

**MONITORING REPORT FORM (CDM-MR)**  
**Version 01 – in effect as of: DD/MM/YYYY****CONTENTS**

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**MONITORING REPORT**  
**Version 01 Date 13/09/2010**

**“Blended cement with increased blend” at Orient cement’s Devapur and Jalgaon plants in India**  
**Reference number: 0456**  
**4<sup>th</sup> monitoring period: 01/04/2008 – 31/03/2009 (First and last days included)**

**SECTION A. General description of the project activity****A.1. Brief description of the project activity: >>**

&gt;&gt;

Orient Cement (Props: Orient Paper & Industries Limited), operates two cement manufacturing units - the Devapur Unit in Andhra Pradesh and the Jalgaon Unit in Maharashtra, India. The two units have been using readily available fly ash from the thermal power plants in the region to produce PPC blend cement (Portland Pozzolana Cement) since 2002.

The project has been adding increasing quantities of fly ash than the prevailing practices in the region of its operation of the two plants and thus replacing equivalent quantity of clinker. The objective of the project is to lower greenhouse gas emissions through the substitution of clinker using fly ash and contribute to a sustainable means of using fly ash in the region.

The technology involved in blending fly ash has been developed indigenously by Orient Cement (Props: Orient Paper & Industries Limited). The Research and Development at Orient Cement (Props: Orient Paper & Industries Limited) has relied on technical and other market information for increasing the blending of fly ash and on the properties of PPC. The units made a concerted effort and conducted a feasibility study for the sourcing, handling, utilizing of fly ash from the nearby thermal power plants. The research centre at Orient Cement (Props: Orient Paper & Industries Limited) uses sophisticated analyzers such as XRD, optical microscope study of clinker cement and fly ash.

The fly ash is procured from the respective thermal power plant’s fly ash handling system storage silos. The fly ash is transported in 20 MT closed tankers and transported to the units where it is conveyed pneumatically to 500 MT steel silos for storage. Pneumatic handling ensures no loss of fly ash. From the silo fly ash is fed using flow control guide into the cement mill together with clinker and gypsum. Gypsum and fly ash are ground to required fineness inside the mill. Regular samples are taken and tested for fineness and quality.

The Project has been registered with UNFCCC as CDM Project Activity under Sectoral Scope No. 4: Manufacturing industries. The project was registered on 27 Aug 2006 with crediting period of 01 Apr2002 - 31Mar 2012 (Fixed). The UNFCCC reference number for the project activity is 0456. The DOE for the project was Det Norske Veritas Certification Ltd. (DNV). Project started implementation from 15/01/2001, when the first equipment order – the fly ash handling system was placed to EEL, the equipment provider. The project has commenced commercial operation of fly ash addition from 18/12/2001.

The monitoring period covered under the report extending from 01.4.2008 to 31.03.2009 and the GHG reduction has been calculated for the period extending from 01.4.2008 to 31.03.2009, both the dates inclusive.

**Total CER generated during this period is 128893.199 tCO<sub>2</sub> eq.**

**A.2. Project Participants**

&gt;&gt;

Name of Party involved (*) (host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Government. of India	Orient Cement ( Props : Orient Paper & Industries Limited )	No

**A.3. Location of the project activity:**

&gt;&gt;

The Project activity has been implemented within the existing units of Orient Cement (Props: Orient Paper & Industries Limited) at Devapur in Andhra Pradesh and Jalgaon in Maharashtra, India.

Devapur plant is located within the Kasipet Mandal in Devapur village in Andhra Pradesh. The site is at a distance of 300 km from Hyderabad, the nearest city. The nearby railway stations are Bellampally at a distance of 25 km and Mancherla around 35 km. Devapur unit sources fly ash from the nearby National Thermal Power Plant (NTPC) Ramagundam which is 70 Km away from the plant and Thermal power station Chandrapur of Maharashtra state power generation company Ltd. which is 418 Km away from the Plant.

Jalgaon unit is located at Nashirabad Village, on National Highway 6 in Jalgaon District, Maharashtra, India. The site is at a distance of 14 km from Bhusawal and Jalgaon, the nearby cities. The nearest railway station is Bhusawal at a distance of 14 km. Jalgaon unit sources fly ash from the nearby Bhusawal Thermal Power Station (BTPS) at Deepnagar which is 26 km away and Thermal power station Paras of Maharashtra state power generation company Ltd. which is 320 Km away from the Plant.

**A.4. Technical description of the project**

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The project has been adding increasing quantities of fly ash than the prevailing practices in the region of its operation of the two plants and thus replacing equivalent quantity of clinker.

Reduction in percentage of clinker used in cement manufacturing eventually helps in reducing GHGs emissions associated with clinker manufacturing. The project activity would therefore reduce direct onsite emissions from clinkerisation and direct off-site emissions due to power generation at the thermal power plants per unit of cement produced.

The cement plants undertaking the CDM project activities have the following capacities:

- Devapur Unit – 1.7 million tonnes per annum
- Jalgaon Unit – 0.7 million tonnes per annum.

The technology involved in blending fly ash has been developed indigenously by Orient Cement (Props: Orient Paper & Industries Limited). The Research and Development at Orient Cement (Props: Orient Paper & Industries Limited) has relied on technical and other market information for increasing the blending of fly ash and on the properties of PPC. The units made a concerted effort and conducted a feasibility study for the sourcing, handling, utilizing of fly ash from the nearby thermal power plants. The research centre at Orient Cement (Props: Orient Paper & Industries Limited) uses sophisticated analyzers such as XRD, optical microscope study of clinker cement and fly ash.

The fly ash is procured from the respective thermal power plant's fly ash handling system storage silos. The fly ash is transported in 20 MT closed tankers and transported to the units where it is conveyed pneumatically to 500 MT steel silos for storage. Pneumatic handling ensures no loss of fly ash. From the silo fly ash is fed



using flow control guide into the cement mill together with clinker and gypsum. Gypsum and fly ash are ground to required fineness inside the mill. Regular samples are taken and tested for fineness and quality.

**A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:**

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ACM0005 Version 2, 28 November, 2005 - Consolidated Methodology for Increasing the Blend in Cement Production has been applied.

**A.6. Registration date of the project activity:**

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The project was registered by UNFCCC on 27.08.2006

**A.7. Crediting period of the project activity and related information (start date and choice of crediting period):**

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This is 4<sup>th</sup> monitoring report and there is no change in start date. The monitoring period covered under the report extending from 01.4.2008 to 31.03.2009 and the GHG reduction has been calculated for the period extending from 01.4.2008 to 31.03.2009, both the dates inclusive.

**A.8. Name of responsible person(s)/entity(ies):**

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<b>Organization:</b>	Orient Cement ( Props : Orient Paper & Industries Limited )
Street/P.O.Box:	Devapur Cement Works
Building:	
City:	
State/Region:	District Adilabad, Andhra Pradesh
Postfix/ZIP:	504218
Country:	India
Telephone:	+ 918736240709
FAX:	+ 918736240522
E-Mail:	<a href="mailto:orirndvp@sancharnet.in">orirndvp@sancharnet.in</a> , <a href="mailto:bpandey@orientcement.com">bpandey@orientcement.com</a>
URL:	
Represented by:	
Title:	President
Salutation:	Mr.
Last Name:	Pandey
Middle Name:	
First Name:	Bhagwat
Department:	
Mobile:	+ 919703918115, 9959553504
Direct FAX:	+ 918736240522
Direct tel:	+ 918736240709
Personal E-Mail:	<a href="mailto:Pandey002@yahoo.com">Pandey002@yahoo.com</a>

**SECTION B. Implementation of the project activity****B.1. Implementation status of the project activity**

&gt;&gt;

Project started implementation from 15/01/2001, when the first equipment order – the fly ash handling system was placed to EEL, the equipment provider. The project has commenced commercial operation of fly ash addition from 18/12/2001.

The Project was registered with UNFCCC as CDM Project Activity under Sectoral Scope No. 4: Manufacturing industries. The project was registered on 27 Aug 2006 with crediting period of 01 Apr2002 - 31Mar 2012 (Fixed). The UNFCCC reference number for the project activity is 0456. The DOE for the project was Det Norske Veritas Certification Ltd. (DNV).

**Detail of overhaul times, downtimes of equipment, exchange of equipment:**

Sl. No.	Equipment Detail	Down time in Hrs.	Reason
	NA	NA	NA

No such events situations that occurred during the monitoring period, which may impact the applicability of the methodology

**B.2. Revision of the monitoring plan**

&gt;&gt;

The monitoring plan has been revised and was submitted to UNFCCC for approval by DOE on 9.3.2010. The revised monitoring plan has been approved by UNFCCC. This monitoring report has been prepared using UNFCCC approved revised Monitoring plan Version 1.1 dated 31.08.2010.

**B.3. Request for deviation applied to this monitoring period**

&gt;&gt;

NA

**B.4. Notification or request of approval of changes**

&gt;&gt;

NA

**SECTION C. Description of the monitoring system**

&gt;&gt;

The Devapur and Jalgaon plant of Orient cement is operated by Company operating personnel. The President has assigned the responsibility to Vice President (tech) of Devapur and Vice President of Jalgaon for the project management, monitoring and reporting. They are assisted by the CDM team headed by DGM (Process).

The operation, data transfer and reporting procedures are incorporated into the ISO 9001 and ISO 14001 procedures with the company.

Orient cement (Props: Orient Paper & Industries Limited) is an ISO 9001, ISO 14001 and OHSAS 18001 certified company. Hence the QA & QC procedures are equivalent to applicable National and International Standards in terms of equipment and analytical methods. Calibration of all relevant equipments is done as per existing QMS. The QA & QC procedures are set and implemented as per existing QMS system in order to:

Secure a good consistency through planning to implementation of this CDM project and

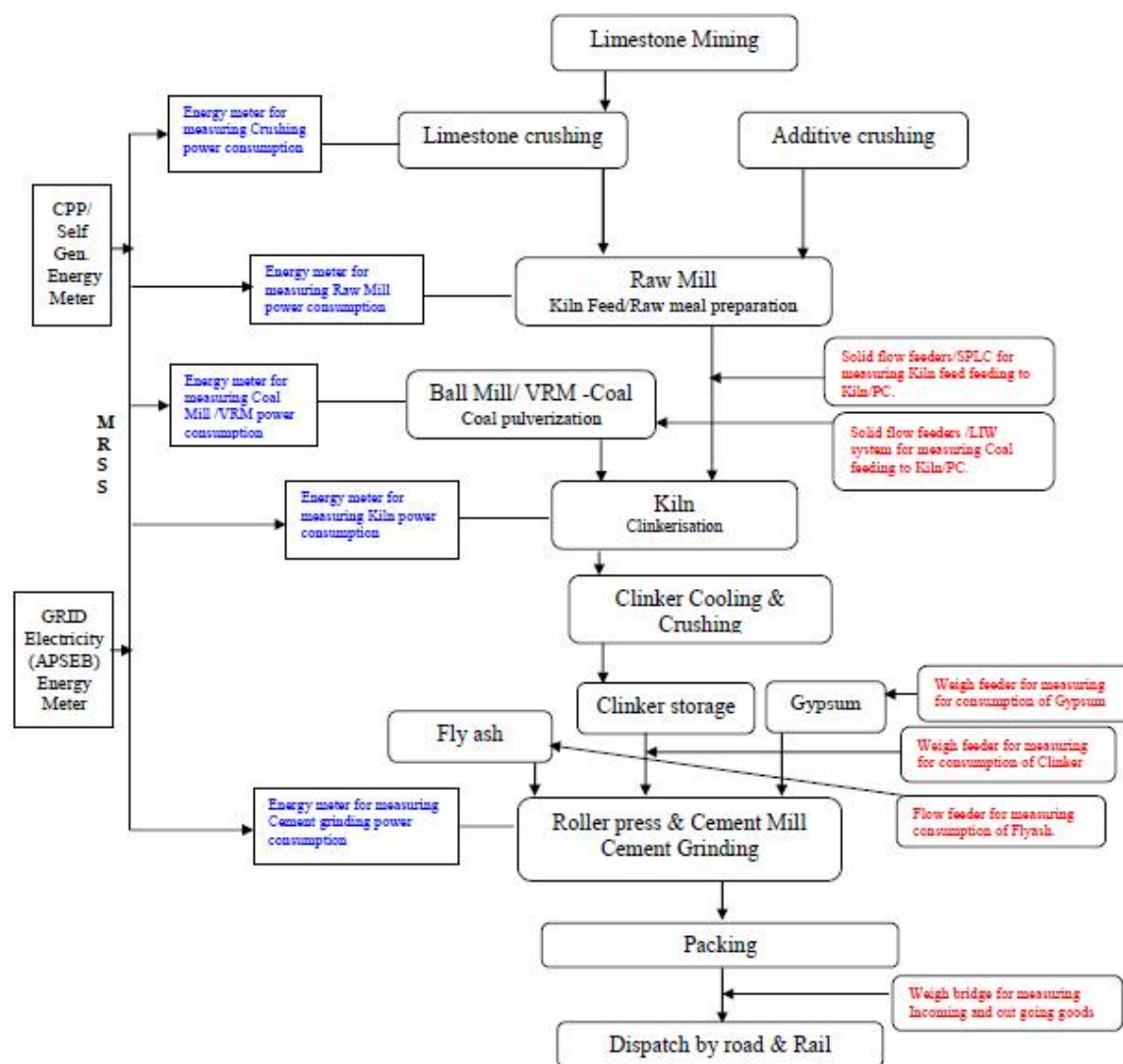


- Stipulate who has responsibility for what and,
- Avoid any misunderstanding between people and organization involved.

Both the plants of Orient cement under CDM project activity are ISO 9001 (QMS) and ISO 14001 (EMS) & OHSAS 18001 certified. All the relevant monitoring, recording, calibration are carried under both the system for different parameters and the relevant procedures are there in each plant. Internal audit is conducted at regular interval to check whether both the systems are in line with the written down procedure or not. In addition the environmental performance report is submitted to concern SPCB annually in the form of Environment statement. Both the Stack and ambient air monitoring is conducted as per the directions under consent to operate for both the plants and the monitoring reports are maintained in house. The comprehensive table detailing the source for each parameter and its monitoring procedure, frequency, recording procedure, retention time, calibration procedure and record format number etc., are listed in CDM Manual. The CDM Manual also includes various procedures for review meeting of data, procedure for non- conformance and corrective action, procedure for computer system management, procedure for training, environment monitoring etc in line with the existing QMS and the EMS.

**Emergency procedures for monitoring system in place:**

The plant maintains the data in both hard and soft copy formats; the same is also stored in the MIS. CDM Coordinator receives monthly CDM related data from the plant and if any discrepancies are observed, questions are raised and corrective action taken as required.

**Line Diagram showing all relevant monitoring points:**

APSEB: Andhra Pradesh State Electricity Board  
MRSS: Main receiving Sub Station

**Calibration/Maintenance of Measuring and Analytical Instruments:**

All measuring and analytical instruments are being calibrated as per the methodology ACM0005 and created as a protocol in Orient's Quality management system procedures. The maintenance methods and procedures have been incorporated as part of the ISO 9001 procedures and CDM Manual and form an integral part of the systems and procedures for the organization.

**Data Monitored for Baseline Emissions Calculations**

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Comment
1.1	$In\ CaO_{BSL}$	<i>In plant clinkerisation unit</i>	$T\ CaO$	$M, C$	<i>Daily</i>	
1.2	$Out\ CaO_{BSL}$	<i>In plant clinkerisation unit</i>	$T\ CaO$	$M, C$	<i>Daily</i>	
1.3	$In\ MgO_{BSL}$	<i>In plant clinkerisation unit</i>	$t\ MgO$	$M, C$	<i>Daily</i>	
1.4	$Out\ MgO_{BSL}$	<i>In plant clinkerisation unit</i>	$t\ MgO$	$M, C$	<i>Daily</i>	
1.5	<i>Quantity of limestone used in the clinkerisation unit in baseline</i>	<i>In plant clinkerisation unit</i>	<i>Kilo tonnes</i>	$M$	<i>Annually</i>	
1.6	<i>Quantity of clinker used for PPC production</i> $CLNK_{BSL}$	<i>In plant grinding unit</i>	<i>Kilo tonnes</i>	$M$	<i>Annually</i>	
1.7	$FFi,$	<i>In plant clinkerisation unit</i>	<i>tonnes</i>	$M$	<i>Annually</i>	
1.8	$EFFi\_BLS$	<i>IPCC default values for the fuels type</i>	<i>tCO2/tonne of fuel used</i>	$C$	<i>Annually</i>	
1.9	$BELEgrid\_CLNK_{BSL}$	<i>In plant clinkerisation unit</i>	$MWh$	$M, C$	<i>Monthly</i>	
1.10	$EFgrid\_BSL$	<i>In plant data</i>	$tCO2/MWh$	$C, E$	<i>Annually</i>	
1.11	$BELEsg\_CLNK_{BSL}$	<i>In plant data</i>	$MWh$	$M$	<i>Monthly</i>	
1.12	$EFsg_{BSL}$	<i>In plant data</i>	$tCO2/MWh$	$M, C, E$	<i>Annually</i>	
1.13	<i>ADDy Quantity of additives added in the baseline</i>	<i>In plant data</i>	<i>Kilo tonnes</i>	$M$	<i>Monthly</i>	





ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Comment
1.14	BEcalcin, <i>BSL</i>	<i>In plant data</i>	<i>tCO2/tonne of clinker</i>	<i>C</i>	<i>Annually</i>	
1.15	BEfossil_fuel, <i>BSL</i>	<i>In plant data</i>	<i>tCO2/tonne of clinker</i>	<i>C</i>	<i>Annually</i>	
1.16	BEele_grid_CLNK, <i>BSL</i>	<i>In plant data</i>	<i>tCO2/tonne of clinker</i>	<i>C</i>	<i>Annually</i>	
1.17	BEele_sg_CLNK, <i>BSL</i>	<i>In plant data</i>	<i>tCO2/tonne of clinker</i>	<i>C</i>	<i>Annually</i>	
1.18	BEele_grid_BC, <i>BSL</i>	<i>In plant data</i>	<i>tCO2/tonne of blended cement</i>	<i>C</i>	<i>Annually</i>	
1.19	BEele_sg_BC, <i>BSL</i>	<i>In plant data</i>	<i>tCO2/tonne of blended cement</i>	<i>C</i>	<i>Annually</i>	
1.20	Bblend,y	<i>In plant data</i>	<i>Tonne of clinker/tonne of blended cement</i>	<i>C</i>	<i>Annually</i>	
1.21	BC BSL	Plant records	Kilo tines of BC	M	Annually	It is part of day to day plant operation
1.22	BELEgrid_BC,BSL	Plant records	MWh	M,C	Annually	This is part of day to day operation leading to power consumption and recorded in plant records
1.23	BELEsg_BC,BSL	Plant records	MWh	M, C	Annually	This is part of day to day operation when there is requirement of self generation and recorded in plant record



ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Comment
1.24	BELEgrid_ADD	Plant records	MWh	M	Annually	This is part of day to day operation leading to power consumption and recorded in plant records
1.25	BELEsg_ADD,BSL	Plant records	MWh	M	Annually	This is part of day to day operation when there is requirement of self generation and recorded in plant record
1.26	Fi,j,BSL	Plant records	KL of FO, HSD and tonne of Coal	M	Monthly	Part of day to day operation and recorded in the plant records
1.27	COEFi,j BSL	IPCC	tCO2/tonne of fuel i	C	Annually	Calculated using IPCC factor
1.28	GENj,BSL	Plant records	MWh	M	Annually	This is part of day to day operation when there is requirement of self generation and recorded in plant record
1.29	BEele_grid_ADD,BSL	Plant records	tCO2/tonne of blended cement	C	Annually	Calculated annually based on plant records
1.30	BEele_sg_ADD,BSL	Plant records	tCO2/tonne of blended cement	C	Annually	Calculated annually based on plant records

**Data Monitored for Project Emissions Calculations**

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Comment
2.1	In CaO <sub>y</sub>	In plant clinkerisation unit	t CaO	M,C	Daily	Is a part of normal day to day operation of clinkerisation unit of the plant. This is calculated as the CaO content (%) of the raw material times the raw material quantity (tonnes)
2.2	Out CaO <sub>y</sub>	In plant clinkerisation unit	t CaO	M,C	Daily	Is a part of normal day to day operation of clinkerisation unit of the plant. This is calculated as the CaO content (%) of the clinker times clinker produced (tonnes)
2.3	In MgO <sub>y</sub>	In plant clinkerisation unit	t MgO	M,C	Daily	Is a part of normal day to day operation of clinkerisation unit of the plant. This is calculated as the MgO content (%) of the raw material times the raw material quantity (tonnes)
2.4	Out MgO <sub>y</sub>	In plant clinkerisation unit	t MgO	M,C	Daily	Is a part of normal day to day operation of clinkerisation unit of the plant. This is calculated as the MgO content (%) of the clinker times clinker produced (tonnes)
2.5	Quantity of limestone used in the clinkerisation unit	In plant clinkerisation unit	Kilo tonnes	M	Annually	The plant records usages of limestone for clinker production on monthly basis. For annual records same can be cross checked in annual financial accounts/ opening



ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Comment
						and closing balance of raw material used.
2.6	Quantity of clinker used for PPC production CLNK <sub>y</sub>	In plant grinding unit	Kilo tonnes	M	Annually	The plant records usages of clinker for PPC production on monthly basis. For annual records same can be cross checked in annual financial records/ opening and closing balance of clinker.
2.7	FFi <sub>y</sub> ,	In plant clinkerisation unit	tonnes	M	Annually	The plant records usages of coal for clinker production on monthly basis. For annual records same can be cross checked in annual financial records/ opening and closing balance of raw material consumption
2.8	Emission factor of coal used in clinkerisation unit, EFFi	In Plant clinkerisation unit	tCO <sub>2</sub> /tonne	C	Annually	EFFi is calculated using Carbon content of coal used and default carbon oxidation factor of 0.98. Carbon content of coal used is analyzed by independent Lab.
2.9	PELEgrid_CLNK <sub>y</sub>	In plant clinkerisation unit	MWh	M,C	Monthly	Total Grid electricity purchased (GE) and total self generated electricity produced (SG) as well as total electricity consumed up to clinkerisation (PELE_CLNK <sub>y</sub> ) is measured daily by dedicated meters and the same is recorded



ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Comment
						<p>in online Energy Management System(EMS). The entire detail of measurements and metering is clearly delineated in the CDM manual. Based on the above mentioned measured data, the grid electricity up to clinkerisation is calculated as per following proportionate formula:.</p> <p><b>PELEgrid_CLNK,y = PELE_CLNK,y x [GE/(GE+SG)].</b></p> <p>In addition to above formula please refer the detail under ID numbers 2.29 , 2.30 and 2.31</p>
2.10	PELEsg_CLNK,y	In plant data	MWh	M,C	Monthly	<p>Total Grid electricity purchased (GE)and total self generated electricity produced(SG) as well as total electricity consumed up to clinkerisation (PELE_CLNK,y) is measured daily by dedicated meters and the same is recorded in online Energy Management System(EMS). The entire detail of measurements and metering is clearly</p>



ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Comment
						delineated in the CDM manual. Based on the above mentioned measured data, the self generated electricity up to clinkerisation is calculated as per following proportionate formula: $PELE_{sg\_CLNK,y} = PELE_{CLNK,y} \times [SG/(GE+SG)]$ In addition to above formula please refer the detail under ID numbers 2.29, 2.30 and 2.31
2.11	EF <sub>sg_y</sub>	In plant data	tCO <sub>2</sub> /MWh	M,C,E	Annually	Unit would record the estimated emission factor of the in-house electricity generation based on calculated total in-house net power generation and total emission due to burning of fossil fuel like HSD, FO and Coal. Total emission will be calculated using IPCC default NCV, carbon content, carbon oxidation factor, supplier's specific gravity and measured consumption quantity in case of HSD and FO and measured quantity and emission factor(EFFi) in case of coal as mentioned



ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Comment
						against serial No. 2.8 above. Total net power generation (ID number 2.28) and emission from power generation (ID number 2.26 & 2.27) is defined below.
2.12	ADDy Quantity of additives	In plant data	Kilo tonnes	M	Monthly	The plant records usages of fly ash for PPC production on monthly basis. For annual records same can be cross checked in annual financial records/ opening and closing balance of fly ash
2.13	PEcalcin,y	In plant data	tCO2/tonne of clinker	C	Annually	
2.14	PEfossil_fuel,y	In plant data	tCO2/tonne of clinker	C	Annually	
2.15	PEele_grid_CLN K,y	In plant data	tCO2/tonne of clinker	C	Annually	
2.16	PEele_sg_CLNK,y	In plant data	tCO2/tonne of clinker	C	Annually	
2.17	PEele_grid_ADD,y	In plant data	tCO2/tonne of blended cement	C	Annually	
2.18	PEele_sg_ADD,y	In plant data	tCO2/tonne of blended cement	C	Annually	
2.19	PEele_grid_BC,y	In plant data	tCO2/tonne of blended cement	C	Annually	
2.20	PEele_sg_BC,y	In plant	tCO2/tonn	C	Annually	



ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Comment
		data	e of blended cement			
2.21	Pblend,y	In plant data	Tonne of clinker/tonne of blended cement	C	Annually	
2.22	PELEgrid_BC,y	In plant data	MWh	M,C	Monthly	Total Grid electricity purchased (GE) and total self generated electricity produced (SG) as well as total electricity consumed for production of blended cement (PELE_BC,y) is measured daily by dedicated meters and the same is recorded in online Energy Management System (EMS). The entire detail of measurements and metering is clearly delineated in the CDM manual. Based on the above mentioned measured data, the grid electricity for production of blended cement is calculated as per following proportionate formula: <b>PELEgrid_BC,y = PELE_BC,y x [GE / (GE+SG)]</b>
2.23	PELEsg_BC,y	In plant data	MWh	M,C	Monthly	Total Grid electricity purchased (GE) and total self generated





ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Comment
						<p>electricity produced(SG) as well as total electricity for production of blended cement (PELE_BC,y) is measured daily by dedicated meters and the same is recorded in online Energy Management System(EMS). The entire detail of measurements and metering is clearly delineated in the CDM manual. Based on the above mentioned measured data, the self generated electricity for production of blended cement is calculated as per following proportionate formula:.</p> $\text{PELEsg\_BC,y} = \text{PELE\_BC,y} \times [\text{SG} / (\text{GE} + \text{SG})]$
2.24	PELEgrid_ADD	In plant data	MWh	M	Monthly	Not Applicable ,as fly ash is not ground separately
2.25	PELEsg_ADDy	In plant data	MWh	M	Monthly	Not Applicable ,as fly ash is not ground separately
2.26	Fi ,j, y	In plant data	KL of FO, HSD and tonne of Coal	M	Monthly	HSD and FO consumption for power generation is measured through level measurement of fuel tank and consumption of coal used in power



ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Comment
						generation is measured by online coal weighing/feeding system.
2.27	COEF <sub>i,j</sub> y	IPCC for HSD and FO and third party measured C% for coal	t CO <sub>2</sub> / KL of HSD and FO and t CO <sub>2</sub> / tonne coal	C	Annually	Fuel specific emission factor of HSD and FO is calculated using IPCC default factor of carbon content, NCV, carbon oxidation factor and supplier's specific gravity data and that of coal is calculated using third party measured C% and IPCC default carbon oxidation factor.
2.28	GEN <sub>j</sub> y	In plant data	MWh	M	Annually	This is total net power generated by in-house HSD and FO fired DG set and coal fired power plant. Net power generation by coal based power plant is measured and added with measured net power generated by DG sets to arrive at total net power generated in the self generation unit of the plant.
2.29	GE	In plant data	MWh	M	Monthly	This is total Grid power electricity entering to main bus bar and is measured by dedicated energy meters at plant main receiving substation (MRSS) from external power Grid
2.30	SG	In plant	MWh	M,C	Monthly	This is total self



ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Comment
		data				generated electricity consumed by the plant and is measured by dedicated energy meters at plant main receiving substation (MRSS) from self generation units.
2.31	PELE_CLNK,y	In plant data	MWh	M,C	Monthly	Total electricity consumed up to clinkerisation (PELE_CLNK,y) is measured daily by dedicated meters and the same is recorded in online Energy Management System(EMS). Based on measured electricity consumption at different sections (Crushing, Raw Mill, Kiln) of clinkerisation, total electricity consumed up to clinkerisation is calculated.
2.32	PELE_BC,y	In plant data	MWh	M,C	Monthly	Total electricity consumed for production of cement in cement mill section is measured daily by dedicated meters and the same is recorded in online Energy Management system (EMS). Total electricity consumed for production of blended cement (PELE_BC,y) is calculated based on



ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Comment
						measured electricity consumption of cement mill section.
2.33	CLNKy	In plant data	Kilo tonnes	M,C	Annual	The daily clinker production is calculated from the proportional amount of Kiln feed (Raw meal) and the data is sum up to get the annual production. The Kiln feed will be measured and recorded in factory report.

**Data Monitored for Leakage Emissions Calculations**

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Comment
3.1	TFcons	<i>In plant data</i>	<i>Kg of fuel/kilometre</i>	<i>C</i>	<i>Annually</i>	
3.2	Dadd_source	<i>In plant data</i>	<i>Km</i>	<i>M</i>	<i>Per trip</i>	
3.3	TEF	<i>IPCC default values for fuel used in transportation of fly ash</i>	<i>tonneCO2/kg fuel used</i>	<i>E</i>	<i>Annually</i>	<i>Data on grid generation and power plant details has been sourced from State grid and central electricity authority of India</i>
3.4	Qadd ELEconveyor_ADD	<i>In plant data</i>	<i>MWh</i>	<i>M</i>	<i>Monthly</i>	
3.5	EFgrid	<i>In plant data</i>	<i>t CO2/MWh</i>	<i>C</i>	<i>Annually</i>	<i>Latest</i>



						<i>published grid emission factor from CEA (Central Electricity Authority) applicable for the reporting period (ex-post) will be used for CER calculation. However if ex-ante value (0.988 tCO<sub>2</sub>/MWh) found to be conservative to ex-post grid emission factor, ex-ante value will be used for CER calculation.</i>
3.6	Qadd	<i>In plant data</i>	<i>Tonne of additive/vehicle</i>	<i>M</i>	<i>Per trip</i>	
3.7	Áy	<i>In plant data</i>	<i>Tonne of additive</i>	<i>M/C</i>	<i>Annually</i>	
3.8	Ablend,y	<i>Baseline calculation</i>	<i>tonne of additives/tonne of BC</i>	<i>C</i>	<i>Annually</i>	<i>Baseline benchmark share of additives per tonne of BC updated for year y</i>
3.9	Pblend,_y	<i>Plant records</i>	<i>tonne of additives/tonne of BC</i>	<i>C</i>	<i>Annually</i>	<i>Share of additives per tonne of BC in year y</i>

#### SECTION D. Data and parameters

##### D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

<b>Data / Parameter:</b>	<b>Stoichiometric emission factor for CaO</b>
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Data unit:	(tCO <sub>2</sub> /t CaO)
Description:	Stoichiometric emission factor for CaO
Source of data used:	Standard stoichiometric data provided in the methodology
Value (s)	0.785
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)	Baseline and project.
Additional comment:	None

<b>Data / Parameter:</b>	<b>Stoichiometric emission factor for MgO</b>
Data unit:	(tCO <sub>2</sub> /t MgO)
Description:	Same value is used both in baseline and project scenario
Source of data used:	Standard stoichiometric data provided in the methodology
Value (s)	1.092
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)	Baseline and project
Additional comment:	None

<b>Data / Parameter:</b>	<b>TEF</b>
Data unit:	<i>Kg CO<sub>2</sub>/kg fuel used</i>
Description:	<i>IPCC default values for fuel used in transportation of fly ash</i>
Source of data used:	IPCC
Value (s)	3.1772
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)	Leakage
Additional comment:	None

## D.2. Data and parameters monitored

### Data Monitored for Baseline Emissions Calculations:

<b>Data / Parameter:</b>	<i>In CaO<sub>BSL</sub></i>
Data unit:	<i>t CaO</i>
Description:	CaO content of the raw material is measured daily in % and multiplied by raw material quantity in tonnes
Measured/ Calculated/ Default	M,C
Source of data:	<i>In plant clinkerisation unit</i>
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline



Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Daily
Calculation method (if applicable):	CaO content of the raw material is measured daily in % and multiplied by raw material quantity in tonnes
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	<i>Out CaO<sub>BSL</sub></i>
Data unit:	<i>t CaO</i>
Description:	CaO content of the clinker is measured daily in % and multiplied by clinker produced tonnes.
Measured/ Calculated/ Default	M,C
Source of data:	<i>In plant clinkerisation unit</i>
Value (s) of Monitored Parameter	838342.7536
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Daily
Calculation method (if applicable):	CaO content of the clinker is measured daily in % and multiplied by clinker produced tonnes.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	<i>In MgO<sub>BSL</sub></i>
Data unit:	<i>t MgO</i>
Description:	MgO content of the raw material is measured daily in % and multiplied by raw material quantity in tonnes
Measured/ Calculated/ Default	M,C
Source of data:	<i>In plant clinkerisation unit</i>



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Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Daily
Calculation method (if applicable):	MgO content of the raw material is measured daily in % and multiplied by raw material quantity in tonnes
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	<i>Out MgO<sub>BSL</sub></i>
Data unit:	<i>t MgO</i>
Description:	MgO content of the clinker is measured daily in % and multiplied by clinker produced tonnes.
Measured/ Calculated/ Default	M,C
Source of data:	<i>In plant clinkerisation unit</i>
Value (s) of Monitored Parameter	16839.394
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Daily
Calculation method (if applicable):	MgO content of the clinker is measured daily in % and multiplied by clinker produced tonnes.
QA/QC procedures applied:	Please refer QA/QC table provided below.





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<b>Data / Parameter:</b>	Quantity of limestone used in the clinkerisation unit in baseline
Data unit:	Kilo tonnes
Description:	Quantity of limestone used in the clinkerisation unit in baseline
Measured/ Calculated/ Default	M
Source of data:	In plant clinkerisation unit
Value (s) of Monitored Parameter	1791.015
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	NA
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	<i>Quantity of clinker used for PPC production</i> $CLNK_{BSL}$
Data unit:	<i>Kilo tonnes</i>
Description:	Quantity of clinker used for PPC production.
Measured/ Calculated/ Default	M
Source of data:	<i>In plant grinding unit</i>
Value (s) of Monitored Parameter	5.568894
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually



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Calculation method (if applicable):	NA
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	FF <sub>i</sub> ,
Data unit:	Tonnes
Description:	Fuel consumed in clinkerisation unit.
Measured/ Calculated/ Default	M
Source of data:	In plant clinkerisation unit
Value (s) of Monitored Parameter	199773.7
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	NA
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	EFF <sub>i</sub> BLS
Data unit:	tCO <sub>2</sub> /tonne of fuel used
Description:	Emission factor for fossil fuel i (t CO <sub>2</sub> /tonne of fuel)
Measured/ Calculated/ Default	C
Source of data:	IPCC default values for the fuels type
Value (s) of Monitored Parameter	1.845536
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number,	NA



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calibration frequency, date of last, calibration, validity)	
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated using Carbon content of the fuel (here coal)/100 * (44/12)* 0.98
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	BELEgrid_CLNK, <i>BSL</i>
Data unit:	MWh
Description:	Baseline grid electricity for clinker production
Measured/ Calculated/ Default	M
Source of data:	<i>In plant clinkerisation unit</i>
Value (s) of Monitored Parameter	43598.49
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	NA
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	EFgrid_BSL
Data unit:	<i>tCO<sub>2</sub>/MWh</i>
Description:	Baseline grid emission factor
Measured/ Calculated/ Default	C, E
Source of data:	<i>In plant data</i>
Value (s) of Monitored Parameter	0.988
Indicate what the data are used for (Baseline/ Project/Leakage	Baseline



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emission calculations) applied:	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	The calculation made by CEA govt. of India and published in their website.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	BELEsg_CLNK, <i>BSL</i>
Data unit:	<i>MWh</i>
Description:	Baseline self generation of electricity for clinker production
Measured/ Calculated/ Default	M
Source of data:	<i>In plant data</i>
Value (s) of Monitored Parameter	46806.89
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations) applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	This is measured data
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	EFsg_ <i>BSL</i>
Data unit:	<i>tCO2/MWh</i>
Description:	Baseline electricity self generation emission factor
Measured/ Calculated/ Default	M,C,E
Source of data:	<i>In plant data</i>



Value (s) of Monitored Parameter	0.757751371
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated by dividing total emission (tCO <sub>2</sub> ) from each fuel type consumed in a period divided by net power generation (MWh)
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	ADDy Quantity of additives added in the baseline
Data unit:	<i>Kilo tonnes</i>
Description:	Quantity of additives added in the baseline annually
Measured/ Calculated/ Default	M
Source of data:	In plant data
Value (s) of Monitored Parameter	1799
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	This is measured data
QA/QC procedures applied:	Please refer QA/QC table provided below.



<b>Data / Parameter:</b>	BE <sub>calcin, BSL</sub>
Data unit:	tCO <sub>2</sub> /tonne of clinker
Description:	Baseline emissions per tonne of clinker due to calcinations of calcium carbonate and magnesium carbonate
Measured/ Calculated/ Default	C
Source of data:	In plant data
Value (s) of Monitored Parameter	0.522248
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on measured CaO%, MgO% and Clinker production data. For detail refer baseline calculation section.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	BE <sub>fossil_fuel, BSL</sub>
Data unit:	tCO <sub>2</sub> /tonne of clinker
Description:	Baseline emissions per tonne of clinker due to combustion of fossil fuels for clinker production
Measured/ Calculated/ Default	C
Source of data:	In plant data
Value (s) of Monitored Parameter	0.284628
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA



Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on measured fuel consumption and their respective calculated emission factor and measured Clinker produced during the monitoring period. For detail refer baseline calculation section provided below.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	BEele_grid_CLNK <sub>BSL</sub>
Data unit:	tCO <sub>2</sub> /tonne of clinker
Description:	Baseline grid electricity emissions for clinker production per tonne of clinker
Measured/ Calculated/ Default	C
Source of data:	In plant data
Value (s) of Monitored Parameter	0.033254105
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on measured grid power consumption and respective calculated grid emission factor from CEA and measured Clinker produced during the monitoring period. For detail refer baseline calculation section provided below.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	BEele_sg_CLNK <sub>BSL</sub>
Data unit:	tCO <sub>2</sub> /tonne of clinker
Description:	Baseline emissions from self generated electricity for clinker production per tonne of clinker
Measured/ Calculated/ Default	C
Source of data:	In plant data



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Value (s) of Monitored Parameter	0.027381258
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on measured self generated power consumption and respective calculated emission factor and measured Clinker produced during the monitoring period. For detail refer baseline calculation section provided below.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	BEele_grid_BC, BSL
Data unit:	tCO2/tonne of blended cement
Description:	Baseline grid electricity emissions for BC grinding
Measured/ Calculated/ Default	C
Source of data:	In plant data
Value (s) of Monitored Parameter	0.0341848
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on grid power consumption for BC grinding, respective grid emission factor and total BC produced during the monitoring period. For detail refer baseline calculation section provided below.
QA/QC procedures	Please refer QA/QC table provided below.





applied:	
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<b>Data / Parameter:</b>	BE <sub>ele sg BC, BSL</sub>
Data unit:	tCO <sub>2</sub> /tonne of blended cement
Description:	Baseline self generated electricity emissions for BC grinding
Measured/ Calculated/ Default	C
Source of data:	In plant data
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on self generated power consumption for BC grinding, self generation emission factor and total BC produced during the monitoring period. For detail refer baseline calculation section provided below.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	Bblend,y
Data unit:	Tonne of clinker/tonne of blended cement
Description:	Baseline benchmark of share of clinker per tonne of BC updated for year y
Measured/ Calculated/ Default	C
Source of data:	In plant data
Value (s) of Monitored Parameter	0.778793429
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency,	NA



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date of last, calibration, validity)	
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated as defined in the methodology.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	BC BSL
Data unit:	Kilo tines of BC
Description:	Annual production of BC in the base year.
Measured/ Calculated/ Default	M
Source of data:	Plant records
Value (s) of Monitored Parameter	7.566
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	Measured data
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	BELEgrid_BC,BSL
Data unit:	MWh
Description:	Baseline grid electricity for grinding BC
Measured/ Calculated/ Default	M,C
Source of data:	Plant records
Value (s) of Monitored Parameter	261.78
Indicate what the data are used for (Baseline/ Project/Leakage emission	Baseline



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calculations)applied:	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	Calculated based on measured data
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	BELEsg_BC,BSL
Data unit:	MWh
Description:	Baseline self generation electricity for grinding BC
Measured/ Calculated/ Default	M,C
Source of data:	Plant records
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	Calculated based on Measured data
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	BELEgrid_ADD
Data unit:	MWh
Description:	Baseline grid electricity for grinding additives
Measured/ Calculated/ Default	M



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Source of data:	Plant records
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is measured data.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	BELEsg_ADD,BSL
Data unit:	MWh
Description:	Baseline self generated electricity for grinding additives
Measured/ Calculated/ Default	M
Source of data:	Plant records
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is measured data.
QA/QC procedures applied:	Please refer QA/QC table provided below.



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<b>Data / Parameter:</b>	$F_{i,j}$ ,BSL
Data unit:	KL of FO, HSD and tonne of Coal
Description:	Quantity of Fuel i consumed for self generation
Measured/ Calculated/ Default	M
Source of data:	Plant records
Value (s) of Monitored Parameter	HSD – 1055.96 KL FO – 16431.67 KL
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	This is measured data
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	$COEF_{i,j}$ BSL
Data unit:	tCO <sub>2</sub> /tonne of fuel i
Description:	CO <sub>2</sub> emission coefficient of fuel i (tCO <sub>2</sub> / mass or volume unit of the fuel i )
Measured/ Calculated/ Default	C
Source of data:	IPCC
Value (s) of Monitored Parameter	COEF_HSD – 2.70 tCO <sub>2</sub> / KL COEF_FO – 2.92 tCO <sub>2</sub> / KL
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/	Annually



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Recording frequency:	
Calculation method (if applicable):	This calculated based on IPCC
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	GENj,BSL
Data unit:	MWh
Description:	Total power generated
Measured/ Calculated/ Default	M
Source of data:	Plant records
Value (s) of Monitored Parameter	67082.12
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is measured data
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	BEele_grid_ADD,BSL
Data unit:	tCO2/tonne of blended cement
Description:	Baseline grid electricity emissions for additive preparation
Measured/ Calculated/ Default	C
Source of data:	Plant records
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class,	NA



serial number, calibration frequency, date of last, calibration, validity)	
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on Grid power consumption for additive preparation, grid emission factor and BC produced during the monitoring period. For detail refer baseline calculation section provided below.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	BEele_sg_ADD,BSL
Data unit:	tCO <sub>2</sub> /tonne of blended cement
Description:	Baseline self generated electricity emissions for additive preparation
Measured/ Calculated/ Default	C
Source of data:	Plant records
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on self generated power consumption for additive preparation, emission factor of self generated electricity and BC produced during the monitoring period. For detail refer baseline calculation section provided below.
QA/QC procedures applied:	Please refer QA/QC table provided below.

**Data Monitored for Project Emissions Calculations**

<b>Data / Parameter:</b>	In CaO <sub>y</sub>
Data unit:	t CaO
Description:	CaO content of the raw material is measured daily in % and multiplied by raw material quantity in tonnes
Measured/ Calculated/	M,C



Default	
Source of data:	In plant clinkerisation unit
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Daily
Calculation method (if applicable):	CaO content of the raw material is measured daily in % and multiplied by raw material quantity in tonnes
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	Out CaO <sub>v</sub>
Data unit:	t CaO
Description:	CaO content of the clinker is measured daily in % and multiplied by clinker produced tonnes.
Measured/ Calculated/ Default	M,C
Source of data:	In plant clinkerisation unit
Value (s) of Monitored Parameter	1257131.9475
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Daily
Calculation method (if applicable):	CaO content of the clinker is measured daily in % and multiplied by clinker produced tonnes.
QA/QC procedures applied:	Please refer QA/QC table provided below.





<b>Data / Parameter:</b>	In MgO <sub>v</sub>
Data unit:	t MgO
Description:	MgO content of the raw material is measured daily in % and multiplied by raw material quantity in tonnes
Measured/ Calculated/ Default	M,C
Source of data:	In plant clinkerisation unit
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Daily
Calculation method (if applicable):	MgO content of the raw material is measured daily in % and multiplied by raw material quantity in tonnes
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	Out MgO <sub>v</sub>
Data unit:	t MgO
Description:	MgO content of the clinker is measured daily in % and multiplied by clinker produced tonnes.
Measured/ Calculated/ Default	M,C
Source of data:	In plant clinkerisation unit
Value (s) of Monitored Parameter	26355.78
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration,	Please refer equipment calibration detail provided in Annexure 1 below.



validity)	
Measuring/ Reading/ Recording frequency:	Daily
Calculation method (if applicable):	MgO content of the clinker is measured daily in % and multiplied by clinker produced tonnes.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	Quantity of limestone used in the clinkerisation unit
Data unit:	Kilo tonnes
Description:	Quantity of limestone used in the clinkerisation unit
Measured/ Calculated/ Default	M
Source of data:	In plant clinkerisation unit
Value (s) of Monitored Parameter	2750
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if Applicable):	The plant records usages of limestone for clinker production on monthly basis. For annual records same can be cross checked in annual financial accounts/ opening and closing balance of raw material used.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	Quantity of clinker used for PPC production CLNK <sub>y</sub>
Data unit:	Kilo tonnes
Description:	Quantity of clinker used for PPC production in the project year (kilo tonnes of clinker)
Measured/ Calculated/ Default	M
Source of data:	The plant records usages of clinker for PPC production on monthly basis. For annual records same can be cross checked in annual financial records/ opening and closing balance of clinker.
Value (s) of Monitored Parameter	1702.913



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Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is measured data
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	FFi_y
Data unit:	Tonnes
Description:	Quantity of fuel (coal) used for clinkerisation.
Measured/ Calculated/ Default	M
Source of data:	In plant clinkerisation unit. The plant records usages of coal for clinker production on monthly basis. For annual records same can be cross checked in annual financial records/ opening and closing balance of raw material consumption
Value (s) of Monitored Parameter	325291.876
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is measured data
QA/QC procedures applied:	Please refer QA/QC table provided below.



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<b>Data / Parameter:</b>	Emission factor of coal used in clinkerisation unit, EFFi
Data unit:	tCO2/tonne
Description:	Emission factor for fossil fuel i (t CO2/tonne of fuel)
Measured/ Calculated/ Default	C
Source of data:	In Plant clinkerisation unit, EFFi is calculated using Carbon content of coal used and default carbon oxidation factor of 0.98. Carbon content of coal used is analyzed by independent Lab.
Value (s) of Monitored Parameter	1.82577
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated using measured carbon content of the fuel (here coal) /100 * (44/12)* 0.98
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PELEgrid_CLNK,y
Data unit:	MWh
Description:	Project grid electricity for clinker production
Measured/ Calculated/ Default	M,C
Source of data:	In plant clinkerisation unit. Total Grid electricity purchased (GE)and total self generated electricity produced(SG) as well as total electricity consumed up to clinkerisation (PELE_CLNK,y) is measured daily by dedicated meters and the same is recorded in online Energy Management System(EMS). The entire detail of measurements and metering is clearly delineated in the CDM manual.
Value (s) of Monitored Parameter	130368.96609
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class,	Please refer equipment calibration detail provided in Annexure 1 below.



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serial number, calibration frequency, date of last, calibration, validity)	
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if Applicable):	Based on the above mentioned measured data, the grid electricity up to clinkerisation is calculated as per following proportionate formula: $PELE_{grid\_CLNK,y} = PELE\_CLNK,y \times [GE/(GE+SG)]$ .
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PELEsg_CLNK,y
Data unit:	MWh
Description:	Project Self generation of electricity for clinker production
Measured/ Calculated/ Default	M, C
Source of data:	In plant data. Total Grid electricity purchased (GE)and total self generated electricity produced(SG) as well as total electricity consumed up to clinkerisation (PELE_CLNK,y) is measured daily by dedicated meters and the same is recorded in online Energy Management System(EMS). The entire detail of measurements and metering is clearly delineated in the CDM manual.
Value (s) of Monitored Parameter	1838.84061
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	Based on the above mentioned measured data, the self generated electricity up to clinkerisation is calculated as per following proportionate formula: $PELE_{sg\_CLNK,y} = PELE\_CLNK,y \times [SG/(GE+SG)]$
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	EFsg_y
Data unit:	tCO2/MWh



Description:	Project electricity self generation emission factor
Measured/ Calculated/ Default	M,C,E
Source of data:	In plant data. Unit would record the estimated emission factor of the in-house electricity generation based on calculated total in-house net power generation and total emission due to burning of fossil fuel like HSD, FO and Coal.
Value (s) of Monitored Parameter	0.80558
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if Applicable):	Total emission will be calculated using IPCC default NCV, carbon content, carbon oxidation factor, supplier's specific gravity and measured consumption quantity in case of HSD and FO and measured quantity and emission factor(EFFi) in case of coal as mentioned against serial No.2. 8 above. Total net power generation (ID number 2.28) and emission from power generation (ID number 2.26 & 2.27) as defined above.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	ADDy Quantity of additives
Data unit:	<i>Kilo tonnes</i>
Description:	Quantity of additives added in the project annually. The plant records usages of fly ash for PPC production on monthly basis. For annual records same can be cross checked in annual financial records/ opening and closing balance of fly ash
Measured/ Calculated/ Default	M
Source of data:	In plant data
Value (s) of Monitored Parameter	795.170
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment	Please refer equipment calibration detail provided in Annexure 1 below.



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(type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if Applicable):	This is measured data
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PEcalcin,y
Data unit:	tCO2/tonne of clinker
Description:	Project emissions per tonne of clinker due to calcinations of calcium carbonate and magnesium carbonate
Measured/ Calculated/ Default	C
Source of data:	In plant data
Value (s) of Monitored Parameter	0.52408
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if Applicable):	This is calculated based on measured CaO%, MgO% and Clinker production data. For detail refer project calculation section.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PEfossil_fuel,y
Data unit:	tCO2/tonne of clinker
Description:	Project emissions per tonne of clinker due to combustion of fossil fuels for clinker production
Measured/ Calculated/ Default	C
Source of data:	In plant data



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Value (s) of Monitored Parameter	0.30647
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if Applicable):	This is calculated based on measured fuel consumption and their respective calculated emission factor and measured Clinker produced during the monitoring period. For detail refer project emission calculation section provided below.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PEele_grid_CLNK,y
Data unit:	tCO <sub>2</sub> /tonne of clinker
Description:	Project grid electricity emissions for clinker production per tonne of clinker
Measured/ Calculated/ Default	C
Source of data:	In plant data
Value (s) of Monitored Parameter	0.06647
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on measured grid power consumption and respective calculated grid emission factor from CEA and measured Clinker produced during the monitoring period. For detail refer project emission calculation section provided below.





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QA/QC procedures applied:	Please refer QA/QC table provided below.
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<b>Data / Parameter:</b>	PEele_sg_CLNK,y
Data unit:	tCO2/tonne of clinker
Description:	Project emissions from self generated electricity for clinker production per tonne of clinker
Measured/ Calculated/ Default	C
Source of data:	In plant data
Value (s) of Monitored Parameter	0.00076
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on measured self generated power consumption and respective calculated emission factor and measured Clinker produced during the monitoring period. For detail refer project emission calculation section provided below.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PEele_grid_ADD,y
Data unit:	tCO2/tonne of blended cement
Description:	Project grid electricity emissions for additive preparation
Measured/ Calculated/ Default	C
Source of data:	Plant records
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class,	NA



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serial number, calibration frequency, date of last, calibration, validity)	
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on Grid power consumption for additive preparation, grid emission factor and BC produced during the monitoring period. For detail refer project emission calculation section provided below.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PEele_sg_ADD,y
Data unit:	tCO2/tonne of blended cement
Description:	Project self generated electricity emissions for additive preparation
Measured/ Calculated/ Default	C
Source of data:	Plant records
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on self generated power consumption for additive preparation, emission factor of self generated electricity and BC produced during the monitoring period. For detail refer project emission calculation section provided below.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PEele_grid_BC,y
Data unit:	tCO2/tonne of blended cement
Description:	Project grid electricity emissions for BC grinding
Measured/ Calculated/ Default	C
Source of data:	In plant data



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Value (s) of Monitored Parameter	0.02644
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on grid power consumption for BC grinding, respective grid emission factor and total BC produced during the monitoring period. For detail refer project emission calculation section provided below.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PEele_sg_BC,y
Data unit:	tCO <sub>2</sub> /tonne of blended cement
Description:	Project self generated electricity emissions for BC grinding
Measured/ Calculated/ Default	C
Source of data:	In plant data
Value (s) of Monitored Parameter	0.00033
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated based on self generated power consumption for BC grinding, self generation emission factor and total BC produced during the monitoring period. For detail refer project emission calculation section provided below.
QA/QC procedures	Please refer QA/QC table provided below.



applied:	
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<b>Data / Parameter:</b>	Pblend,y
Data unit:	Tonne of clinker/tonne of blended cement
Description:	Project period benchmark share of clinker per tonne of BC updated for year y
Measured/ Calculated/ Default	C
Source of data:	In plant data
Value (s) of Monitored Parameter	0.74783
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated as defined in the methodology.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PELEgrid_BC,y
Data unit:	MWh
Description:	Project grid electricity for grinding BC
Measured/ Calculated/ Default	M, C
Source of data:	In plant data. Total Grid electricity purchased (GE)and total self generated electricity produced(SG) as well as total electricity consumed for production of blended cement (PELE_BC,y) is measured daily by dedicated meters and the same is recorded in online Energy Management System(EMS). The entire detail of measurements and metering is clearly delineated in the CDM manual.
Value (s) of Monitored Parameter	68580.32246
Indicate what the data are used for (Baseline/ Project/Leakage emission	Project



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calculations)applied:	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	Based on the above mentioned measured data, the grid electricity for production of blended cement is calculated as per following proportionate formula: <b><math>PELE_{grid\_BC,y} = PELE_{BC,y} \times [GE / (GE+SG)]</math></b>
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PELEsg_BC,y
Data unit:	MWh
Description:	Project self generation electricity for grinding BC
Measured/ Calculated/ Default	M, C
Source of data:	In plant data. Total Grid electricity purchased (GE)and total self generated electricity produced(SG) as well as total electricity for production of blended cement (PELE_BC,y) is measured daily by dedicated meters and the same is recorded in online Energy Management System(EMS). The entire detail of measurements and metering is clearly delineated in the CDM manual.
Value (s) of Monitored Parameter	678.08235
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	Based on the above mentioned measured data, the self generated electricityfor production of blended cement is calculated as per following proportionate formula: <b><math>PELE_{sg\_BC,y} = PELE_{BC,y} \times [SG / (GE+SG)]</math></b>
QA/QC procedures applied:	Please refer QA/QC table provided below.



<b>Data / Parameter:</b>	PELEgrid_ADD
Data unit:	MWh
Description:	Project grid electricity for grinding additives
Measured/ Calculated/ Default	M
Source of data:	In Plant data
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	NA.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PELEsg_ADDy
Data unit:	MWh
Description:	Project self generated electricity for grinding additives
Measured/ Calculated/ Default	M
Source of data:	In plant data
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/	Monthly



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Recording frequency:	
Calculation method (if applicable):	NA
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	$F_{i,j,y}$
Data unit:	KL of FO, HSD and tonne of Coal
Description:	Quantity of Fuel $i$ consumed for self generation
Measured/ Calculated/ Default	M
Source of data:	In plant data
Value (s) of Monitored Parameter	HSD – 60.332 KL FO – 704.313 KL
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	HSD and FO consumption for power generation is measured through level measurement of fuel tank and consumption of coal used in power generation is measured by online coal weighing/ feeding system.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	$COEF_{i,j,y}$
Data unit:	t CO <sub>2</sub> / KL of HSD and FO and t CO <sub>2</sub> / tonne coal
Description:	CO <sub>2</sub> emission coefficient of fuel $i$ (tCO <sub>2</sub> / mass or volume unit of the fuel $i$ )
Measured/ Calculated/ Default	C
Source of data:	IPCC
Value (s) of Monitored Parameter	COEF_HSD – 2.70 tCO <sub>2</sub> / KL COEF_FO – 2.92 tCO <sub>2</sub> / KL
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project



Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	Fuel specific emission factor of HSD and FO is calculated using IPCC default factor of carbon content, NCV, carbon oxidation factor and supplier's specific gravity data and that of coal is calculated using third party measured C% and IPCC default carbon oxidation factor.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	GEN <sub>j,y</sub>
Data unit:	MWh
Description:	This is total net power generated by in-house HSD and FO fired DG set and coal fired power plant.
Measured/ Calculated/ Default	M
Source of data:	In plant data
Value (s) of Monitored Parameter	2758.99100
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	Net power generation by coal based power plant is measured and added with measured net power generated by DG sets to arrive at total net power generated in the self generation unit of the plant.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	GE
Data unit:	MWh
Description:	This is total Grid power electricity entering to main bus bar and is measured by dedicated energy meters at plant main receiving substation





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	(MRSS)from external power Grid
Measured/ Calculated/ Default	M
Source of data:	Plant records
Value (s) of Monitored Parameter	195497.700
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	This is measured data.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	SG
Data unit:	MWh
Description:	This is total self generated electricity consumed by the plant and is measured by dedicated energy meters at plant main receiving substation (MRSS) from self generation units.
Measured/ Calculated/ Default	M,C
Source of data:	In plant data
Value (s) of Monitored Parameter	2758.991
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	This is total self generated electricity consumed by the plant and is



applicable):	measured by dedicated energy meters at plant main receiving substation (MRSS) from self generation units.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PELE_CLNK,y
Data unit:	MWh
Description:	Total electricity consumed up to clinkerisation
Measured/ Calculated/ Default	M,C
Source of data:	In plant data. Total electricity consumed up to clinkerisation (PELE_CLNK,y) is measured daily by dedicated meters and the same is recorded in online Energy Management System(EMS).
Value (s) of Monitored Parameter	132207.807
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	Based on measured electricity consumption at different sections (Crushing, Raw Mill, Kiln) of clinkerisation, total electricity consumed up to clinkerisation is calculated.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	PELE_BC,y
Data unit:	MWh
Description:	Total electricity consumed for production of blended cement
Measured/ Calculated/ Default	M,C
Source of data:	Total electricity consumed for production of cement in cement mill section is measured daily by dedicated meters and the same is recorded in online Energy Management system (EMS).
Value (s) of Monitored	69258.40481



Parameter	
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	Total electricity consumed for production of blended cement (PELE_BC,y) is calculated based on measured electricity consumption of cement mill section.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	CLNKy
Data unit:	Kilo tonnes
Description:	Annual production of clinker in year y
Measured/ Calculated/ Default	M,C
Source of data:	In plant data. The daily clinker production is calculated from the proportional amount of Kiln feed (Raw meal) and the data is sum up to get the annual production. The Kiln feed will be measured and recorded in factory report.
Value (s) of Monitored Parameter	1937.925
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Annual
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.

**Data Monitored for Leakage Emissions Calculations:**

<b>Data / Parameter:</b>	TFcons
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Data unit:	Kg of fuel/ kilometre
Description:	Fuel consumption for the vehicle per kilometre
Measured/ Calculated/ Default	C
Source of data:	In plant data
Value (s) of Monitored Parameter	0.2831
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Leakage
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This calculated based on vehicle fuel mileage.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	Dadd_source
Data unit:	Km
Description:	Distance between the source of additive and the project activity plant
Measured/ Calculated/ Default	M
Source of data:	In plant data
Value (s) of Monitored Parameter	116.87
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Leakage
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Per trip



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Calculation method (if applicable):	NA
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	TEF
Data unit:	tonneCO <sub>2</sub> /kg fuel used
Description:	Emission factor of fuel used for fly ash transportation
Measured/ Calculated/ Default	E
Source of data:	IPCC default values for fuel used in transportation of fly ash
Value (s) of Monitored Parameter	3.1772
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Leakage
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	Calculated based on IPCC default value of fuel carbon content and NCV, fuel density and carbon oxidation factor.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	QaddELEconveyor_ADD
Data unit:	MWh
Description:	Electricity consumption for conveyor system for additives
Measured/ Calculated/ Default	M
Source of data:	In plant data
Value (s) of Monitored Parameter	1300.671
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Leakage
Monitoring equipment (type, accuracy class,	Please refer equipment calibration detail provided in Annexure 1 below.



serial number, calibration frequency, date of last, calibration, validity)	
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	This is measured data.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	<b>Grid emission factor in year y</b>
Data unit:	tCO <sub>2</sub> / MWh
Description:	Baseline grid emission factor
Measured/ Calculated/ Default	C
Source of data:	<i>Grid emission factor from CEA (Central Electricity Authority)</i>
Value (s) of Monitored Parameter	Ex-ante value (used in CER calculation conservatively): Southern Grid – 0.988 Western grid – 0.984
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Baseline, Project and Leakage
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated by CEA based on combined mergin methodology.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	<b>Qadd</b>
Data unit:	Tonne of additive / vehicle
Description:	Quantity of additive carried in one trip per vehicle
Measured/ Calculated/ Default	M
Source of data:	In plant data
Value (s) of Monitored Parameter	19.43
Indicate what the data	Leakage



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are used for (Baseline/ Project/Leakage emission calculations)applied:	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Per trip
Calculation method (if applicable):	This is measured data.
QA/QC procedures applied:	Please refer QA/QC table provided below.

<b>Data / Parameter:</b>	Áy
Data unit:	Tonne of additives
Description:	Annual consumption of additive
Measured/ Calculated/ Default	M, C
Source of data:	In plant data
Value (s) of Monitored Parameter	795170.286
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Leakage
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	Please refer equipment calibration detail provided in Annexure 1 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	Calculated based on measured additive quantity.
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	Ablend,y
Data unit:	tonne of additives/tonne of BC
Description:	Baseline benchmark share of additives per tonne of BC updated for year y
Measured/ Calculated/	C



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Default	
Source of data:	In plant data
Value (s) of Monitored Parameter	0.25217
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Leakage
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	Calculated as per methodology
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	Pblend,y
Data unit:	tonne of additives/tonne of BC
Description:	Share of additives per tonne of BC in year y
Measured/ Calculated/ Default	C
Source of data:	Plant records
Value (s) of Monitored Parameter	0.33464
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Leakage
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	Calculated as per methodology
QA/QC procedures applied:	Please refer QA/QC table provided below.



**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.
1.1	Low	Testing as per National standards and for monitoring and calibration procedures, please refer CDM Manual
1.2	Low	Do
1.3	Low	Do
1.4	Low	Do
1.5	Low	QMS procedure is adopted for monitoring and calibration (Please refer CDM manual)
1.6	Low	QMS procedure is adopted for monitoring and calibration (Please refer CDM manual)
1.7	Low	QMS procedure is adopted for monitoring and calibration (Please refer CDM manual)
1.8	Low	Testing is done by reputed NABL research Laboratories
1.9	Low	This is a measured and calculated value and EMS procedure is adopted for monitoring and calibration (Please refer CDM manual) of values used for calculation
1.10	Low	Calculated using ACM0002 methodology
1.11	Low	This is a measured and calculated value and EMS procedure is adopted for monitoring and calibration (Please refer CDM manual) of values used for calculation
1.12	Low	This is a measured and calculated value and EMS procedure is adopted for monitoring and calibration (Please refer CDM manual) of values used for calculation
1.13	Low	QMS procedure is adopted for monitoring and calibration (Please refer CDM manual)
1.14	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
1.15	Low	This is a calculated value and QA / QC consists of cross checking with daily company report



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.
1.16	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
1.17	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
1.18	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
1.19	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
1.20	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
1.21	Low	QMS procedure is adopted for monitoring and calibration (Please refer CDM manual)
1.22	Low	This is a calculated value and EMS procedure is adopted for monitoring and calibration (Please refer CDM manual) of values used for calculation
1.23	Low	Do
1.24	Low	Do
1.25	Low	Do
1.26	Low	This is measured value and QA / QC consists of cross checking with daily company report and part of existing QMS
1.27	Low	IPCC data is used for calculation.
1.28	Low	This is measured data and QA / QC consists of cross checking with daily company report
1.29	Low	This is a calculated value and QA / QC consists of cross checking with daily company report.
1.30	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
2.1	Low	Testing as per BIS standards and for monitoring and calibration procedures please CDM Manual
2.2	Low	Do



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.
2.3	Low	Do
2.4	Low	Do
2.5	Low	QMS procedure is adopted for monitoring and calibration (Please refer CDM manual)
2.6	Low	QMS procedure is adopted for monitoring and calibration (Please refer CDM manual)
2.7	Low	QMS procedure is adopted for monitoring and calibration (Please refer CDM manual)
2.8	Low	Testing is done by independent research Laboratories
2.9	Low	This is a calculated value and EMS procedure is adopted for monitoring and calibration (Please refer CDM manual) of values used for calculation
2.10	Low	This is a calculated value and EMS procedure is adopted for monitoring and calibration (Please refer CDM manual) of values used for calculation
2.11	Low	This is a calculated value and EMS procedure is adopted for monitoring and calibration (Please refer CDM manual) of values used for calculation
2.12	Low	QMS procedure is adopted for monitoring and calibration (Please refer CDM manual)
2.13	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
2.14	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
2.15	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
2.16	Low	This is a calculated value and QA / QC consists of cross checking with daily company report



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.
2.17	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
2.18	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
2.19	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
2.20	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
2.21	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
2.22	Low	This is a calculated value and EMS procedure is adopted for monitoring and calibration (Please refer CDM manual) of values used for calculation
2.23	Low	Do
2.24	Low	Do
2.25	Low	Do
2.26	Low	This is measured value and QA / QC consists of cross checking with daily company report and part of existing QMS
2.27	Low	IPCC data is used for calculation in case of FO & HSD. For coal this is calculated based on third party measured carbon content of coal and IPCC default carbon oxidation factor.
2.28	Low	This is measured data and QA / QC consists of cross checking with daily company report
2.29	Low	This is measured data. The meter is under controlled and supervised by Government bodies (Andhra Pradesh State Electricity Board)
2.30	Low	This is measured data. The meters are of high accuracy class and are calibrated by external agencies.
2.31	Low	This data is calculated from measured data. The meters are of high accuracy class and are calibrated by external agencies.



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.
2.32	Low	This data is calculated from measured data. The meters are of high accuracy class and are calibrated by external agencies.
2.33	Low	This is calculated based on measured data. Meters are calibrated.
3.1	Low	The risk is mitigated by getting the duly signed data from transporters
3.2	Low	The risk is mitigated by calculating distance using Transporter guide of India
3.3	Low	IPCC default values used for transport fuel
3.4	Low	This is measured data. Internally checked by concerned department.
3.5	Low	Calculated using ACM0002 methodology
3.6	Low	QMS procedure is adopted for monitoring and calibration
3.7	Low	The risk is mitigated by cross checking with published fly ash generation and consumption record for the region available in the public domain.
3.8	Low	This is a calculated value and QA / QC consists of cross checking with daily company report.
3.9	Low	This is a calculated value and QA / QC consists of cross checking with daily company report

## SECTION E. Emission reductions calculation

### E.1. Baseline emissions calculation

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#### **Baseline Emissions:**

$$BEBC,y = [BEclinker * BBlend,y] + BEele\_ADD\_BC \text{ ----- (1)}$$

where:



BEBC<sub>y</sub> = Baseline CO<sub>2</sub> emissions per tonne of blended cement type (BC) (t CO<sub>2</sub>/tonne BC)

BEclinker = CO<sub>2</sub> emissions per tonne of clinker in the baseline in the project activity plant (t CO<sub>2</sub>/tonne clinker) and defined below

BBlend<sub>y</sub> = Baseline benchmark of share of clinker per tonne of BC updated for year y (tonne of clinker/tonne of BC)

BEele\_ADD\_BC = Baseline electricity emissions for BC grinding and preparation of additives (tCO<sub>2</sub>/tonne of BC)

Identification Details	Description	Unit	2008-09
BE clinker	CO <sub>2</sub> emissions per tonne of clinker in the baseline in the project activity plant and defined below	(t CO <sub>2</sub> /tonne clinker)	0.86751
BBlend <sub>y</sub>	Baseline benchmark of share of clinker per tonne of BC updated for year y	(tonne of clinker/tonne of BC)	0.74783
BEele_ADD_BC	Baseline electricity emissions for BC grinding and preparation of additives	(tCO <sub>2</sub> /tonne of BC)	0.02677
BEBC <sub>y</sub>	Baseline CO <sub>2</sub> emissions per tonne of blended cement type (BC)	tCO <sub>2</sub> /tonne BC	0.67552

## E.2. Project emissions calculation

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### Project Emissions:

$$PEBC_y = [PEclinker_y * PBlend_y] + PEele\_ADD\_BC_y \text{ -----(5)}$$

where:

PEBC<sub>y</sub> = CO<sub>2</sub> emissions per tonne of BC in the project activity plant in year y (tCO<sub>2</sub>/tonne BC)

PEclinker<sub>y</sub> = CO<sub>2</sub> emissions per tonne of clinker in the project activity plant in year y (t CO<sub>2</sub>/tonne clinker) and defined below

PBlend<sub>y</sub> = Share of clinker per tonne of BC in year y (tonne of clinker/tonne of BC)

PEele\_AD,D\_BC<sub>y</sub> = Electricity emissions for BC grinding and preparation of additives in year y (tCO<sub>2</sub>/tonne of BC)

Identification Details	Description	Unit	2008-09
PEBC <sub>y</sub>	CO <sub>2</sub> emissions per tonne of BC in the project activity plant in year y	tCO <sub>2</sub> /tonne BC	0.62411
PEclinker <sub>y</sub>	CO <sub>2</sub> emissions per tonne of clinker in the project activity plant in year y	(t CO <sub>2</sub> /tonne clinker)	0.89778
PBlend <sub>y</sub>	Share of clinker per tonne of BC in year y	(tonne of clinker/tonne of BC)	0.66536
PEele_AD,D_BC <sub>y</sub>	Electricity emissions for BC grinding and preparation of additives in year y	(tCO <sub>2</sub> /tonne of BC)	0.02677



$$PEclinker,y = PEcalcin,y + PEfossil\_fuel,y + PEele\_grid\_CLNK,y + PEele\_sg\_CLNK,y \quad (5.1)$$

where:

$PEclinker,y$  = Emissions of CO<sub>2</sub> per tonne of clinker in the project activity plant in year y (t CO<sub>2</sub>/tonne clinker)

$PEcalcin,y$  = Emissions per tonne of clinker due to calcinations of calcium carbonate and magnesium carbonate in year y (t CO<sub>2</sub>/tonne clinker)

$PEfossil\_fuel,y$  = Emissions per tonne of clinker due to combustion of fossil fuels for clinker production in year y (t CO<sub>2</sub>/tonne clinker)

$PEele\_grid\_CLNK,y$  = Grid electricity emissions for clinker production per tonne of clinker in year y (t CO<sub>2</sub>/tonne clinker)

$PEele\_sg\_CLNK,y$  = Emissions from self-generated electricity per tonne of clinker production in year y (t CO<sub>2</sub>/tonne clinker)

Identification Details	Description	Unit	2008-09
$PEclinker,y$	CO <sub>2</sub> emissions per tonne of clinker in the project activity plant in year y	(t CO <sub>2</sub> /tonne clinker)	0.89778
$PEcalcin,y$	Emissions from the calcinations of limestone	(t CO <sub>2</sub> /tonne clinker)	0.52408
$PEfossil\_fuel,y$	per tonne of clinker due to combustion of fossil fuels for clinker production in year y	(t CO <sub>2</sub> /tonne clinker)	0.30647
$PEele\_grid\_CLNK,y$	Grid electricity emissions for clinker production per tonne of clinker in year y	(t CO <sub>2</sub> /tonne clinker)	0.06647
$PEele\_sg\_CLNK,y$	Emissions from self-generated electricity per tonne of clinker production in year y	(t CO <sub>2</sub> /tonne clinker)	0.00076

$$PEcalcin,y = 0.785 * (OutCaOy - InCaOy) + 1.092 * (OutMgOy - InMgOy) / [CLNKy * 1000] \quad (5.1.1)$$

where:

$PEcalcin,y$  = Emissions from the calcinations of limestone (tCO<sub>2</sub>/tonne clinker)

0.785 = Stoichiometric emission factor for CaO (tCO<sub>2</sub>/t CaO)

1.092 = Stoichiometric emission factor for MgO (tCO<sub>2</sub>/t MgO)

$InCaO,y$  = CaO content (%) of the raw material \* raw material quantity (tonnes)

$OutCaO,y$  = CaO content (%) of the clinker \* clinker produced (tonnes)

$InMgO,y$  = MgO content (%) of the raw material \* raw material quantity (tonnes)

$OutMgO,y$  = MgO content (%) of the clinker \* clinker produced (tonnes)



Identification Details	Description	Unit	2008-09
PEcalcin,y	Emissions from the calcinations of limestone	(t CO <sub>2</sub> /tonne clinker)	0.52408
OutCaO - Year average	CaO content (%) of the clinker* clinker produced (tonnes)	tonnes	1257131.9475
- Year average	CaO content (%) of the clinker	%	64.8700
InCaO - Year average	CaO content (%) of the raw material * raw material quantity (tonnes)	tonnes	0.0000
- Year average	CaO content (%) of the raw material	%	0.0000
- Year average	Quantity of Clinker raw material (tonnes)	tonnes	2750000.0000
OutMgO - Year average	MgO content (%) of the clinker * clinker produced (tonnes)	tonnes	26355.7800
- Year average	MgO content (%) of the clinker	%	1.3600
InMgO - Year average	MgO content (%) of the raw material * raw material quantity (tonnes)	Tonnes	0.0000
- Year average	MgO content (%) of the raw material	%	0.0000
CLNKy	Annual production of clinker in year y (Kilo tonnes)	Kilo Tonnes	1937.9250

$$PE_{fossil\_fuel,y} = [ \sum FFi_y * EFFi ] / CLNK_y * 1000 \text{ -----(5.1.2)}$$

where:

FFi<sub>y</sub> = Fossil fuel of type i consumed for clinker production in year y (tonnes of fuel i)

EFFi = Emission factor for fossil fuel i (tCO<sub>2</sub>/tonne of fuel)

CLNK<sub>y</sub> = Annual production of clinker in year y (kilotonnes of clinker)

Identification Details	Description	Unit	2008-09
PE <sub>fossil_fuel,y</sub>	tCO <sub>2</sub> per tonne of clinker due to combustion of fossil fuels for clinker production in year y	(t CO <sub>2</sub> /tonne clinker)	0.30647
FFi <sub>BSL</sub>	Fossil fuel of type i consumed for clinker production in the baseline (tonnes of fuel i)	tonnes of coal (dry basis)	325291.87600
EFFi	Emission factor for fossil fuel i (t CO <sub>2</sub> /tonne of fuel)	(t CO <sub>2</sub> /tonne of fuel)	1.82577
FFi <sub>BSL</sub>	Fuel 2 (Rice husk) consumed for clinker production	tonnes of Rice Husk	0.00000



EFFi	Emission factor for fossil fuel i (t CO <sub>2</sub> /tonne of rice husk)	(t CO <sub>2</sub> /tonne of rice husk)	0.00000
FFi_BSL	Fuel 3 (Saw Dust) consumed for clinker production	tonnes of Saw Dust	0.00000
EFFi	Emission factor for fossil fuel i (t CO <sub>2</sub> /tonne of Saw Dust)	(t CO <sub>2</sub> /tonne of Saw Dust)	0.00000
CLNKy	Annual production of clinker in year y	Kilo Tonnes	1937.92500

$$PEele\_grid\_CLNK,y = [PELEgrid\_CLNK,y * EFgrid\_y] / [CLNKy * 1000] \quad (5.1.3)$$

where:

PELEgrid\_CLNK,y = Grid electricity for clinker production in year y (MWh)

EFgrid\_y = Grid emission factor in year y (t CO<sub>2</sub>/MWh)

CLNKy = Annual production of clinker in year y (kilotonnes of clinker)

Please note:

*Since ex-ante grid emission factor is conservative to ex-post grid emission factor, ex-ante grid emission values have been used in CER calculation. Both ex-ante and ex-post grid emission factors have been sourced from Central Electricity Authority (CEA) published literature.*

**Ex-ante values:**

*SREB – 0.988 t CO<sub>2</sub>e/ MWh (applicable for Devapur plant)*

*Western Grid – 0.984 t CO<sub>2</sub>e/ MWh (applicable for Jalgaon plant)*

**Ex-post Values:**

*South – 0.90 tCO<sub>2</sub>e/ MWh*

*NEWNE – 0.84 tCO<sub>2</sub>e/ MWh*

$$PEelec\_sg\_CLNK,y = [PELEsg\_CLNK,y * EFsg\_y] / [CLNKy * 1000] \quad (5.1.4)$$

where:

PELEsg\_CLNK,y = Self generation of electricity for clinker production in year y (MWh)

EFsg\_y = Emission factor for self generated electricity in year y (t CO<sub>2</sub>/MWh)

CLNKy = Annual production of clinker in year y (kilotonnes of clinker)

Identification Details	Description	Unit	2008-09
PEele_sg_CLNK,y	Emissions from self-generated electricity per tonne of clinker production in year y	(t CO <sub>2</sub> /tonne clinker)	0.00076
PELEsg_CLNK,y	Self generation of electricity for clinker production in year y	(MWh)	1838.84061
EFsg_y	Emission factor for self generated electricity in year y	(t CO <sub>2</sub> /MWh)	0.80558
CLNKy	Annual production of clinker	Kilo Tonnes	1937.92500

in year y

The emission factor for self generation ( $EF_{sg,y}$ ) is calculated as the generation-weighted average emissions per electricity unit (tCO<sub>2</sub>/MWh) of all self-generating sources in the project boundary serving the system.

$$EF_{sg,y} = \frac{\sum_{i,j} F_{i,j,y} \cdot COEF_{i,j}}{\sum_j GEN_{j,y}} \quad \text{----- (6)}$$

$F_{i,j,y}$  = amount of fuel  $i$  (in a mass or volume unit) consumed by relevant power sources  $j$  in year(s)  $y$ ,  
 $j$  = on-site power sources,

$COEF_{i,j,y}$  = CO<sub>2</sub> emission coefficient of fuel  $i$  (tCO<sub>2</sub> / mass or volume unit of the fuel), taking into account the carbon content of the fuels used by relevant power sources  $j$  and the percent oxidation of the fuel in year(s)  $y$ , and

$GEN_{j,y}$  = \*Net electricity (MWh) generated by the source  $j$  in year  $y$

\* Net electricity generation has been considered as per EB26 decision.

Net power generated (Mwh)	Name and Quantity of Fuel 1 (HSD) consumed for self generation (KL)	Name and Quantity of Fuel 2 (FO) consumed for self generation (KL)	CO2 emission coefficient of fuel HSD (tCO2/KL)	CO2 emission coefficient of fuel FO (tCO2/KL)	2008-09 Emission factor for self generated electricity in year y (tCO2/ Mwh)
GEN <sub>j,i</sub>	F_HSD	F_FO	COEF_HSD	COEF_FO	EF <sub>sg_y</sub>
2758.99100	60.332	704.313	2.70063	2.92436	0.80558

$$PE_{ele\_ADD\_BC,y} = PE_{ele\_grid\_BC,y} + PE_{ele\_sg\_BC,y} + PE_{ele\_grid\_ADD,y} + PE_{ele\_sg\_ADD,y} \quad (5.2)$$

where:

$PE_{ele\_grid\_BC}$  = Grid electricity emissions for BC grinding in year y (tCO<sub>2</sub>/tonne of BC)

$PE_{ele\_sg\_BC}$  = Emissions from self generated electricity for BC grinding in year y (tCO<sub>2</sub>/tonne of BC)

$PE_{ele\_grid\_ADD}$  = Grid electricity emissions for additive preparation in year y (tCO<sub>2</sub>/tonne of BC)

$PE_{ele\_sg\_ADD}$  = Emissions from self generated electricity additive preparation in year y (tCO<sub>2</sub>/tonne of BC)

Identification Details	Description	Unit	2008-09
$PE_{ele\_AD,D\_BC,y}$	Electricity emissions for BC grinding and preparation of additives in year y	(tCO <sub>2</sub> /tonne of BC)	0.02677
$PE_{ele\_grid\_BC,y}$	Grid electricity emissions for BC grinding in year y	(tCO <sub>2</sub> /tonne of BC)	0.02644



PEele_sg_BC,y	Emissions from self generated electricity for BC grinding in year y	(tCO <sub>2</sub> /tonne of BC)	0.00033
PEele_grid_ADD,y	Grid electricity emissions for additive preparation in year y	(tCO <sub>2</sub> /tonne of BC)	0.00000
PEele_sg_ADD,y	Emissions from self generated electricity additive preparation in year y	(tCO <sub>2</sub> /tonne of BC)	0.00000

$$PEele\_grid\_BC,y = [PELEgrid\_BC,y * EFgrid\_BSL,y] / [BCy * 1000] \quad (5.2.1)$$

Where :

PELEgrid\_BC,y = Baseline grid electricity for grinding BC (MWh)

EFgrid\_y = Grid emission factor in year y (t CO<sub>2</sub>/MWh)

BCy = Annual production of BC in year y (kilotonnes of BC)

Identification Details	Description	Unit	2008-09
PEele_grid_BC,y	Grid electricity emissions for BC grinding in year y	(tCO <sub>2</sub> /tonne of BC)	0.02644
PELEgrid_BC,y	grid electricity for grinding BC	(MWh)	
	Devapur	(MWh)	48074.25665
	Jalgaon	(MWh)	20506.06581
EFgrid_y	Grid emission factor in year y for SREB	(t CO <sub>2</sub> /MWh)	0.98800
EFgrid_y	Grid emission factor in year y for Western Grid	(t CO <sub>2</sub> /MWh)	0.98400
Bcy	Annual production of BC in year y	(kilo tonnes of BC)	2559.39720

$$PEelec\_sg\_BC,y = [PELEsg\_BC,y * EFsg\_y] / [BCy * 1000] \quad (5.2.2)$$

Where:

PELEsg\_BC,y = Self generated electricity for grinding BC in year y (MWh)

EFsg\_y = Emission factor for self generated electricity in year y (t CO<sub>2</sub>/MWh)

BCy = Annual production of BC in year y (kilotonnes of BC)

Identification Details	Description	Unit	2008-09
PEele_sg_BC,y	Emissions from self generated electricity for BC grinding in year y	(tCO <sub>2</sub> /tonne of BC)	0.00033
PELEsg_BC,y	Self generated electricity for grinding BC in year y	(MWh)	678.08235



EFsg_y	Emission factor for self generated electricity in year y	(t CO <sub>2</sub> /MWh)	0.80558
Bcy	Annual production of BC in year y	(kilotonnes of BC)	*1661.190204

\*This data is for Devapur only, since there is no self generation electricity facility at Jalgaon

$$PEele\_grid\_ADD = [PELEgrid\_ADD * EFgrid\_y] / [BCy * 1000] \quad (5.2.3)$$

Where:

BELEgrid\_ADD = Baseline grid electricity for grinding additives (MWh)

EFgrid\_y = Grid emission factor in year y (t CO<sub>2</sub>/MWh)

BCy = Annual production of BC in year y (kilotonnes of BC)

Identification Details	Description	Unit	2008-09
PEele_grid_ADD,y	Grid electricity emissions for additive preparation in year y	(tCO <sub>2</sub> /tonne of BC)	0.00000
BELEgrid_ADD	grid electricity for grinding additives in year y	(MWh)	0.00000
EFgrid_y	Grid emission factor in year y	(t CO <sub>2</sub> /MWh)	NA
Bcy	Annual production of BC in year y	(kilotonnes of BC)	2559.39720

$$PEelec\_sg\_ADD,y = [PELEsg\_ADD,y * EFsg\_y] / [BCy * 1000] \quad (5.2.4)$$

Where:

PELEsg\_ADD,y = Baseline self generation electricity for grinding additives (MWh)

EFsg\_y = Emission factor for self generated electricity in year y (t CO<sub>2</sub>/MWh)

BCy = Annual production of BC in year y (kilotonnes of BC)

Identification Details.	Description	Unit	2008-09
PEele_sg_ADD,y	Emissions from self generated electricity additive preparation in year y	(tCO <sub>2</sub> /tonne of BC)	0.00000
PELEsg_ADD,y	self generation electricity for grinding additives in year y	(MWh)	0.00000
EFsg_y	Emission factor for self generated electricity in year y	(t CO <sub>2</sub> /MWh)	NA
Bcy	Annual production of BC in year y	(kilotonnes of BC)	*1661.190204

\*This data is for Devapur only, since there is no self generation electricity facility at Jalgaon

### E.3. Leakage calculation

&gt;&gt;

#### Leakages:

$$\text{Ladd\_trans} = [(\text{TFcons} * \text{Dadd\_source} * \text{TEF}) * 1/\text{Qadd} * 1/1000 + (\text{ELEconveyor\_ADD} * \text{EFgrid}) * 1/\text{ADDy}] \quad (2)$$

where:

Ladd\_trans = Transport related emissions per tonne of additives (t CO<sub>2</sub>/tonne of additive)

TFcons = Fuel consumption for the vehicle per kilometre (kg of fuel/kilometre)

Dadd\_source = Distance between the source of additive and the project activity plant (km)

TEF = Emission factor for transport fuel (kg CO<sub>2</sub>/kg of fuel)

ELEconveyor\_ADD = Annual Electricity consumption for conveyor system for additives (MWh)

EFgrid = Grid electricity emission factor (tonnes of CO<sub>2</sub>/MWh)

Qadd = Quantity of additive carried in one trip per vehicle (tonnes of additive)

ADDy = Annual consumption of additives in year y. (t of additives)

Identification Details	Description	Unit	2008-09
Ladd_trans	Transport related emissions per tonne of additives	tonne CO <sub>2</sub> /tonne of additive	0.00703
TFcons	Fuel consumption for the vehicle per kilometre	kg fuel/km (3 km/l)	0.28310
Dadd_source	Distance between the source of additive and the project activity plant	km	116.87000
TEF	Emission factor for transport fuel	(kg CO <sub>2</sub> /kg of fuel)	3.17720
ELEconveyor_ADD	Electricity consumption for conveyor system for additives	MWh	1300.67100
EFgrid	Baseline grid emission factor of SREB	(t CO <sub>2</sub> /MWh)	0.98800
Qadd	Quantity of additive carried in one trip per vehicle	(tonnes of additive)	19.43000
ADDy =	Annual consumption of additive	(tonnes of additives)	795170.28600

And leakage emissions per tonne of BC due to additional additives are determined by

$$\text{Ly} = \text{Ladd\_trans} * [\text{Ablend,y} - \text{Pblend,y}] * \text{BCy} \quad (2.1)$$

where:

Ly = Leakage emissions for transport of additives (kilotonnes of CO<sub>2</sub>)

BCy = Production of BC in year y (kilotonnes of BC)

Ablend,y = Baseline benchmark share of additives per tonne of BC updated for year y (tonne of additives/tonne of BC)

Pblend,y = Share of additives per tonne of BC in year y (tonne of additives/tonne of BC)



Identification Details	Description	Unit	2008-09
Ly	Leakage emissions for transport of additives	kilotonnes of CO2	-1.48303
BCy	Production of BC in year y	(kilotonnes of BC)	2559.39720
Pblend,y	Share of additives per tonne of BC in year y	(tonne of additives/tonne of BC)	0.33464
ABlend,y	Baseline benchmark share of additives per tonne of BC updated for year y	(tonne of additives/tonne of BC)	0.25217

#### E.4. Emission reductions calculation / table

&gt;&gt;

As suggested by the methodology ACM0005, version 2, 28 November, 2005, the GHG emission reduction, (ERy), achieved by the project activity for a given year is:

#### FORMULA FOR EMISSION REDUCTION CALCULATION

$$ERy = \{ [BEBC,y - PEBC,y] * BCy + Ly \} * (1 - \alpha y)$$

Emission reduction achieved during monitoring period delineated in the report has been presented in the following table.

Identification Details	Unit	2008-2009
ERy	thousand tonnes of CO2	128.893199
BEBC,y	(t CO2/tonnes of BC)	0.67552
PEBC,y	(t CO2/tonnes of BC)	0.62411
BCy	(thousand tonnes)	2536.26036
Ly	kilotonnes of CO2	-1.48303
$\alpha y$	Ratio	0

**E.5. Comparison of actual emission reductions with estimates in the CDM-PDD**

&gt;&gt;

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO <sub>2</sub> e)	107366	128893

**E.6. Remarks on difference from estimated value in the PDD**

&gt;&gt;

The key reason in increase in emission reduction in comparison to estimated value in PDD are as follows:

- 1) Increase in total blended cement production from once considered in PDD calculation. In the registered PDD emission reduction was calculated with projected production of 1215000 Mt of blended cement for year 2008-2009. Actual production for the period is higher to 2536260.36 Mt. However the plant production capacity has remained the same as before during the registration of the project.
- 2) The share of clinker (0.66536 tonne of clinker per tonne of BC) per tonne of blended cement in 2008-09 has been reduced more than set bench mark figure (0.74783 tonne of clinker per tonne of BC) tonne of clinker per tonne of BC) used In PDD estimation.

**Annexure – 1: Equipment calibration Details**

A. Measuring Equipments Calibration details						
Sl. No	Name of Measuring instrument	Accuracy class	Calibration date covering period 2008-2009	Calibration freq. (Months)	Location	Function
<b>Devapur Plant:</b>						
1	PC solid flow feeder	+/- 2.0 TPH	01.06.2009 12.12.2008 14.06.2008	6	Kiln I	Measurement and feeding of raw material to kiln I
2	Kiln solid flow feeder	+/- 2.0 TPH	01.06.2009 12.12.2008 14.06.2008	6	Kiln I	Measurement and feeding of raw material to kiln I
3	SLPC for IBAU system	+/- 1 %	21.10.2009 24.10.2008 24.10.2007	12	Kiln II	Measurement and feeding of raw material to kiln II



4	PC loss in weight	+/- 0.1 TPH	09.04.2009 11.10.2008 10.04.2008	6	Kiln I	Measurement and feeding of Coal to PC kiln I
5	Kiln side Coal feeder	+/- 2 %	02.12.2008 05.12.2007	12	Kiln I	Measurement and feeding of Coal to kiln I
6	Solid flow feeder/LIW system coal feeder - PC	+/- 0.1 TPH	10.04.2009 12.10.2008 22.04.2008	6	Kiln II	Measurement and feeding of Coal to PC kiln II
7	Solid flow feeder/LIW system coal feeder - Kiln	+/- 0.1 TPH	10.04.2009 12.10.2008 22.04.2008	6	Kiln II	Measurement and feeding of Coal to kiln II
8	Fly ash flow feeder	+/- 1.0 TPH	04.04.2009 06.10.2008 08.04.2008	6	Cement mill 1	Measurement and feeding of Fly ash to Cement Mill I
9	Clinker Weigh feeder	+/- 2.0 TPH	09.02.2009 11.08.2008 17.02.2008	6	Cement mill 1	Measurement and feeding of Clinker to Cement Mill I
10	Gypsum Weigh feeder	+/- 0.25 TPH	09.02.2009 11.08.2008 08.02.2008	6	Cement mill 1	Measurement and feeding of Gypsum to Cement Mill I
11	Flyash flow feeder	+/- 1.0 TPH	08.12.2008 10.06.2008 07.12.2007	6	Cement mill 2	Measurement and feeding of Fly ash to Cement Mill II
12	Gypsum Weigh feeder	+/- 0.4 TPH	03.02.2009 05.08.2008 05.02.2008	6	Cement mill 2	Measurement and feeding of Gypsum to Cement Mill II
13	Clinker Weigh feeder	+/- 2.0 TPH	02.02.2009 04.08.2008 04.02.2008	6	Cement mill 2	Measurement and feeding of Clinker to Cement Mill II





14	WEIGH Bridge For Truck	Class-III	19.03.2009 28.03.2008	12	Plant	Measurement of incoming/outgoing truck(Loaded/Empty)
15	WEIGH Bridge For Wagon	Class-III	19.03.2009 28.03.2008	12	Plant	Measurement of incoming/outgoing wagon(Loaded/Empty)
<b>Jalgaon Plant:</b>						
1	Clinker Weigh feeder	+/- 2.0 TPH	01.06.2009 01.12.2008 24.07.2008 24.01.2008	6	Jalgaon	Measurement and feeding of Clinker to Cement Mill
2	Gypsum Weigh feeder	+/- 0.4 TPH	02.06.2009 02.12.2008 25.07.2008 25.01.2008	6	Jalgaon	Measurement and feeding of Gypsum to Cement Mill
3	Solid flow feeder	+/- 0.1 TPH	05.03.2009 05.12.2008 01.10.2008 01.07.2008 01.04.2008	3	Jalgaon	Measurement and feeding of Fly ash to Cement Mill

<b>B. Energy Meter Calibration Detail</b>						
Sl. No.	Identification No.	Location	Make	Accuracy Class	Purpose	Calibration Date
<b>DEVAPUR PLANT</b>						
1	EM – 3	MRSS	SOCOMECEC	+/- 1.0	Total KWH of RM-1 MM area	19.03.2009 28.03.2008
2	EM – 4	MRSS	SOCOMECEC	+/- 1.0	Total KWH of RM-2 MM & Aux.	19.03.2009 27.03.2008
3	EM – 5	MRSS	SOCOMECEC	+/- 1.0	Total KWH of Kiln-2 area	19.03.2009 28.03.2008
4	EM – 6	MRSS	SOCOMECEC	+/- 1.0	Total KWH of Kiln-1 area	19.03.2009 28.03.2008
5	EM – 7	MRSS	SOCOMECEC	+/- 1.0	KWH of VRM (MM & D/C fan) Add to Kiln-1	19.03.2009 27.03.2008
6	EM – 8	MRSS	SOCOMECEC	+/- 1.0	CM-2 Roller Press	19.03.2009 28.03.2008



7	EM – 9	MRSS	SOCOMECC	+/- 1.0	CM-02 Main Motor & Aux.	19.03.2009 28.03.2008
8	EM – 10	MRSS	SOCOMECC	+/- 1.0	Total KWH of PBSR area	19.03.2009 27.03.2008
9	EM – 11	MRSS	SOCOMECC	+/- 1.0	Total KWH of Mines Crusher	18.03.2009 27.03.2008
10	EM – 12	MRSS	SOCOMECC	+/- 1.0	KWH of CM-1 MM (E&W)	18.03.2009 27.03.2008
11	EM – 14	MRSS	SOCOMECC	+/- 1.0	Work Shop power	22.03.2009 28.03.2008
12	EM – 15	RM-1	SOCOMECC	+/- 1.0	RM - 1 Lighting	23.03.2009 31.03.2008
13	EM – 30	RM- 2	SOCOMECC	+/- 1.0	Plant Lighting	21.03.2009 31.03.2008
14	EM – 36	Kiln – 2	SOCOMECC	+/- 1.0	Colony Power supply	20.03.2009 30.03.2008
15	EM – 37	Kiln – 2	SOCOMECC	+/- 1.0	Pump House - 2 PDB	20.03.2009 29.03.2008
16	EM – 44	Kiln – 1	SOCOMECC	+/- 1.0	Kiln -01 Lighting	22.03.2009 29.03.2008
17	EM – 49	CM – 2	SOCOMECC	+/- 1.0	Compressor - 2 MCC – 30PDB	21.03.2009 29.03.2008
18	EM – 50	CM – 2	SOCOMECC	+/- 1.0	Packing Plant 03 MCC 31/2	21.03.2009 29.03.2008
19	EM – 51	CM – 2	SOCOMECC	+/- 1.0	Packing Plant 04 MCC 31/1 PBD	21.03.2009 29.03.2008
20	EM – 55	CM – 1	SOCOMECC	+/- 1.0	Lighting ADM Building	22.03.2009 28.03.2008
21	EM – 56	CM – 1	SOCOMECC	+/- 1.0	F. Compressor MCC - 16	22.03.2009 28.03.2008
22	EM – 57	CM – 1	SOCOMECC	+/- 1.0	Pump House - 1	22.03.2009 28.03.2008
23	EM – 58	CM – 1	SOCOMECC	+/- 1.0	Packing Plant 1 MCC 15 A	22.03.2009 28.03.2008
24	EM – 59	CM – 1	SOCOMECC	+/- 1.0	Packing Plant 2 MCC 15 B	22.03.2009 28.03.2008
25	EM – 60	CM – 1	SOCOMECC	+/- 1.0	CM - 1 Aux. MCC 14	21.03.2009 28.03.2008
26	EM – 61	Kiln – 1	SOCOMECC	+/- 1.0	Chilling plant power MCC 10PDB	22.03.2009 29.03.2008



27	EM – 62	P. Plant	SOCOMECEC	+/- 1.0	Lighting Packing Plant	23.03.2009 30.03.2008
28	EM – 63	PBSR	SOCOMECEC	+/- 1.0	Garage lighting	22.03.2009 31.03.2008
29	EM – 64	RM-1	SOCOMECEC	+/- 1.0	Kiln - 1 Comp. House MCC-5	23.03.2009 31.03.2008
30	EM – 66	CM-1	SOCOMECEC	+/- 1.0	CM-1 Separator MCC	21.03.2009 28.03.2008
31	DG – 1	DG House	ABB	+/- 1.0	DG - 1 Power generation	20.03.2009 30.03.2008
32	DG – 3	DG House	ABB	+/- 1.0	DG - 3 Power generation	19.03.2009 30.03.2008
33	DG – 4	DG House	ABB	+/- 1.0	DG - 4 Power generation	22.03.2009 30.03.2008
34	DG – 5	DG House	ABB	+/- 1.0	DG - 5 Power generation	20.03.2009 30.03.2008
35	DG – O/G	DG House	ABB	+/- 1.0	Plant use power consumption.	22.03.2009 30.03.2008
36	EM - 67	Cement Mill	SOCOMECEC	+/- 1.0	Fly ash unloading compressor 1	22.03.2009 30.03.2008
37	EM - 68	Cement Mill	SOCOMECEC	+/- 1.0	Fly ash unloading compressor 2	22.03.2009 30.03.2008
38	EM - 69	Cement Mill	SOCOMECEC	+/- 1.0	Fly ash unloading compressor -3	22.03.2009 30.03.2008
<b>JALGAON PLANT</b>						
1	PP7316	Substation	KRYKARD	0.5	Energy measurement Load Center2	09.09.2008 24.09.2007
2	PP7317	Substation	KRYKARD	0.5	Energy measurement of Sepol Fan Motor	11.09.2008 24.09.2007
3	PP7318	Substation	KRYKARD	0.5	Energy measurement Load Center1	09.09.2008 24.09.2007
4	PP7319	Substation	KRYKARD	0.5	Energy measurement for 33Kv incomer	10.09.2008 24.09.2007
5	PP7321	Substation	KRYKARD	0.5	Energy measurement of Cement Mill Motor	11.09.2008 24.09.2007
6	PP7322	Substation	KRYKARD	0.5	Energy measurement of Polycom Fixed Motor	11.09.2008 24.09.2007
7	PP7323	Substation	KRYKARD	0.5	Energy measurement Load Center3	10.09.2008 24.09.2007



8	PP7324	Substation	KRYKARD	0.5	Energy measurement of Polycom Moving Motor	11.09.2008 24.09.2007
9	1K104093	PMCC-2N	HPL-SOCOMECH	+/- 1.0	Energy measurement for fly ash compressor motor	09.09.2008 14.12.2007

Please note: - Energy meters are calibrated once in a year.

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#### History of the document

Version	Date	Nature of revision
01	EB 54, Annex 34 28 May 2010	Initial adoption.
<b>Decision Class:</b> Regulatory <b>Document Type:</b> Guideline, Form <b>Business Function:</b> Issuance		