CLEAN DEVELOPMENT MECHANISM
SIMPLIFIED PROJECT DESIGN DOCUMENT
FOR SMALL-SCALE PROJECT ACTIVITIES (SSC-CDM-PDD)
Version 02

CONTENTS

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.

SECTION A. General description of the small-scale project activity

A.1. Title of the small-scale project activity:

>> GHG emission reduction by energy efficiency improvement of clinker cooler in cement manufacturing at Rajashree cement, India.
Version 01
22th December 2005

A.2. Description of the small-scale project activity:

>> Rajashree Cement (RC) is the progressive Cement Manufacturing Company of India, operating since 1984. Rajashree cement belongs to well known Grasim Industries Ltd of Aditya Birla group of companies. RC is manufacturing cement {ordinary portland cement (OPC), portland pozzolana cement (PPC)} & clinker. The present capacity of plant is 4.2 Million TPA. The project activity is applied to line I and III of RC out of three lines of clinker production.

The project activity is performed in two phases for line I:

1. Up-gradation of pre-heater section from (5th stage to 6th stage) as a part of phase one which was completed in year 2001-02
2. Up-gradation of clinker cooler in phase two completed in year 2002-03

The project activity upgrades clinker cooler for energy efficiency in the cement manufacturing process. Cement process Line-I and III of the plant were commissioned with the best available technology by the KHD, Germany. A reciprocating grate cooler was used for clinker cooling.

The project is the redesigning and retrofitting of the grate system with Omega plate type system, which will increase the cooler recuperation efficiency i.e. utilise more heat in clinker cooler. In this project activity new clinker inlet distribution system is used to distribute the clinker on the reciprocating grate. Due to the benefits of the inlet grate system in clinker cooler, the proper cooling of inlet is taking place with additional benefit of high temperature tertiary air ducts.

The project activity contributes to sustainable development at the local, regional and global levels in the following ways:

Social Well Being:

The project activity has reduced the GHG emissions to the atmosphere associated with the production of cement, by reducing the consumption of fossil fuels. The project activity has also resulted in providing better 'Occupational Health & Safety' (OHS) conditions at the work place. The project activity reduces the consumption of coal, a key energy resource in India, thereby making it available for other purposes.

Economical well being:

The project activity has resulted in reducing the operational costs involved with the manufacture of cement and conservation of natural resources.

Environmental well being:

A) Thermal energy conservation

The project activity reduces specific thermal consumption for cement production and conserves the energy. Indian economy is highly dependent on "Coal – a finite natural resource" as fuel to generate power and heat for production processes. Since, this project activity reduces its specific thermal energy consumption it has positively contributed towards conservation of coal, a non-renewable natural resource and making coal available for other important applications.

B) GHG emission reduction

The project activity is helping in the CO_2 emission reduction. Due to saving in coal the amount of emission from per unit of clinker is also reduced.

Technological Well Being:

The project promotes better usage of energy in the cement industry, by implementing the latest technology available.

This way this project activity is helping in sustainable development.

A.3. Project participants:

>>

Name of Party involved	**Private and/or public entity (ies) proj ect participants**	**Kindly indicate if the Party involved wishes to be considered as project participant (Yes/ No)**
India (Host Country)	Rajashree Cement Adityanagar, Malkhed Road, District: Gulbarga Karnataka, PIN 585292 India	No

A.4. Technical description of the small-scale project activity:

>>

A.4.1. Location of the small-scale project activity:

>> RC is located at P.O. Adityanagar, district Gulbarga (Karnataka). Adityanagar lies between the parallels of latitude 17^0 5' - 17^0 10', and between the meridians of longitude 77^0 10' - 77^0 15'. The location of proposed project activity is at Rajashree Cement. The plant is well connected by railway and road transport.

A.4.1.1. Host Party(ies):

>> India

A.4.1.2. Region/State/Province etc.:

>> Karnataka

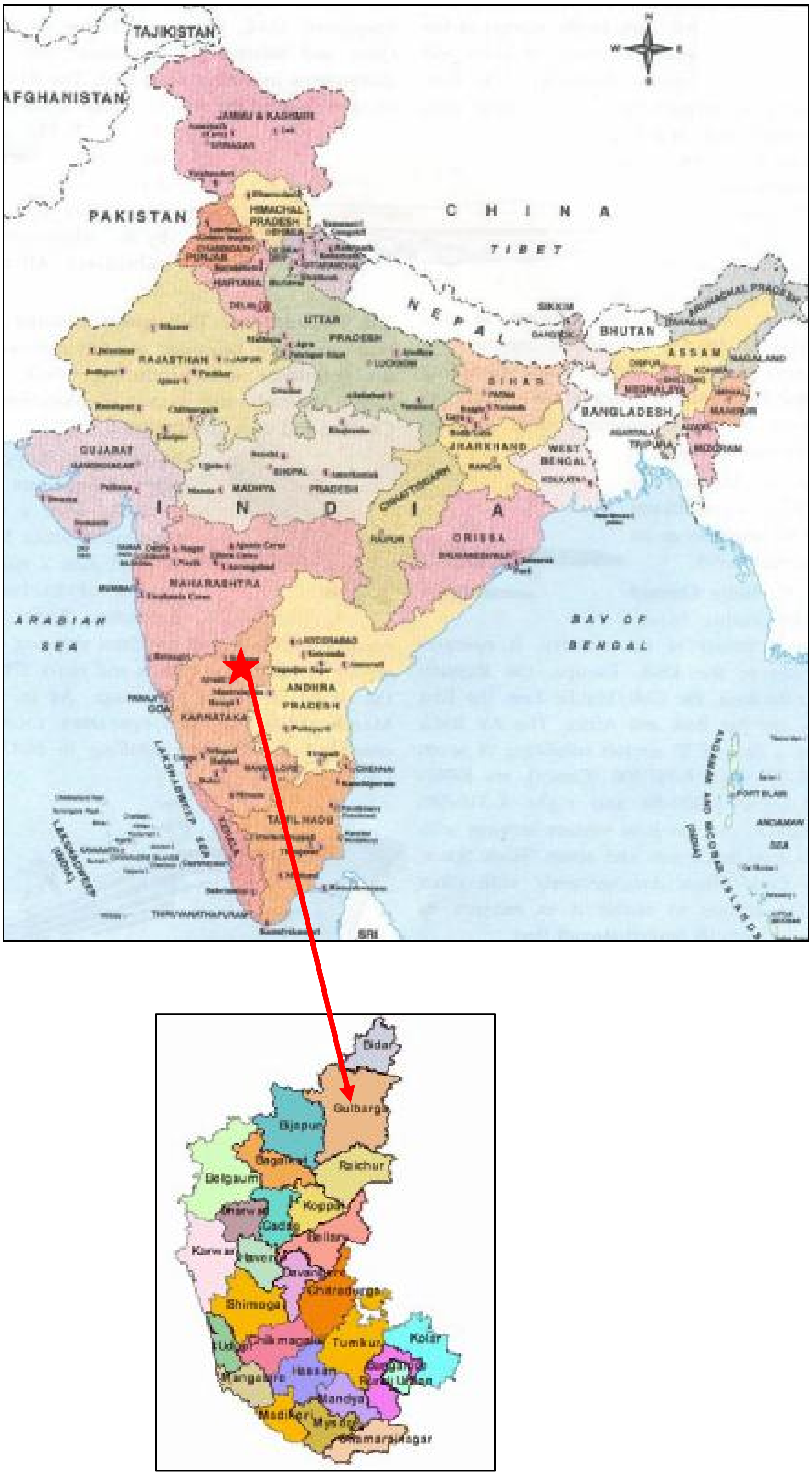
A.4.1.3. City/Town/Community etc:

>> P. O. Adityanagar, Dist: Gulbarga

A.4.1.4. Detail of physical location, including information allowing the unique identification of this small-scale project activity(ies):

>> The physical location of project is shown in the map below:

Fig 1 : Location of activity site



A.4.2. Type and category(ies) and technology of the small-scale project activity:

>> Type and Category of Project Activity

The project meets the applicability criteria of the small-scale CDM project activity category, Type-II: energy efficiency improvement projects (D: Energy efficiency and fuel switching measures for industrial facilities) of the 'Indicative simplified baseline and monitoring methodologies for selected small scale CDM project activity categories'.

Main Category: ***Type II – Energy efficiency improvement project***

Sub Category: ***D. Energy efficiency and fuel switching measures for industrial facilities***

As per the provisions of appendix B of simplified modalities and procedures for small scale CDM project activities (version 07), Type II D "Comprises any energy efficiency and fuel switching measure implemented at a single industrial facility. This category covers project activities aimed primarily at energy efficiency; a project activity that involves primarily fuel switching falls into category III.B. Examples include energy efficiency measures (such as efficient motors), fuel switching measures (such as switching from steam or compressed air to electricity) and efficiency measures for specific industrial processes (such as steel furnaces, paper drying, tobacco curing, etc.). The measures may replace existing equipment or be installed in a new facility. The aggregate energy savings of a single project may not exceed the equivalent of 15 GWh_e per year. A total saving of 15 GWh_e per year is equivalent to a maximal saving of 45 GWh_{th} per year in fuel input."

As per paragraph 1 of II. D. of appendix B of the UNFCCC defined simplified modalities and procedures for small-scale CDM project activities, 'The aggregate energy savings of a single project may not exceed the equivalent of 15 GWh_e per year. A total saving of 15 GWh_e per year is equivalent to a maximal saving of 45 GWh_{th} per year in fuel input'. The project activity is energy efficiency project and saving depends on the cooler efficiency and clinker production. The efficiency increase will be almost constant and the production may vary within the limit.

The baseline and emission reduction calculations from the project would be based on paragraphs 3 and 4 of appendix B (version 07, dated 28th November 2005) and the monitoring methodology would be based on guidance provided in paragraph 6, 7 and 8 of II D of the same appendix B.

Technology to be applied to the project activity:

Line 1: Preheater up-gradation

Preheater consists of number of cyclones to transfer heat from gases to the material entering at the top stage. It is a counter current flow. Material comes in contact with gas and gets heated up. At the entry point material temperature is approx.70°C, but when it comes to Kiln inlet, its temperature increases upto 1000°C.The gas which flows from kiln is at 1100°C and when it passes out of pre-heater 5th stage, it is approx.300°c and in 6th stage preheater, it is around 260-270°C. A secondary firing is also done in calciner to increase gas temperature and increase calcination of material and it is around 60% of the total coal required for clinkerisation.

In cyclone of preheater there are two parts. The upper part called riser duct is meant for heat transfer. Where as the cone and cylindrical part acts as a separator. Material falls down and is transferred to another cyclone where as gases are sucked by means of preheater fan.

By this project activity pre heater exist gas temperature reduces to 260°C from 300°C. This 40°C temperature drop gives further reduction in specific fuel consumption. In practice, addition of one stage, raw feed, which enters the pre heater tower, has sufficient time to absorb temperature from gas and cool down pre heater exist gas temperature. By this retrofit measure, it is possible to achieve fossil fuel saving. The project activity reduces specific thermal energy consumption to a great extent and slight increase in specific electrical energy consumption.

Line 1 and 3: Cooler up gradation:

The technology provider was KHD, Germany at inception of the lines. They supplied reciprocating grate cooler for clinker cooling with original plant. The reciprocating grate system comprises rows of alternately fixed and movable grate plates, secured by means of T-bolts to grate support girders. The plates of various grades of steel are used along with the cooler corresponding to the different thermal and mechanical loading conditions. The holes in the rear part of the plate's acts as nozzles, directing the cooling air flow vertically upwards. Air is forced horizontally into the bed of clinker through the gaps between the fixed and the movable plate rows and through the holes in the end faces of the plates. The cooling stream and the continual agitation of the clinker by the grate movements ensure that the clinker particles come into intimate contact with the air.

The project is the redesigning of the grate system with Omega plate type system, which will increase the cooler recuperation efficiency. This Omega type system works due to the design of Omega plates (Row aerated & Chamber aerated). The cooling of clinker takes place faster due to concentrated flow of air to the clinker bed through the row aerated and beam aerated omega plates.

The technology employed is Omega plate type grate cooler system. This technology is the retrofitting of the existing system. It uses the new clinker inlet distribution system to distribute the clinker on the grate. The inlet area consists of 7 fixed rows. The omega grate system consisting of fixed and moving beams. The omega plates are of row aerated and chamber aerated type. Row aerated plates are provided with cooling air for each row of plates through dedicated flexible cooling air lines and chamber aerated rows are provided cooling air through pressurised chamber. The combined effect of row and chamber aerated plates helps in faster cooling of clinker and better heat recuperation through tertiary air duct (TAD) and also reduction clinker temp.

The clinker is transported by inclination of the inlet and by the cooling air.

A.4.3. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed small-scale project activity, including why the emission reductions would not occur in the absence of the proposed small-scale project activity, taking into account national and/or sectoral policies and circumstances:

>> The project activity would reduce the specific heat consumption in the clinker cooler section in the cement production. The project activity would thereby bring about a reduction in direct on-site emissions from reduced thermal energy consumption.

Though the Ministry of Environment and Forest (MoEF), Ministry of Power (MoP) and Ministry of Non conventional Energy Sources (MNES) in India encourage energy conservation on voluntary basis but do not compel cement industries to reduce their specific energy consumption to a prescribed standard. Further, the Department of Industries/ the Bureau of Indian Standards/ Cement Manufacturers Association/ National Council for Building Materials also have not imposed any directives towards specific energy consumption in specific section in cement manufacturing. The project proponent has implemented the project activity over and above the national or sectoral requirements. The GHG reductions achieved by the project activity are additional to those directed by the governmental policies and regulations. The other “additionality” criteria of the project activity are dealt with in section B

A.4.3.1 Estimated amount of emission reductions over the chosen crediting period:

>>

Line 1:

Year	**Annual Estimation of Emission reduction tCO_2e**
2004	12,135
2005	14,358
2006	14,358
2007	14,358
2008	14,358
2009	14,358
2010	14,358
2011	14,358
2012	14,358
2013	14,358
Total	**141,361**
Crediting Years	**10**
Average Emission reduction over the crediting period (t CO2)	**14,136**

Line 3:

Year	**Annual Estimation of Emission reduction tCO_2e**
2004	12,201
2005	13,281
2006	13,281
2007	13,281
2008	13,281
2009	13,281
2010	13,281
2011	13,281
2012	13,281
2013	13,281

Total	**131,731**
Crediting Years	**10**
Average Emission reduction over the crediting period	**13,173**

A.4.4. Public funding of the small-scale project activity:

>> No public funding for the project activity.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a larger project activity:

>>

According to appendix C of simplified modalities and procedures for small-scale CDM project activities, '***debundling'*** is defined as the fragmentation of a large project activity into smaller parts. A small-scale project activity that is part of a large project activity is not eligible to use the simplified modalities and procedures for small-scale CDM project activities.

According to para 2 of appendix C[1]

A proposed small-scale project activity shall be deemed to be a debundled component of a large project activity if there is a registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- With the same project participants;
- In the same project category and technology/measure;
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small- scale activity at the closest point

In view of above-mentioned points of de-bundling, Rajashree Cement's project activity is not a part of any of the above, therefore, considered as small scale CDM project activity.

[1] Appendix C to the simplified M&P for the small-scale CDM project activities, http://cdm.unfccc.int/Projects/pac/howto/SmallScalePA/sscdebund.pdf

SECTION B. Application of a baseline methodology:

B.1. Title and reference of the approved baseline methodology applied to the small-scale project activity:

>> Main Category: **Type II – Energy efficiency improvement projects**

Sub Category: **II. D-Energy efficiency and fuel switching measures for industrial facilities**

The reference has been taken from the list of the small-scale CDM project activity categories contained in 'Appendix B of the simplified M&P for small-scale CDM project activities-Version 7 (28^{th} November 2005)'.

B.2 Project category applicable to the small-scale project activity:

>> The project activity fits under Type II.D – Energy efficiency and fuel switching measures for industrial facilities under Appendix B. The project activity is the retrofit in cooler for energy efficiency. The project activity is reducing the use of energy in cement manufacturing and will fall under the category II. D. of the appendix B.

The project activity fits under Type II.D – Demand-side energy efficiency programmes for specific technologies under Appendix B as it uses an energy efficient technology at different sites that replaces existing equipment or is installed at new sites. As per Type II – D project category, the aggregate energy savings by a single project should not exceed 45 $GWh_{thermal}$ per year. Here a single project refers to one sub-bundle as defined in paragraph below.

The EB 21 meeting report, Annex 21 - 'General Principles of Bundling', states that 'project activities within a bundle can be arranged into one or more sub-bundles, with each project activity retaining its distinctive characteristics which includes technology/ measure; location; application of simplified baseline methodology. The project activities within the sub-bundle belong to the same type and the of output capacity of project activities within a sub-bundle shall not exceed the maximum output capacity limit for its type'.

The application of the efficient clinker cooler is at two different places in the different line of clinker production. The saving in thermal energy from the project activity is in the tune of 43 $GWh_{thermal}$ from line 1 and 40 $GWh_{thermal}$ from line 3.

Based on above calculation it is clear that the project activity is well within the range of small scale project activity II.D.

The project activity is applied in a part of clinker manufacturing process i.e. cooler. The cooler used for cooling the clinker and waste heat recovery to the clinker manufacturing process. Since the cooler is not a direct energy user; it takes heat from the fuel applied to the preheater and kiln, efficiency before and after project activity is used for the estimation of heat saving.

All types of fuel use in the cement manufacturing will be monitored and the average emission factor will be calculated based on the fuel mix for the emission reduction calculations. The information regarding baseline and project data are presented in the table below:

Table 2: Baseline and project activity data requirement and data source

S. No.	Parameter	Data source
Baseline Scenario		
1	Cooler efficiency	Plant
2	Fuel used in clinker manufacturing	Plant
3	Calorific value of the fuel used	Plant
Project Scenario		
4	Cooler efficiency	Plant
5	Fuel used in clinker manufacturing	Plant
6	Calorific value of the fuel used	Plant
7	Emission factor of the fuel used	Default emission factor from IPCC

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

>> In accordance with paragraph 3 of the simplified modalities and procedures for small-scale CDM project activities, a simplified baseline and monitoring methodology listed in Appendix B may be used for a small-scale CDM project activity if project participants are able to demonstrate to a designated operational entity that the project activity would otherwise not be implemented due to the existence of one or more barrier(s) listed in Attachment A of Appendix. B. These barriers are:

- Investment barrier
- Technological barrier
- Barrier due to prevailing practice
- Other barriers

The implementation of the energy efficiency project activity in cooler is a voluntary step undertaken by no direct or indirect mandate by law.

The main driving force to this 'Climate change initiative' is:

- GHG reduction
- Fossil fuel conservation

However, the project proponent was aware of the various barriers associated to project implementation. But it is felt that the availability of carbon financing against a sale consideration of carbon credits generated due to project activity would help to overcome these barriers. Some of the key barriers are discussed below:

Technological barriers

Skilled and experienced engineers/ operators to operate and maintain the technology were not available, which could have lead to equipment disrepair and malfunctioning.

Before the retrofit measure in the cooler project proponent has expected following operational problems:

Snowman formation: Snowman is clinker pile which can be formed due to slow movement of clinker. The project activity was the modification in the grate system therefore clinker moving pattern was likely to change. Project proponent has expected the snowman formation due to the change in grate system. The snowman formation leads to operational problems in clinker manufacturing and reduces the efficiency also. Removal of hard snowman called for plant shut down also. For smooth operation the snowman should not be formed and the same should be broken if formed. The project proponent actually faced same problem after clinker cooler retrofit measure and installed UT pumps and air blasters for the same.

Unfamiliarity with technology: The project proponent was not aware with the technology used in cooler retrofitting. Operational problems with the unfamiliarity of technology lead to reluctance of operators working in the section.

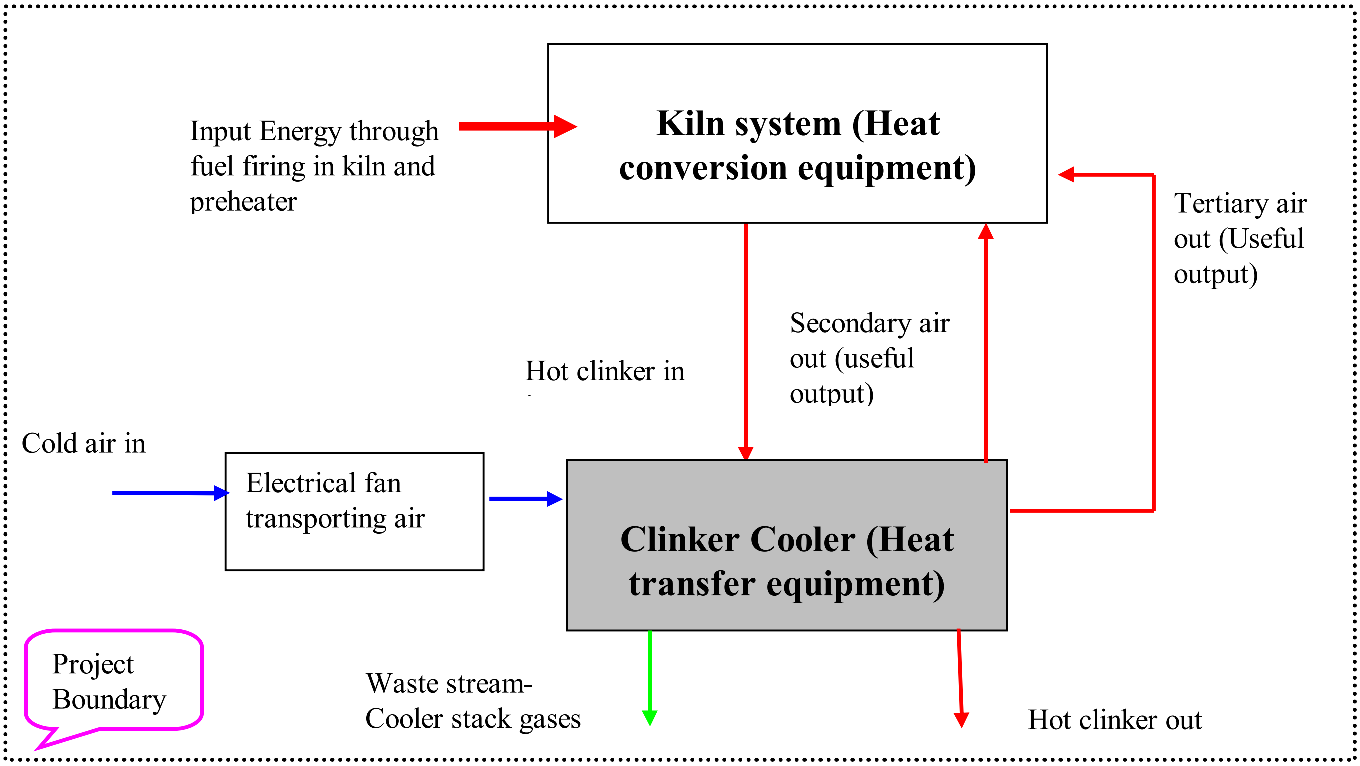
Barriers due to prevailing practice

The 'cooler energy efficiency project', when implemented as ***retrofit measure***, was "one of the first of a kind" project, due to low penetration of this technology, in Indian cement industries. Cooler is very critical part of the cement process, and general belief in Indian cement industry is that 'tempering with it may lead to production stoppages and quality problems'. Therefore, this technology, due to its 'state-of-the-art' features, risk potential and complexity, is still scarcely implemented in Indian cement industry.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the small-scale project activity:

>> Based on baseline methodology, 'the project boundary is the physical, geographical site of the industrial facility, processes or equipment that is affected by the project activity'. The project boundary selected is the clinker cooler (heat transfer equipment directly associated with heat conversion equipment *i.e.* kiln) and kiln system (heat conversion equipment), including preheater section because these all equipments are effecting from the project activity. The pictorial presentation of the project boundary is given below:

Project Boundary



Date of baseline development: 11/12/2005

Rajashree cement and associated consultants

SECTION C. Duration of the project activity / Crediting period:

C.1. Duration of the small-scale project activity:

>>

C.1.1. Starting date of the small-scale project activity:

>>
15/06/2001

C.1.2. Expected operational lifetime of the small-scale project activity:

>> 20 Years 0 months

C.2. Choice of crediting period and related information:

>> Fixed

C.2.1. Renewable crediting period:

>> Not Applicable

C.2.1.1. Starting date of the first crediting period:

>> Not Applicable

C.2.1.2. Length of the first crediting period:

>> Not Applicable

C.2.2. Fixed crediting period:

>>

C.2.2.1. Starting date:

>> 01/02/2004

C.2.2.2. Length:

>> 10 Years 0 months

SECTION D. Application of a monitoring methodology and plan:

>>

D.1. Name and reference of approved monitoring methodology applied to the small-scale project activity:

>> **Title:** Monitoring Methodology for the category II D – Energy efficiency and fuel switching measures for industrial facilities.

Reference: 'Paragraph 6 to 8' as provided in Type II.D. of Appendix B of the simplified modalities and procedures for small-scale CDM project activities - Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-Scale CDM Project Activity Categories.

D.2. Justification of the choice of the methodology and why it is applicable to the small-scale project activity:

>> As established in Section B.2 the project activity falls under Category II.D. Energy efficiency in clinker cooler leads to mitigation of GHG emissions that would have been produced by the inefficient operation. In order to monitor the mitigation of GHG due to the project activity, the fuel used and efficiency need to be measured. The project activity is the retrofit to cooler for energy efficiency. In the monitoring all the parameters related with fuel use and efficiency of cooler is monitored.

In the monitoring plan mainly these data is monitored:

1. Fuel used in clinker manufacturing
2. Calorific value of the fuel
3. Parameters related with the cooler efficiency

Based on the monitored data and the IPCC emission factors the baseline emissions and project activity emissions are calculated.

There is no technology transfer in the project activity therefore the project activity doesn't lead to any leakage emissions. The difference between the baseline and project emissions is reported as emission reductions from the project activity.

D.3 Data to be monitored:

>> <u>Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:</u>

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
P.1	Clinker production (Clk)	Plant	Tons/day	Measured and calculated	Recorded continuously	100%	Electronic	
P.2	Quantity of fuel consumed (Q_{Fuel})	Plant	Tons/month	Measured and calculated	Recorded continuously and reported monthly	100%	Electronic	Weigh bridge
P.3	Emission factor of fuel (EF_{Fuel})	IPCC	TCO_2/TJ	Fixed	Fixed	100%	Electronic	Fixed
P.4	Calorific value of fuel consumed (CV_{Fuel})	Plant	Kcal/kg	Measured	Recorded continuously and reported monthly	100%	Electronic	Bomb calorimeter
P.5	Average emission factor ($EF_{average}$)	Plant	TCO_2/TJ	Calculated	Monthly	100%	Electronic	
Clinker cooler Efficiency calculations								

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
P.6	Inlet temperature of clinker in cooler ($T_{Clk\ In}$)	Plant	°C	Estimated	Fixed	100%	Electronic	The inlet temperature of clinker in cooler is estimated constant in pre and post project scenario, based on technology supplier.
P.7	Specific heat of clinker ($S_{Clk\ In}$)	Formulae provided by technology suppler	Kcal/kg°C	Calculated	Weekly	100%	Electronic	
P.8	Temperature of clinker dust from kiln to cooler (T_{Dust})	Plant	°C	Estimated	Fixed	100%	Electronic	Same as clinker temperature.
P.9	Clinker dust from kiln to cooler (M_{Dust})	Plant	TPD	Estimated	Fixed	100%	Electronic	Based on technology supplier mass of recirculation dust is 2% of the clinker produced.
P.10	Specific heat of clinker Dust from kiln to	Formulae provided by technology suppler	Kcal/kg°C	Calculated	Weekly	100%	Electronic	The specific heat is calculated based on the formula provided by technology supplier.

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
	cooler (S_{Dust})							
P.11	Inlet temperature of cooling air in cooler ($T_{Cooling\ Air}$)	Plant	°C	Measured	Daily	100%	Electronic	Average temperature of minimum and maximum ambient temperature
P.12	Static pressure of cooler fans ($StPr_1$)	Plant	mm water gauge	measured	Weekly	100%	Electronic	Instrument used: Digital Manometer
P.13	Density of air (D_a)	Data book	Kg/m^3	Calculated	Weekly	100%	Electronic	
P.14	Area of cooler fans (ArCf1)	Plant	M^2	Measured once on starting of project activity	Fixed	100%	Electronic	
P.15	Mass flow rate of cooling air in cooler ($M_{Cooling\ Air}$)	Plant	kg/hr	Measured & Calculated	Weekly	100%	Electronic	Calculated based on the flow rate of air and density of air.

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
P.16	Specific heat of cooling air ($S_{Cooling\ Air}$)	Formulae provided by technology suppler	Kcal/ kg/°C	Calculated	Fixed	100%	Electronic	
P.17	Power consumed by cooler fans (P_{Fan})	Plant	KWh /day	Measured	Monitored continuously and reported weekly	100%	Electronic	Instrument used: Energy meter
P.18	Exhaust air temperature from cooler ($T_{Exhaust\ Air\ Cooler}$)	Plant	°C	Measured	Weekly	100%	Electronic	Instrument used: Thermocouple
P.19	Exhaust air temperature from ESP ($T_{Exhaust\ Air\ ESP}$)	Plant	°C	Measured	Weekly	100%	Electronic	Instrument used: Thermocouple
P.20	Static Pressure from ESP exhaust ($StPr_{ESP}$	Plant	mm water gauge	Measured	Weekly	100%	Electronic	Instrument used: Pitot Tube

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
	$_{Exhaust}$)							
P.21	Dynamic Pressure from ESP exhaust (DyPr $_{ESP\ Exhaust}$)	Plant	mm water gauge	Measured	Weekly	100%	Electronic	Instrument used: Pitot Tube
P.22	Mass flow rate of cooler exhaust gas (M $_{Exhaust\ gas}$)	Plant	kg/hr	Measured & Calculated	Weekly	100%	Electronic	Calculated based on the pressure and density.
P.23	Specific heat of cooler Exhaust gas (S $_{Exhaust\ gas}$)	Formulae provided by technology suppler	Kcal/ kg / °C	Calculated	Fixed	100%	Electronic	
P.24	Temperature of clinker dust from cooler (T $_{Dust\ cooler}$)	Plant	°C	Estimated	Weekly	100%	Electronic	Temperature of dust will be same as exhaust air temperature from cooler.
P.25	Clinker dust	Plant	Kg /m^3 of	Estimated	Every six	100%	Electronic	Drop test should be conducted in every six

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
	from cooler ($M_{Dust\ Cooler}$)		exhaust air		month			month.
P.26	Specific heat of clinker Dust rom cooler ($S_{Dust\ cooler}$)	Formulae provided by technology suppler	Kcal/kg°C	Calculated	Fixed	100%	Electronic	
P.27	Temperature of clinker from cooler ($T_{Clk\ Out}$)	Plant	°C	Calculated	Weekly	100%	Electronic	Instrument used: Thermocouple
P.28	Clinker from cooler ($M_{Clk\ Out}$)	Plant	TPD	Measured and Calculated	Daily	100%	Electronic	Same as clinker inlet.
P.29	Specific heat of clinker from cooler ($S_{Clk\ Out}$)	Formulae provided by technology suppler	Kcal/kg°C	Calculated	Fixed	100%	Electronic	
P.30	Radiation losses from cooler (R	Data book	Kcal/hr	Calculated	Weekly	100%	Electronic	Surface temperature is fixed based on temperatures measured by technology supplier.

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
	$_{Loss}$)							
P.31	Kiln running hours (K hrs)	Plant	Hrs	Monitored	Daily	100%	Electronic	
P.32	Cooler Efficiency (Eff $_{Cooler}$)	Plant	%	Calculated	Weekly	100%	Electronic	

Relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary and how such data will be collected and archived:

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
Clinker cooler Efficiency calculations								
B.1	Clinker production (Clk)	Plant	Tons/day	Measured and calculated	Recorded continuously	100%	Electronic	
B.2	Inlet	Plant	°C	Estimated	Fixed	100%	Electronic	The inlet temperature of clinker in cooler is

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
	temperature of clinker in cooler ($T_{Clk\ In}$)							estimated constant in pre and post project scenario, based on technology supplier.
B.3	Specific heat of clinker ($S_{Clk\ In}$)	Formulae provided by technology suppler	Kcal/kg°C	Calculated	Weekly	100%	Electronic	
B.4	Temperature of clinker dust from kiln to cooler (T_{Dust})	Plant	°C	Estimated	Fixed	100%	Electronic	Same as clinker temperature.
B.5	Clinker dust from kiln to cooler (M_{Dust})	Plant	TPD	Estimated	Fixed	100%	Electronic	Based on technology supplier mass of recirculation dust is 2% of the clinker produced.
B.6	Specific heat of clinker Dust from kiln to cooler (S	Formulae provided by technology suppler	Kcal/kg°C	Calculated	Weekly	100%	Electronic	The specific heat is calculated based on the formula provided by technology supplier.

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
	Dust)							
B.7	Inlet temperature of cooling air in cooler ($T_{Cooling\ Air}$)	Plant	°C	Measured	Daily	100%	Electronic	Average temperature of minimum and maximum ambient temperature
B.8	Static pressure of cooler fans ($StPr_1$)	Plant	mm water gauge	measured	Weekly	100%	Electronic	Instrument used: Digital Manometer
B.9	Density of air (Da)	Data book	Kg/m^3	Calculated	Weekly	100%	Electronic	
B.10	Area of cooler fans (ArCf1)	Plant	M^2	Measured once on starting of project activity	Fixed	100%	Electronic	
B.11	Mass flow rate of cooling air in cooler ($M_{Cooling\ Air}$)	Plant	Kg/hr	Measured & Calculated	Weekly	100%	Electronic	Calculated based on the flow rate of air and density of air.
B.12	Specific	Formulae	Kcal/ kg/°C	Calculated	Fixed	100%	Electronic	

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
	heat of cooling air ($S_{Cooling\ Air}$)	provided by technology suppler						
B.13	Power consumed by cooler fans (P_{Fan})	Plant	KWh /day	Measured	Monitored continuously and reported weekly	100%	Electronic	Instrument used: Energy meter
B.14	Exhaust air temperature from cooler ($T_{Exhaust\ Air\ Cooler}$)	Plant	°C	Measured	Weekly	100%	Electronic	Instrument used: Thermocouple
B.15	Exhaust air temperature from ESP ($T_{Exhaust\ Air\ ESP}$)	Plant	°C	Measured	Weekly	100%	Electronic	Instrument used: Thermocouple
B.16	Static Pressure from ESP exhaust ($StPr_{ESP\ Exhaust}$)	Plant	mm water gauge	Measured	Weekly	100%	Electronic	Instrument used: Pitot Tube

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
B.17	Dynamic Pressure from ESP exhaust ($DyPr_{ESP\ Exhaust}$)	Plant	mm water gauge	Measured	Weekly	100%	Electronic	Instrument used: Pitot Tube
B.18	Mass flow rate of cooler exhaust gas ($M_{Exhaust\ gas}$)	Plant	Kg/hr	Measured & Calculated	Weekly	100%	Electronic	Calculated based on the pressure and density.
B.19	Specific heat of cooler Exhaust gas ($S_{Exhaust\ gas}$)	Formulae provided by technology suppler	Kcal/ kg / °C	Calculated	Fixed	100%	Electronic	
B.20	Temperature of clinker dust from cooler ($T_{Dust\ cooler}$)	Plant	°C	Estimated	Weekly	100%	Electronic	Temperature of dust will be same as exhaust air temperature from cooler.
B.21	Clinker dust from cooler	Plant	Kg /m^3 of exhaust air	Estimated	Every six month	100%	Electronic	Drop test should be conducted in every six month.

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
	($M_{Dust\ Cooler}$)							
B.22	Specific heat of clinker Dust rom cooler ($S_{Dust\ cooler}$)	Formulae provided by technology suppler	Kcal/kg°C	Calculated	Fixed	100%	Electronic	
B.23	Temperature of clinker from cooler ($T_{Clk\ Out}$)	Plant	°C	Calculated	Weekly	100%	Electronic	Instrument used: Thermocouple
B.24	Clinker from cooler ($M_{Clk\ Out}$)	Plant	TPD	Measured and Calculated	Daily	100%	Electronic	Same as clinker inlet.
B.25	Specific heat of clinker from cooler ($S_{Clk\ Out}$)	Formulae provided by technology suppler	Kcal/kg°C	Calculated	Fixed	100%	Electronic	
B.26	Radiation losses from cooler (R_{Loss})	Data book	Kcal/hr	Calculated	Weekly	100%	Electronic	Surface temperature is fixed based on temperatures measured by technology supplier.

ID number *(Please use numbers to ease cross-referencing to D.3)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
B.27	Kiln running hours (K hrs)	Plant	Hrs	Monitored	Daily	100%	Electronic	
B.28	Cooler Efficiency (Eff $_{Cooler}$)	Plant	%	Calculated	Weekly	100%	Electronic	

D.4. Qualitative explanation of how quality control (QC) and quality assurance (QA) procedures are undertaken:

>>

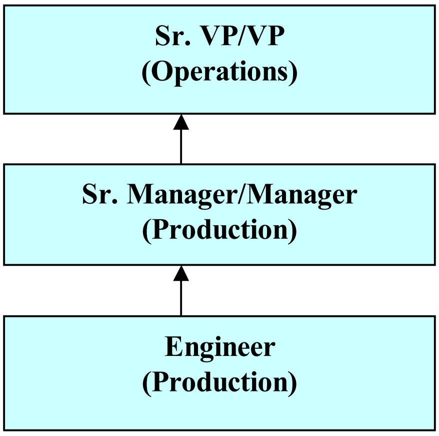
D.4.1 Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored		
Data *(Indicate table and ID number e.g. 3.-1.; 3.2.)*	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.

P.3, P.5, P.7, P.10, P.13,P.14, P.16, P.23, P.26, P.29, P.31, B.3, B.6, B.9, B.10, B.12, B.19, B.22, B.25, B.27,	*Low*	IPCC values/ Values from Data books/ formulae from technology supplier/calculation
P.1, P.2, P.4, P.6, P.8, P.11, P.12, P.15, P.18, P.19, P.20, P.21, P.22, P.24, P.25, P.27, P.28, B.1,B.2, B.4, B.7, B.8, B.11, B.14, B.15, B.16, B.17, B.18, B.20, B.21, B.23, B.24	*Low*	ISO-9001 procedure is in place.
P.9, P.17, P.30, B.5, B.13, B.26	*Medium*	Standard measurement procedure is defined./ values from technology supply.

D.5. Please describe briefly the operational and management structure that the project participant(s) will implement in order to monitor emission reductions and any leakage effects generated by the project activity:

>> Emission monitoring and calculation procedure will follow the following organisational structure. All data and calculation formula required to proceed is given in the section D in PDD.

Organisational structure for monitoring plan



Monitoring and calculation activities and responsibility

Monitoring and calculation activities	**Procedure and responsibility**
Data source and collection	Data is taken from the purchase, materials and accounting system. Most of the data is available in ISO 9001 quality management system.
Frequency	Monitoring frequency should be as per section D of PDD.
Review	All received data is reviewed by the engineers in the production.
Data compilation	All the data is compiled and stored in production department.
Emission calculation	Emission reduction calculations will be done annual based on the data collected. Engineers of production department will do the calculations
Review	Sr. Manager/ Manager, Production will review the calculation.
Emission data review	Final calculations is reviewed and approved by VP/EVP Operations.
Record keeping	All calculation and data record will be kept with the Production.

D.6. Name of person/entity determining the monitoring methodology:

>> Rajashree and its associate consultants

SECTION E.: Estimation of GHG emissions by sources:

E.1. Formulae used:

>>

E.1.1 Selected formulae as provided in appendix B:

>> No formulae for GHG emission reduction is specified for Category II.D of Appendix B of the Simplified Modalities and Procedures for Small-scale CDM Project Activities.

E.1.2 Description of formulae when not provided in appendix B:

>>

E.1.2.1 Describe the formulae used to estimate anthropogenic emissions by sources of GHGs due to the project activity within the project boundary:

>>

1. Clinker Production

Clinker production, Clk, (TPD) = (Raw meal feed to Kiln (TPD)/Raw meal to clinker conversion factor[2])

2. Specific Heats of all materials

Specific heat (Kcal/kg/C) = $a + b\,T + c\,T^2 + d\,T^3 + e\,T^4$

Heat Capacity – Coefficients					
Gas/Mat	***T^0**	***T^1**	***T^2**	***T^3**	***T^4**
O2	0.2130	7.796E-05	-7.563E-08	4.074E-11	-8.183E-15
CO2	0.1906	1.771E-04	-1.733E-07	9.315E-11	-1.894E-14
N2+Ar	0.2465	-3.284E-06	4.366E-08	-2.750E-11	5.504E-15
H2O,steam	0.4445	2.910E-05	6.887E-08	-3.726E-11	6.472E-15
H2O, liq.	1.0000				
Rawmeal	0.2060	1.014E-04	-3.673E-08		
Clinker	0.1742	1.414E-04	-1.283E-07	5.074E-11	

3. Mass flow rate of cooling air

3.1 Density of Air

Density of air (Da) (kg/m^3) = [1.293[3] x 273[4] x 9827[5]]/ [10336[6] x (273+air temp.)]

3.2 Mass Flow rate of air in cooler (m3/hr)

[2] Conversion factor is calculated by the National council for building and materials, India.

[3] Density of air at normal temp and pressure (NTP) =1.293 kg/Nm^3

[4] Temperature in Kelvin

[5] Atmospheric pressure at 402 meter latitude (Latitude of plant, mm water gauge)

[6] Atmospheric pressure at 0 meter latitude (mm water gauge)

M cooling air m³/hr= $\left\lfloor\sqrt{(2 * g * St\,\mathrm{Pr}) * Density}\right\rfloor \times Area \times 3600$

Where

g = Acceleration due to gravity (9.8 m/s^2)

StPr = Static pressure of air (mm water gauge)

4. **Heat delivered by cooler fan**

Heat delivered by cooler fans (Kcal/hr) = (Power consumed by cooler fans (kWh/day) x 860[7]/ operating hours)

5. **Flow rate of cooler exhaust gas**

M Exhaust gas m³/hr= $\left\lfloor\sqrt{(2 * g * Dy\,\mathrm{Pr}) * Density}\right\rfloor \times Area \times 3600$

Where

g = Acceleration due to gravity (9.8 m/s^2)

DyPr = Dynamic pressure of exhaust gas (mm water gauge)

5.1 Density of exhaust gas

Density of gas (kg/m^3) = [1.293 x 273 x 9827]/ [10336 x (273+gas temp.)]

6. **Radiation losses**

Radiation losses (Kcal/hr) = $(80.33*((T^{8}+t^{9})/2)^{-0.724}$ x $((T-t)^{1.33})$ +(4 x 10^{-8} x $((T)^4-(t)^4)$)*cooler surface area (m^2)

Cooler efficiency calculation

1. **Heat input by any incoming streams**

$$Heat\ Input = \sum_{i=1.....n} Mass \times Specific\ Heat \times Temperature$$

2. **Heat Loss from outgoing streams**

$$Heat\ Loss = \sum_{i=1.....n} (Mass \times Specific\ Heat \times Temperature) + Radiation\ Losses$$

3. **Efficiency of the clinker cooler**

$$Efficiency_{\Pr oject} = {(Heat\ Input - Losses)} \Big/ {Heat\ Input}$$

Average emission factor

1. Total heat supplied to the system

[7] Thermal equivalent of electricity 1 kWh = 860 Kcal

[8] Cooler average surface temperature in kelvin, 393 K

[9] Ambient temperature in kelvin

$$Average\ Emission\ factor = \frac{\sum_{i=1.....n}(Quantity\ of\ fuel \times Calorific\ Value \times Emission\ Factor)}{\sum_{i=1.....n}(Quantity\ of\ fuel \times Calorific\ Value)}$$

E.1.2.2 Describe the formulae used to estimate leakage due to the project activity, where required, for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities

>> Not Applicable

E.1.2.3 The sum of E.1.2.1 and E.1.2.2 represents the small-scale project activity emissions:

>> Same as E.1.2.1

E.1.2.4 Describe the formulae used to estimate the anthropogenic emissions by sources of GHGs in the baseline using the baseline methodology for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities:

>>

1. **Clinker Production**

Clinker production, Clk, (TPD) = (Raw meal feed to Kiln (TPD)/Raw meal to clinker conversion factor[10])

2. **Specific Heats of all materials**

Specific heat (Kcal/kg/C) = a + b T + c T^2 + d T^3 + e T^4

Heat Capacity Coefficients					
Gas/Mat	**a*T^0**	**B*T^1**	**c*T^2**	**d*T^3**	**e*T^4**
O2	0.2130	7.796E-05	-7.563E-08	4.074E-11	-8.183E-15
CO2	0.1906	1.771E-04	-1.733E-07	9.315E-11	-1.894E-14
N2+Ar	0.2465	-3.284E-06	4.366E-08	-2.750E-11	5.504E-15
H2O,steam	0.4445	2.910E-05	6.887E-08	-3.726E-11	6.472E-15
H2O, liq.	1.0000				
Raw meal	0.2060	1.014E-04	-3.673E-08		
Clinker	0.1742	1.414E-04	-1.283E-07	5.074E-11	

3. **Mass flow rate of cooling air**

   a. **Density of Air**

Density of air (Da) (kg/m^3) = [1.293[11] x 273[12] x 9827[13]]/ [10336[14] x (273+air temp.)]

[10] Conversion factor is calculated by the National council for building and materials, India.

[11] Density of air at Normal temp and pressure (NTP) =1.293 kg/Nm3

[12] Temperature in Kelvin

[13] Atmospheric pressure at 402 meter latitude (Latitude of plant, mm water gauge)

b. Mass Flow rate of air in cooler (m3/hr)

M cooling air m³/hr= $\left\lfloor \sqrt{(2 * g * St\,\mathrm{Pr}) * Density} \right\rfloor \times Area \times 3600$

Where

g = Acceleration due to gravity (9.8 m/s^2)

StPr = Static pressure of air (mm water gauge)

4. Heat delivered by cooler fan

Heat delivered by cooler fans (Kcal/hr) = (Power consumed by cooler fans (kWh/day) x 860[15]/ operating hours)

5. Flow rate of cooler exhaust gas

M Exhaust gas m³/hr= $\left\lfloor \sqrt{(2 * g * Dy\,\mathrm{Pr}) * Density} \right\rfloor \times Area \times 3600$

Where

g = Acceleration due to gravity (9.8 m/s^2)

DyPr = Dynamic pressure of exhaust gas (mm water gauge)

5.1 Density of exhaust gas

Density of gas (kg/m^3) = [1.293 x 273 x 9827]/ [10336 x (273+gas temp.)]

6. Radiation losses

Radiation losses (Kcal/hr) = $(80.33*((T^{16}+t^{17})/2)^{-0.724} \times ((T-t)^{1.33}) + (4 \times 10^{-8} \times ((T)^4-(t)^4))$*cooler surface area ($m^2$)

Cooler efficiency calculation

1. Heat input by any incoming streams

$$Heat\ Input = \sum_{i=1.....n} Mass \times Specific\ Heat \times Temperature$$

2. Heat Loss from outgoing streams

$$Heat\ Loss = \sum_{i=1.....n} (Mass \times Specific\ Heat \times Temperature) + Radiation\ Losses$$

3. Efficiency of the clinker cooler

$$Efficiency_{Baseline} = {(Heat\ Input - Losses)} \big/ {Heat\ Input}$$

---

[14] Atmospheric pressure at 0 meter latitude (mm water gauge)

[15] Thermal equivalent of electricity 1 kWh = 860 Kcal

[16] Cooler average surface temperature in kelvin, 393 K

[17] Ambient temperature in kelvin

E.1.2.5 Difference between E.1.2.4 and E.1.2.3 represents the emission reductions due to the project activity during a given period:

>>

Emission Reduction Calculations

Step 1: Increase in efficiency

$$Increase\ in\ Efficiency = (Efficiency\ in\ project\ activity - Baseline\ efficiency)$$

Step 2: Saving in heat input due to increase in efficiency

$$Saving\ in\ Heat\ Input = \left(\frac{Increase\ in\ efficiency}{Efficiency\ in\ project\ case} \right) \times Heat\ input\ in\ project\ activity$$

Step 3: Emission reduction

$$Emission\ \mathrm{Re}duction = (Saving\ in\ heat\ input) \times\ Average\ Emission\ factor$$

E.2 Table providing values obtained when applying formulae above:

>>

Line 1:

Year	Annual Estimation of Emission reduction tCO_2e
2004	12,135
2005	14,358
2006	14,358
2007	14,358
2008	14,358
2009	14,358
2010	14,358
2011	14,358
2012	14,358
2013	14,358
Total	**141,361**
Crediting Years	**10**
Average Emission reduction over the crediting period (t CO2)	**14,136**

Line 3:

Year	Annual Estimation of Emission reduction tCO_2e
2004	12,201
2005	13,281
2006	13,281
2007	13,281
2008	13,281
2009	13,281
2010	13,281
2011	13,281
2012	13,281
2013	13,281
Total	**131,731**
Crediting Years	**10**
Average Emission reduction over the crediting period	**13,173**

SECTION F.: Environmental impacts:

F.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

>> >>

The Ministry of Environment and Forests (MoEF), Government of India, under the Environment Impact Assessment Notification vide S.O. 60(E) dated 27/01/94 has listed a set of industrial activities in Schedule I[18] of the notification which for setting up new projects or modernization/ expansion will require environmental clearance and will have to conduct an Environment Impact Assessment (EIA) study. However, the project under consideration does not require any EIA to be conducted.

Article 12 of the Kyoto Protocol requires that a CDM project activity contribute to the sustainable development of the host country. Assessing the project activity's positive and negative impacts on the local environment and on society is thus a key element for each CDM project.

Rajashree Cement being an ISO 14001, OHSAS 18001 organisation, has specialized environmental management systems & consistent evaluation of the impacts, key parameters have ensured that the company meets the environmental targets. The project activity is one such voluntary measure, which has positive long-term environmental impact. The nature of the impacts that are evident during the operational phase is discussed in detail given below. The environmental impact during the construction phase is regarded as temporary or short term and hence does not affect the environment significantly.

Project activity does not lead to any significant negative impact. Neither does the host country require EIA study to be conducted for this kind of projects. As stated above project activities not included under Schedule I of Environment Impact Assessment Notification of MoEF for environmental clearance of new projects or modification of old ones needn't conduct the EIA. Environmental impacts from project activity are discussed in the table below:

SL. NO.	ENVIRONMENTAL IMPACTS & BENEFITS	REMARKS
A	CATEGORY: ENVIRONMENTAL – RESOURCE CONSERVATION	
1	**Coal conservation:** The project activity reduces specific thermal energy consumption for cement production and conserves the energy. By reducing the specific thermal energy, the project activity reduces an equivalent amount of coal consumption per unit of cement produced that would have been required to cater to the baseline project option.	The project activity is a step towards and coal conservation.

[18] http://envfor.nic.in/legis/legis.html#H

SL. NO.	ENVIRONMENTAL IMPACTS & BENEFITS	REMARKS
B	CATEGORY: ENVIRONMENTAL – AIR QUALITY	
	By reducing the thermal energy content of the cement manufacturing, the project activity reduces CO_2 emissions.	The project activity reduces emission of CO_2 -a global entity.
C	CATEGORY: ENVIRONMENTAL –WATER	
1	The project activity does not contribute to water pollution.	No impact
D	CATEGORY: ENVIRONMENTAL – LAND	
1	Reduction in specific consumption demand further reduces quarry/coal mining; which leads to loss of biodiversity, land destruction and erosions arising from such activities. **There is no possible soil or land pollution arising due to project activity.**	The project activity leads to positive impact on Land environment.
E	CATEGORY: ENVIRONMENTAL – NOISE GENERATION	
1	**The project activity does not contribute to noise pollution.**	-
F	CATEGORY: SOCIAL	
1	**Mining Risks:** Quarry mining of coal experiences landslides and destruction in the history of mining. Thus by less consumption of coal project activity would indirectly reduce chances of landslides and landscape destruction at mining sites. The adverse heath impacts caused from quarrying of materials on the mining persons, nearby habitats and ecosystem, would therefore be avoided.	The project is expected to bring positive changes in the life style and quality of life and reduce mining risks.
G	CATEGORY: ECOLOGY	
1	By reducing the coal, the project activity has a beneficial impact on the flora, fauna in the vicinity of the mining sites.	-

SECTION G. Stakeholders' comments:

G.1. Brief description of how comments by local stakeholders have been invited and compiled:

>> The project activity occurred at RC's cement plant in Adityanagar. The project activity will reduce the use of thermal energy *i.e.* fossil fuel.

The various stakeholders identified for the project are as under.

- Elected body of representatives administering the local area (village Panchayat)
- Central & State Pollution Control Board
- Ministry of Environment & Forest (MoEF), Government of India
- Consultants
- Equipment Suppliers

Stakeholders list includes the government and non-government parties, which are involved in the project at various stages. At the appropriate stage of the project development, stakeholders/ relevant bodies were involved to get the project clearance.

G.2. Summary of the comments received:

>> The project activity is energy efficiency in clinker cooler. Due to this project proponent will use less quantities of fossil fuels in clinker manufacturing. The project activity has positive environmental impact in term of emissions. KPCB has prescribed standards of environmental compliance and monitors the adherence to the standards. The cement plant received the Consent to Establish (or No Objection Certificate (NOC)) and the Consent to Operate from KPCB during the commissioning of the plant. The project activity reduces the environmental impacts on the local ambient quality and meets all the statutory requirements. RC submits an annual Environmental Statement to KPCB and also describes the Environmental aspects of the plant in its annual report.

The project is being implemented at existing facility of RC thus project does not require any displacement of the local population. This implies that the project will not cause any adverse social impacts on the local population but helps in improving the quality of life for them.

G.3. Report on how due account was taken of any comments received:

>> The project proponent has not received any negative comment for the project activity.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Rajashree cement
Street/P.O.Box:	P.O. Adityanagar ,Malkhed road
Building:	
City:	Gulbarga
State/Region:	Karnataka
Postfix/ZIP:	585292
Country:	India
Telephone:	91-8441-288888 / 288339
FAX:	91-8441-287286
E-Mail:	skgupta@adityabirla.com
URL:	
Represented by:	
Title:	General manager (T & D cell)
Salutation:	Mr.
Last Name:	Gupta
Middle Name:	
First Name:	Shailendra
Department:	Tech & Dev Cell
Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	skgupta@adityabirla.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There is no public funding for the project from parties included in Annex I.
