving its social and environmental programs.

Scope

The scope of the validation is the independent and objective review of the project design document, the baseline study and monitoring plan and other relevant documents of the use of blast furnace slag in the production of blended cement at Votorantim Cimentos. The information in these documents is reviewed against the criteria defined in the Marrakech Accords (Decision 17) and the Kyoto Protocol (Article 12) and subsequent guidance from the CDM Executive Board.

The validation 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.

Overview of documentation that has been reviewed and names of persons that have been interviewed as part of the validation

Please refer to Annex 3.

DOE Validation team

Name	Role
Áurea Nardelli	Team leader / lead assessor
Fabian Gonçalves	Local assessor
Irma Lubrecht	Technical reviewer

Description of methodology for carrying out validation

- Review of CDM-PDD and additional documentation attached to it
- Assessment against CDM requirements (e.g. by use of a validation protocol)

- **Report of findings by the DOE, e.g. by use of type of findings (e.g. corrective action requests, clarifications or observations). Please explain the way findings are “labelled” during validation.**
- **Include statements or assessments in the section “Conclusions, final comments and validation opinion” below.**

Review of CDM-PDD and additional documentation

The validation was performed primarily as a document review of the publicly available project documents (see Annex 2 for the list of documents). The assessment was carried out by trained assessors using a validation protocol.

A site visit was required to verify assumptions in the baseline. Additional information was required to complete the validation, which was obtained through telephone, e-mail and face-to-face interviews with the project developers and their consultant. These were performed by the local assessor, from SGS do Brazil. The results of the site visit carried out on 29th November 2005 are summarized in Annex 6 to this report.

Assessment against CDM requirements

In order to ensure transparency, a validation protocol was customised for the project. The protocol shows requirements, means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements the project is expected to meet; and
- It documents both how a particular requirement has been validated and the result of the validation.

The validation protocol consists of several tables. The different columns in these tables are described below.

<i>Checklist Question</i>	<i>Means of verification (MoV)</i>	<i>Comment</i>	<i>Draft and/or Final Conclusion</i>
<i>The various requirements are linked to checklist questions the project should meet.</i>	<i>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.</i>	<i>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.</i>	<i>This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). New Information Request (NIR) is used when the validation team has identified a need for further clarification.</i>

The completed validation protocol for this project is attached as Annex 4 to this report.

Report of findings and use of type of findings.

As an outcome of the validation process, the team can raise different types of findings.

Where insufficient or inaccurate information is available and clarification or new information is required the Assessor shall raise a **New Information Request (NIR)** specifying what additional information is required.

Where a non-conformance arises that requires the Project Developer to do something (for example correct something in the PDD) the Assessor shall raise a **Corrective Action Request (CAR)**.

A CAR is issued, where:

- I. mistakes have been made with a direct influence on project results;
- II. validation protocol requirements have not been met; or
- III. there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be verified.

The validation process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a NIR may result in a CAR. Information or clarifications provided as a result of an NIR may lead to a CAR. Observations may also be raised which are for the benefit of future projects and future verification or validation actors. These have no impact upon the completion of the validation or verification activity.

Corrective Action Requests and New Information Requests are raised in the draft validation protocol and detailed in a separate form (Annex 5). In this form, the Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.

For this project, the CARs and NIRs were closed out through communication between validation team and Votorantim staff and its consultant. Changes to the project design were necessary to clarify the issues raised.

Explanation by the submitting designated operational entity of how it has taken due account of comments on validation requirements received, in accordance with the CDM modalities and procedures, from Parties, stakeholders and UNFCCC accredited non-governmental organizations;

- **Description of how and when the PDD was made publicly available**
- **Description of how comments were received and made publicly available**
- **Explanation of how due account has been taken of comments received**
- **Compilation of all comments received (Identify the submitter)**

In accordance with the CDM modalities and procedures, the project design document of this proposed CDM project activity has been made publicly available and comments have been invited from Parties, stakeholders and UNFCCC accredited non-governmental organizations. This process is described in Annex 1 to this report, which is available as a separate document.

Conclusions, final comments and validation opinion

- **Provide conclusions on each requirement under paragraph 37 of the CDM modalities and procedures, describing how these requirements have been met. This shall include assessments and findings (e.g. corrective action requests, clarifications or observations) in relation to each requirement, including a confirmation that all issues raised have been addressed to the satisfaction of the DOE.**
- **Final comments and validation opinion**

Participation requirements

The project participants are Votorantim Cimentos (Brazil) and Ecoinvest Carbon Brasil Ltda (Brazil). Brazil is listed as the host Party. Brazil has ratified the Kyoto Protocol on 23rd August 2002 (http://unfccc.int/files/essential_background/kyoto_protocol/application/pdf/kpstats.pdf).

At time of the draft validation, no Letter of Approval from the host country had been provided.

The Brazilian letter of approval for the CDM project is obtained after the validation of the project by the Designated Operational Entity. The Brazilian DNA does not issue the letter of approval until the DOE validates the project. For this reason, project proponents asked the DOE to issue the validation report so that the approval of the host country can be requested. The Letter of Approval is signed when the DNA of Brazil has received and analysed the validation report.

The Letter of Approval was issued on 25 October 2006.

Annex I Party participants are not identified yet.

Baseline and monitoring methodology

The baseline methodology applied to the project activity is ACM0005 "Consolidated Baseline Methodology for Increasing the Blend in Cement Production".

ACM0005 is applicable to projects that increase the share of additives (i.e. reduce the share of clinker) in the production of cement types beyond current practices in the country. In the case of Votorantim Cimentos project, the increase in the share of additives and corresponding reduction in the share of clinker in the production of cement types occurs due to the use of blast furnace slag.

The methodology is applicable under the following conditions:

- *There is no shortage of additives related to the lack of blending materials:* Project participants demonstrated that there is no alternative allocation or use for the additional amount of additives used in the project activity. It was confirmed that the blast furnace slag is produced by the steel and iron industry in the region of the project activity and if the slag was not used as additive in cement manufacture, it would likely be disposed in landfills. As verified on site, Votorantim Cimentos has long term purchase agreements with slag suppliers and have a slag stock as strategic reserve in the case of shortage.
- *It is applicable to domestically sold output of the project activity plant and excludes export of blended cement:* The production of the plants included in the project activity is sold domestically. It was confirmed by document review and by interviews with the project managers.
- *Adequate data are available on cement types in the market:* Two associations provide reliable and publicly available information about the cement industry in Brazil: ABCP – Associação Brasileira de Cimento Portland (Brazilian Association of Portland Cement) and SNIC – Sindicato Nacional da Indústria do Cimento (National Association of the Cement Industry). Both organizations have

information publicly available in their websites and periodical reports.

The project boundary complies with ACM0005 and includes the cement production plant, any onsite power generation, and the power generation in the grid. Three emission sources are considered:

- Direct emissions at the cement plant due to fuel combustion for firing the kiln and on-site generation of electricity.
- Direct emissions due to calcination of limestone.
- Indirect emissions from fossil fuel combustion in power plants in the grid due to electricity use at the cement plant for: crushing and grinding the raw materials used for clinker production; driving the kiln and kiln fans; finish grinding of cement; and processing of additives.

Any transport related emissions for the delivery of additional additives are included in the emissions related to the project activity as leakage.

The baseline methodology is used in conjunction with the approved consolidated monitoring methodology "Consolidated Monitoring Methodology for Increasing the Blend in Cement Production" (ACM0005).

It was verified that the project fulfils the conditions under which the methodology is applicable. The formulas required by the methodology for calculation of baseline and project emissions, for leakage and for determining the emissions reductions were detailed in the PDD and correctly applied.

Additionality

The additionality of the project activity is demonstrated and assessed using the "Tool for the demonstration and assessment of additionality", from the CDM EB, Version 2. The project described Steps 0 (Preliminary screening based on the starting date of the project activity) and Steps 1-5 of the tool (with exception of Step 2 - Investment analysis, which was not undertaken).

The starting date of the project activity (01/09/2000) was confirmed; the equipment was verified during site visit and respective dated purchase document.

Additional documents about the starting of project operation (01/01/2001) were verified (Clinker worksheets, Electricity worksheets, Coal worksheets and worksheet DO, issued on 2000 and 2001; these documents demonstrates the reduction in the use of clinker, electricity and coal in the Votorantim plants).

Votorantim also provided evidence that the incentive from the CDM was seriously considered in the decision to proceed with the project activity. It was confirmed that the company is member (since 1999) of the World Business Council for Sustainable Development and signatory of the Cement Industry Initiative. The information was verified in the company website http://www.votorantim-cimentos.com/responsabilidade/principais_acoes.shtml. As a signatory of the environmental protocol of cement industries, Votorantim has the commitment of control CO2 emissions and to contribute to mitigate the climate change. Additional evidences that Votorantim has participate in the meetings of cements companies regarding this protocol were verified by the local assessor during the site visit by interviews and consultation to websites (www.wbcsdcement.org ; www.votoran.com.br).

Step 3 - Barrier Analysis was used for identifying the most plausible scenario among all realistic and credible alternatives to the project activity. Seven barriers were identified, covering investments and technological barriers.

During the desk study, additional information was requested about the identified barriers that would prevent the implementation of the project activity (NIR 6).

It was discussed that the barrier 1 was not a significant barrier among the set of seven barriers presented, as Votorantim is a large economic group and would not face many difficulties to have access to debt funding. Barrier 2 is part of the economic context of Brazil: the attractiveness of the capital market. The most important barriers faced by the project activity are barriers 3, 4, 5 and 7. It was verified that the production process had to be adapted for implementation of the project activity. New equipment was installed specifically for the use of slag, as verified on site and by purchase documents (new dryer of slag, new mills, field instruments and auxiliary equipment). Improvements in controls and logistics were also verified on-site. A system and infrastructure to regularize the supplying and transport of slag were implanted. Long term slag purchase agreements were signed between Votorantim and slag suppliers (verified contract between Votorantim and Cosipa (slag supplier), signed on 1 May 2001).

New procedures were needed because of the use of the blast furnace slag in the cement production. The documents were checked on-site and the staff and operators were interviewed (Procedures: *Inspecção seletiva secador de escória Hazemag, Segurança na troca de revestimento revolvedor, Destruir eixos do secador de escória, limpeza do secador*). In addition, the internal quality plan was updated to cover the use of slag in the production (Quality plan PDO01298 rev06, PD00938 rev07). NIR 6 was closed out.

The barriers analysis demonstrated that the proposed project activity (scenario 1) faced barriers that prevent the implementation of this type of project activity; and do not prevent the implementation of other alternatives (scenarios 2 and 3). It was concluded from the barriers analysis that the scenario 3 is the most likely baseline scenario among the 5 alternatives presented. In this scenario, the mills increase the use of blast furnace slag in a pre-defined rate, lower than the project activity rate. Section B.3 of the PDD was revised.

Monitoring plan

The monitoring plan was detailed in the Section D.4 of PDD.

During the desk study, it was verified that the monitoring plan did not comply with all requirements of ACM 0005 (raised CAR1). For closing-out the CAR 1, the monitoring plan was revised according to the methodology. Section D of the revised PDD covered correctly the parameters to be monitored.

No monitoring of sustainable indicators/environmental impacts was presented in the PDD (CAR 2 was raised). For closing-out the CAR 2, it was provided information about social and environmental impacts and their monitoring. It was verified that the monitoring of environmental impacts of the project activity is made according to the requirements of the environmental agency in each State where the mills are located. As the project activity does not result in significant environmental impacts, the agencies have not required any special or continuous monitoring. It was clarified in the Section F.2 of the revised PDD.

Regarding sustainable development indicators, it was described in Section A.2 of the PDD the project contributions to Sustainable Development. In addition, it was verified that Votorantim Cimentos has a corporate environmental performance indicator that measures the evolution of several environmental aspects in the operations of the plants, including those ones included in the project activity. The environmental performance indicator compasses energy use, water use, raw material substitution, co-processing and co-firing of alternative materials and fuels among others. There is an environmental management system implemented in the plants and some of them are ISO 14000 certified. CAR 2 was closed out.

During the desk study, no information about training requirements was identified in the documentation provided by the project. NIR 5 was raised.

It was verified during the site visit and by interviews with project managers and operators that training was required for the operation of the new slag dryer. New routines had to be established for the quality control of slag and they were included in the QA/QC procedures. The logistics of slag did not involve a new procedure/training, but resulted in new activities with transport, supply chain, logistics suppliers,

storage and movement of slag inside the sites. Relevant procedures are available at the project sites, which copies were provided to SGS team. The personnel interviewed during the site visit understand their specific responsibilities. The PDD was revised and include the clarification above-mentioned. NIR 5 was closed out.

It was verified that there were not procedures identified for project performance reviews before data is submitted for verification. CAR 7 was raised.

For closing-out CAR 7, a specific procedure was described by the project proponent and sent to the validator. It includes responsibilities clearly identified; Votorantim's Corporate Environment Coordinator will gather the data from the plants and submit it to Ecoinvest that is responsible for the final review in order to verify inconsistencies in the calculations before each verification.

Environmental Impacts

NIR 3 was raised during the desk study, requesting additional information about environmental legal requirements applicable to the project activity.

It was verified that the project was implemented in six cement plants and each one of the plants has its own environmental license issued by the state environmental agencies (states of Minas Gerais, São Paulo and Rio de Janeiro). No specific environmental impact assessments (EIA/RIMA), were requested by the environmental agencies for the project activity. The current environmental licenses were checked by the local assessor and copies were provided to the validator (see Annex 4 of this report, list of references consulted during ground truthing). Section F of PDD was revised to include details about environmental impacts. NIR 3 was closed out.

Comments by local stakeholders

Local stakeholders have been invited by letters to comment on the Votorantim CDM project. The consultation process covered the six sites where the project activity has been developed. Documented evidences regarding the local stakeholder consultation were provided during the site visit.

The invitation was sent to specific stakeholders, considered representative of the general public, as defined by Resolution 1 of the DNA:

- The municipality mayor house;
- The municipality chamber;
- The local attorneys' office;
- The Brazilian NGO Forum;
- The state environmental agency;
- The municipality's environmental authority;
- Local communities' associations.

No comments were received from local stakeholders

Other requirements

In the page 1 of the PDD it was excluded: "version 02 – in effect as of: 1 July 2004". It is require to verify the latest version of the PPD (CAR 4) and do not change any format or font of the original template. The PDD was revised. It was evidenced that PDD used is in accordance with the most recent version available at the UNFCCC website: <http://cdm.unfccc.int/Reference/Documents> CAR 4 was closed out.

The information used in the PDD could be verified from the documents and spreadsheets provided during the site visit (see references) and from information available in the internet.

Final comments and validation opinion

Actions have been taken to close out 7 findings.

SGS has performed a validation of project: Use of blast furnace slag in the production of blended cement at Votorantim Cimentos.

The validation was performed on the basis of the UNFCCC criteria and host country criteria, as well as criteria given to provide consistent project operations, monitoring and reporting. Using a risk based approach, the validation of the project design documentation and the subsequent follow-up interviews have provided SGS with sufficient evidence to determine the fulfilment of the stated criteria.

By the use of blast furnace slag, an alternative raw material, as substitute of clinker in the manufacturing of cement at Votorantim Cimentos, the project results in reducing greenhouse gas emissions that are real, measurable and give long-term benefits to the mitigation of climate change. A review of the barriers presented demonstrates that the proposed project activity was 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. If the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

The validation is based on the information made available to SGS and the engagement conditions detailed in the report. The validation has been performed using a risk based approach as described above. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence SGS can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

The DOE declares herewith that in undertaking the validation of this proposed CDM project activity it has no financial interest related to the proposed CDM project activity and that undertaking such a validation does not constitute a conflict of interest which is incompatible with the role of a DOE under the CDM.

By submitting this validation report, the DOE confirms that all validation requirements are met.

M.van der Linden

Name of authorized officer signing for the DOE

Date and signature for the DOE

05-10-2006



Section below to be filled by UNFCCC secretariat

Date when the form is received at UNFCCC secretariat

Date at which the registration fee has been received

Date at which registration shall be deemed final

Date of request for review, if applicable

Date and number of registration	Date	Number