# VALIDATION REPORT

## VIKRAM CEMENT

## EMISSION REDUCTION THROUGH PARTIAL SUBSTITUTION OF FOSSIL FUEL WITH ALTERNATIVE FUELS LIKE AGRICULTURAL BY-PRODUCTS AND MUNICIPAL SOLID WASTE (MSW) IN THE MANUFACTURING OF PORTLAND CEMENT AT VIKRAM CEMENT (VC), NEEMUCH (MP), INDIA

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| Approved by:<br>Mr. Rainer Winter | Organisational unit:<br>TÜV NORD JI/CDM Certification Program |
| Client:<br>VIKRAM CEMENT | Client ref.:<br>Mr. R.M.Gupta ( Sr. Executive President ) |

Summary/Opinion:

The Vikram Cement, has commissioned the TÜV NORD JI/CDM Certification Program to validate the project: *"Emission reduction through partial substitution of fossil fuel with alternative fuels like agricultural by products and Municipal Solid Waste (MSW) in the manufacturing of portland cement at Vikram Cement (VC), Neemuch (MP), India",* with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords), and the relevant decisions by COP/MOP and CDM Executive Board.

The project activity involves partial replacement of the fossil fuels like coal and pet coke used in the kiln system (line III) for clinker formation by the alternative fuels like agricultural by products and MSW derived fuel - RDF as thermal energy source to the raw mix so that it can be converted as clinker. The project activity intends to reduce GHG emissions to the extent of sum of baseline emission (*GHG emissions from fossil fuels displaced by the alternatives and emissions from reduction of on-site transport of fossil fuels*) and leakage (*leakage from transport of alternative fuel less leakage due to reduced transport of fossil fuels, due to burning of biomass residue that is used as alternative fuel, baseline GHG emissions due to anaerobic decomposition of biomass residues at landfills and GHG emissions that could be generated during the preparation of alternative fuels outside the project site)* deduct by project emission (*GHG emissions from alternative fuels , from on-site transport of alternative fuels*).

A risk-based approach has been followed to perform this validation. In the course of the draft validation 12 Corrective Action Requests (CARs) and 14 Clarification Requests (CRs) and 1 outstanding issue were raised and successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, technology supplier, local stakeholders, employees of VC, consultant, JMC officials and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (India) and all relevant UNFCCC requirements for CDM. Project activity approval has been obtained from National CDM Authority as DNA of India vide the Letter number F. No. 4/14/2005-CCC, dated September 23, 2005
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the GHG emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 867722 $tCO_2e$ is most likely to be achieved within the 10 years (fixed) crediting period.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

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|---|---|
| Report No.:<br>53700107-07/12 | Subject Group:<br>Environment |

Report title:

*EMISSION REDUCTION THROUGH PARTIAL SUBSTITUTION OF FOSSIL FUEL WITH ALTERNATIVE FUELS LIKE AGRICULTURAL BY PRODUCTS AND MSW IN THE MANUFACTURING OF PORTLAND CEMENT AT VIKRAM CEMENT (VC), NEEMUCH (MADHYA PRADESH), INDIA*

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**Indexing terms**

Climate change
CDM
Validation
Kyoto Protocol

## Abbreviations

| | |
|---|---|
| **BAU** | Business as usual |
| **CA** | Corrective Action / Clarification Action |
| **CAR** | Corrective Action Request |
| **CDM** | Clean Development Mechanism |
| **CEA** | Central Energy Authority |
| **CER** | Certified Emission Reduction |
| **$CO_2$** | Carbon dioxide |
| **$CO_{2e}$** | Carbon dioxide equivalent |
| **CP** | Certification Program |
| **CR** | Clarification Request |
| **DNA** | Designated National Authority |
| **E&Y** | Ernst & Young |
| **EB** | CDM Executive Board |
| **EIA** | Environmental Impact Assessment |
| **GHG** | Greenhouse gas(es) |
| **Govt.** | Government |
| **IETA** | International Emissions Trading Association |
| **INR** | Indian Rupees |
| **IPCC** | Intergovernmental Panel on Climate Change |
| **IREDA** | Indian Renewable Energy Development Agency |
| **IRR** | Internal Rate of Return |
| **JMC** | Jaipur Municipal Corporation |
| **ISO** | International Standards Organisation |
| **Kg** | Kilogram |
| **kW** | Kilowatt |
| **kWh** | Kilowatt hour |
| **m** | meter |
| **MNES** | Ministry of Non Conventional Energy Sources, Government of India |
| **MoEF** | Ministry of Environment and Forest, Government of India |
| **MoV** | Means of Verification |
| **MSW** | Municipal Solid Waste |
| **MT** | Metric Tonne |
| **MU** | Million Units (of electricity) |
| **MVP** | Monitoring and Verification Plan |
| **NCCBM** | National Council for Cement and Building Materials |

| | |
|---|---|
| **NCV** | Net Calorific Value of Fuel |
| **NGO** | Non Government Organisation |
| **NPV** | Net Present Value |
| **ODA** | Official Development Assistance |
| **PDD** | Project Design Document |
| **QC/QA** | Quality control/Quality assurance |
| **RBI** | Reserve Bank of India |
| **RDF** | Residual Derived Fuel |
| **UNFCCC** | United Nations Framework Convention on Climate Change |
| **VC** | Vikram Cement |

## *Table of Contents* *Page*

# 1 INTRODUCTION

Vikram Cement (VC), facilitated by Ernst & Young Pvt Ltd (E&Y), has commissioned the JI/CDM Certification Program (CP) of TÜV NORD CERT GmbH to validate the project:

> *"Emission Reduction Through Partial Substitution of Fossil Fuel With Alternative Fuels Like Agricultural By Products And MSW In The Manufacturing Of Portland Cement At Vikram Cement (VC), Neemuch (Madhya Pradesh), India"*

with regard to the relevant requirements for CDM project activities.

## 1.1 Objective

The purpose of this validation is to have an independent third party assess the project design. In particular the project's baseline, the monitoring plan (MP), and the project's compliance with

- the requirements of Article 12 of the Kyoto Protocol/KP/;
- the CDM modalities and procedures as agreed in the Marrakech Accords under decision 17/CP.7/MA/; the annex to the decision;
- subsequent decisions made by COP/MOP and CDM Executive Board;
- other relevant rules, including the host country (India) legislation and sustainability criteria

are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen as necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs).

## 1.2 Scope

The validation scope is given as an independent and objective review of the project design, the project's baseline study and monitoring plan (based on Approved methodology ACM0003 / Version 04, Sectoral Scope: 4, 28 July 2006, Revision to the approved baseline methodology ACM0003, "Emissions reduction through partial substitution of fossil fuels with alternative fuels in cement manufacture"), which are included in the PDD/PDD1/ and other relevant supporting documents.

The items covered in the validation are described below:

- **UNFCCC and Host Country Criteria**
  - UNFCCC/Kyoto Protocol requirements, in particular,
    - the requirements of the CDM as set out in decision 17/CP.7 (Marrakech Accords)/MA/,

  - the present annex, and
  - relevant decisions by COP/MOP and CDM Executive Board
- Host country requirements / criteria

- **CDM Project Description**
  - Project design
  - Project boundaries
  - Predicted CDM project GHG emissions

- **Project Baseline**
  - Baseline methodology
  - Baseline GHG emissions

- **Monitoring Plan**
  - Monitoring methodology
  - Indicators/data to be monitored and reported
  - Responsibilities

- **Background investigation and follow up interviews**

- **Global Stakeholder consultation**
  - Publishing the PDD on TUV NORD website
  - Review of comments

- **Draft validation reporting with CARs and CRs, if any**

- **Final validation reporting.**

The information included in the PDD and the supporting documents were reviewed against the requirements and criteria mentioned above. The TÜV NORD CERT GmbH JI/CDM CP has, based on the recommendations in the Validation and Verification Manual/VVM/, employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs/CPM/. The validation is based on the information made available to TÜV NORD JI/CDM CP and on the contract conditions.

The validation is not meant to provide any consulting to the project participant. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

## 1.3 GHG Project Description

### 1.3.1 Project Scope

The considered GHG project can be classified as a CDM project in the sector given in Table 1-1 (according to List of Sectoral Scopes of UNFCCC).

**Table 1-1:** Project Scope

| No. | Project Scope |
|---|---|
| 4 | Manufacturing industries |

### 1.3.2 Project Entities

The following entities are involved in the developing of the project:

| | |
|---|---|
| **Project Proponent:** | Vikram Cement (VC)<br>Vikram Nagar, P.O. Khor<br>Vikram Cement Factory<br>Neemuch, Madhya Pradesh<br>PIN- 458470, India |
| Contact person: | Mr. R.M.Gupta (Sr. Executive President)<br>+91– 07420-230108/230566, +91-94253 28083<br>rmgupta@adityabirla.com |
| **Project Consultant:** | Ernst & Young Pvt Ltd<br>Risk and Business Solutions<br>18th floor, Express Towers<br>Nariman Point, Mumbai<br>PIN- 400 021, India |
| Contact Person: | Shashi Prakash (Consultant)<br>+91 - 22 - 6665 5661, +91 – 93242 10189<br>Shashi.Prakash@in.ey.com |

### 1.3.3 Project location

The project site is located at Vikram Cement, Khor; district Neemuch, state Madhya Pradesh, India. VC site lies parallels of latitude 24° 15'North, and the meridians of longitude 74° 45' East.

### 1.3.4 Technical project description

The project activity involves partial replacement of the fossil fuels like coal and pet coke used in the kiln system (line III) for clinker formation by the alternative fuels like agricultural by products and MSW derived fuel - RDF as thermal energy source to the raw mix so that it can be converted as clinker. Biomass has proposed to collect from the near by village to VC site from biomass suppliers and for RDF, VC has made the agreement[/JMC/] on dated 13/07/2005 between Jaipur Municipal Corporation and VC to "establishment of processing plant for useful conversion of MSW at Jaipur on BOOT (Build Own Operate and Transfer) basis".

Project activity "Emission reduction through partial substitution of fossil fuel with alternative fuels like agricultural by products and Municipal Solid Waste (MSW) in the manufacturing of portland cement at Vikram Cement (VC), Neemuch (MP), India" as described in PDD will likely to substitute 564.76 TJ/month by using heat input from alternative fuel. Based on estimated alternative fuel consumption:

- Average 2870 tons per year of biomass residue having heat value, 3000 k Cal/ kg
- 36225 tons per year RDF having heat value, 3500 k Cal/ kg

Thus, the project activity helps to avoid GHG emission that would have occurred with continuation of previous practice when VC was fulfilling its need of thermal energy by using fossil fuels like coal and pet coke. The project activity intends to reduce GHG emissions to the extent of the difference of baseline emission and sum of project emission and leakage.

The estimated amount of emission reductions over the chosen 10-year "non-renewable crediting period" is **867,722** $tCO_2e$ for the crediting period 01/07/2007 to 30/06/2017.

## 2 VALIDATION TEAM

- The Validation Team was led by **Asim Kumar Jana**, TÜV Nord -Mumbai, India. Mr. Jana, M.Tech. (Env Engg), Dipl in Industrial Safety, is a TUV-CERT Lead auditor for ISO 9001/14001 and OHSAS 18001 and certified energy auditor by Bureau of Energy Efficiency of India. Currently he is Manager-CDM Services for TÜV NORD India operation. He is an appointed assessor for TÜV NORD JI/CDM CP and performed validation and verification of several CDM projects. For this validation he was assisted by:
- **Manojkumar Borekar**, TÜV Nord -Pune, India. Mr. Borekar, M.Tech. (Energy Management), B.E. (Mechanical Engineering) and Certified Energy Auditor by Bureau of Energy Efficiency of India (Ministry of Power). Currently he is GHG and Energy Auditor-CDM Services for TÜV NORD India operation. He is an

appointed CDM/JI Expert for TÜV NORD JI/CDM CP and performed validation and verification of several CDM projects.

The validation report is verified by:

- **Mr. Rainer Winter**. Mr. Winter works at TÜV NORD as ISO 9001/ 14001 Auditor and environmental verifier for EMAS. He is also an approved emission verifier within the European Emission Trading Scheme. Mr. Winter is an authorized JI/CDM assessor and is in charge of the TÜV NORD JI/CDM CP.

# 3 METHODOLOGY

The validation of the project was carried from January'2007 to April'2007. It was divided into two phases: the pre-validation and the validation phase. The pre-validation consisted of the following three phases:

- A desk review of the PDD (incl. annexes) and supporting documents with the use of a customised validation protocol/CPM/ according to the Validation and Verification Manual/VVM/;
- Back ground investigation and follow-up interviews with personnel of the project proponent, the consultant, legal authorities and other stakeholders;
- Reporting of validation findings taking into account the public comments received on TUV NORD website.

The draft validation report includes Corrective action, Clarification Requests (CAR and CR) and outstanding issue identified in the course of this validation.

A **Corrective Action Request** is established if

- Mistakes have been made in assumptions or the project documentation which directly will influence the project results,
- The requirements deemed relevant for validation of the project with certain characteristics have not been met or
- There is a risk that the project would not be registered by the UNFCCC or that emission reductions cannot be verified and certified.

A **Clarification Request** is issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

The final validation started after issuance of proposed corrective action (CA) of these CAR and CR by the project proponent. The validator has assessed the proposed CA with a positive result and after the closure of these CAR and CR the project proponent has issued the final version of the PDD. On the basis of this the final validation report and opinion were issued.

## 3.1 Validation Protocol

In order to ensure consideration of all relevant assessment criteria, a validation protocol was used. The protocol shows, in a transparent manner, criteria and requirements, means of verification and the results from pre-validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements that a CDM project is expected to meet;
- It ensures a transparent validation process where the independent entity will document how a particular requirement has been validated and the result of the determination.

The validation protocol consists of three tables: Table 1 (Mandatory Requirements); Table 2 (Requirement Checklist); and Table 3 (Resolution of Corrective Action and Clarification Request) as described in Figure 1.

The completed (till draft conclusion) validation protocol is enclosed in Annex I to this report identifying 12 Corrective Action Requests, 14 Clarification Requests and 1 outstanding issue.

| ***Validation Protocol Table 1: Mandatory Requirements*** | | | |
|---|---|---|---|
| ***Requirement*** | ***Reference*** | ***Conclusion*** | ***Cross reference*** |
| *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 (**OK**), or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.* | *Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.* |

| ***Validation Protocol Table 2: Requirement checklist*** | | | | |
|---|---|---|---|---|
| ***Checklist Question*** | ***Reference*** | ***Means of verification (MoV)*** | ***Comment*** | ***Draft and/or Final Conclusion*** |
| *The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. 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 (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **Clarification** is used when the validation team has identified a need for further clarification.* |

| ***Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests*** | | | |
|---|---|---|---|
| ***Draft report clarifications and corrective action requests*** | ***Ref. to checklist question in table 2*** | ***Summary of project owner response*** | ***Validation conclusion*** |
| *If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.* | *Reference to the checklist question number in Table 2 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 validation team should be summarised in this section.* | *This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".* |

**Figure 1:** Validation protocol tables

## 3.2 Review of Documents

The draft PDD[/PDD1/] was submitted by VC in January 2007 and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the validation team used additional documentation by third parties like host party legislation, consent, agreement, technical reports referring to the project design or to the basic conditions and technical data.

The documents that were considered during the (pre-) validation process are given in chapter 7 of this report. They are listed as follows:

- Documents provided by the project proponent (Table 7-1)
- Background investigation and assessment documents (Table 7-2)
- Websites used (Table 7-3).

In order to ensure the transparency of the decision making process, the reference codes listed in tables 7-1 to 7-3 are used in the validation protocol and – as far applicable – in the report itself.

## 3.3 Follow-up Interviews

During 24-25/01/2007, the TÜV NORD JI/CDM CP performed the validation interviews with the project proponent, project developer, alternative fuel transporters, local villagers and plant operating personnel to confirm selected information and to resolve issues identified in the document review.

The key interviewed persons and the main topics of the interviews are summarised in Table 3-1.

**Table 3-1** Interviewed persons and interview topics

| Interviewed Persons / Entities | Interview topics |
|---|---|
| Project proponent representatives | - Chronological description of Project with documents of key steps of phased implementation.<br>- Technical details of the project realisation- project feasibility, designing, engineering, operational life time, Instrumentation details for GHG monitoring of the project<br>- Host Government Approval<br>- Post registration involvement of Annex-I Party<br>- Approval procedures and status<br>- Quality and environmental management system<br>- Monitoring and measurement equipment<br>- Financial aspects<br>- Crediting period<br>- Project activity starting date<br>- CER allocation /ownership<br>- Baseline study assumptions<br>- Sustainable development issues<br>- EIA Study<br>- Analysis of local stake holder consultation<br>- Salient operational data – technical specification, operating parameters<br>- Roles and responsibilities of the staff members w.r.t project management, monitoring, calibration and reporting<br>- Emergency Response Plan<br>- Availability of MSW with seasonal variation<br>- Survey of Jaipur city for MSW potential, composition of MSW<br>- Policy of Rajasthan state Government regarding MSW |
| Consultant (E&Y) | - Editorial aspects of PDD<br>- Methodology selection aspects<br>- Base line study, leakage and additionality<br>- Details of emission reduction calculation<br>- Applicability of methodology<br>- Stakeholder consideration |
| Plant Operational Personnel | - Operational data – electricity consumption and alternative/ fossil fuel consumption,<br>- Verification and calibration schedule and QA/QC |

| Interviewed Persons / Entities | Interview topics |
|---|---|
| | procedure |
| Local Villagers | - Information on project activity, social, economic and environmental impact of the project activity,<br>- Biomass availability, type of biomass available, benefits of project activity to Damodharpura village<br>- Other use of agricultural residue<br>- Local crop of nearby area<br>- Development due to VC in near by rural region<br>- Environmental issue related to the combustion of RDF and agricultural waste in the kiln III at VC site and transportation |
| Transporter of Alternative Fuel | - Maximum and minimum distance between alternative fuel site and project activity site<br>- Mileage of transport vehicle<br>- Road condition between alternative fuel site and project activity site<br>- Dust and air pollution to the surrounding villagers<br>- Provision to ensure that there is no environmental adverse impact due to the spillage of RDF and agricultural waste, environmental issue related to the transportation of RDF and agricultural waste<br>- Safety issue while handling the RDF. |
| Commissioner (Health) and Health officer– Jaipur Municipal Corporation | - Availability of MSW<br>- Collection and processing of MSW<br>- Other use of MSW<br>- Health, environmental issue related to the collection and processing of MSW |

A detailed list including the functions or designations of the interviewed persons is given in chapter 7 (see. Table 7-4). This table also includes reference codes to be used in the validation protocol.

## 3.4 Resolution of Clarification and Corrective Action Requests

In order to remedy any mistakes, problems or any other outstanding issues, which needed to be clarified for positive conclusion on the project design, CARs and CRs were raised.

In this validation report 12 CARs, 14 CRs and 1 outstanding issue are raised.

The CARs / CRs are documented in Annex and addressed in table no 3 of validation protocol.

## 3.5 Public Stake Holder Comments

The PDD was made publicly available through TÜV NORD JI/CDM CP web site www.global-warming.de. Comments on the PDD were invited within 30 days, i.e. 16/01/2007 to 14/02/2007.

No comments were received. In case comments would have been received, they would have also been made publicly available on this web site.

## 3.6 Finalising the report

The draft validation report containing a set of CARs, CRs and outstanding issue was submitted to the project proponent. The project design document was revised addressing the CARs, CRs and outstanding issue issued by TÜV NORD JI/CDM CP. After reviewing the revised and resubmitted project documentation/PDD2/; resolving the CARs, CRs and outstanding issue concerns, TÜV NORD JI/CDM CP issues this final validation report and opinion.

# 4 VALIDATION FINDINGS

In the following paragraphs the findings from the desk review of the draft PDD[/PDD1/], visits, interviews and supporting documents are summarised. This also includes the corresponding corrective action taken by the client and its final assessment.

The results are shown in table 4-1:

**Table 4-1:** Summary of CAR and CR issued

| Validation topic [1)] | No. of CAR | No. of CR |
|---|---|---|
| Participation requirements (A3) | 0 | 0 |
| Project design (A1-A2) | 1 | 2 |
| Baseline and additionality (B) | 4 | 5 |
| Crediting Period (C) | 0 | 1 |
| Monitoring plan (D) | 2 | 3 |
| Calculation of GHG emissions (E) | 2 | 2 |
| Environmental impacts (F) | 2 | 0 |
| Comments of local stakeholders (G) | 1 | 1 |
| **SUM** | **12** | **14** |

1) The letters in brackets refer to the validation protocol

2) One outstanding issue is addressed in table no 3 of validation protocol regarding applicable version of additionality tool

For an in depth evaluation of all validation items it should be referred to the validation protocol (Annex). Annex also includes all CARs, CRs and outstanding issue (Table 3).

## 4.1 Participation Requirements

India as a non Annex-I party meets all relevant participation requirements. In the Letter of Approval[/HCA/] dated 23/09/2005, the Indian DNA, National CDM Authority under Ministry of Environment and Forests confirmed the voluntary participation of Vikram Cement as Project Participant in the CDM project activity.

No Annex-I party was identified by the project participant however the same will be identified in due time, as per the post registration involvement by Annex I party provisions (no. 57) made in 18th EB meeting.

## 4.2 Project design

The objective of this project activity is "partial replacement of the fossil fuels used in the kiln system for clinker formation by the alternative fuels (agriculture residues, RDF) in line number 3 (three) ", and also contributes towards several socio-economic benefits. VC has entered into agreement/JMC/ (Jaipur Municipal Corporation, July 13, 2005, L.S.V.No. 260, Agreement) with Jaipur Municipal Corporation for supply of MSW. MSW will be supplied at the allocated land near Jaipur and will be processed to make Residual Derived Fuel (RDF) and transported via covered truck from Jaipur site to Neemuch plant of VC (about 400 km away from Jaipur site). Biomass is proposed to be collected from the near by villages in the range of 50 km from the surrounding area in Neemuch district to VC site from biomass suppliers. VC will use Soya husk and Sarso husk only as biomass residue, because these biomass don't have any other useful application. The minimum availability of Soya bean husk is 60 MT per day for 6 (six) months in year (10800 MT for the period October to March of year) and Sarso husk is 175 MT/day for 3 (three) months in year (15750 MT, for the period February to April)/BAR/. The quantity used in project activity is around 2870 MT per year, which is little more than 10 per cent/BAR/ of surplus biomass availability. The alternative fuel (Agriculture residue) is available in near by area. Approximate diameter for the availability is 50 km. The main alternative fuel RDF will be transported from the Jaipur which is 400 km from the VC site. The project activity will replace the fossil fuel which was being transported from the 800 km distance from the VC site.

The project activity has imported German technology from M/s KHD Humboldt Wedag for the making RDF from MSW at Jaipur site. The technology of using RDF along with agriculture waste at VC, kiln line III is also imported. It is proposed to store the alternative fuel in separate yard. MSW derived fuel will be fed by front loader across the street to a feed hopper. The feed hopper is loaded sideways via ramp by front loader than from the feed bin the MSW derived fuel is extracted by weigh feeder and transported to belt conveyor to the bucket elevator. Bucket elevator will be directed upwards and has to be de dusted by bag hose filter; from there the material will be discharged into a feed chute. Here, double flap chute is installed through which material will be fed to the calciner in a controlled quantity. While agriculture waste will be transported pneumatically into 3 (three) feed bins and then fed at the constant rate by controlled speed of screw conveyor into to the bucket elevator.

This type of project activity is in line with sustainable development policies of the country and national regulation / policy on Environmental Protection/HCA/. Nevertheless in the Host Government Approval it is stated that VC has to comply with the following conditions:

- VC shall not sell the CERs to any agency/ company/ organization which purchases the CERs using ODA Funds
- VC shall inform the national CDM Authority regarding all transaction details of CERs including the name and address of the party to which CERs were sold within 30 days of transfer of the CERs
- VC shall furnish expeditiously any information, during the lifetime of the project as requested by the National CDM Authority.
- VC shall obtain all statutory clearances and other approvals as required from the competent authorities for setting up of the project
- All transaction shall be subject to supervision of the Executive Board of the CDM, under the authority and guidance of the COP/MOP

Based on the financial information furnished by the project participants, no ODA does contribute to the financing of the project/SOF/.

The geographical (VC is located at P.O. Khor; Distt. Neemuch (MP). VC site lies parallels of latitude 24° 15' North, and meridians of longitude 74° 45' East. The location of proposed project activity is at Vikram Cement, Khor, Distt. Neemuch, Madhya Pradesh. The physical boundary of the project activity covers the point of alternate fuel supply to the point of clinker produced as per section B.4 of PDD. Thus, the project activity includes clinker production line III and MSW fuel preparation plant at Jaipur. . Line III, which is part of the project activity has production capacity of 3000 T/day. This is justified by specification given by the supplier of the plant (Buckau Wolf, September 1, 1989, Technical specification/TS/, CMT/PR/GMY/729698). The calculations for the estimation of emission reduction are based on 345 (three hundred and forty five) days of production per annum. 10 (ten) years crediting period, 20 (twenty) years operational lifetime) are clearly defined.

In the course of the project validation the CAR A1, CR A1 and CR A2 was raised and successfully closed out (ref Annex: Validation Protocol - Table 3).

## 4.3 Baseline and Additionality

The project activity is applying ACM0003/Version 04, "Emission reduction through partial substitution of fossil fuels with alternative fuels in cement manufacture". The baseline methodology is approved by the CDM EB in its meeting of 28/07/2006.

The project activity is a partial replacement of fossil fuel by alternative fuels, including renewable biomass in the cement-manufacturing unit and adheres to the Sectoral Scope 4 that it represents. In addition to ACM0003/Version 04, ACM 0002/version 06 (19/05/2006) for baseline emission and Additionality Tool, version 03 (EB-29) for proofing the project as additional are also applied.

## Baseline Scenario

### Applicability of the baseline methodology

Validation team observations with respect to applicability of the baseline methodology are as follows:

- Project activity proposes to use biomass residues like agriculture residues. Preparation of the biomass, occurring before use in the project activity, does neither require significant energy quantities except from transportation of the biomass, nor does it cause significant GHG emissions. There is no other process is involved for the fuel preparation of biomass residue.

- For the estimation of $CO_2$ emissions reduction, the reduced emission due to fuel burning requirements is taken into account. The reduction in $CO_2$ emissions of clinkerisation process due to use of alternative fuels is not taken into account based on guidelines of methodology. The emission reduction calculations of section E have also not considered any $CO_2$ emissions from decarbonisation of raw materials (i.e. $CaCO_3$ and $MgCO_3$ bearing minerals). (Please refer the emission reduction calculation for details).

- VC has submitted the evidence (Buckau Wolf, September 1, 1989, Technical specification, CMT/PR/GMY/729698) to Validation team for understanding the installed capacity. The emission reduction calculations are based on 345 days of production per annum. PDD has considered the installed capacity of the kiln while estimating reduction in emission. This is in line with the applicability criteria of ACM0003/Version 04.

- As per applicability criteria of the methodology ACM0003/Version 04, VC has demonstrated "amount of alternative fuels available for the project is at least 1.5 times the amount required to meet the consumption of all users consuming the same alternative fuels, i.e. the project and other alternative fuel users". VC has submitted Shah Technical Consultant Pvt. Ltd, July 10, 2002, STC/DSC/MSO/2319, Final master plan of solid waste management for Jaipur city/JMC/. As per the report and discussion with Commissioner -Health and Health Officer, (Jaipur Municipal Corporation), it is concluded that MSW is dumped in land filled at the different zones of Jaipur city by Jaipur Municipal Corporation. It is demonstrated through these reports that the availability of MSW is 487394 MT/year against total planned predicted requirement of MSW for project activity is 120750 MT/year.

  Availability of biomass in the region of VC is demonstrated by report "VC, October 2004, Biomass Assessment Report/BAR/, Neemuch, Madhya Pradesh". Availability of biomass is 605818 MT/yr in which 521960 MT/yr and 12332

MT/yr is domestic sector and industrial sector consumption respectively. Total planned predicted requirement of biomass for project activity is 2870 MT/yr while grand availability of biomass residue is 71526 MT/yr. Biomass is proposed to collect from the near by villages in the range of 05 to 75 km from the surrounding area in Neemuch district to VC site from biomass suppliers. The VC will use Soya husk and Sarso husk only as biomass residue, because they don't have any other useful application. The minimum availability of Soya bean husk is 60 MT per day for 6 (six) months in year (10800 MT for the period October to March of year) and Sarso husk is 175 MT/day for 3(three) months in year (15750 MT, for the period February to April). The quantity used in project activity is around 2870 MT per year, which is 10 per cent of surplus biomass availability.

During the discussion between local stakeholders like Sarpanch/IM03/ Khor village, it is concluded that biomass is consumed by domestic sector and industrial sector. The remaining biomass is left to burn in uncontrolled manner. This is fulfilling the applicability criteria of ACM0003/Version 04.

From the above discussions it is ascertained that the project activity meets the applicability criteria of ACM0003/Version 04.

**Baseline scenario**

As per ACM0003/Version 04, Baseline scenario needs to be arrived in following steps

1. Define alternative scenarios for the fuel mix

   The alternative scenarios considered by VC are
   1. Continuation of the current practice scenario
   2. Using the average fuel mix used in cement industries in India
   3. The proposed CDM project activity where the fossil fuel is partly substituted with the alternative fuel

2. Option 1: Select baseline scenario through financial analysis
   Option 2: Select baseline scenario through barriers analysis

Analysis of baseline scenario is as below:

- Baseline scenario 1: Continuation of current practice scenario having emission factor 97.53 t $CO_2$/TJ
- Baseline scenario 2: Using the average fuel mix used in the cement industries in India having emission factor 95.12 t$CO_2$/TJ
- Baseline scenario 3: Scenario in which traditional fuels are partially substituted with alternative fuels (i.e. the proposed CDM project activity) having emission factor 97.35 t $CO_2$/TJ

While selecting the baseline scenario for the project activity, the project proponent has selected option 2, (Select the baseline scenario through the barrier analysis) of ACM0003/Version 04.

Based on barrier analysis the scenario 1 is most likely scenario in the absence of project activity. Scenario 1 i.e. continuation of current practices is selected as a baseline scenario. However by comparing the emission factor of scenario 1,2 and 3, the most conservative average emission factor is 95.12 $tCO_2/TJ$ which belongs to scenario no 2. So baseline GHG emission calculation is based on most conservative average emission factor.

**Baseline Emissions**

The baseline emissions calculation explained under section B.6.2 of PDD has adopted methodology ACM0003/Version 04. Baseline emissions from the fossil fuel(s) like Indian coal, imported coal, and pet coke displaced by the alternative fuel like agriculture residue and RDF. Emission factor for fossil fuel ($EF_{FF}$) is the estimated baseline value and would be the lowest of the following $CO_2$ emission factors:

- Weighted average annual $CO_2$ emission factor for the fossil fuel(s) consumed and monitored ex ante during the year before the validation,
- Weighted average annual $CO_2$ emission factor for the fossil fuel(s) consumed and monitored during the corresponding verification period (e.g. the period during which the emission reductions to be certified have been achieved),
- Weighted average annual $CO_2$ emission factor for the fossil fuel(s) that would have been consumed according to the baseline scenario determined in section 1 and 2 of the "Additionality and baseline scenario selection"

Validation team has cross checked the data of month wise clinker production[/CP/] for the year and VC internal Management Information System generated documents comprising the determination of baseline including the sources of the data, which are recognized as being authentic and the underlying algorithms that are the baseline emission calculations. The specific fuel consumption for the project activity as well as the baseline case is determined by finding out the ratio of clinker production to fuel consumption. Fuel consumption of the project activity is determined from measurement of the fuel fed into the kiln. The production of the clinker is determined by use of a ratio of raw material mix to clinker production. This ratio is determined by National Council for Cement and Building Materials (NCCBM, November 1994, CSR – GRM – SP 674, Establishment of Limestone Consumption Factor) for VC, which is a reputed institution and whose reports are considered by judicial as well as tax authorities.

VC receives two main fuel mainly coal and pet coke both of Indian and imported type. Fuel fed to the kiln is measured with the help of load cell of respective poldos. Predetermined per cent age of coal and pet coke during the preparation of fuel and weight measurement by using the poldos load cell ascertains the accurate weight measurement of particular fuel and project proponent records same in daily report.

While calculating baseline GHG emissions due to anaerobic decomposition of biomass residues in landfills and biomass residues which would have been burnt in

the absence of the project, all default value are used as per methodology ACM0003/ version 04 and IPCC. Lower heating value of the fossil fuel used in the baseline is considered as per IPCC guideline.

The validation team has checked the underlying input values as well as the spreadsheet programming and the other current officially published guideline.

Baseline determination is performed on the basis of a combined margin of operating margin and build margin. Simple operating margin method is selected to determine the operating margin by the project proponents. A pre-condition for using this method is that the low cost/ must run resources constitute less than 50 per cent of total grid generation in last 5 years. VC has checked this condition with the help of data of electricity generated in western as well as northern regional grid/cea/ from year 2000-2001 to the year 2004-2005. The choice of these years is acceptable since; this data was the latest available at the time of preparation of PDD. The emission factor is taken from the Central Electricity Authority data (version 1.1, December 2006) for calculating the grid emission factor. VC has considered baseline of Northern region grid for fuel preparation Jaipur site and Western grid of India for the VC, Neemuch plant.

The calculation of the emission factor was sound and transparently given as separate attachment to PDD. As a result of the check the validation team is convinced of the result of the grid emission factor calculation.

The resultant figure of grid emission factor are as below is deemed to be adequate, transparent as well as conservative.

| **Simple Operating Margin (tCO2/MWh) (incl. Imports)** | | | | | |
|---|---|---|---|---|---|
| Region | 2000-01 | 2001-02 | 2002-03 | 2003-04 | 2004-05 |
| North | 0.98 | 0.98 | 1.00 | 0.99 | 0.98 |
| West | 0.98 | 1.01 | 0.98 | 0.99 | 1.01 |
| **Build Margin (tCO2/MWh) (not adjusted for imports)** | | | | | |
| | 2000-01 | 2001-02 | 2002-03 | 2003-04 | 2004-05 |
| North | | | | | 0.53 |
| West | | | | | 0.78 |
| **Combined Margin in tCO2/MWh (incl. Imports)** | | | | | |
| | 2000-01 | 2001-02 | 2002-03 | 2003-04 | 2004-05 |
| North | 0.76 | 0.76 | 0.77 | 0.76 | **0.75** |
| West | 0.88 | 0.89 | 0.88 | 0.88 | **0.89** |

Relevant national and sectoral policies have been considered such as decisions of the Ministry of Environment and forest, Madhya Pradesh pollution control board, Rajasthan pollution control board and the energy policy of the Government of India. The project is also in line with Northern as well as Western Regional Electricity Board.

Nevertheless, CAR B1- B2, CR B1- B2 have raised and were successfully closed (ref Annex: Validation Protocol - Table 3).

## Additionality

The additionality was demonstrated according to the version 03 of the "Tool for demonstration and assessment of additionality".

The arguments to justify the additionality were summarised in table 4-2. This table also includes the assessment of the validation team.

**Table 4-2:** Additionality assessment

| Step1) | Argument PP | Assessment of the validation team | |
|---|---|---|---|
| 1a | **Define alternatives to the project activity**: VC has proposed 3 realistic and feasible alternative to the proposed CDM project activity, which includes<br>Alternative 1: Continuation of current practice scenario<br>Alternative 2: Using the average fuel mix used in the cement industries in India<br>Alternative 3: Scenario in which traditional fuels are partially substituted with alternative fuels (i.e. proposed CDM project activity). | The alternative 1 could be justified as a realistic and credible alternative to the project activity. All other alternatives given in the step 1a cannot be considered as realistic alternatives as alternative 3 faces several barriers as given in step 3 and the other alternatives are not viable due to capital investment, common practice analysis and/or other barriers like management or regulatory barrier. So only alternative 1 remains as a plausible and credible alternative for the project activity.<br>Based on the analysis; baseline scenario 1: continuation of current practice scenario is selected as most likely scenario among other possible scenario because of below reasons:<br>▪ No capital investment<br>▪ No prevailing practice barrier (this is not a common practice)<br>▪ No other barriers like management or regulatory barrier | ☒ Step passed<br>☐ Step not passed<br>☐ Not applicable |
| 1b | **Enforcement of applicable laws and regulations:** The alternatives mentioned above are in compliance with the applicable legal and regulatory requirements. | All alternatives mentioned in step 1a are in line with the national regulations and able to meet compliances of environmental regulations. Identified realistic and credible alternative scenario (1) to the project activity that are in compliance with mandatory legislation and regulations taking into account the enforcement in the region / country and EB decisions on national and/or sectoral policies and regulations. | |

| Step1) | Argument PP | Assessment of the validation team | |
|---|---|---|---|
| **2a** | **Determine appropriate analysis method:** The project activity is the partial substitution of fossil fuels by alternative fuels is generating revenues by saving fuel cost other than the CDM revenue so the option I (simple cost analysis) , can not be used for the project analysis.<br>Option II (investment comparison analysis) is the comparison method. It is practically very difficult to apply this option in a transparent and conservative manner for the VCs project activity. Hence The Option III (benchmark analysis) is applied for the project activity. | ☐ Argument not justified<br>☐ Argument not convincing<br>☐ Argument justified but not decisive<br>☒ Argument justified / significant | ☒ Step passed<br>☐ Step not passed<br>☐ Not applicable<br><br>*Option III (benchmark analysis) must be justified/significant and demonstrated under sub step 2b,2c and 2d in transparent and conservative manner.* |
| **2b** | **Option III. Apply benchmark analysis:** In accordance with the additionality tool, benchmark analysis is applied by comparing the IRR (financial indicator) the project activity (without CDM benefits) with the company's internal benchmark for all commercial projects. | .<br>☐ Argument not justified<br>☐ Argument not convincing<br>☐ Argument justified but not decisive<br>☒ Argument justified / significant | |
| **2c** | **Calculation and comparison of financial indicators:** The detail financial analysis/xcs/ shows that for the benchmark analysis the indicator opted is the opportunity cost bench mark (IRR of 12 per cent, this is the company's internal benchmark of VC for all commercial project). The internal rate of return (IRR), with and without CDM benefit has been calculated for the project activity. The IRR calculations of project activity exhibit that the IRR of the project without CDM funding (5.59 per cent) is below company's internal benchmark. By the support of CDM funds availed against CERs, project activity will be able to improve IRR, more than minimum rate of risk free return as well as internal benchmark for all commercial projects. | ☐ Argument not justified<br>☐ Argument not convincing<br>☐ Argument justified but not decisive<br>☒ Argument justified / significant | |

| Step1) | Argument PP | Assessment of the validation team | |
|---|---|---|---|
| **2d** | **Sensitivity analysis:** In order arrived at the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions, sensitivity analysis is opted. Realistic range of assumptions on alternative fuel price variations is considered. The fuel prices in the IRR calculations are taken as base (100 per cent) and the variation in the IRR with increasing and decreasing fuel prices are calculated. Hence sensitivity analysis on the basis of realistic deviations in assumptions, the IRR of project activity is unlikely to be the most financially attractive than the financial benchmark. | ☐ Argument not justified<br>☐ Argument not convincing<br>☐ Argument justified but not decisive<br>☒ Argument justified / significant | |

| Step1) | Argument PP | Assessment of the validation team | |
|---|---|---|---|
| **3a** | **Identify barriers that would prevent the implementation of type of the proposed project activity: -**<br>**Investment barriers:** VC has invested high upfront cost (more than INR 300 million)/xcs/ by considering equipment cost, commissioning and erection cost. VC is investing in the good engineering infrastructure to ensure proper and effective utilization of alternative fuels, to overcome the technical trouble and to get the confidence in the smooth process and quality of product. Further more VC has invested additional transaction costs to get, supporting CDM funding and developing and maintaining M and V protocol to fulfil CDM requirements. VC realised a considerable amount of financial burdens due project activity. Instead of increasing their profit margin by increasing their production, VC has taken the initiative of producing clinker with the use of alternative fuels. However with the goal of obtaining CDM benefit due to project activity VC took the decision of taking the investment risks and to invest in the CDM project activity after computing the proposed CDM funding. | ☐ Argument not justified<br>☐ Argument not convincing<br>☐ Argument justified but not decisive<br>☒ Argument justified / significant | ☒ Step passed<br>☐ Step not passed<br>☐ Not applicable |

| Step1) | Argument PP | Assessment of the validation team | |
|---|---|---|---|
| | **Technological Barrier:** In Indian cement sector MSW to RDF conversion technology is first time used. VC has predicted below technical barriers before the starting of the project activity<br>1. Feeding of alternative fuel: The alternative fuel has more affinity to moisture; it makes fuel flowing difficult and may directly affect on clinker quality.<br>2. Change in raw meal composition: In order to meet the desired clinker quality standard, VC has to monitor and control the characteristics of alternate fuel as well as raw meal composition.<br>3. Process disturbance: Due to different type of alternate fuels the disturbance in process is most likely to happen.<br>4. Non-uniformity of alternate fuel: As the biomass residue will not be processed, fineness cannot be maintained which may lead to more retention time in the calciner to burn completely. | ☐ Argument not justified<br>☐ Argument not convincing<br>☒ Argument justified but not decisive<br>☐ Argument justified / significant | |
| | **Barriers due to prevailing practice:**. Based on CMA statistical data for the fuel used in Indian cement sector; it is concluded that there is no cement plant in the India using the RDF. The project activity is first of its kind in India. The Grasim industries limited – cement division south of same company group has registered project for alternative fuel and MSW use. However South Grasim has not started using MSW. Therefore the project activity will be first to use MSW and biomass residue and faces the prevailing practice barrier. | ☐ Argument not justified<br>☐ Argument not convincing<br>☐ Argument justified but not decisive<br>☒ Argument justified / significant | |

| Step1) | Argument PP | Assessment of the validation team | |
|---|---|---|---|
| **3b** | **Sub-step 3 b. Show that the identified barriers would not prevent a wide spread implementation of at least one of the alternatives (except the proposed project activity):** It has been observed in Sub-step 3a that the project activity has its associated barriers to successful implementation which are:<br>• Investment barrier<br>• Technological barrier<br>The other realistic alternatives available with VC in absence of the project activity are evaluated above and concluded that identified barriers are not preventing the implementation of alternatives to the project activity. | ☐ Argument not justified<br>☐ Argument not convincing<br>☐ Argument justified but not decisive<br>☒ Argument justified / significant | |
| **4 a** | **Sub-step 4a. Analyze other activities similar to the proposed project activity:** As per Cement Statistics 2005, Cement manufacturing association, India, project activity is not a common practice in Indian Cement industry. Currently no cement industry is using the alternative fuel in India and use of alternate fuels is most uncommon practice in Indian cement industry. South Grasim of same company group has registered CDM project for alternative fuel and MSW use. However South Grasim has not started using MSW and biomass residue. | ☐ Argument not justified<br>☐ Argument not convincing<br>☐ Argument justified but not decisive<br>☒ Argument justified / significant | ☒ Step passed<br>☐ Step not passed<br>☐ Not applicable |
| **4 b** | **Sub-step 4b. Discuss any similar options that are occurring:** Similar activities are neither widely observed nor commonly carried out, It is evident that due to investment and technical barrier to the project activity has less likelihood to happen. VC is one of the first cement industries to start the project activity. Therefore the project activity is not common practice and no similar projects currently implemented in India. | ☐ Argument not justified<br>☐ Argument not convincing<br>☐ Argument justified but not decisive<br>☒ Argument justified / significant | |

| Step1) | Argument PP | Assessment of the validation team |
|---|---|---|
| **Assessment of the validation team** | | ☒ **Project is additional**<br>☐ **Project is not additional** |

1) acc. to Additionality Tool

The additionality of the project has been demonstrated as per the algorithm given in the additionality tool. The additionality of project activity is demonstrated as below:

As per the statistics (Cement Statistics 2005, Cement manufacturing association, India) of CMA and the statistical data for the fuel used in Indian cement sector it is concluded that there is no similar cement plant in India. The project activity is first of its kind in India. The application of RDF for carrying out a project similar to the VC is not common practice as of date in India hence barriers due to prevailing practice has been accepted by validation team.

During the discussion with technical team of VC, validation team realise the technical barriers associated with project activity like feeding of RDF and biomass, change in raw meal composition, process disturbance, non-uniformity of alternate fuel. Further more the additionality of the project has been demonstrated by the "Benchmark Analysis" route. Benchmark analysis/xcs/ along with confirming sensitivity analysis are elaborated with arguments of reality. As per page no 1, point no 5, of additionality tool version 03, while validating the application of additionality tool, validation team has made systematic use of information to identify source and to estimate the risk. On the basis of risk (sensitivity) analysis validation team has found uncertainity in the chosen benchmark (risk free returns on bank deposite) which varies from 5.38 to 13.0 per cent for the period 1972-2007. Further more as per the point no 4 of sub step 2b, of additionality tool "the benchmark is to represent standard returns in the markets, considering the specific risk of the project type" hence risk free returns on bank deposite is not covering a specific risk subject to particular project type. The reference of RBI returns has considered only for risk analysis whereas company internal benchmark has considered while arriving at additionality conclusion. As per sensitivity analysis evaluation, only in few cases IRR values crossed the risk free returns on bank deposite. But at none of the variations, IRR without CDM benefits is nearer to company's internal benchmark. Hence, in risk analysis, the consistent internal benchmark is considered. As per sub step 2b, point 4 C, during the assessment validation team found a company internal benchmark is reliable with consistency. During site visit and consequent discussion with financial expert of VC, validation team has ascertained that the decision of project activity implementation was a long term strategic decision only with company's steady internal benchmark. VC has submitted this benchmark and validation team has confirm that this reliable benchmark has been consistently used in the past. By keeping uncertainty in view and in order to reduce the risk and priority setting among risk issue, opportunity cost benchmark (12 per cent) was considered by validation team for arriving at the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions. Hence risk free returns of bank deposite were not

considered as a decision making point while concluding the additionality of project activity. Further more, the additionality case for VC has also passed through step 3 (barrier analysis) and step 4 (common practice analysis) and not solely depends on step 2 (investment analysis). However step 2 (investment analysis) was considered as one of the significant supportive to additionality claim.

According to the PDD the impact of CDM registration of the VC project help in overcoming the financial barriers demonstrated in the PDD. The need of CDM funds for the project activity, which will help to improve the project competitiveness and financial sustainability and help in the reduction of anthropogenic greenhouse gas.

Thus the validation team arrived at the opinion that the project activity can be assessed to be additional and is not a BAU case. Taking this into account, it is TUV's opinion that the PDD sufficiently demonstrates that the project activity faces barriers and the barriers do not prevent the baseline scenario.

Nevertheless, CAR B1, CAR B3- B4, CR B3-B5 has raised and were successfully closed (ref Annex: Validation Protocol - Table 3).

## 4.4 Crediting Period

The intended crediting period of the project is fixed 10 years (2007 to 2017).

The starting date of the crediting period was expected to be on 01/06/2007. The project proponent supports this through e-mail of 05/03/2007 where it is indicated that the project activity will start its operation in June 2007, considering adequate period for the project activity to stabilise its operation.

In the context of starting date of crediting period CR C1 was raised and successfully closed (ref Annex: Validation Protocol - Table 3).

As the project activity faces some time delay the expected starting date of the crediting period couldn't be kept. Therefore the crediting period changed to the **01/07/2007**, while the emission reduction calculations are based on the date 01/06/2007. Nevertheless this has no effect on the estimated emission reductions.

## 4.5 Monitoring Plan

The project activity is applying Approved Monitoring Methodology ACM0003/Version 04 titled "Emission reduction through partial substitution of fossil fuels with alternative fuels in cement manufacture." Applicability criteria for monitoring methodology ACM0003/Version 04 are same as applicability criteria of the baseline methodology ACM0003/Version 04.

An understanding of the monitoring plan with respect to the project activity is as follows:

a. Estimate or measure emissions occurring within the project boundary
b. Determine the baseline emission
c. Estimate changes in emission outside the project boundary.

The monitoring plan takes into account the baseline emissions, leakages as well as project emissions. The monitoring plan is in line with requirements of ACM0003/Version 04. PDD has made provisions for monitoring the GHG emission reduction due to the project activity. All the data necessary for the estimation or measuring the GHG emissions within the project boundary in the project scenario as well as baseline scenario have been included in the monitoring plan of PDD

The roles, responsibilities and authority for the project activity management, reporting and monitoring procedure and quality control /quality assurance procedure are explain in PDD. Implementation of the monitoring plan can be verified during the next stage of verification and certification.

**Data monitoring:** Validation team has checked monitoring methods of key parameters and instruments. Monitoring of energy meter, load cell based solid flow feeder for weight measurement (coal, petcock, RDF, agriculture waste, raw meal), at VC site as well as energy meter at Jaipur site involves in proposed monitoring. The system is proposed to compile data, generate reports and provides flexibility for data usage. Further more monitoring instruments used in the field level monitoring consist of bomb calorimeter; weigh bridge and meters with a local display/output at the measuring point. Data are proposed to record manually in logbooks by technicians.

**Equipments used:** PDD, Annex 4, table: "Monitoring parameters and related equipment details" describes different proposed monitoring data with procedure for monitoring the instrument, traceability of instrument calibration, tag number/ instrument serial number, service and technical definition of instrument, make of instrument, location of instrument, calibration method, range of instrument, uncertainty, linkage with system management, ISO document number. Monitoring instruments are proposed to used in the project activity for monitor, display, control, collect, store the key parameters of monitoring plan and for generating reports.

**Frequency of monitoring:** The recording frequencies of parameters are mentioned in Section B, of PDD.

**Energy parameters:** All energy related parameters like electricity consumption at VC and Jaipur site will be monitored by digital energy meters and also proposes to record in relevant logbook.

**Fuel parameters:** Quantity and calorific values of fuel used (RDF, agricultural waste, coal, pet coke) are proposed to be monitored on a batch basis.

**Data recording:**

**Methods of recording project activity data:** Logbooks[/VC/] consisting all critical parameters of kiln (line III) are prepared and maintained for recording the process data. Energy related parameters (like kWh consumed) are proposed to be recorded by respective energy meters.

**Data archiving:** Details of data archiving are descried in Section B of PDD. Monitored data are collected as per the recording frequency for generating reports/VC/. As per PDD, history of monitored data can be viewed in logbooks and stored for two years after the end of crediting period.

**Review procedures and frequency:** validation team has discussed with VC official during site visit regarding the review procedures and frequency. Respective area in charge of VC and Jaipur site proposed to review the progress of the implementation of documented procedures, records of monitoring plan and quality system records/VC/ on a daily basis.

**Calibration methods:** Validation team has referred the PDD, Annex 4, table: "Monitoring Plan "Table: Monitoring parameters and related equipment details" and relevant reference document to understand the calibration method of different key monitoring parameters. Calibration procedures/VC/ are adopted to maintain accuracy of equipments/instruments of the plant. Calibration of Monitoring Equipment for CDM is systematically link with the system management/VC/. Scheduled training will be given for personnel on calibration of equipments and Instruments.

**Calibration frequency:** During discussion with project proponent, it is concluded that, periodic calibration schedule/VC/ will be carried out over the year for all electrical and electronic instruments and recorded in calibration reports.

**Uncertainties related to GHG emissions:** As per PDD, Annex 4, table: "Monitoring Plan "Table: Monitoring parameters and related equipment details," mentioned uncertainty related to monitoring the parameters. Various uncertainties are mentioned in the ISO Document with Document No. 11:02:00 00. Deliberation of uncertainty related to the different monitoring parameters mentioned in, Annex 4 of PDD, takes due care of conservative approach in calculation of GHG emission calculation.

Nevertheless, CAR D1-D2 and CR D1-D3 have been raised and were successfully closed (ref Annex: Validation Protocol - Table 3).

## 4.6 Calculation of GHG Emissions

Methodologies for calculating emission reductions are documented. The project intends to reduce GHG emissions to the extent of the difference of baseline emission and sum of project emission and leakage.

In accordance with ACM0003/Version 04 the emission reduction calculation covering leakage, project emission and baseline is demonstrated in separate attachment to the PDD.

The default values provided in the ACM0003/Version 04 for the leakage calculation are selected rightly and leakage is presented. Project emission is also rightly calculated in the PDD/PDD2/. Based on the independent check by the validation team the overall calculation of emission reduction/XCS/ is correct and conservative.

As per ACM0003/Version 04, the spatial extent of the project boundary comprises all production process related to clinker production. Project boundary primarily includes pyro-processing. As per ACM0003/Version 04, the project boundary cover the point of alternative fuel supply to the point of clinker produced, calciner and kiln system where the project proponent has a full control.

Consideration of all GHG (es)

- $CO_2$ emission due to combustion of the fossil fuel likes coal and pet coke in kiln system. This emission was happening even before the project activity. Due to partial substitution of fossil fuel with alternative fuels like agricultural by products and MSW derived fuel-RDF, there is reduction in $CO_2$ emission due to combustion of alternative fuels like agriculture by-product that is Soya husk, Sarso husk and renewable part of MSW derived fuel-RDF. Also reduction in $CO_2$ emission due to reduced transport of fossil fuel. The project activity also generates $CO_2$ emissions due to on-site/off-site transportation, offsite drying and preparation of alternative fuel, combustion of non-renewable part of MSW derived fuel-RDF in project activity, Leakage resulting from transport of alternative fuels
- $CH_4$ (Methane) emission from the kilns is negligible and is ignored. The project activity also generates $CH_4$ emissions due to anaerobic decomposition of waste in landfills. Off-site transportation of fuel also contributes in $CH_4$ emissions.
- CFCs (Chlorofluorocarbons) or PFCs (Per fluorocarbons) are not used in the project activity and hence, they are neglected.
- $SF_6$ (Sulphur Hexafluoride) is not used directly in the project activity.
- $N_2O$ (Nitrous Oxide) is also generated by project activity due to on site transportation of alternative fuel.

Calculation of baseline

It is noted here that the specific fuel consumption is the most important parameter for the project activity. The fuel consumption is weighed and recorded as part of regular monitoring practice of VC. In order to estimate the clinker production, VC makes use of clinker conversion factor certified by National Council for Cement and Building Material/NCCBM/. Value of this factor is 1.52. VC has submitted a formal procedure (VC, May 2006, Vikram/Clinker/Verification/0601, Periodic verification of lime stone consumption and clinker production) for calculation of the clinker production with the help of this factor.

Project emission

Composition of RDF is the most important parameter while calculating the emission reduction due to the project activity. Exact composition of RDF to be used in project activity available since the project activity is yet to start its operation. Hence, as an estimate the national average of MSW is used to calculate the RDF composition

(Technology Information Forecasting and Assessment Council (TIFAC), department of science and technology, Government of India, New Delhi, March 11, 2004, Presentation on "electricity from MSW). However, the actual composition of RDF needs to be considered while carrying out emission reduction calculations during next stage of verification and certification.

The project activity is consuming electricity at two sites, Jaipur (Rajasthan State – Northern regional grid) as well as Neemuch (Madhya Pradesh- Western regional grid). The electricity consumed by the project activity is considered as a project emission. The baseline emission factor for Jaipur site is from Northern region grid of India where emission factor is 0.75 tCO2e/MWh[/cea/] .The emission factor for Neemuch site is from Western region grid of India where the emission factor is 0.89 t $CO_2$e/MWh. Both of these emission factors are checked by Validation team and are found to be conservative for the given application.

Leakage

Validation team has also checked the emission factor for the transportation of the fuel within and outside the project boundary. The emission factor due to transportation of the alternative fuel by trucks is considered 1.107 kg CO2e/km. The emission factor for transportation of fuel is taken from Indian National communication to UNFCCC. Calculations of emission reduction are based on the guidance of ACM0003/Version 04. The formulas used in the project activity and data used in assuming values are validated by Validation team. They are in line with applied methodology. Acc. to the final PDD the project is expected to reduce emissions of **867,722** $tCO_2e$ over a 10 (ten) years of fixed crediting period.

Nevertheless, CAR E1- E2 and CR E1-E2 have been raised and were successfully closed (ref Annex: Validation Protocol - Table 3).

**Please note: Due to time delays the starting date of the project activity was shifted from 01/06/2007 to 01/07/2007. Even if the calculations are based on a starting date in beginning of June 2007 (as stated in the PDD and relevant other documents) the change to beginning of July 2007 is not influencing the emission reduction calculations.**

## 4.7 Environmental Impacts

According to Ministry of Environment and Forests Environment, Government of India, Impact Assessment Notification S.O.60 (E), dated 27/01/1994 an expansion/modernization project activity having investment of less than INR 500 million is not required to carry out an Environment Impact Assessment (EIA) (http://www.envfor.nic.in/legis/eia/so-60(e).doc). The project activity is having an investment of less than INR 500 million (N.Patidar & Co., May 31, 2006, Sources of fund for alternate fuel feeding plant) and can be classified as modernisation project. However, as per notification mentioned above, EIA is not necessary for the project activity. PDD has given a summary of the environmental impact of the project activity. VC has also obtained relevant air and water consents and all necessary statutory clearances from the respective bodies/SC/.

Section D.1 of PDD has described the transboundary impact analysis for the project activity and no significant impact is estimated on the environment due to the project activity.

Consent to operate is yet to be obtained from Rajasthan State Pollution Control Board for RDF preparation site. This document should be checked during the next stage of verification and certification of the project activity.

Nevertheless, CAR F1- F2 has been raised and was successfully closed (ref Annex: Validation Protocol - Table 3).

## 4.8 Comments by Local Stakeholders

PDD has considered two broad categories of stakeholders Government and Non-Government. Identified Government/local body stakeholders to the project activity and their response to the project activity are as follows:

1. Ministry of Environment and Forest, Government of India (MoEF, September 23, 2005, F. No. 4/14/2005-CCC, Host country approval)
2. Municipal Corporation of cities of Jaipur (Jaipur Municipal Corporation and VC, July 18, 2005, Agreement for 'Establishment of Processing Plant for Useful Conversion of MSW at Jaipur on BOOT basis)
3. State pollution control boards (MPPCB, February 23, 2004, 3334/TS/MPPB/2004, Consent to operate with scrap tyre/scrap cut tyres waste / municipal solid waste, other solid waste (other than hazardous waste) as fuel and RSPCB, February 21, 2006, RPCB/ROJP/S/CITY/267/2983, Consent to establish for proposed MSW plant at Khasara, District Jaipur)
4. Elected body of representatives administering the local area. (Sarpanch (Village head), Letter of appreciation for the project activity, Damodarpura village)

The approvals and consents granted to the project activity are considered as positive comments for the project activity. Consultants and equipment suppliers are the other stakeholders identified for the project activity.

Clearances or permissions for operation of the plant are considered as positive responses to the project activity.

As part of validation process, validation team had interviews with the following stakeholders:

- Transporter of Alternative Fuel/IM03/
- Commissioner (Health) and Health officer– Jaipur Municipal Corporation/IM04/
- Sarpanch, Village Khor/IM03/
- Employees of VC/IM01/
- Technology and equipment supplier/IM02/

During the Validation of project activity information on combustion of RDF and agricultural waste in the kiln III at VC site, transportation of RDF, environmental issue related to the combustion of RDF and agricultural waste in the kiln III at VC site and transportation. Information on the path followed by vehicle while transporting the RDF and agricultural waste, provision to ensure that there is no environmental adverse impact due to the spillage of RDF and agricultural waste, environmental issue related to the transportation of RDF and agricultural waste, safety issue while handling the RDF was collected from above mentioned stakeholders. Validation team has received no adverse comment on above discuss issues.

Information gathered during the interview suggested that municipal waste is available in sufficient amount to cater the need of the VC project activity. The project activity has potential for generating additional employment for the local population. Further, it was concluded that gram panchayats and forest department have systems to ensure that the woody biomass is used in sustainable way and the environment is not affected.

Stakeholders have been directly asked to comment on the project activity vide letter dated 12/09/2006/LSC/ and received the supportive and positive comments vide letter dated 13/09/2006.

A summary of the comments received and a note on how these concerns are addressed are included in the PDD.

Nevertheless, CAR G1 and CR G1 have raised and were successfully closed (ref Annex: Validation Protocol - Table 3).

# 5 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

According to the modalities for the validation of CDM projects, TÜV NORD JI/CDM CP published the draft PDD on its website www.global-warming.de on 16 January 2007 and invited comments within 30 days, until 14 February 2007 by parties, stakeholders and UNFCCC accredited non-governmental organisations. No comment was received.

# 6 VALIDATION OPINION

The Vikram Cement, has commissioned the TÜV NORD JI/CDM Certification Program to validate the project: *"Emission reduction through partial substitution of fossil fuel with alternative fuels like agricultural by products and Municipal Solid Waste (MSW) in the manufacturing of portland cement at Vikram Cement (VC), Neemuch (MP), India",* with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords), and the relevant decisions by COP/MOP and CDM Executive Board.

The project activity involves partial replacement of the fossil fuels like coal and pet coke used in the kiln system (line III) for clinker formation by the alternative fuels like agricultural by products and MSW derived fuel - RDF as thermal energy source to the raw mix so that it can be converted as clinker. The project activity intends to reduce GHG emissions to the extent of sum of baseline emission (GHG emissions from fossil fuels displaced by the alternatives and emissions from reduction of on-site transport of fossil fuels) and leakage (leakage from transport of alternative fuel less leakage due to reduced transport of fossil fuels, due to burning of biomass residue that is used as alternative fuel, baseline GHG emissions due to anaerobic decomposition of biomass residues at landfills and GHG emissions that could be generated during the preparation of alternative fuels outside the project site) deduct by project emission (GHG emissions from alternative fuels , from on-site transport of alternative fuels).

A risk-based approach has been followed to perform this validation. In the course of the draft validation 12 Corrective Action Requests (CARs), 14 Clarification Requests (CRs) and one outstanding issue were raised and successfully closed.

The review of the project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and review of comments by parties, technology supplier, local stakeholders, employees of VC, consultant, JMC officials and NGOs have provided TÜV NORD JI/CDM CP with sufficient evidence to validate the fulfilment of the stated criteria.

In detail the conclusions can be summarised as follows:

- The project is in line with all relevant host country criteria (India) and all relevant UNFCCC requirements for CDM. Project activity approval has been obtained from National CDM Authority as DNA of India vide the Letter number F. No. 4/14/2005-CCC, dated September 23, 2005
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of the GHG emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 867722 $tCO_2e$ is most likely to be achieved within the 10 years (fixed) crediting period.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

Mumbai, 2007-08-08

Asim Kumar Jana

TÜV NORD JI/CDM Certification Program

# 7 REFERENCES

**Table 7-1:** Documents provided by the project proponent

| Reference | Document |
|---|---|
| /**BAR**/ | VC, October 2004, Biomass Assessment Report, Neemuch, Madhya Pradesh |
| /**CAS**/ | Crisil Advisory Services, May 2001, Module 3,Trends in Cement prices |
| /**CMA**/ | Statistics of Cement Manufacturing Association for the year 2005 (CMA, September 2005) |
| /**CON**/ | VC, April 03, 1989, Contract for supply of imported cement plant of capacity of 3000 t per day, BOM/VC-III/P-I/Contract/June 88 |
| /**CP**/ | N.Patidar & Co., May 25, 2006, Month wise clinker production for the year ended March 31, 2006 |
| /**CR**/ | VC, Instrument department, March 3, 2006, Doc No. 11:01:04:04(Line III), equipment calibration report |
| /**ET**/ | Economic times, March 23, 2004, August 10, 2004, January 06, 2006 |
| /**ES**/ | Environmental statement, J.M.EnviroNet Pvt Ltd, Pollution generated |
| /**HCA**/ | Host Country Approval: Ministry of Environment and Forests, Government of India, September 23, 2005, F. No. 4/14/2005-CCC |
| /**ISO**/ | 1. ISO 9001-2000<br>2. ISO 14001 -2004<br>3. SA 8000 - 2001<br>4. OHSAS 18001-1999 |
| /**JMC**/ | 1. Jaipur Municipal Corporation, July 13, 2005, L.S.V.No. 260, Agreement<br>2. Shah Technical Consultant Pvt. Ltd, July 10, 2002, STC/DSC/MSO/2319, Final master plan of solid waste management for Jaipur city |
| /**LOI**/ | 1. VC, January 13, 2005, VC/LOI/04/2005, LOI Imported Coal |

| Reference | Document |
|---|---|
| | 2. VC, December 24, 2004, Block proposal for installation of alternate fuel firing system for VC III processing unit of MSW |
| /**LSC**/ | Proof of local stakeholder consultation dated 13/09/2006 |
| /**MD**/ | Management decision with CDM associated consideration dt 17 August 2003 |
| /**MOC**/ | Modalities of communicating with the CDM EB and the UNFCCC Secretariat, issued on 13/02/2007 |
| /**NCCBM**/ | NCCBM, November 1994, Establishing limestone consumption factor for M/s Vikram Cement Limited, Vikramnagar, Khor, CSR-GRM-SP-674 |
| /**PB**/ | VC, May 24, 2005, price bid under package no JMC/MSW/2004/07, Processing cost breakup of RDF |
| /**PC**/ | VC, Petcoke price escalation spread sheet wide e-mail date 05/02/2007 |
| /**PDD**/ | 1. Project Design Document entitled "Emission reduction through partial substitution of fossil fuel with alternative fuels like agricultural by products and Municipal Solid Waste (MSW)" in the manufacturing of portland cement of VC" (hosted for public comments during 16/01/07 to 14/02/07)<br>2. Revised PDD: "Emission reduction through partial substitution of fossil fuel with alternative fuels like agricultural by products and Municipal Solid Waste (MSW)" in the manufacturing of portland cement of VC" (Corrected and submitted by Project Proponent in April 2007)<br>3. Final PDD: "Emission reduction through partial substitution of fossil fuel with alternative fuels like agricultural by products and Municipal Solid Waste (MSW)" in the manufacturing of portland cement of VC" (Corrected and submitted by Project Proponent in August 2007) |
| /**PO**/ | 1. VC, BOM/VC/BBP/IMP/P.O. 669/ 04-05, purchase order for supply and supervision and commissioning of the alternative fuel feeding/ firing system for VC<br>2. VC, March 1, 2006, GIL/VC/PC/PO/15, Purchase order of petcoke for Reliance Industries Limited and VC, December 14, 2005 |
| /**RAJ**/ | 1. Rajasthan Government policy regarding the usage of MSW |
| /**SA**/ | SSM Coal B.V., December 14, 2005, Agreement number 20005587, Sale |

| Reference | Document |
|---|---|
| | agreement for the supply of petroleum coke |
| /**SC**/ | 1. MPPCB, February 2, 2004, No. 3334/TS/MPPCB/2004, Grant of consent of the board under section 21 of the air) preventive and control of pollution) act, 1981<br>2. MPPCB, November 29, 2005, No. 8422/TS/MPPCB/2005, Renewal of consent of consent of the board under section 25/26 of the water (prevention and control of pollution) act, 1974<br>3. RPCB, February 21, 2006, RPCB/ROJP/S/CITY/267/2983Consent to establish under the provision of air (prevention and control of pollution) act 1981 and under the provisions of water (prevention and control of pollution) act 1974 for processing Refused Derived Fluff/ Pellet from MSW plant of capacity 52000 MT per year at Kharsa No 338, village Langadiawas, Tehsil Jamwaramgarh, District Jaipur. |
| /**SD**/ | Proof of Project Activity Start Date: VC, December 24, 2004, Block proposal for installation of alternate fuel firing system for VC III processing unit of MSW. |
| /**SOF**/ | N.Patidar & Co., May 31, 2006, Sources of fund for alternate fuel feeding plant |
| /**TIFAC**/ | Technology Information Forecasting and Assessment Council (TIFAC), department of science and technology, Government of India, New Delhi, March 11, 2004, Presentation on "electricity from MSW |
| /**TS**/ | Buckau Wolf, September 1, 1989, Technical specification, CMT/PR/GMY/729698 |
| /**VC**/ | – VC, Doc No. 11:02:00:00, system procedure, calculation of measurement uncertainty<br>– VC, January 03, 2006, VC/QC/EC/3.01/2006/9010, Quarterly air monitoring report<br>– VC, 13 November 2006, Periodic verification of lime stone consumption and clinker production, Doc no PRD-OP-24<br>– VC, June 1,2004, Issue no 03, Rev No. 02, On site emergency plan<br>– VC, February 2007, Vikram/CDM/Training/0601, Training manual for CDM<br>– VC, May 2006, Vikram/CDM/calibration/0602, Procedure for calibration<br>– VC, May 2006, Vikram/CDM/IA/0603, Procedure for internal audit<br>– VC, May 2006, Vikram/CDM/Performance/0604/Procedure for data verification<br>– VC, March 23, 2006, daily production report<br>– VC, October, 2006, operational control procedure |

| Reference | Document |
|---|---|
| | – VC, December 14, 2005, Characteristic of PPC Cement, VC standard, Doc no – VC-3.04 |
| /**XCS**/ | Supporting Excel calculation sheets IRR, Baseline and emission reduction |

**Table7-2:** Background investigation and assessment documents

| Reference | Document |
|---|---|
| /**ACM0003**/ | Approved methodology ACM0003 / Version 04, Sectoral Scope: 4, 28 July 2006, Revision to the approved baseline methodology ACM0003, "Emissions reduction through partial substitution of fossil fuels with alternative fuels in cement manufacture " |
| /**ACM 0002**/ | Consolidated methodology for grid-connected electricity generation from renewable sources (version 06: 19 May 2006) |
| /**TA**/ | • Tool for the demonstration and assessment of additionality (version 2), 28 November 2005<br>• Tool for the demonstration and assessment of additionality (version 3), EB-29 |
| /**CPM**/ | TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms) |
| /**CBD**/ | $CO_2$ Baseline Database for Indian Power Sector -User Guide, Ver 1.1 dated Dec'06 published by CEA. |
| /**GCP**/ | UNFCCC: Guidelines for completing CDM-PDD and CDM-NM (Version 06.1) |
| /**GEF**/ | Official data sources for Grid Emission Factor (Regional Grid, 04-05) |
| /**IPCC-GP**/ | IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories, 2006 |
| /**IPPC-RM**/ | Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual |
| /**KP**/ | Kyoto Protocol (1997) |
| /**MNES**/ | Baseline Guidelines |

| Reference | Document |
|---|---|
| /**MA**/ | Decision 17/CP. 7 (Marrakesh – Accords and Annex to decision 17/CP.7) |
| /**NATCOM**/ | National Communication to UNFCCC (Chapter 2 on NCV value) |
| /**VVM**/ | IETA, PCF Validation and Verification Manual (V. 4) |

**Table 7-3:** Websites used

| Reference | Link | Organisation |
|---|---|---|
| /**cea**/ | www.cea.nic.in | Central Electricity Authority |
| /**dna-i**/ | www.envfor.nic.in/cdm | The National Clean Development Mechanism (CDM) Authority |
| /**imef**/ | www.envfor.nic.in | Indian Ministry of Environment and Forest |
| /**imp**/ | www.powermin.nic.in | Indian Ministry of Power |
| /**ipcc**/ | www.ipcc-nggip.iges.or.jp | IPCC publications |
| /**UNFCC**/ | http://cdm.unfccc.int | UNFCCC |
| /**ieta**/ | http://www.ieta.org/ | Website of International Emission trading Association (IETA) |
| /**MoP**/ | http://www.powermin.nic.in/ | Website of Ministry of Power, Government of India |

**Table 7-4:** List of interviewed persons

| Reference | MoI[1] | | Name | Organisation / Function |
|---|---|---|---|---|
| /**IM01**/ | V | ☒ Mr. ☐ Ms | Arun Dave | Senior Manager – Technical Cell (Vikram Cement) |
| /**IM01**/ | V | ☒ Mr. ☐ Ms | Umesh Shrivastava | Manager – P and B (Vikram |

| Reference | MoI[1] | | Name | Organisation / Function |
|---|---|---|---|---|
| | | | | Cement) |
| /**IM01**/ | V | ☒ Mr.<br>☐ Ms | Vivek Mishra | Senior Engineer – Technical Cell (Vikram Cement) |
| /**IM02**/ | V | ☒ Mr.<br>☐ Ms. | Shashi Prakash | Consultant – (E & Y) |
| /**IM02**/ | T | ☒ Mr.<br>☐ Ms | Jitendrakumar | Project Manager - Humboldt Wedag India Pvt. Ltd. |
| /**IM03**/ | V | ☒ Mr.<br>☐ Ms. | Tulsidas Nagar | Sarpanch - Khor Village |
| /**IM03**/ | V | ☒ Mr.<br>☐ Ms. | Ramkumar Chowdhary | Transporter of alternative fuel |
| /**IM03**/ | V | ☒ Mr.<br>☐ Ms. | Anil Nagada | Transporter of alternative fuel |
| /**IM04**/ | T | ☒ Mr.<br>☐ Ms. | Shakti Singh Sisodia | Commissioner (Health) – Jaipur Municipal Corporation |
| /**IM04**/ | T | ☒ Mr.<br>☐ Ms. | Rajendrakumar Garg | Health Officer – Jaipur Municipal Corporation |

[1)] Means of Interview: (**T**elephone, **E**-Mail, **V**isit)

# ANNEX

Validation Protocol

## ANNEX : VALIDATION PROTOCOL

**Table 1: Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities**

| REQUIREMENT | Reference | CONCLUSION | Cross Reference / Comment |
|---|---|---|---|
| 1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3 | Kyoto Protocol Art.12.2 | OK | Table 2, Section E.4.1<br>Annex 1 party will be identified in due time. The post registration involvement by Annex I party will be as per provisions (decision no 57) made in 18th EB meeting. |
| 2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof | Kyoto Protocol Art. 12.2, Marrakech Accords, CDM Modalities §40a | OK | Table 2, Section A.3 |
| 3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC | Kyoto Protocol Art.12.2. | OK | Table 2, Section E.4.1 |
| 4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved | Kyoto Protocol Art. 12.5a, Marrakech Accords, CDM Modalities §40a | OK | In the LoA, host party approval, wide its letter F. No. 4/14/2005-CCC, dated 23/09/2005, the Indian DNA, National CDM Authority under Ministry of Environment and Forests confirmed the voluntary participation in the proposed CDM project activity. |
| 5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change | Kyoto Protocol Art. 12.5b | OK | Table 2, Section E.4.1 |
| 6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM | Kyoto Protocol Art. | ~~CAR B3-B4, CR~~ | Table 2, Section B.2. |

| REQUIREMENT | Reference | CONCLUSION | Cross Reference / Comment |
|---|---|---|---|
| project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity | 12.5c, Marrakech Accords, CDM Modalities §43 | ~~B1-B5 and Outstanding issue~~ | |
| 7. Potential public funding for the project from Parties in Annex I is not a diversion of official development assistance | Marrakech Accords | OK | The funding of the project will not involve ODA as stated under A.4.5. of PDD |
| 8. Parties participating in the CDM shall designate a national authority for the CDM | Marrakech Accords, CDM Modalities §29 | OK | The Indian DNA is National CDM Authority under Ministry of Environment and Forests.<br>Annex 1 party will be identified before project registration, if required. Accordingly DNA of Annex 1 party will be made available. |
| 9. The host country is a Party to the Kyoto Protocol | Marrakech Accords, CDM Modalities §30 | OK | India is a Party to the Kyoto Protocol and has ratified the Protocol on 26 Aug 2002. |
| 10. Comments by local stakeholders are invited, a summary of these provided and how due account was taken of any comments received | Marrakech Accords, CDM Modalities §37b | OK | Table 2, Section G |
| 11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, has been 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 | Marrakech Accords, CDM Modalities §37c | OK | Table 2, Section F |

| REQUIREMENT | Reference | CONCLUSION | Cross Reference / Comment |
|---|---|---|---|
| by the Host Party has been carried out. | | | |
| 12. Baseline and monitoring methodology is previously approved by the CDM Methodology Panel | Marrakech Accords, CDM Modalities §37e | ~~CAR B1~~ | Table 2, Section B.1.1 and D.1.1<br>Approved methodology ACM0003 / Version 04, Sectoral Scope: 4, 28 July 2006, Revision to the approved baseline methodology ACM0003, "Emissions reduction through partial substitution of fossil fuels with alternative fuels in cement manufacture "is previously approved by the CDM Methodology Panel<br>Reference of the approved baseline methodology applied to the project activity under section B of PDD is erroneously editited and requires appropriate revision (Cp ACM0003 / Version 04).<br>In addition under section B.1 of PDD, below references with applicable version are not mentioned:<br>▪ Tools for demonstration and assessment of |

| REQUIREMENT | Reference | CONCLUSION | Cross Reference / Comment |
|---|---|---|---|
| | | | additionality<br>▪ ACM0002 as reference for the grid emission factors from CEA |
| 13. Provisions for monitoring, verification and reporting are in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP | Marrakech Accords, CDM Modalities §37f | ~~CAR B4 CAR D1, CR A2, CR B2, CR D1~~ | Table 2, Section B |
| 14. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available | Marrakech Accords, CDM Modalities, §40 | ~~CAR G1~~ | The PDD was made available for public commenting on www.global-warming.de and http://cdm.unfccc.int/Projects/Validation/index.html from 16/01/2007 to 14/02/2007 for 30 days. Until the end of the stakeholder commenting process, no comment has been received. |

| REQUIREMENT | Reference | CONCLUSION | Cross Reference / Comment |
|---|---|---|---|
| 15. 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, CDM Modalities, §45c,d | ~~CAR B1, CR A2, CR D1~~ | Table 2, Section B.2 |
| 16. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure | Marrakech Accords, CDM Modalities, §47 | OK | Table 2, Section B.2 |
| 17. The project design document is in conformance with the UNFCCC CDM-PDD format | Marrakech Accords, CDM Modalities, Appendix B, EB Decisions | ~~CAR D1, CAR B1, CAR F2, CAR E1~~ | The PDD is in conformance with version 03.1 of the CDM-PDD. Nevertheless CAR D1, CAR B1, CAR F2, CAR E1 has been raised. |

## Table 2: Requirements Checklist

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| ***A. General Description of Project Activity***<br>*The project design is assessed.* | | | | | |
| **A.1. Project Boundaries**<br>*Project Boundaries are the limits and borders defining the GHG emission reduction project.* | | | | | |
| A.1.1. Are the project's spatial (geographical) boundaries clearly defined? | /PDD/ (A.4) | DR | The project activity is located at Vikram Cement, Khor; district Neemuch, state Madhya Pradesh. Neemuch lies between the parallels of latitude 24° 15'- 24° 35' North, and between the meridians of longitude 74° 45' - 75° 37' East. However the location of project is not exactly specified, CR A1 has been raised.<br>The longitude and latitude of Vikram Cement (not the city) is necessary for the unique identification of the project activity. | ~~CR A1~~ | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| A.1.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined? | /PDD/ (B.4) /IM01/ /JMC/ /BAR/ /PO/1 | DR, I | The system boundary of the project activity includes the agriculture by product production, Jaipur Municipal Corporation, MSW processing, electricity used for fuel preparation, electricity used for transportation of alternative fuel transportation, calciner and kiln of cement manufacturing line number 3.<br>The project activity includes the agricultural by product storage facility, feeding system, calciner, kiln system and associated utilities, which are located in the Neemuch plant. The project activity also includes transportation of agricultural by product and RDF, located outside the plant boundary (Cp A.4.3. Technology to be employed by the project activity of PDD). However, the details of the MSW / RDF storage facility at Jaipur site have not been systematically included in the PDD.<br>VC explain the alternative fuel availability under section B.2 of PDD, nevertheless approximate average distance for transport of alternative fuels ($D_{AF}$) and fossil fuel ($Q_{FF}$), is mentioned in PDD. | ~~CAR A1~~<br>~~CR A2~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| **A.2. Technology to be employed**<br>*Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.* | | | | | |
| A.2.1. Does the project design engineering reflect current good practices? | /PDD/ (A.4.3. , Section D) /IM01/ /SC/ /PO/1 | DR, I | Yes, The project activity has imported technology from M/s KHD Humboldt Wedag, Germany for making RDF from MSW at Jaipur site. RDF and agriculture waste are proposed to use as fuel at VC, kiln line 3. The order on KHD reflects good practices.<br>Other environmental protection aspects have been considered as per the environmental clearance obtained from Ministry of Environment and Forests, Govt. of India.<br>Project activity has also received the clearance from MPPCB and RPCB. | OK | |
| A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country? | /PDD/ (A.4.3.) /IM01/ /CMA/ | DR,I | The project activity is one of the first municipal solid waste based fuel utilisation project in Cement Industry of India. Hence, it is a new technology for the host country. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period? | /PDD/ (A.2.) /IM01/ | DR, I | Project technology is not likely to be substituted.<br>The basics of the technology are not likely to change significantly and significant improvement over the present technology is not expected.<br>Developed countries are already having plants, which are substituting 40 per cent fossil fuel. However, implementation of such projects may not be immediate in host country. | OK | |
| A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? | /PDD/ (B.7.2) /IM01/ /VC/ /PO/1 | DR, I | A technical team of VC officials have already visited various plants in Europe to gain first hand knowledge of the working of these plants.<br>VC, already placed purchase order to M/s KHD Humboldt Wedag for supply, supervision and commissioning for the making RDF from MSW at Jaipur site and using RDF along with agriculture waste at VC, kiln line 3. Project activity was under commissioning during validation stage. M/s KHD Humboldt Wedag. | OK | |
| A.2.5. Does the project make provisions for meeting training and maintenance | /IM01/ /VC/ | I | Yes, the project activity has made provision for meeting training and | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| needs? | | | maintenance needs | | |
| **A.3. Contribution to Sustainable Development**<br>*The project's contribution to sustainable development is assessed.* | | | | | |
| A.3.1. Is the project in line with relevant legislation and plans in the host country? | /PDD/ (D.2.) /SC/ /HCA/ /JMC/ | DR | The project is holding the necessary operating license and is in line with relevant legislation. Below Environmental Clearance has been obtained by project activity<br>1. MPPCB, 02/02/2004, No. 3334/TS/MPPCB/2004, Grant of consent of the board under section 21 of the air) preventive and control of pollution) act, 1981<br>2. MPPCB, 29/11/2005, No. 8422/TS/MPPCB/2005, Renewal of consent of consent of the board under section 25/26 of the water (prevention and control of pollution) act, 1974<br>3. RPCB, 21/02/2006, RPCB/ROJP/S/CITY/267/2983Consent to establish under the provision of air (prevention and control of pollution) act 1981 and under the provisions of water (prevention and | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | control of pollution) act 1974 for processing Refused Derived Fluff/ Pellet from MSW plant of capacity 52000 MT per year at Kharsa No 338, village Langadiawas, Tehsil Jamwaramgarh, District Jaipur.<br>The project activity is in line with applicable laws of the country. | | |
| A.3.2. Is the project in line with host-country specific CDM requirements? | /PDD/ (A.2.) /HCA/ /SC/ /JMC/ | DR | Yes, the project is in line with National CDM Authority under Ministry of Environment and Forests (MoEF) as a DNA of Government of India (Host Country). Project proponent has obtained the Host Country Approval from Ministry of Environment and Forests, Government of India, MoEF, September 23, 2005, 4/14/2005-CCC | OK | |
| A.3.3. Is the project in line with sustainable development policies of the host country? | /HCA/ /PDD/ | DR | In its HCA, MoEF, September 23, 2005, 4/14/2005-CCC, the Indian DNA confirmed that the project contributes to sustainable development in India. | OK | |
| A.3.4. Will the project create other environmental or social benefits than GHG emission reductions? | /PDD/ (A.2, D.2) /SC/ | DR, I | Yes, The project activity will generate additional employment as well as income generation for the rural population.<br>The project activity will also encourage | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | cement industry to use alternate fuel. | | |
| ***B. Project Baseline***<br>*The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.* | | | | | |
| **B.1. Baseline Methodology**<br>*It is assessed whether the project applies an appropriate baseline methodology.* | | | | | |
| B.1.1. Is the baseline methodology previously approved by the CDM Methodology Panel? | /PDD/ (B.1.) /ACM0003/ | DR | Yes, the baseline methodology is previously approved by the CDM Methodology Panel under,<br>Approved methodology ACM0003 / Version 04, Sectoral Scope: 4, 28/07/2006, Revision to the approved baseline methodology ACM0003, "Emissions reduction through partial substitution of fossil fuels with alternative fuels in cement manufacture"<br>Reference of the approved baseline methodology applied to the project activity under section B of PDD is erroneously editited and requires appropriate revision (Cp ACM0003 / Version 04).<br>In addition under section B.1 of PDD, | ~~CAR B1~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | below references with applicable version are not mentioned:<br>▪ Tools for demonstration and assessment of additionality<br>▪ ACM0002 as reference for the grid emission factors from CEA<br>The aspects energy quantities require for any preparation of the biomass, occurring before use in the project activity, except from transportation and/or drying of the biomass, and associate GHG emissions' by considering applicability condition is ignored and needs further clarification (Cp ACM0003/Version 4, 2nd bullet of applicability). | ~~CR B1~~ | |
| B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified? | /PDD/ (B.2.) /IM02/ /ACM0003/ | DR, I | Approved baseline methodology ACM0003/Version 04, Sectoral Scope: 4 are applicable to the project activity. This methodology applies to project activities of "Emission reduction through partial substitution of fossil fuels with alternative fuels in cement manufacture" and hence; the application of the methodology is justified.<br>Please refer B.1.1 | ~~CAR B1~~ ~~CR B1~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| **B.2. Baseline Determination**<br>*The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.* | | | | | |
| B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent? | /PDD/ (B.2., B.4) /IM02/ /ACM0003/ | DR, I | The justification of the choice of the applied methodology is explained under section B.2 of the PDD. | OK | |
| B.2.2. Has the baseline been determined using conservative assumptions where possible? | /PDD/ (B.4., Annex 3) /ACM0003/ /XCS/ /IM 02/ | DR, I | The project proponent has opted for barrier analysis for "Baseline scenario selection".<br>As per ACM0003/Version 03, VC would determine the Emission Factor for fossil fuel displaced by alternative fuel as the lowest value of the following 3 (three) options<br>1) Weighted average annual $CO_2$ Emission Factor for the fossil fuel(s) consumed and monitored ex ante during the year before validation<br>2) Weighted average annual $CO_2$ | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | Emission Factor for the fossil fuel(s) consumed and monitored during the corresponding verification period (e.g. the period during the emission reductions to be certified have been achieved),<br>3) Weighted average annual $CO_2$ Emission Factor for the fossil fuel(s) that would have been consumed according to the baseline scenario determined in section B of the PDD | | |
| B.2.3. Has the baseline been established on a project-specific basis? | /PDD/ (Annex 3) | DR | Yes, baseline is project specific. | OK | |
| B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations? | /PDD/ (B.4.) /LOI/ /CMA/ | DR, I | Yes, relevant national and sectoral policies like pricing of fossil and alternative fuel are considered while designing the baseline scenario.<br>The sensitivity analysis is presented in section B.4 of the PDD.<br>As part of the sectoral study, the baseline scenario has taken into account the prevailing practice in cement industry of India with respect to use of fuel for cement kilns in India. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| B.2.5. Is the baseline determination compatible with the available data? | /PDD/ (Annex 3) /XCS/ /CMA/ | DR | The baseline emission estimation is supported by available data.<br>Validation team made an independent assessment on the calculation and the authenticity of the data sources to arrive to the resultant baseline emission figure mentioned in the PDD.<br>The numeration of the baseline scenarios (Cp table no 3-7 of PDD) doesn't match with baseline information given in Annex Furthermore annex 3, para 1 of PDD, is showing a statement "The baseline for the project activity is a variable baseline" whereas the methodology requires that one baseline be selected.<br>VC explains the alternative fuel availability under section B.2 of PDD, nevertheless approximate average distance for transport of alternative fuels ($D_{AF}$) and fossil fuel ($Q_{FF}$), is mentioned in PDD.<br>Emission reduction and baseline calculations provided in the PDD were verified by validation team. Conversely basis for heating values of different fuels has not been described in the PDD. | ~~CAR B2~~<br>~~CR A2~~<br>~~CR B2~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | Further more,<br>– Step 2 (Cp section B.6.3, page no 32 of PDD) detail calculation of $HC_{AF,y}$ and $HC_{FF}$ is missing while calculating moisture penalty.<br>– F fraction of $CH_4$ in landfill gas under section B.6.3 of PDD, page no 37 showing values – 0.5, and excel sheet "landfill emissions" has considered 0.4, these deviation needs further clarification.<br>– Value applied for $VEF_{CH4}$, $VEF_{N2O}$, $VEF_{CO2}$, $VEF_{D}$ in section B.6.2 of PDD is mismatched with Annex 4 of PDD | | |
| B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios? | /PDD/<br>/ACM0003/<br>/IM02/<br>/CMA/ | DR, I | The project proponent has opted for barrier analysis for "Baseline scenario selection".<br>Based on the analysis; baseline scenario 1: continuation of current practice scenario is selected as most likely scenario among other possible scenario | | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | because<br>• No capital investement<br>• No prevailing practice barrier (this is not a common practice)<br>• No other barriers like management or regulatory barrier | OK | |
| B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario (e.g. through demonstrating investment barriers, technology barriers, barriers to prevailing practices, and/or other barriers or through quantitative evidence that the project would otherwise not be implemented)? | /PDD/<br>/B.5/<br>/IM 01/<br>/IM 02/<br>/AT/<br>/XCS/<br>/CAS/<br>/PO/1 | DR, I | Spreadsheet entitled "Enclosure_1_Vikram_Jan2007" having sub sheet named cost saving IRR, is unclear about the accounting of power consumption and associated cost for drying the alternative fuels outside the project site ($PD_{ADO}$) while calculating net benefit due to the project activity.<br>In addition page no 18, table no 10 of PDD showing the electricity cost INR 4.06/ KWh, but applicable to which site is not mentioned and needs further clarification.<br>In order to demonstrate financial barrier, VC has submitted IRR spreadsheet calculation (Cp Enclosure_1_Vikram_Jan2007), though back up calculation with reference of | ~~CAR B3~~<br>~~CAR B4~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | below concern is not suitably explained in PDD.<br>– Production loss due to plant shutdown during commissioning<br>– Electricity used for transportation of alternative fuel = 1964844 KWh<br>– Power consumption of drying the alternative fuels outside the project site ($PD_{ADO}$) = 7009848 KWh<br>– Processing cost of MSW = INR 615 /ton<br>– Transportation Cost of MSW = INR 600 /ton<br>Further sensitivity analysis conducted by considering company's internal benchmark and risk-free interest on bank deposit in India for year 2004-05. However estimated IRR is crossing the benchmark used (risk-free interest on bank deposit). Proper justification is needed to demonstrate that the proposed project activity is not the baseline scenario.<br>The aspects energy quantities require for any preparation of the biomass, occurring | | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | before use in the project activity, except from transportation and/or drying of the biomass, and associate GHG emissions' by considering applicability condition is ignored and needs further clarification (Cp ACM0003/Version 4, 2nd bullet of applicability).<br><br>Emission reduction and baseline calculations provided in the PDD were verified by validation team. Conversely basis for heating values of different fuels has not been described in the PDD.<br><br>Further more,<br>– Step 2 (Cp section B.6.3, page no 32 of PDD) detailed calculation of $HC_{AF,y}$ and $HC_{FF}$ is missing while calculating moisture penalty.<br>– F fraction of $CH_4$ in landfill gas under section B.6.3 of PDD, page no 37 showing values – 0.5, and excel sheet "landfill emissions" has considered 0.4, these deviation needs further clarification.<br>– Value applied for $VEF_{CH4}$, $VEF_{N2O}$, | ~~CR B1~~<br><br>~~CR B2~~ | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | $VEF_{CO2}$, $VEF_D$ in section B.6.2 of PDD is mismatched with Annex 4 of PDD | | |
| | | | The time period of calculating the IRR does neither correspond to the expected lifetime (20 years) of the project activity nor to the crediting period (10 years). This needs clarification. | ~~CR B3~~ | |
| | | | In sub-step 3a the barrier due to prevailing practice is missing (Cp Tool for the demonstration and assessment of additionality). | ~~CR B4~~ | |
| | | | While explaining investment barrier, project proponent has tabulated IRR analysis (Cp B.5, table no 10 of PDD) However VC needs to clarify the reference of escalation in the prices of imported coal, Indian coal and pet coke considered in IRR spreadsheet. | ~~CR B5~~ | |
| | | | During the course of validation, "Tool for the demonstration and assessment of additionality (version 2), 28 November 2005" changed to (version 3), 16 February 2007; hence as per ACM 0003, pg 3, The additionality of the project activity shall be demonstrated and | ~~Outstan~~ | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | assessed using the latest version of the "Tool for the demonstration and assessment of additionality" agreed by the CDM Executive Board, which is available on the UNFCCC CDM web site. | ~~ding issue~~ | |
| B.2.8. Have the major risks to the baseline been identified? | /PDD/ /IM01/ | DR, I | All CARs/ CRs raised in the context of baseline scenario selection in above sections are to be resolved before providing conclusions. | OK | |
| B.2.9. Is all literature and sources clearly referenced? | /PDD/ (Annex– 3) | DR | The baseline sections of the PDD are supported by official data sources in the table of Annex 3 of the PDD.<br>VC explains the alternative fuel availability under section B.2 of PDD, nevertheless approximate average distance for transport of alternative fuels ($D_{AF}$) and fossil fuel ($Q_{FF}$), is mentioned in PDD.<br>Emission reduction and baseline calculations provided in the PDD were verified by validation team. Conversely basis for heating values of different fuels has not been described in the PDD.<br>Further more, | ~~CR A2~~<br>~~CR B2~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | – Step 2 (Cp section B.6.3, page no 32 of PDD) detail calculation of $HC_{AF,y}$ and $HC_{FF}$ is missing while calculating moisture penalty.<br>– F fraction of $CH_4$ in landfill gas under section B.6.3 of PDD, page no 37 showing values – 0.5, and excel sheet "landfill emissions" has considered 0.4, these deviation needs further clarification.<br>– Value applied for $VEF_{CH4}$, $VEF_{N2O}$, $VEF_{CO2}$, $VEF_{D}$ in section B.6.2 of PDD is mismatched with Annex 4 of PDD. | | |
| ***C. Duration of the Project/ Crediting Period***<br>*It is assessed whether the temporary boundaries of the project are clearly defined.* | | | | | |
| C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable? | /PDD/ (C.1.1) /SD/ /IM01/ | DR, I | Starting date of the project activity is indicated as December 24, 2004 in section C.1.1 of the PDD. This is supported through internal document of VC (VC, 24/12/2004, Block proposal for installation of alternate fuel firing system for VC 3 processing unit of MSW). | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | Project activity lifetime of 20 (twenty) years as stated in PDD. | | |
| C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max. two x 7 years or fixed crediting period of max. 10 years)? | /PDD/ (C.2.2.2.) | DR | As per PDD, VC has selected the fixed crediting period of 10 (ten) years. The starting date of fixed crediting period mentioned in PDD is 01/07/2007, nevertheless CR C1 has been raised<br>During site visit of validation process, the project activity was under commissioning stage. Hence VC should clarify about suitable starting date of fixed crediting period according to the most likely commercial production begin. | ~~CR C1~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| ***D. Monitoring Plan***<br>*The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).* | | | | | |
| **D.1. Monitoring Methodology**<br>*It is assessed whether the project applies an appropriate baseline methodology.* | | | | | |
| D.1.1. Is the monitoring methodology previously approved by the CDM Methodology Panel? | /PDD/ (B.7) /ACM 0003/ | DR | Yes, the project applies approved monitoring methodology ACM0003 / Version 04, Sectoral Scope: 4, 28/07/2006, Revision to the approved baseline methodology ACM0003, "Emissions reduction through partial substitution of fossil fuels with alternative fuels in cement manufacture" is previously approved by the CDM Methodology Panel. | OK | |
| D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified? | /PDD/ (B.7) /ACM 0003/ | DR | Approved monitoring methodology ACM0003/Version 04, Sectoral Scope: 4, is applicable to the project activity. This methodology applies to project activities | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | of "Emission reduction through partial substitution of fossil fuels with alternative fuels in cement manufacture" and hence; the application of the methodology is justified. | | |
| D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices? | /PDD/ (B.7) /ISO/ | DR | Yes, the monitoring plan with QA/QC procedure based on ACM0003 shows conservative calculations of emission reduction.<br>Moreover, ISO systems are also in place.<br>Nevertheless below CR has been raised.<br>Project proponent is required to submit the supportive documents for the following procedures:<br>• Dealing with possible monitoring data adjustments and uncertainties related to measurement of GHG emission.<br>• Internal audits of GHG project compliance with operational requirements where applicable.<br>• Training of monitoring personnel.<br>• Emergency preparedness for cases where emergencies can cause unintended emissions | ~~CR D1~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | • Day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)<br>• Project performance reviews<br>• Corrective actions<br>• Calibration certificate with traceability of all monitoring equipment | | |
| D.1.4. Is the discussion and selection of the monitoring methodology transparent? | /PDD/ (B.7.) /VC/ /ACM 0003/ | DR | The Monitoring Plan presents the monitoring and reporting of the main project components in a clear and transparent manner.<br>Project proponent has explained the monitoring plan in section B of PDD. For better transparency on monitoring plan of project activity, VC should provide the further background information used in the application of the monitoring methodology, while revising the PDD by considering below indicate (Cp CDM-PDD guidelines), version 06.2)<br>– Procedure for monitoring the parameter<br>– Uncertainty of monitoring | ~~CAR D1~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | instruments<br>– Tag number or equipment serial number of instrument<br>– Data description<br>– Traceability of calibration method/ standard<br>– Service and technical definition of instrument<br>– Make of instrument<br>– Location of instrument<br>– Calibration Method/procedure of monitoring equipment<br>– Range of monitoring instrument<br>– Linkage with system management<br><br>Project proponent is required to submit the supportive documents for the following procedures:<br><br>• Dealing with possible monitoring data adjustments and uncertainties related to measurement of GHG emission.<br>• Internal audits of GHG project compliance with operational requirements where applicable.<br>• Training of monitoring personnel.<br>• Emergency preparedness for | | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | cases where emergencies can cause unintended emissions<br>• Day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)<br>• Project performance reviews<br>• Corrective actions<br>• Calibration certificate with traceability of all monitoring equipment | ~~CR D1~~ | |
| **D.2. Monitoring of Project Emissions**<br>*It is established whether the monitoring plan provides for reliable and complete project emission data over time.* | | | | | |
| D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period? | /PDD/<br>(B.7.1) | DR | Project emission related parameters/ indicators are provided in PDD.<br>Please refer CAR D1 in table no 3 of validation protocol.<br>Below key monitoring parameters are omitted under section B of PDD<br>– Quantity of fossil fuel which is reduced due to consumption of | ~~CAR D1~~ | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | alternative fuels ($RQ_{FF}$)<br>– Amount of biomass residues of type j used as alternative fuel that would be landfilled in the absence of the project in the year x (t/yr) ($QAFL_{j,x}$)<br>– Fuel savings from on-site transportation of fossil fuels (t/yr) ($OF_{FF)}$<br>– Heat input from alternative fuels (TJ/yr) in project case ($HI_{AF}$)<br>– Share of heat input from alternative fuels $S_{AF}$<br>In addition monitoring of emissions related to on-site transportation of alternative fuels is missing.<br>Further more data archived for $EF_{FF}$ and data unit for $EF_{TCO2}e$ is not inline with ACM 0003 (Cp ACM0003 / Version 04).<br>According to the 'Guidelines for completing the PDD …' section B.6.2 should include only parameters that are not monitored throughout the crediting period but that are determined once and thus remains fixed throughout the crediting period. This doesn't apply to all | ~~CAR D2~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| | | | parameters listed in this section and needs further clarification (Cp ACM 0003/Version 04). | ~~CR D2~~ | |
| D.2.2. Are the choices of project GHG indicators reasonable? | /PDD/ (B.7.1) | DR | Yes the choice of project GHG indicator ($CO_2$) is reasonable. | OK | |
| D.2.3. Will it be possible to monitor / measure the specified project GHG indicators? | /PDD/ (B.7.1) | DR | See comment made under D.2.1. | ~~CAR D1~~ ~~CAR D2~~ | OK |
| D.2.4. Will the indicators give opportunity for real measurements of achieved emission reductions? | /PDD/ (B.7.1) | DR | See comment made under D.2.1. | ~~CAR D1~~ ~~CAR D2~~ | OK |
| D.2.5. Will the indicators enable comparison of project data and performance over time? | /PDD/ (B.7.1) | DR | See comment made under D.2.1. | ~~CAR D1~~ ~~CAR D2~~ | OK |
| **D.3. Monitoring of Leakage** *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.* | | | | | |
| D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage? | /PDD/ (B.7.1.) /ACM0003/ | DR | All relevant data necessary for monitoring plan are provided in PDD for the collection and archiving for determining leakage. | OK | |
| D.3.2. Have relevant indicators for GHG leakage been included? | /PDD/ (B.7.1.) | DR | See comment made under D.3.1. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | /ACM0003/ | | | | |
| D.3.3. Will it be possible to monitor the specified GHG leakage indicators? | /PDD/ (B.7.1.) /ACM0003/ | DR | See comment made under D.3.1. | OK | |
| **D.4. Monitoring of Baseline Emissions** *It is established whether the monitoring plan provides for reliable and complete project emission data over time.* | | | | | |
| D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period? | /PDD/ (B.7.1.) /ACM 0003/ | DR | VC explains the alternative fuel availability under section B.2 of PDD, nevertheless approximate average distance for transport of alternative fuels ($D_{AF}$) and fossil fuel ($Q_{FF}$), is mentioned in PDD.<br>Emission reduction and baseline calculations provided in the PDD were verified by validation team. Conversely basis for heating values of different fuels has not been described in the PDD.<br>Further more,<br>– Step 2 (Cp section B.6.3, page no 32 of PDD) detail calculation of $HC_{AF,y}$ and $HC_{FF}$ is missing while calculating moisture penalty. | ~~CR A2~~<br>~~CR B2~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | – F fraction of $CH_4$ in landfill gas under section B.6.3 of PDD, page no 37 showing values – 0.5, and excel sheet "landfill emissions" has considered 0.4, these deviation needs further clarification.<br>– Value applied for $VEF_{CH4}$, $VEF_{N2O}$, $VEF_{CO2}$, $VEF_{D}$ in section B.6.2 of PDD is mismatched with Annex 4 of PDD | | |
| D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable? | /PDD/ (B.7.1, Annex -3) /IM 02/ | DR, I | Yes, the choice of baseline data is reasonable. | OK | |
| D.4.3. Will it be possible to monitor the specified baseline indicators? | /PDD/ (B.7.1, Annex -3) /IM 02/ | DR | It will be possible to monitor the baseline indicators, the comments made under D.4.2. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
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| **D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts**<br>*It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.* | | | | | |
| D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts? | /EIA/<br>/SC/<br>/IM01/ | DR,I | The monitoring plan provides no plan for collection and achieving of relevant data concerning to environmental, social and economic impacts. However, the project proponent needs to submit environment statement at periodic intervals to the pollution control board.<br>It may be noted that the DNA of India does not require the monitoring of specific sustainable development indicators. | OK | |
| D.5.2. Is the choice of indicators for sustainability development (social, environmental, economic) reasonable? | /EIA/<br>/SC/<br>/IM01/ | DR,I | The monitoring plan has no provision for collecting and archiving social and economical impacts.<br>DNA of India does not require the monitoring of specific sustainable development indicators. | OK | |
| D.5.3. Will it be possible to monitor the specified sustainable development indicators? | /EIA/<br>/SC/<br>/IM01/ | DR | The environmental indicators will be measured by VC as statutory requirements Rajasthan Pollution Control Board and Madhya Pradesh Pollution | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | Control Board.<br>The economic and social indicators can be traced with the help of data published by Government of India or state government | | |
| D.5.4. Are the sustainable development indicators in line with stated national priorities in the Host Country? | /PDD/ (D.2) /HCA/ | DR | Specified sustainable development indicators are verified against stated national priorities of India.<br>However, in its LoA, MoEF, F. 23/09/2005, No. 4/14/2005-CCC, Host Country Approval, the Indian DNA confirmed that the project contributes to sustainable development in India. | OK | |
| **D.6. Project Management Planning**<br>*It is checked that project implementation is properly prepared for and that critical arrangements are addressed.* | | | | | |
| D.6.1. Is the authority and responsibility of project management clearly described? | /PDD/ (B.7.2) /IM01/ | DR, I | Yes, project has been implemented by VC. Responsibility of project management is briefly described in PDD. | OK | |
| D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described? | /PDD/ (Annex 1) /IM01/ | DR,I | As per PDD, Annex 1, authority and responsibility for registration, monitoring, measurement and reporting clearly described. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| D.6.3. Are procedures identified for training of monitoring personnel? | /PDD/ (B.7.2) /IM01/ | DR, I | PDD addresses the qualified staff VC at site. This is also confirmed during interview. Still CR D1has been raised<br><br>Project proponent is required to submit the supportive documents for the following procedures:<br>• Dealing with possible monitoring data adjustments and uncertainties related to measurement of GHG emission.<br>• Internal audits of GHG project compliance with operational requirements where applicable.<br>• Training of monitoring personnel.<br>• Emergency preparedness for cases where emergencies can cause unintended emissions<br>• Day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)<br>• Project performance reviews<br>• Corrective actions<br>• Calibration certificate with traceability of all monitoring | ~~CR D1~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | equipment | | |
| D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions? | /IM01/ | I | Procedures for emergency preparedness are submitted by VC. This is also confirmed during interview. | OK | |
| D.6.5. Are procedures identified for calibration of monitoring equipment? | /PDD/ (B.7.2) /ISO/ | DR | Procedure for calibration of monitoring equipment is mentioned under QA/QC procedure of the PDD. Moreover, ISO systems are also in place.<br>Refer CAR D1 and CR D1 | ~~CAR D1 CR D1~~ | OK |
| D.6.6. Are procedures identified for maintenance of monitoring equipment and installations? | /PDD/ (B.7.2.) | DR, I | Procedure for maintenance of monitoring equipment is mentioned under QA/QC procedure of the PDD<br>Refer CAR D1 and CR D1 | ~~CAR D1 CR D1~~ | OK |
| D.6.7. Are procedures identified for monitoring, measurements and reporting? | /PDD/ (B.7.2) | DR, I | Refer CAR D1, CR D1 and CR D3 | ~~CAR D1 CR D1 CR D3~~ | OK |
| D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation) | /PDD/ (B.7.2) | DR,I | Refer CAR D1, CR D1 and CR D3 | ~~CAR D1 CR D1 CR D3~~ | OK |
| D.6.9. Are procedures identified for dealing with possible monitoring data | /PDD/ | DR | Refer CAR D1 and CR D1 | ~~CAR D1 CR D1~~ | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| adjustments and uncertainties? | (B.7.2) | | | | |
| D.6.10. Are procedures identified for review of reported results/data? | /PDD/ (B.7.2) | DR | Refer CAR D1 and CR D1 | ~~CAR D1 CR D1~~ | OK |
| D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable? | /IM01/ | I | Refer CAR D1 and CR D1 | ~~CAR D1 CR D1~~ | OK |
| D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally? | /IM01/ | I | Refer CAR D1 and CR D1 | ~~CAR D1 CR D1~~ | OK |
| D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting? | /IM01/ | I | Refer CAR D1 and CR D1 | ~~CAR D1 CR D1~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| ***E. Calculation of GHG Emissions by Source***<br>*It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.* | | | | | |
| **E.1. Predicted Project GHG Emissions**<br>*The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.* | | | | | |
| E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design? | /PDD/ (B.6.1, B.6.2) | DR | Below key monitoring parameters are omitted under section B of PDD<br>– Quantity of fossil fuel which is reduced due to consumption of alternative fuels ($RQ_{FF}$)<br>– Amount of biomass residues of type j used as alternative fuel that would be landfilled in the absence of the project in the year x (t/yr) ($QAFL_{j,x}$)<br>– Fuel saving from on-site transportation of fossil fuels (t/yr) ($OF_{FF}$ )<br>– Heat input from alternative fuels (TJ/yr) in project case ($HI_{AF}$) | ~~CAR D2~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | – Share of heat input from alternative fuels $S_{AF}$<br>In addition monitoring of emissions related to on-site transportation of alternative fuels is missing.<br>Furthermore data archived for $EF_{FF}$ and data unit for $EF_{TCO2}e$ is not inline with ACM 0003 (Cp ACM0003 / Version 04).<br>Under section B.6.4 of PDD, summary of ex-ante estimation of emission reduction is explained, however the categorization under<br>– Estimation of project activity emission<br>– Estimation of baseline emission<br>– Estimation of leakage<br>is not available in table requires appropriate amendment (Cp guidelines for completing the project design document (CDM-PDD), version 06.2).<br>While comparing annex 4 of PDD, emission reduction calculation and section B.3 "emissions sources included in or excluded from the project boundary", page no 11 of PDD, below significant | ~~CAR E1~~ | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | basis are not considered<br>• In project activity $CO_2$ emission from the burning of alternative fuel is due to non renewable part However as per mentioned statement "The main emission from combustion of fossil fuel in absence of project activity"<br>• Baseline GHG emissions due to anaerobic decomposition of biomass waste in the landfill ($LW_{CH4,y}$) is ignored as an emission source<br>• $CO_2$ emissions from the consumption of electricity for alternative fuel preparation is not apparent<br>• GHG emissions due to biomass that would be burned in the absence of the project ($BB_{CH4}$), is not considered<br>• $CH_4$ emission due to fossil fuel consumed for transportation of fossil and alternative fuel is missing | ~~CAR E2~~ | |
| E.1.2. Are the GHG calculations documented in a complete and transparent manner? | /PDD/ | DR | See the comment made in E.1.1. | ~~CAR D2~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | (B.6.1, B.6.2) | | | | |
| E.1.3. Have conservative assumptions been used to calculate project GHG emissions? | /PDD/ (B.6.1, B.6.2) | DR | See the comment made in E.1.1. | ~~CAR D2~~ | OK |
| E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation? | /PDD/ (B.6.1, B.6.2) | DR | See the comment made in E.1.1. | ~~CAR D2~~ | OK |
| E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated? | /PDD/ (B.6.1, B.6.2) | DR | See the comment made in E.1.1. | ~~CAR D2~~ | OK |
| **E.2. Leakage** *It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.* | | | | | |
| E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified? | /PDD/ (B.6.) /XCS/ | DR,I | Yes, the leakage effects beyond the chosen project boundaries are properly defined | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| E.2.2. Have these leakage effects been properly accounted for in calculations? | /PDD/ (B.6.) /XCS/ | DR, I | Yes, the leakage effects are properly accounted for in the calculations | OK | |
| E.2.3. Does the methodology for calculating leakage comply with existing good practice? | /PDD/ (B.6.) /XCS/ | DR, I | Yes, the methodology for calculating leakage complies with good practice | OK | |
| E.2.4. Are the calculations documented in a complete and transparent manner? | /PDD/ (B.6.) /XCS/ | DR, I | Yes, calculations are compete and transparent | OK | |
| E.2.5. Have conservative assumptions been used when calculating leakage? | /PDD/ (B.6.) /XCS/ | DR, I | Yes assumptions for calculating leakages are conservative. | OK | |
| E.2.6. Are uncertainties in the leakage estimates properly addressed? | /PDD/ (B.6.) /XCS/ /VC/ | DR, I | VC has submitted generic procedure for calculation of measurement of uncertainty. Leakage calculations are conservative. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| **E.3. Baseline Emissions**<br>*The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.* | | | | | |
| E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions? | /PDD/<br>(B.6.)<br>(Annex 3) | DR | Emission reduction and baseline calculations provided in the PDD were verified by validation team. Conversely basis for heating values of different fuels has not been described in the PDD.<br>Further more,<br>– Step 2 (Cp section B.6.3, page no 32 of PDD) detail calculation of $HC_{AF,y}$ and $HC_{FF}$ is missing while calculating moisture penalty.<br>– F fraction of $CH_4$ in landfill gas under section B.6.3 of PDD, page no 37 showing values – 0.5, and excel sheet "landfill emissions" has considered 0.4, these deviation needs further clarification.<br>– Value applied for $VEF_{CH4}$, $VEF_{N2O}$, $VEF_{CO2}$, $VEF_D$ in section B.6.2 of PDD is mismatched with Annex 4 of PDD | ~~CR B2~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions? | /PDD/ (B.6.) | DR | Yes, see the comment given in E.1.1. | ~~CR B2~~ | OK |
| E.3.3. Are the GHG calculations documented in a complete and transparent manner? | /PDD/ (B.6. Annex 3 ) /XCS/ | DR | Please refer CR B2, CR E1, CR E2 | ~~CR B2~~ ~~CR E1~~ ~~CR E2~~ | OK |
| E.3.4. Have conservative assumptions been used when calculating baseline emissions? | /PDD/ (B.6. Annex 3 ) /XCS/ | DR | Yes, see the comment given in E.1.1. | ~~CR B2~~ | OK |
| E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation? | /PDD/ (B.6. Annex 3 ) /XCS/ | DR | Please refer CR D1 | ~~CR D1~~ | OK |
| E.3.6. Have the project baseline(s) and the project emissions been determined | /PDD/ | DR | Please, see the comment above. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| using the same appropriate methodology and conservative assumptions? | (B.6. Annex 3 ) /XCS/ | | | | |
| **E.4. Emission Reductions** *Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.* | | | | | |
| E.4.1. Will the project result in fewer GHG emissions than the baseline scenario? | /PDD/ (B.6, Annex 3 ) /XCS/ | DR | All CARs/ CRs raised in the context of baseline calculations in the preceding section E are to be resolved before providing conclusions. Yes, the project activity will result in fewer emission than the baseline scenario | OK | |
| ***F. Environmental Impacts*** *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.* | | | | | |
| F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described? | /PDD/ (Section D) /EIA / /IM01/ | DR, I | Environmental impacts are considered significant by the project participants and identified under section D.1 of PDD, however below few important majors are not addressed and requires appropriate amendments in PDD | | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | – Dust pollution due to agricultural by product at VC site<br>– Stake gas analysis with respect to combustion RDF and agricultural<br>– Odor, health problem related to MSW/RDF handling and combustion of RDF in kiln<br>– Proper control mechanism for environmental pollution<br>– Segregation of biodegradable and non biodegradable waste procedure of MSW at Jaipur site<br>– Disposal of non biodegradable and by-product of RDF process<br>– Leaching of land at Jaipur site due to MSW handling<br>– Fly, insect nuisance at Jaipur site<br>– Applicable legislation<br>– Methane emission from MSW storage at Jaipur site<br>– Additional fertilizer requirement or used of agri by product other than project activity<br><br>As per section A.4.3 of PDD, technology to be employed is the development of the process with help of KHD Humboldt | ~~CAR F1~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | Wedag technology services, Germany however a description of how environmentally safe and sound technology, is not enlighten (Cp CDM-PDD guideline, section A.4.3). | ~~CAR F2~~ | |
| F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved? | /PDD/ (Section D) /IM01/ /EIA/ /SC/ | DR, I | The cost of the project activity is less than INR 500 million, the limit above which an expansion/ modernization project activity needs to carry out environmental impact assessment. Thus, EIA consultation process is not necessary for the project activity. | OK | |
| F.1.3. Will the project create any adverse environmental effects? | /PDD/ (Section D) EIA /IM01/ | DR, I | No, the project will not create any adverse environmental effects.<br>Please refer F.1.1 of table no 2 of validation protocol. | ~~CAR F1~~ ~~CAR F2~~ | OK |
| F.1.4. Are transboundary environmental impacts considered in the analysis? | /PDD/ (Section D) /IM01/ | DR, I | The project is not likely to cause any transboundary impacts | OK | |
| F.1.5. Have identified environmental impacts been addressed in the project design? | /PDD/ (Section D.) /IM01/ | DR, I | Environmental impacts are considered significant by the project participants and identified under section D.1 of PDD, however below few important majors are not addressed and requires appropriate | ~~CAR F1~~ | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | amendments in PDD<br>– Dust pollution due to agricultural by product at VC site<br>– Stake gas analysis with respect to combustion RDF and agricultural<br>– Odour, health problem related to MSW/RDF handling and combustion of RDF in kiln<br>– Proper control mechanism for environmental pollution<br>– Segregation of biodegradable and non biodegradable waste procedure of MSW at Jaipur site<br>– Disposal of non biodegradable and by-product of RDF process<br>– Leaching of land at Jaipur site due to MSW handling<br>– Fly, insect nuisance at Jaipur site<br>– Applicable legislation<br>– Methane emission from MSW storage at Jaipur site<br>– Additional fertilizer requirement or used of agri by product other than project activity<br>As per section A.4.3 of PDD, technology | | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | to be employed is the development of the process with help of KHD Humboldt Wedag technology services, Germany however a description of how environmentally safe and sound technology, is not enlighten (Cp CDM-PDD guideline, section A.4.3). | ~~CAR F2~~ | |
| F.1.6. Does the project comply with environmental legislation in the host country? | /PDD/ /IM01/ /SC/ | DR,I | The project participant is Vikram Cement and India as the host party. No Annex I party is involved in the project activity at this stage. DNA of India has granted the project activity host party approval, which is F. No. 4/14/2005-CCC, dated September 23, 2005.<br>VC has received consent to establish from Rajasthan Pollution Control Board under the provision of air (prevention and control of pollution) act 1981 and under the provisions of water (prevention and control of pollution) act 1974 for processing Refused Derived Fluff/ Pellet from MSW plant of capacity 52000 MT per year at Kharsa No 338, village Langadiawas, Tehsil Jamwaramgarh, District Jaipur. Biomass is proposed to collect from the near by village to VC site from biomass suppliers. | OK | |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | VC has also received consent of the board (Reference: 3334/TS/MPPCB/2004) under section 21 of air (prevention and control of pollution) act, 1981 by Madhya Pradesh Pollution Control Board (MPPCB) to use of scrape tyres/scrap cut tyres waste/MSW, other solid waste (other than hazardous waste) as a fuel valid for cement production capacity 40 (Forty) lacs MT per year. | | |
| ***G. Comments by Local Stakeholder***<br>*Validation of the local stakeholder consultation process.* | | | | | |
| G.1.1. Have relevant stakeholders been consulted? | /PDD/ (Section E.) /LSC/ | DR | Yes, stakeholder consultation has been conducted by VC. Various government authorities, local elected body representatives and beneficiaries due to project activity such as consultants and equipment suppliers are identified as stakeholders to the project activity. These are relevant stakeholders.<br>Under section E.1 of PDD, various stakeholders identified for the project activity, though employees working at Jaipur as well as Neemuch site are | ~~CR G1~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | ignored and desire further clarification. | | |
| G.1.2. Have appropriate media been used to invite comments by local stakeholders? | /PDD/ (Section E.) /LCS/ | DR, I | Project proponent had sent a letter, to local stakeholder to provide the information of project activity during the conceptualization of project activity period. | OK | |
| G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws? | /imef/ /LSC/ /MA/ /EC/ | | The cost of the project activity is less than INR 500 million, the limit above which an expansion/ modernisation project activity needs to carry out stakeholder consultation process as part of the environmental impact assessment. Thus, stakeholder consultation process is not required for the project activity. | OK | |
| G.1.4. Is a summary of the stakeholder comments received provided? | /PDD/ (Section E.) /LSC/ | DR | Yes, as required by the modalities and procedures of CDM, a summary of the comments is included in the section E.2 of PDD.<br>Project proponent has identified various stakeholders, under section E.1 of PDD however the reference of "The local stakeholder process should be completed before submitting the proposed project activity to a DOE for validation" (Cp CDM-PDD guidelines, version 06.2) is not | ~~CAR G1~~ | OK |

| CHECKLIST QUESTION | Ref. | MoV* | COMMENTS | Draft Concl. | Final Concl. |
|---|---|---|---|---|---|
| | | | mentioned in PDD and requires amendments with supportive evidence. In addition stake holder's consultation and minutes of meetings should be included in the section E.2 and E.3 of PDD with the specific environmental and health related question. | | |
| G.1.5. Has due account been taken of any stakeholder comments received? | /PDD/ (Section E.) /LSC/ | DR | A comprehensive note on the due account of the comments received has been presented in the Section E.3 of the PDD. The same was compared with the proof of the local stakeholder consultation /LSC/ and found OK. There are no negative comments for the project activity by stakeholders. | OK | |

**Table 3: Resolution of Corrective Action and Clarification Requests**

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| **Outstanding issue:**<br>During the course of validation, "Tool for the demonstration and assessment of additionality (version 2), 28 November 2005" has changed to (version 3), EB 29; hence as per ACM 0003, pg 3, The additionality of the project activity shall be demonstrated and assessed using the latest version of the "Tool for the demonstration and assessment of additionality" agreed by the CDM EB, which is available on the UNFCCC CDM web site. | B.2.7 | Additionality of project activity has been demonstrated by applying latest version i.e. version 03 of additionality tool in revised PDD. | Tool for the demonstration and assessment of additionality (version 3), EB 29, has been used to demonstrate the additionality of proposed CDM project activity. Under section B.1 reference of same is also incorporated.<br>Thus outstanding issue has been closed. |
| **CAR A1**<br>The project activity includes the agricultural by product storage facility, feeding system, calciner, kiln system and associated utilities, which are located in the Neemuch plant. The project activity also includes transportation of agricultural by product and RDF, located outside the plant boundary (Cp A.4.3. Technology to be employed by the project activity of PDD). However, the details of the | A.1.2. | The description of MSW and RDF storage facility of the Jaipur is included in the section A.4.3 of the corrected PDD. | Project proponent has incorporated the description of "MSW/RDF storage facility at Jaipur site" under section A.4.3 of revised PDD.<br>Here CAR A1 has been closed. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| MSW / RDF storage facility at Jaipur site have not been systematically included in the PDD. | | | |
| **CAR B1**<br>Reference of the approved baseline methodology applied to the project activity under section B of PDD is erroneously editited and requires appropriate revision (Cp ACM0003 / Version 04).<br>In addition under section B.1 of PDD, below references with applicable version are not mentioned:<br>▪ Tools for demonstration and assessment of additionality<br>▪ ACM0002 as reference for the grid emission factors from CEA | B.1.1, B.1.2 | The corrected No ACM0003 ver 04 is included in the PDD. Similarly the version no of the additionality tool is also included in the relevant section of PDD.<br>The grid emission factor is calculated as per the ACM0002 ver 06. The data used is the taken from central electricity authority, Govt. of India. The data source is authentic and used by many registered project. | References of applicable methodologies like ACM 0003, ACM 0002 and additionality tool with most recent versions are amended in revised PDD at respective sections.<br>Thus CAR B1 has been closed. |
| **CAR B2**<br>The numeration of the baseline scenarios (Cp table no 3-7 of PDD) doesn't match with baseline information given in Annex 3. Furthermore annex 3, para 1 of PDD, is showing a statement "The baseline for the project activity is a variable baseline" whereas the methodology requires that one baseline be selected. | B.2.5 | The necessary correction has been made in the respective sections of revised PDD. | The mismatch between baseline scenarios (Cp table no 3-7 of PDD) with baseline information given in Annex 3 with respect to figures are confirmed and validated by validation team and concluded in revised PDD.<br>Under annex 3 of PDD, now the statement is properly corrected |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| | | | by project proponent.<br>While selecting the baseline scenario for the project activity, the VC has selected option 2, (Select the baseline scenario through the barrier analysis) as per ACM0003/Version 04. Based on barrier analysis validation team has ascertained that, the scenario 1 (continuation of current practices) is most likely scenario in the absence of project activity and selected as a baseline scenario. However by comparing the emission factor of scenario 1, 2 and 3, the most conservative average emission factor is 95.12 $tCO_2/TJ$, which belongs to scenario no 2. So baseline GHG emission calculation is based on most conservative average emission factor.<br>Hence CAR B2 has been closed. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| **CAR B3**<br><br>Spreadsheet entitled "Enclosure_1_Vikram_Jan2007" having sub sheet named cost saving IRR, is unclear about the accounting of power consumption and associated cost for drying the alternative fuels outside the project site ($PD_{ADO}$) while calculating net benefit due to the project activity.<br><br>In addition page no 18, table no 10 of PDD showing the electricity cost INR 4.06/ KWh, but applicable to which site is not mentioned, this needs further clarification. | B.2.7 | There are two sources of electricity is used in the project activity. The one source is used from the Jaipur (Rajasthan state electricity board) and the cost associated with the use of that electricity is included in the processing cost of MSW.<br>Similarly the electricity will be used at the VC, Neemuch site for transportation of the fuel; that electricity is additional electricity and the cost associated with that is included separately in the PDD. The cost 4.06/kWh is the cost of electricity for VC, Neemuch site. | Table no 10, IRR analysis, of revised PDD has incorporated electricity cost INR 4.06/kWh, associated with VC site.<br><br>Also processing cost of MSW, (INR 615/ ton of RDF) is already taking a due account of electricity cost associated with Jaipur site, which is also supported by evidence.<br><br>Hence CAR B3 has been closed. |
| **CAR B4**<br><br>In order to demonstrate financial barrier, VC has submitted IRR spreadsheet calculation (Cp Enclosure_1_Vikram_Jan2007), though back up calculation with reference of below concern is not suitably explain in PDD<br><br>– Production loss due to plant shutdown during commissioning<br>– Electricity used for transportation of | B.2.7 | The following are the response on the different issues of IRR working sheet:<br>1. Production loss: It is estimated that 80 hrs will take for alignment of the alternative fuel feeding system with the existing cement manufacturing system. The realisation is | During the discussion with planning/ budgeting/financial official of VC as well as the assessment of submitted evidences, validation team had made the below conclusion:<br><br>The basis of production loss due to plant shutdown during commissioning is explained under sub-step 3a of |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| alternative fuel = 1964844 KWh<br>– Power consumption of drying the alternative fuels outside the project site ($PD_{ADO}$) = 7009848 KWh<br>– Processing cost of MSW = INR 615 /ton<br>– Transportation Cost of MSW = INR 600 /ton<br><br>Further sensitivity analysis conducted by considering company's internal benchmark and risk-free interest on bank deposit in India for year 2004-05. However estimated IRR is crossing the benchmark used (risk-free interest on bank deposit). Proper justification is needed to demonstrate that the proposed project activity is not the baseline scenario. | | 500 INR/ton of clinker. The production capacity is 125ton/hr. It will account for 50 Million INR.<br>2. The supporting for the electricity used for transportation of alternative fuel is submitted<br>3. The supporting for drying of alternate fuel is submitted.<br>4. The processing cost supporting is submitted to DOE.<br>5. The excel sheet for transportation cost is being submit with the corrected PDD.<br><br>The risk free return of RBI is fluctuating and has a huge variation. Therefore according to additionality tool ver 03 sub step 2b option 3 point no 4c is considered for benchmark | additionality.<br><br>The reference of electricity used for transportation of alternative fuel is taken from technical specification of technology supplier and given in section B.6.3 of revised PDD<br><br>Section B.6.1 of revised PDD has given the reference of power consumption of drying the alternative fuels outside the project site. The amount of electricity is taken from the technical specification of technology supplier.<br><br>In-house estimation and invited quotation has submitted by VC to arrive at processing cost of MSW. Electricity cost is also the part of processing cost.<br><br>On the basis of sensitivity analysis, validation team has found uncertainity in chosen benchmark (risk free returns on |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| | | analysis (i.e. 12% internal benchmark). The PDD is amended accordingly. | bank deposite) which varies from 5.38 to 13.0 per cent for the period 1972-2007. Further as per sub step 2b, point 4 C of additionality tool and during the assessment, validation team ascertain that a company internal benchmark is reliable with consistency (please refer registered project 0339 by same company group). During site visit and consequent discussion with financial expert of VC, validation team has ascertain that the decision of project activity implemenatation was a long term strategic decision only with company's steady internal benchmark and has got a clearer understanding of their sucess and failure. VC has submitted this benchmark and validation team has confirmed that this reliable benchmark has been consistently used in the past. By keeping uncertainty in |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| | | | view and in order to reduce the risk and priority setting among risk issue, opportunity cost benchmark (12 per cent) was considered by validation team for arriving at the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions.<br><br>Thus CAR B4 has been closed. |
| **CAR D1**<br><br>Project proponent has explained the monitoring plan in section B of PDD. For better transparency on monitoring plan of project activity, VC should provide the further background information used in the application of the monitoring methodology, while revising the PDD by considering below indicate (Cp CDM-PDD guidelines), version 06.2)<br><br>– Procedure for monitoring the parameter<br>– Uncertainty of monitoring instruments<br>– Tag number or equipment serial | D.1.4, D.2.1, B.2.7, D.2.3, D.2.4, D.2.5, D.6.5, D.6.6, D.6.7, D.6.8, D.6.9, D.6.10, D.6.11, D.6.12, D.13 | All the information's are included in the annex 4 of the corrected PDD. | OK<br>Thus CAR D1 has been closed. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| number of instrument<br>– Data description<br>– Traceability of calibration method/ standard<br>– Service and technical definition of instrument<br>– Make of instrument<br>– Location of instrument<br>– Calibration Method/procedure of monitoring equipment<br>– Range of monitoring instrument<br>– Linkage with system management | | | |
| **CAR D2**<br>Below key monitoring parameters are omitted under section B of PDD<br>– Quantity of fossil fuel which is reduced due to consumption of alternative fuels ($RQ_{FF}$)<br>– Amount of biomass residues of type j used as alternative fuel that would be landfilled in the absence of the project in the year x (t/yr) ($QAFL_{j,x}$)<br>– Fuel saving from on-site | D.2.1, D.2.3, D.2.4, D.2.5, E.1.1, E.1.2, E.1.3, E.1.4, E.1.5 | All the parameters are incorporated in the corrected PDD. | Key monitoring parameters $Q_{FF}$, $QAFL_{j,x}$ , $OF_{FF}$ , $HI_{AF}$, $S_{AF}$ , $OT_{GHG}$ has incorporated under section B of PDD.<br>Also data archived for $EF_{FF}$ and data unit for $EF_{tCO2}e$ has made inline with ACM 0003.<br>Thus CAR D2 has been closed. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| transportation of fossil fuels (t/yr) ($OF_{FF}$ )<br>– Heat input from alternative fuels (TJ/yr) in project case ($HI_{AF}$)<br>– Share of heat input from alternative fuels $S_{AF}$<br>In addition monitoring of emissions related to on-site transportation of alternative fuels is missing.<br>Further more data archived for $EF_{FF}$ and data unit for $EF_{TCO2}e$ is not inline with ACM 0003 (Cp ACM0003 / Version 04). | | | |
| **CAR E1**<br>Under section B.6.4 of PDD, summary of ex-ante estimation of emission reduction is explained however the categorization under<br>– Estimation of project activity emission<br>– Estimation of baseline emission<br>– Estimation of leakage<br>is not available in table requires appropriate amendment (Cp CDM-PDD guidelines). | E.1.1 | The table has been corrected according to the guideline given for completing the CDM-PDD. | Section B.6.4 of PDD, has appropriately incorporated emission reduction under category<br>– Estimation of project activity emission<br>– Estimation of baseline emission<br>– Estimation of leakage<br>Hence CAR E1 has been closed. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| **CAR E2**<br><br>While comparing annex 4 of PDD, emission reduction calculation and section B.3 "emissions sources included in or excluded from the project boundary", page no 11 of PDD, below significant basis are not considered.<br><br>• In project activity $CO_2$ emission from the burning of alternative fuel is due to non renewable part However as per mentioned statement "The main emission from combustion of fossil fuel in absence of project activity"<br>• Baseline GHG emissions due to anaerobic decomposition of biomass waste in the landfill ($LW_{CH4,y}$) is ignored as an emission source<br>• $CO_2$ emissions from the consumption of electricity for alternative fuel preparation is not apparent<br>• GHG emissions due to biomass that would be burned in the absence of the project ($BB_{CH4}$), is not considered | E.1.1 | All the relevant data is included in the project boundary explanation in corrected PDD. | OK<br><br>Thus CAR E2 has been closed |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| • $CH_4$ emission due to fossil fuel consumed for transportation of fossil and alternative fuel is missing | | | |
| **CAR F1**<br>Environmental impacts are considered significant by the project participants and identified under section D.1 of PDD, however below few important majors are not addressed and requires appropriate amendments in PDD<br>– Dust pollution due to agricultural by product at VC site<br>– Stake gas analysis with respect to combustion RDF and agricultural<br>– Odor, health problem related to MSW/RDF handling and combustion of RDF in kiln<br>– Proper control mechanism for environmental pollution<br>– Segregation of biodegradable and non biodegradable waste procedure of MSW at Jaipur site<br>– Disposal of non biodegradable and | F.1.1, F.1.3, F.1.5 | All the aspects are discussed in the section D.1 of the corrected PDD. | OK<br>Here CAR F1 has been closed. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| by-product of RDF process<br>– Leaching of land at Jaipur site due to MSW handling<br>– Fly, insect nuisance at Jaipur site<br>– Applicable legislation<br>– Methane emission from MSW storage at Jaipur site<br>– Additional fertilizer requirement or used of agri by product other than project activity | | | |
| **CAR F2**<br>As per section A.4.3 of PDD, technology to be employed is the development of the process with help of KHD Humboldt Wedag technology services, Germany however a description of how environmentally safe and sound technology, is not enlighten (Cp CDM-PDD guideline, section A.4.3). | F.1.1, F.1.3, F.1.5 | The environmental aspects of the technology are described in the section A of the PDD. | Under section A.4.3 of PDD, VC has properly described on *how environmentally safe and sound technology*, in revised PDD. Validation team founds explanation deemed OK.<br>Thus CAR F2 has been closed. |
| **CAR G1**<br>Project proponent has identified various stakeholders, under section E.1 of PDD however the reference of "The local stakeholder process should be completed before submitting the proposed project activity to a DOE for validation" (Cp CDM- | G.1.4 | The stakeholder consultation process is carried out before the submission of PDD to DOE and the supporting letters has been submitted to validation team. The project proponent has not received any negative comments. | Stakeholder consultation was done on 13/09/2006, which is earlier than submission of PDD to DOE and hence web hosting.<br>Under section E.2 and E.3 of revised PDD, it is mentioned that VC has not received any |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| PDD guidelines, version 06.2) is not mentioned in PDD and requires amendments with supportive evidence. In addition stakeholder's consultation and minutes of meetings should be included in the section E.2 and E.3 of PDD with the specific environmental and health related question. | | Under section E, environmental and health issue has been also discussed. The amendments are made in the PDD. | negative comments and same has been cross checked with stakeholder consultation letter.<br>During the local stakeholder (Gram Pradhan/Sarpanch) interviews by validation team, it is concluded that "health and environmental related issues was discussed with the villagers" and then letter was issued to VC.<br>Hence CAR G1 has been closed. |
| **Clarification Request (CR)** | | | |
| **CR A1**<br>The longitude and latitude of Vikram Cement (not the city) is necessary for the unique identification of the project activity. | A.1.1 | The same has been corrected in the PDD | VC Site lies parallels of latitude 24° 15' North, and the meridians of longitude 74° 45' East. The location of proposed project activity is at Vikram Cement, Khor, Distt. Neemuch, Madhya Pradesh.<br>Hence CR A1 has been closed. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| | | | |
| **CR A2**<br>VC explains the alternative fuel availability under section B.2 of PDD, nevertheless approximate average distance for transport of alternative fuels ($D_{AF}$) and fossil fuel ($D_{FF}$), is mentioned in PDD. | A.1.2, B.2.5, B.2.9, D.4.1 | The distance of the transportation of the alternative fuel is included in section A.4.3 of the corrected PDD. | Agriculture residue is available in the approximate diameter of 50 km. RDF will be transported from the Jaipur which is 400 km. from the VC site. During the interviews with alternative fuel transporters as well as standard atlas, distance data has been cross check by validation team.<br>CR A2 thus closed. |
| **CR B1**<br>The aspects 'energy quantities require for any preparation of the biomass, occurring before use in the project activity, except from transportation and/or drying of the biomass, and associate GHG emissions' by considering applicability condition is ignored and needs further clarification (Cp ACM0003/Version 4, 2nd bullet of applicability). | B.1.1, B.1.2, B.2.7 | The same has been incorporated in the PDD. | OK<br>Thus CR B1 has been closed. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| **CR B2**<br><br>Emission reduction and baseline calculations provided in the PDD were verified by validation team. Conversely basis for heating values of different fuels has not been described in the PDD.<br><br>Furthermore,<br><br>– Step 2 (Cp section B.6.3, page no 32 of PDD) detailed calculation of $HC_{AF,y}$ and $HC_{FF}$ is missing while calculating moisture penalty.<br>– F fraction of $CH_4$ in landfill gas under section B.6.3 of PDD, page no 37 showing values – 0.5, and excel sheet "landfill emissions" has considered 0.4, this deviation needs further clarification.<br>– Value applied for $VEF_{CH4}$, $VEF_{N2O}$, $VEF_{CO2}$, $VEF_D$ in section B.6.2 of PDD is mismatched with Annex 4 of PDD | B.2.5, B.2.7, B.2.9, D.2.1, D.4.1, E.3.1, E.3.2, E.3.3, E.3.4 | The basis for heating values is the actual calorific value measure in the lab. The bomb calorimeter is used for the estimation of calorific value.<br>For the MSW the calorific value is considered the guaranteed calorific value given by the technology supplier.<br>The corrections have been made in relevant sections of PDD. | Basis for heating values of different fuels is explained in Annex 4 of revised PDD.<br><br>$HC_{AF,y}$ and $HC_{FF}$ values are now mentioned in PDD while calculating moisture penalty.<br><br>F fraction of $CH_4$ in landfill gas value (0.5) is now corrected in spread sheet which is inline with section B.6.3 of PDD.<br><br>Value applied for $VEF_{CH4}$, $VEF_{N2O}$, $VEF_{CO2}$, $VEF_D$ in section B.6.2 of PDD is now corrected with respect to emission reduction calculation spread sheet.<br><br>Thus CR B2 has been closed. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| **CR B3**<br>The time period of calculating the IRR does neither correspond to the expected lifetime (20 years) of the project activity nor to the crediting period (10 years). This needs clarification. | B.2.7 | 20 years IRR calculated and submitted to the DOE. | VC has resubmitted IRR calculation sheet, which corresponds to the expected lifetime (20 yeas) of the project activity. By these amendments IRR for the project activity without CDM changes from 0.45 to 5.59, and IRR of the project with CDM changes from 10.65 to 13.69. However this changes are not reducing the financial barrier to the project activity and hence opinion.<br>Here CR B3 has been closed. |
| **CR B4**<br>In sub-step 3a the barrier due to prevailing practice is missing (Cp Tool for the demonstration and assessment of additionality). | B.2.7 | The same has been incorporated in the PDD. | OK<br>CR B4 thus closed. |
| **CR B5**<br>While explaining investment barrier, project proponent has tabulated IRR analysis (Cp B.5, table no 10 of PDD). However VC needs to clarify the reference of escalation in the prices of imported coal, Indian coal and pet | B.2.7 | The sources for the escalation in the coal and imported coal were from the CRISIL report for the Indian cement industries. While for the pet coke there was no such type of document was available. | CRISIL report is considered as authentic reference sources to arrive at escalation in the coal and imported coal prices for the Indian cement industries.<br>Also VC has submitted |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| coke considered in IRR spreadsheet. | | While conceptualizing the project activity three years average pet coke prices were available and the average escalation was 3.7 per cent. Seeing the escalation in the coal and imp coal cost this was low. According to expert judgement in the plant the escalation in the pet coke is considered equivalent to imported coal and IRR was calculated.<br><br>All the supporting for the same is provided to DOE. | historical data to understand the escalation in pet coke prices. All data was assessed by validation team and found inline with calculation spread sheet.<br><br>Thus CR B5 has been closed. |
| **CR C1**<br><br>During site visit of validation process, the project activity was under commissioning stage. Hence VC should clarify about suitable starting date of fixed crediting period according to the most likely commercial production begin. | C.1.2 | The project is expected to start from 1st June 2007. The crediting period start date is mentioned as 01/06/2007. The actual crediting period of the project activity will start from the date of registration only for CER estimation purposes the 01/06/2007 is used.<br><br>The same has been corrected in the PDD and crediting period will start from 1st June 2007. | VC has considered starting date of fixed crediting period is 01/06/2007, which is also confirmed during the site visit interviews of VC's officials and likely to be inline with commercial production begin. Furthermore the modalities of communication dated 13/02/2007 submitted by VC declares that statement "*starting date of fixed crediting period will be date not earlier* |

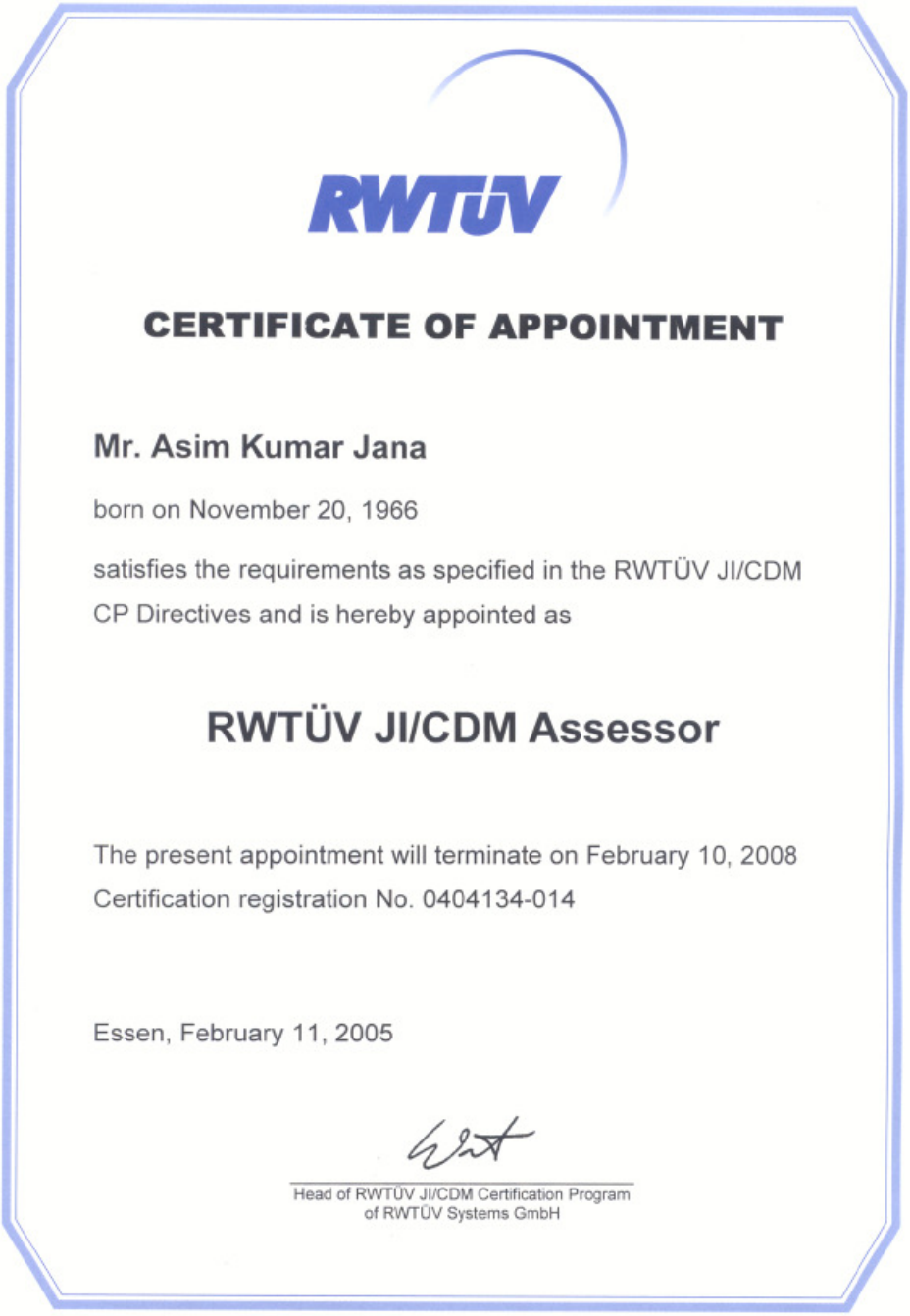
| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| | | **The starting date of the crediting period was shifted to 01/07/2007 subsequently as the project activity faced unexpected time delay.** | *than registration date"*.<br>Hence CR C1 has been closed.<br>**Due to time delays the starting date of the project activity was shifted from 01/06/2007 to 01/07/2007. Even if the calculations are based on a starting date in beginning of June 2007 (as stated in the PDD and relevant other documents) the change to beginning of July 2007 is not influencing the emission reduction calculations.** |
| **CR D1**<br>Project proponent is required to submit the supportive documents for the following procedures:<br>• Dealing with possible monitoring data adjustments and uncertainties related to measurement of GHG emission.<br>• Internal audits of GHG project compliance with operational requirements where applicable. | D.1.3, D.1.4, D.6.3, D.6.5, D.6.6, D.6.7, D.6.8, D.6.9, D.6.10, D.6.11, D.6.12, D.6.13, E.3.5 | The CDM manual and Emergency preparedness plan is prepared and already put in implementation for the project. That plan is covering all the aspects discussed here. | CDM manual and emergency preparedness plan are taking a due account of all issues raised under CR D1. Validation team found it's deemed OK; hence CR D1 has been closed. |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| • Training of monitoring personnel.<br>• Emergency preparedness for cases where emergencies can cause unintended emissions<br>• Day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)<br>• Project performance reviews<br>• Corrective actions<br>• Calibration certificate with traceability of all monitoring equipment | | | |
| **CR D2**<br>According to the 'Guidelines for completing the PDD …' section B.6.2 should include only parameters that are not monitored throughout the crediting period but that are determined once and thus remains fixed throughout the crediting period. This doesn't apply to all parameters listed in this section and needs further clarification (Cp ACM 0003/Version 04). | D.2.1 | The relevant corrections have been done in the PDD. | Parameters, which are not monitored throughout the crediting period but that, are determined once and thus remains fixed throughout the crediting period are only included in section B.6.2 of revised PDD and also checked by validation team.<br>Thus CR D2 has been closed. |
| **CR D3**<br>Under section B.7.1 of PDD information | D.6.7, D.6.8 | The same has been corrected in the PDD. | Appropriate recording frequencies of all key- |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| related to "Data and parameters monitored" are provided, however recording frequency of monitoring parameters is unnoticed. | | | monitoring parameters are mentioned in section B.7.1 of revised PDD.<br><br>Thus CR D3 has been closed. |
| **CR E1**<br><br>MSW and hence composition of RDF is divided in two parts, 84.7 per cent biomass and 15.3 per cent non renewable (Page no 58 of PDD) and associated emission reduction calculation. However monitoring plan is unclear with respect to composition of MSW/RDF monitoring, as there is every chance of changing the composition. | E.3.3 | IPCC default factor is used for this and it will be constant for the entire crediting period. | The expected composition of RDF is taken from reference "Technology Information Forecasting and Assessment Council (TIFAC), department of science and technology, Government of India, New Delhi, March 11, 2004, Presentation on "electricity from MSW".<br>However IPCC guideline suggests (ref: 2006 IPCC Guidelines for National Greenhouse Gas Inventories, volume 2, chapter 2, page 2.17) the default factor for MSW emission factor. The emission factor of MSW/RDF changed from 100 to 91.7 $tCO_2/TJ$ and same is considered for calculation. Hence CR E1 has been closed. |
| **CR E2** | E.3.3 | The relevant corrections have | Average biomass residue |

| Draft report clarification requests and corrective action requests by validation team | Ref. To checklist question in table 2 | Summary of project owner response | Validation team conclusion |
|---|---|---|---|
| The timeframes (point 1 and 2) under section B.2 of PDD don't match with the calculations in later sections B.6.3 and the calculation sheet (Cp. RDF and biomass residue consumption in B.6.3. of PDD). | | been made in the PDD. | consumption per year is 2870 tons while RDF per year is 36225 tons, which is now inline with the calculations in later section B.6.3, and the calculation sheet. All the alternative fuel consumption values are checked by validation team and founds deemed OK hence CR E2 has been satisfactorily closed. |
| **CR G1**<br>Under section E.1 of PDD, various stakeholders identified for the project activity, though employees working at Jaipur as well as Neemuch site are ignored and desire further clarification. | G.1.1 | The employees working at Jaipur as well as VC site were considered for the stakeholder consultation. The letters from the same has been submitted to DOE and the correction is made in the corrected PDD. | Under section E.1 of PDD, employees working at RDF preparation Jaipur site as well as VC, Neemuch site are considered in revised PDD.<br>CR G1 has been closed. |

## CERTIFICATES OF TEAM MEMBERS



RWTÜV

**CERTIFICATE OF APPOINTMENT**

**Mr. Asim Kumar Jana**

born on November 20, 1966

satisfies the requirements as specified in the RWTÜV JI/CDM CP Directives and is hereby appointed as

**RWTÜV JI/CDM Assessor**

The present appointment will terminate on February 10, 2008

Certification registration No. 0404134-014

Essen, February 11, 2005

Head of RWTÜV JI/CDM Certification Program
of RWTÜV Systems GmbH

TÜV NORD

**CERTIFICATE OF APPOINTMENT**

**Mr. Manojkumar Borekar**

born on 1979-10-14

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

**TÜV NORD JI/CDM Expert**

The present appointment will terminate on 2010-01-28
Certification registration No. 06 05 02 - 38

Essen, 2007-01-29

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH

TÜV NORD

## CERTIFICATE OF APPOINTMENT

**Mr. Dipl-Ing. Rainer Winter**

born on 1963-02-21

satisfies the requirements as specified in the TÜV NORD JI/CDM CP directives and is hereby appointed as

## TÜV NORD JI/CDM Assessor

The present appointment will terminate on 2010-02-26
Certification registration No. 04 02 154-03

Essen, 2007-02-27

Head of TÜV NORD JI/CDM Certification Program
of TÜV NORD CERT GmbH