MONITORING REPORT FORM (CDM-MR) *
Version 01 - in effect as of: 28/09/2010

CONTENTS

* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

MONITORING REPORT
Version 1.0 Dated 30/07/2011
"Blended cement with increased blend" at Orient cement's Devapur and Jalgaon plants in India
Reference number: 0456
5th monitoring period: 01/04/2009 – 31/03/2010 (First and last days included)

SECTION A. General description of the project activity

A.1. Brief description of the project activity: >>

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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 Pozzolanna 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 27/08/2006 with crediting period of 01 Apr2002 -31Mar 2012 (Fixed). The UNFCCC reference number for the project activity is 0456. Det Norske Veritas Certification Ltd. (DNV) is the DOE for validation of this Project. This 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 01/04/2009 to 31/03/2010 and the GHG reduction has been calculated for the period extending from 01/04/2009 to 31/03/2010 both the dates inclusive. **Total CER generated during this period is 47344 tCO_2 eq.**

A.2. Project Participants

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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:

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Devapur plant is located within the Kasipet Mandal in Devapur village in Andhra Pradesh. The location of the unit would be 19°01'59"N latitude and 79°27'58" E longitude.

Jalgaon Grinding unit is located at Nashirabad Village, on National Highway 6 in Jalgaon District, Maharashtra, India. The location of the Jalgaon unit is 21°00'57"N latitude and 75°33'54"E longitude

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 Mancherial 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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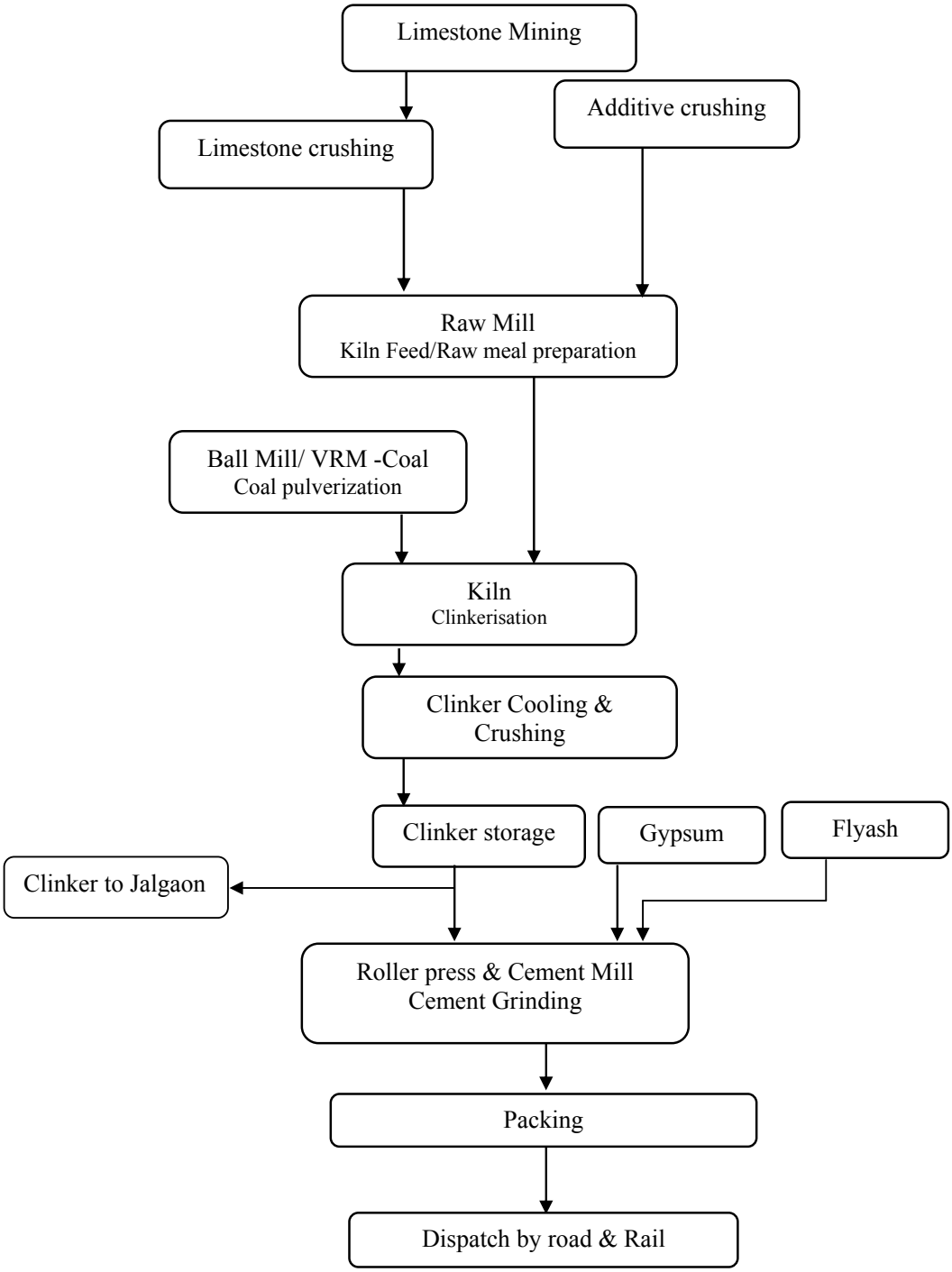
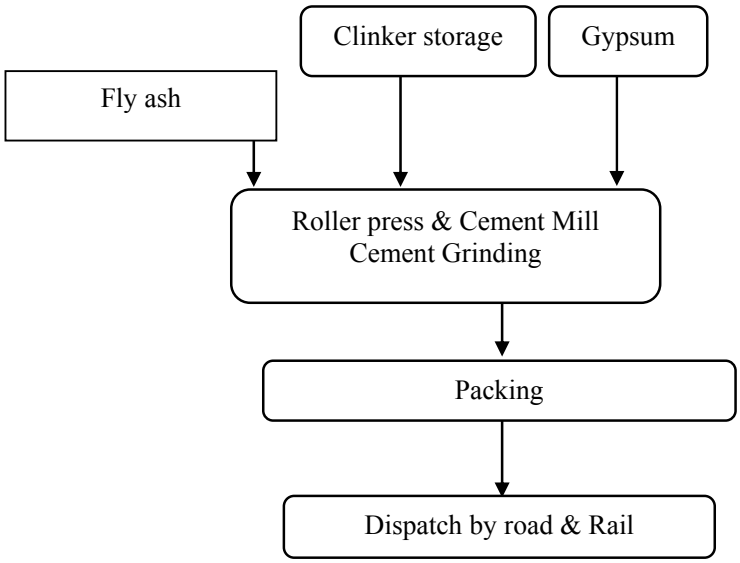
Process Flow Diagram - Devapur



Process Flow Diagram - Jalgaon



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.

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

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Title: Consolidated Methodology for Increasing the Blend in Cement Production, and Methodology adopted: ACM0005 Version 2, Tool utilised for this project activity is Step 3 of the "tool for the determination and assessment of additionality" version 2

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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As per registered PDD the crediting period start date is 01/04/2002 and for 10 years. i.e. up to 31.3.2012 (fixed)

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

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Organization:	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:	orirndvp@sancharnet.in, pktripathy@orientcement.com
URL:	

Represented by:	
Title:	President – Works
Salutation:	Mr.
Last Name:	Tripathy
Middle Name:	
First Name:	P K
Department:	
Mobile:	+ 919160994599,
Direct FAX:	+ 918736240522
Direct tel:	+ 918736240709
Personal E-Mail:	pktripathy@orientcement.com

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

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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 18th December 2001 at Devapur unit. The project was implemented at Jalgaon unit from 15th July 2002.

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. Det Norske Veritas Certification Ltd. (DNV) is the DOE for validation of this Project.

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

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The revised monitoring plan has been approved by UNFCCC on 10th July'2010. However as requested by DOE (FAR) during previous issuance, further revision in monitoring plan has been made. This monitoring report has been prepared based on latest revised monitoring plan, which has been submitted to UNFCCC for approval (Version 1.2) on 30th May'.2011.

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

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NA

B.4. Notification or request of approval of changes

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NA

SECTION C. Description of the monitoring system

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The Devapur and Jalgaon plant of Orient cement is operated by Company operating personnel. The President-Works has assigned the responsibility to Asst. Vice President (Operations) of Devapur and

Vice President of Jalgaon for the project management, monitoring and reporting. They are assisted by the CDM team headed by Dy. Manager (Technical Cell).
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

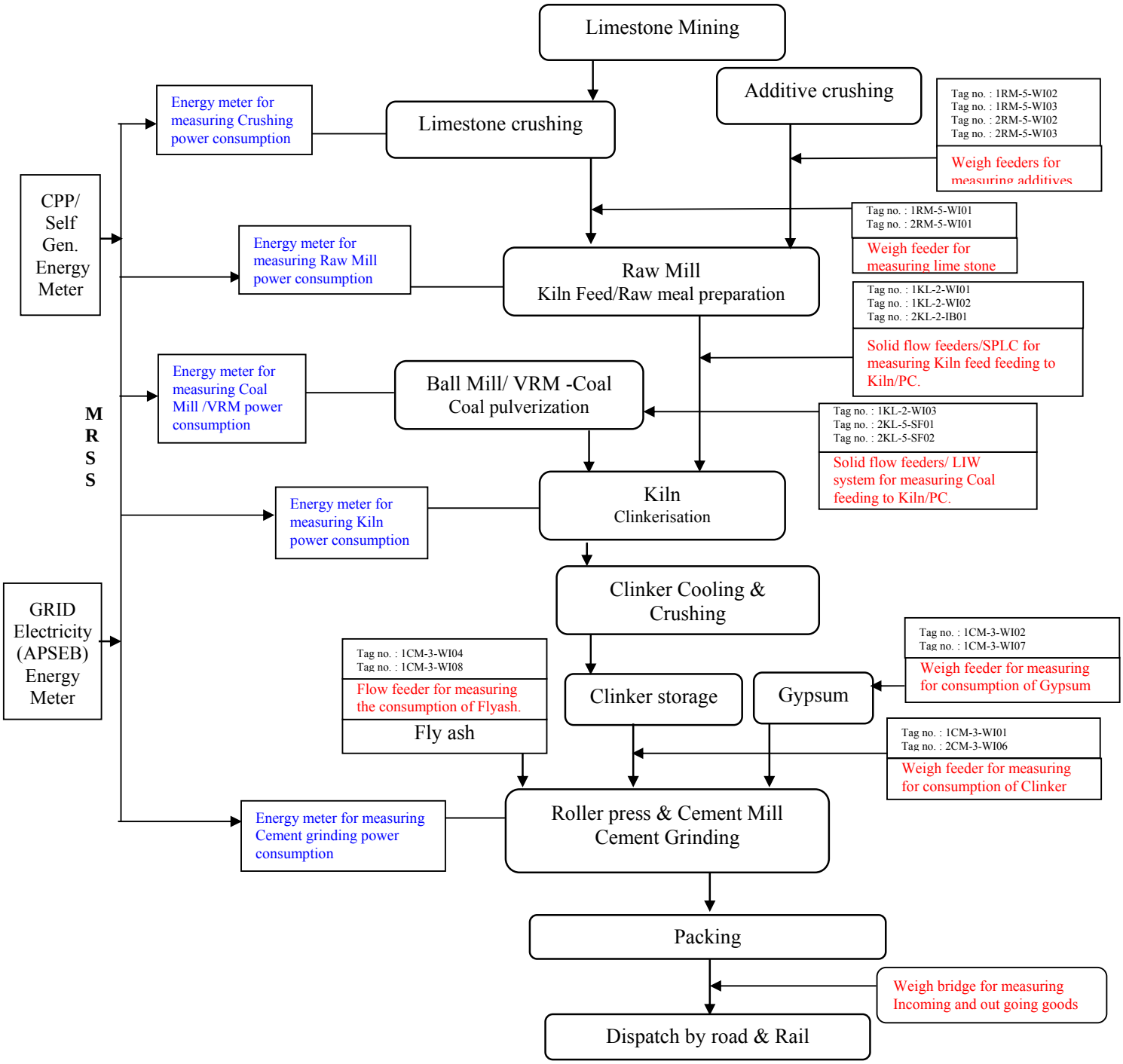
- Stipulate who has responsibility for what and,
- Avoid any misunderstanding between people and organization involved.

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. This is an internal document approved by senior management and the same was made available to DOE during site verification.

Emergency procedures for monitoring system in place:

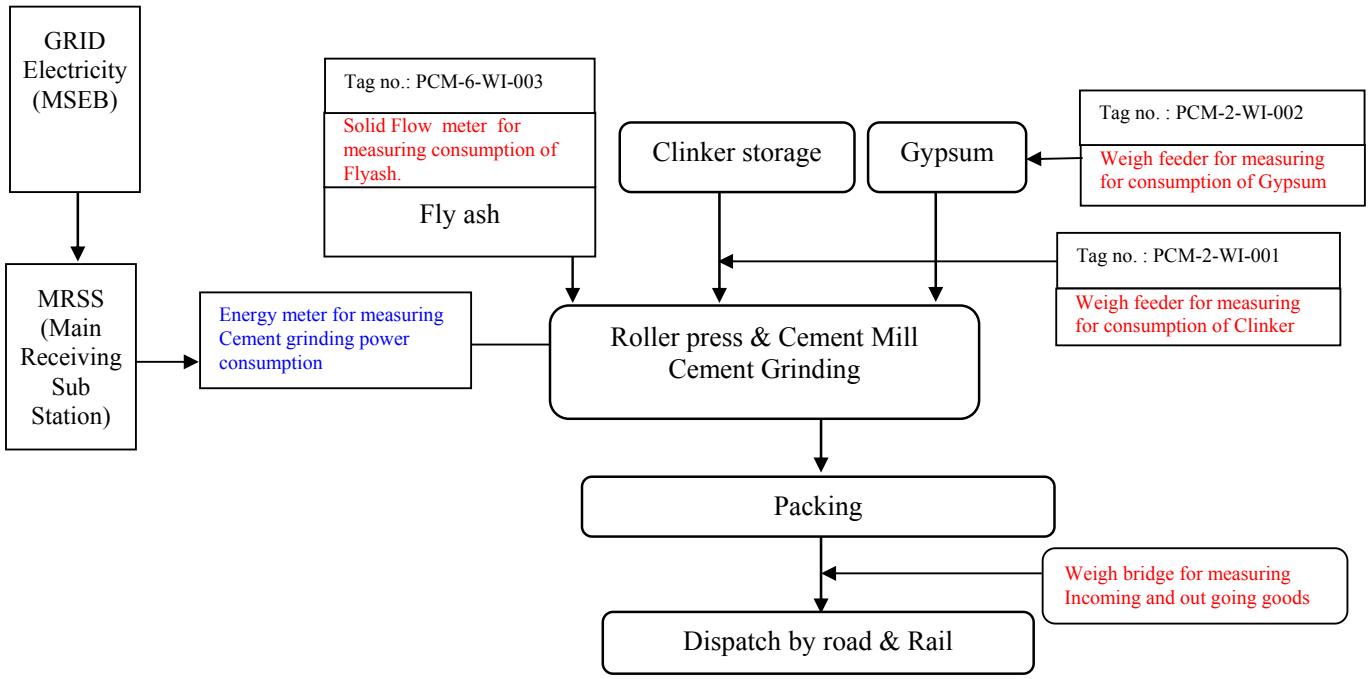
The plant maintains the data in both hard and soft copy formats; the same is also stored in the MIS. CDM Coordinator receives monthly CDM related data from the plant and if any discrepancies are observed, questions are raised and corrective action taken as required.

Line Diagram showing all relevant monitoring points: Devapur



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

Line Diagram showing all relevant monitoring points: Jalgaon



MSEB: Maharashtra State Electricity Board
MRSS: Main receiving Sub Station

Please note that Identification code / Tag nos & Calibration details of all measuring and monitoring equipments of both Devapur and Jalgaon plants including energy meters are mentioned in Annexure 1 & 2 of this Monitoring Report below.

Calibration/Maintenance of Measuring and Analytical Instruments:

Relevant parameters are measured and monitored in line with latest approved revised monitoring plan. All measuring and analytical instruments are being calibrated as per Monitoring plan Version 1.2 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}*	*In plant clinkerisation unit*	*T CaO*	*M,C*	*Daily*	
1.2	*Out CaO_{BSL}*	*In plant clinkerisation unit*	*T CaO*	*M,C*	*Daily*	
1.3	*In MgO_{BSL}*	*In plant clinkerisation unit*	*t MgO*	*M,C*	*Daily*	
1.4	*Out MgO_{BSL}*	*In plant clinkerisation unit*	*t MgO*	*M,C*	*Daily*	
1.5	*Quantity of limestone used in the clinkerisation unit in baseline*	*In plant clinkerisation unit*	*Kilo tonnes*	*M*	*Annually*	
1.6	*Quantity of clinker used for PPC production* $CLNK_{BSL}$	*In plant grinding unit*	*Kilo tonnes*	*M*	*Annually*	
1.7	FFi,	*In plant clinkerisation unit*	*Tonnes*	*M*	*Annually*	
1.8	EFFi_BLS	*IPCC default values for the fuels type*	*tCO2/tonne of fuel used*	*C*	*Annually*	
1.9	BELEgrid_CLNK, $_{BSL}$	*In plant clinkerisation unit*	*MWh*	*M,*	*Monthly*	
1.10	EFgrid_BSL	*In plant data*	*tCO2/MWh*	*C, E*	*Annually*	
1.11	BELEsg_CLNK, $_{BSL}$	*In plant data*	*MWh*	*M*	*Monthly*	
1.12	EFsg_$_{BSL}$	*In plant data*	*tCO2/MWh*	*M,C,E*	*Annually*	
1.13	ADDy Quantity of additives added in the baseline	*In plant data*	*Kilo tonnes*	*M*	*Monthly*	
1.14	BEcalcin, $_{BSL}$	*In plant data*	*tCO2/tonne of clinker*	*C*	*Annually*	
1.15	BEfossil_fuel, $_{BSL}$	*In plant data*	*tCO2/tonne of clinker*	*C*	*Annually*	

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Comment
1.16	BEele_grid_CLNK, $_{BSL}$	*In plant data*	*tCO2/tonne of clinker*	*C*	*Annually*	
1.17	BEele_sg_CLNK, $_{BSL}$	*In plant data*	*tCO2/tonne of clinker*	*C*	*Annually*	
1.18	BEele_grid_BC, $_{BSL}$	*In plant data*	*tCO2/tonne of blended cement*	*C*	*Annually*	
1.19	BEele_sg_BC, $_{BSL}$	*In plant data*	*tCO2/tonne of blended cement*	*C*	*Annually*	
1.20	Bblend,y	*In plant data*	*Tonne of clinker/tonne of blended cement*	*C*	*Annually*	
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

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Comment
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_y	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_y	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_y	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_y	In plant	t MgO	M,C	Daily	Is a part of normal

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Comment
		clinkerisation unit				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 and closing balance of raw material used.
2.6	Quantity of clinker used for PPC production CLNKy	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_y,	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	tCO2/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

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Comment
						analyzed by independent Lab.
2.9	PELEgrid_CLNK,y	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,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 up to clinkerisation is calculated as per following proportionate formula:. **PELEgrid_CLNK,y = PELE_CLNK,y x [GE/(GE+SG)].** In addition to above formula please refer the detail under ID numbers 2.29 , 2.30 and 2.31
2.10	PELEsg_CLNK,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 up to clinkerisation (PELE_CLNK,y) is measured daily by

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Comment
						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 up to clinkerisation is calculated as per following proportionate formula:. **PELEsg_CLNK,y = PELE_CLNK,y x [SG/(GE+SG)]** In addition to above formula please refer the detail under ID numbers 2.29, 2.30 and 2.31
2.11	EFsg_y	In plant data	tCO2/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

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Comment
						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) 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_CLNK,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/ton	C	Annually	

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Comment
		data	ne 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:. **PELEgrid_BC,y = PELE_BC,y x [GE / (GE+SG)]**
2.23	PELEsg_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 for

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Comment
						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:. **PELEsg_BC,y** = **PELE_BC,y** x [SG / (GE+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 generation is measured by online coal weighing/ feeding system.
2.27	COEFi,j y	IPCC for HSD and FO and third party	t CO2/ KL of HSD and FO and t	C	Annually	Fuel specific emission factor of HSD and FO is calculated using

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Comment
		measured C% for coal	CO2/ tonne coal			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	GENj,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 data	MWh	M,C	Monthly	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.
2.31	PELE_CLNK,y	In plant data	MWh	M,C	Monthly	Total electricity consumed up to clinkerisation

ID number	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Comment
						(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 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	l. Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Comment
3.1	TFcons	*In plant data*	*Kg of fuel/ kilometre*	*C*	*Annually*	
3.2	Dadd_source	*In plant data*	*Km*	*M*	*Per trip*	
3.3	TEF	*IPCC default values for fuel used in transportatio n of fly ash*	*tonneCO2/kg fuel used*	*E*	*Annually*	*Data on grid generation and power plant details has been sourced from State grid and central electricity authority of India*
3.4	Qadd ELEconveyor_ADD	*In plant data*	*MWh*	*M*	*Monthly*	
3.5	EFgrid	*In plant data*	*t CO2/MWh*	*C*	*Annually*	*Latest 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 tCO2/ MWh) found to be conservative to ex-post grid emission*

						factor, ex-ante value will be used for CER calculation.
3.6	Qadd	*In plant data*	*Tonne of additive/vehicle*	*M*	*Per trip*	
3.7	Áy	*In plant data*	*Tonne of additive*	*M/C*	*Annually*	
3.8	Ablend,y	*Baseline calculation*	*tonne of additives/tonne of BC*	*C*	*Annually*	*Baseline benchmark share of additives per tonne of BC updated for year y*
3.9	Pblend,_y	*Plant records*	*tonne of additives/tonne of BC*	*C*	*Annually*	*Share of additives per tonne of BC in year y*

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

Data / Parameter:	**Stoichiometric emission factor for CaO**
Data unit:	(tCO2/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

Data / Parameter:	**Stoichiometric emission factor for MgO**
Data unit:	(tCO2/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

Data / Parameter:	**TEF**
Data unit:	*Kg CO2/kg fuel used*

Description:	*IPCC default values for fuel used in transportation of fly ash*
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:

Data / Parameter:	*In CaO_{BSL}*
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/ 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:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	CaO is measured through chemical analysis using standard method, Chemical Burette and Pipette. SOP for analysis is being maintained in the Laboratory
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.

Data / Parameter:	*Out CaO_{BSL}*
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	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)	CaO is measured through chemical analysis using standard method, Chrmical Burette and Pipette. SOP for analysis is being maintained in the Laboratory.
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.

Data / Parameter:	*In MgO_{BSL}*
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:	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	MgO is measured through chemical analysis using standard method, Chemical Burette and Pipette. SOP for analysis is being maintained in the Laboratory.
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.

Data / Parameter:	*Out MgO_{BSL}*
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	16839.394
Indicate what the data are used for (Baseline/ Project/Leakage emission	Baseline

calculations)applied:	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	MgO is measured through chemical analysis using standard method, Chemical Burette and Pipette. SOP for analysis is being maintained in the Laboratory.
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.

Data / Parameter:	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.

Data / Parameter:	Quantity of clinker used for PPC production $CLNK_{BSL}$
Data unit:	*Kilo tonnes*
Description:	Quantity of clinker used for PPC production.
Measured/ Calculated/ Default	M
Source of data:	*In plant grinding unit*
Value (s) of Monitored Parameter	5.5689
Indicate what the data are used for (Baseline/ Project/Leakage emission	Baseline

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):	NA
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	FFi,
Data unit:	*Tonnes*
Description:	Coal 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.

Data / Parameter:	EFFi_BSL
Data unit:	tCO2/tonne of fuel used
Description:	Emission factor for fossil fuel Coal (t CO2/tonne of fuel)
Measured/ Calculated/ Default	C
Source of data:	In plant clinkerisation unit
Value (s) of Monitored Parameter	1.8455
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 using Carbon content of the fuel (here coal)/100 * (44/12)* 0.98
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	BELEgrid_CLNK, $_{BSL}$
Data unit:	MWh
Description:	Baseline grid electricity consumption for clinker production
Measured/ Calculated/ Default	M
Source of data:	*In plant clinkerisation unit*
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 2 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	NA
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	EFgrid_BSL
Data unit:	*tCO2/MWh*
Description:	Baseline grid emission factor
Measured/ Calculated/ Default	C, E
Source of data:	*In plant data*
Value (s) of Monitored Parameter	0.988 for Southern Grid and 0.984 for Western Grid calculated ex-ante and is conservative to the Grid emission factor for 2009-10 (NEWNE – 0.90, South – 0.85 and India as a whole – 0.89) published by CEA, Govt. of India.
Indicate what the data are used for (Baseline/ Project/Leakage emission	Baseline

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 ex-ante using data from CEA govt. of India and published in their website. 2009-10 data is from CEA published literature.
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	$BELEsg\_CLNK_{BSL}$
Data unit:	*MWh*
Description:	Baseline self generation of electricity for clinker production
Measured/ Calculated/ Default	M
Source of data:	*In plant data*
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 2 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.

Data / Parameter:	$EFsg\_{BSL}$
Data unit:	*tCO2/MWh*
Description:	Baseline electricity self generation emission factor
Measured/ Calculated/ Default	M,C,E
Source of data:	*In plant data*
Value (s) of Monitored Parameter	0.7577
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 2 below.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is calculated by dividing total emission (tCO2) 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.

Data / Parameter:	ADDy Quantity of additives added in the baseline
Data unit:	*Kilo tonnes*
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.

Data / Parameter:	$BEcalcin_{,BSL}$
Data unit:	tCO2/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	0.5222
Indicate what the data are used for (Baseline/ Project/Leakage	Baseline

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:	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.

Data / Parameter:	$BEfossil\_fuel_{,BSL}$
Data unit:	tCO2/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	0.2846
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.

Data / Parameter:	$BEele\_grid\_CLNK_{,BSL}$
Data unit:	tCO2/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	0.0332

Parameter	
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.

Data / Parameter:	$BEele\_sg\_CLNK_{,BSL}$
Data unit:	tCO2/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
Value (s) of Monitored Parameter	0.0274
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.

Data / Parameter:	$BEele\_grid\_BC_{,BSL}$
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	0.0342
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 applied:	Please refer QA/QC table provided below.

Data / Parameter:	$BEele\_sg\_BC_{,BSL}$
Data unit:	tCO2/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.

Data / Parameter:	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	0.7788
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 as defined in the methodology.
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	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.

Data / Parameter:	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 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 2 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.

Data / Parameter:	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 2 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.

Data / Parameter:	BELEgrid_ADD
Data unit:	MWh
Description:	Baseline grid 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)	NA.
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is measured data.
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	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)	NA
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	This is measured data.
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	Fi,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.

Data / Parameter:	COEFi,j BSL
Data unit:	tCO2/tonne of fuel i
Description:	CO2 emission coefficient of fuel i (tCO2 / 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 tCO2/ KL COEF_FO – 2.92 tCO2/ 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/ Recording frequency:	Annually
Calculation method (if applicable):	This calculated based on IPCC
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	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 2 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.

Data / Parameter:	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, 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 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.

Data / Parameter:	BEele_sg_ADD,BSL
Data unit:	tCO2/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

Data / Parameter:	In CaO_y
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/ 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)	CaO is measured daily through chemical analysis using standard method, burette and pipette are used for analysis. SOP for analysis is being maintained in the Laboratory
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.

Data / Parameter:	Out CaO_y
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	1165848.9432 This is calculated based on measured data of clinker production and daily measured data of CaO% in the clinker. Daily measured values of CaO% data has been provided in the spreadsheet "CaO_MgO" in the CER calculation file submitted.
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)	CaO is measured daily through chemical analysis using standard method, burette and pipette are used for analysis. SOP for analysis is being maintained in the Laboratory
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.

Data / Parameter:	In MgO_y
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)	MgO is measured daily through chemical analysis using standard method, burette and pipette are used for analysis. SOP for analysis is being maintained in the Laboratory

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.

Data / Parameter:	Out MgO_y
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	23205.4488 This is calculated based on measured data of clinker production and daily measured data of MgO% in the clinker. Daily measured values of MgO% data has been provided in the spreadsheet "CaO_MgO" in the CER calculation file submitted.
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)	MgO is measured daily through chemical analysis using standard method, burette and pipette are used for analysis. SOP for analysis is being maintained in the Laboratory
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.

Data / Parameter:	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	3330
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Project
Monitoring equipment (type, accuracy class, serial number,	Please refer equipment calibration detail provided in Annexure 1 below.

calibration frequency, date of last, calibration, validity)	
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.

Data / Parameter:	Quantity of clinker used for PPC production $CLNK_y$
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	1579.132
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.

Data / Parameter:	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	296655.189
Indicate what the data	Project

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:	Annually
Calculation method (if applicable):	This is measured data
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	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	1.8419
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.

Data / Parameter:	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	84748.2161
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 2 below.
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: PELEgrid_CLNK,y = PELE_CLNK,y x [GE/(GE+SG)].
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	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	44207.8287
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 2 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: PELEsg_CLNK,y = PELE_CLNK,y x [SG/(GE+SG)]
QA/QC procedures	Please refer QA/QC table provided below.

applied:	

Data / Parameter:	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	1.8958
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):	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.

Data / Parameter:	ADDy Quantity of additives
Data unit:	*Kilo tonnes*
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	722.3647
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.

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.

Data / Parameter:	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	0.5228
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.

Data / Parameter:	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
Value (s) of Monitored Parameter	0.3038
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.

Data / Parameter:	PEele_grid_CLNK,y
Data unit:	tCO2/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	0.0465
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.
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	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	0.0466

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.

Data / Parameter:	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, 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 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.

Data / Parameter:	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.

Data / Parameter:	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
Value (s) of Monitored Parameter	0.0221
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.

Data / Parameter:	PEele_sg_BC,y
Data unit:	tCO2/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	0.0193
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 applied:	Please refer QA/QC table provided below.

Data / Parameter:	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	0.7434 (benchmark share of clinker per tonne of BC) 0.6685 (actual share of clinker per tonne of BC for the year 2009-10)
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.

Data / Parameter:	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	52990.7483 33124.57688 **Devapur** 19866.17145 **Jalgaon**
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 2 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: **PELEgrid_BC,y = PELE_BC,y x [GE / (GE+SG)]**
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	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	17279.0141
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 2 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	Based on the above mentioned measured data, the self generated electricity for production of blended cement is calculated as per following proportionate formula: **$PELEsg_{BC,y}$ = $PELE_{BC,y}$** x [SG / (GE+SG)]
QA/QC procedures applied:	Please refer QA/QC table provided below.

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

Data / Parameter:	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	Project

calculations)applied:	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last, calibration, validity)	NA.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	NA
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	Fi ,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 – 177.446 KL FO – 3538.610 KL Coal - 101.825 Kilo Tons
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.

Data / Parameter:	COEFi,j y
Data unit:	t CO2/ KL of HSD and FO and t CO2/ tonne coal
Description:	CO2 emission coefficient of fuel i (tCO2 / 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 tCO2/ KL COEF_FO – 2.92 tCO2/ KL COEF_COAL – 1.19125 tCO2/ tonne of Coal
Indicate what the data	Project

are used for (Baseline/ Project/Leakage 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):	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.

Data / Parameter:	GENj,y
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	69693.610
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.

Data / Parameter:	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 (MRSS)from external power Grid
Measured/ Calculated/ Default	M

Source of data:	Plant records
Value (s) of Monitored Parameter	171226.197
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:	Monthly
Calculation method (if applicable):	This is measured data.
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	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	69693.610
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 2 below.
Measuring/ Reading/ Recording frequency:	Monthly
Calculation method (if applicable):	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.
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	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	128956.0448
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 2 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.

Data / Parameter:	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 Parameter	70269.7624 considering both Devapur and Jalgaon Plant power consumption data
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 2 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.

Data / Parameter:	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	1798.872
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:

Data / Parameter:	TFcons
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	Please refer QA/QC table provided below.

applied:	

Data / Parameter:	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	114. 9
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
Calculation method (if applicable):	NA
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	TEF
Data unit:	tonneCO2/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.

Data / Parameter:	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	1483.721
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 2 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.

Data / Parameter:	**EFgrid ,Grid emission factor in year y**
Data unit:	tCO2/ MWh
Description:	Baseline grid emission factor
Measured/ Calculated/ Default	C
Source of data:	*Grid emission factor from CEA (Central Electricity Authority)*
Value (s) of Monitored Parameter	Ex-ante value (used in CER calculation conservatively): Southern Grid – 0.988 Western grid – 0.984 0.988 for Southern Grid and 0.984 for Western Grid calculated ex-ante and is conservative to the Grid emission factor for 2009-10 (NEWNE – 0.90, South – 0.85 and India as a whole – 0.89) published by CEA, Govt. of India. Ex-ante value has been used conservatively in CER calculation.
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 margin methodology.
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	Qadd
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	17.24
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:	Per trip
Calculation method (if applicable):	This is measured data.
QA/QC procedures applied:	Please refer QA/QC table provided below.

Data / Parameter:	Ay
Data unit:	Ratio
Description:	Emission reduction factor
Measured/ Calculated/ Default	C
Source of data:	Availability of fly ash at source of generation. It is available surplus as per published data in website. http://www.ntpc.co.in/annualreports/2009-10/2009-10-Annexure-to-Directors'-Report.pdf http://www.mahagenco.in/soa/Combine_english_AnnualReport.pdf
Value (s) of Monitored Parameter	0
Indicate what the data are used for (Baseline/ Project/Leakage emission calculations)applied:	Leakage
Monitoring equipment (type, accuracy class, serial number, calibration frequency,	NA

date of last, calibration, validity)	
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	Calculated as per methodology
QA/QC procedures applied:	Cross checked with publicly available information

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/ Default	C
Source of data:	In plant data
Value (s) of Monitored Parameter	0.2566
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	0.3314
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,	NA

validity)	
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, CDM Manual is followed .
1.2	Low	Do
1.3	Low	Do
1.4	Low	Do
1.5	Low	QMS procedure is adopted for monitoring and calibration (along with CDM manual)
1.6	Low	QMS procedure is adopted for monitoring and calibration (along with CDM manual)
1.7	Low	QMS procedure is adopted for monitoring and calibration (along with 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 (along with 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 (along with 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 (along with CDM manual) of values used for calculation
1.13	Low	QMS procedure is adopted for monitoring and calibration (along with CDM manual)
1.14	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.*
1.15	Low	This is a calculated value and QA / QC consists of cross checking with daily company report
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 (along with CDM manual)
1.22	Low	This is a calculated value and EMS procedure is adopted for monitoring and calibration (along with 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 CDM manual is followed .
2.2	Low	Do
2.3	Low	Do
2.4	Low	Do
2.5	Low	QMS procedure is adopted for monitoring

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.*
		and calibration (along with CDM manual)
2.6	Low	QMS procedure is adopted for monitoring and calibration (along with CDM manual)
2.7	Low	QMS procedure is adopted for monitoring and calibration (along with 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 (along with CDM manual) of values used for calculation
2.10	Low	This is a calculated value and EMS procedure is adopted for monitoring and calibration (along with CDM manual) of values used for calculation
2.11	Low	This is a calculated value and EMS procedure is adopted for monitoring and calibration (along with CDM manual) of values used for calculation
2.12	Low	QMS procedure is adopted for monitoring and calibration (along with 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
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

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.*
		company report
2.22	Low	This is a calculated value and EMS procedure is adopted for monitoring and calibration (along with 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.
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

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.*
		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

>>

Baseline Emissions:

BEBC,y = [BEclinker * BBlend,y] + BEele_ADD_BC ---------- (1)

where:

BEBC,y = Baseline CO2 emissions per tonne of blended cement type (BC) (t CO2/tonne BC)
BEclinker = CO2 emissions per tonne of clinker in the baseline in the project activity plant (t CO2/tonne clinker) and defined below
BBlend,y = 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 (tCO2/tonne of BC)

Identification Details	Description	Unit	2009-10
BE clinker	CO2 emissions per tonne of clinker in the baseline in the project activity plant and defined below	(t CO2/tonne clinker)	0.8675
BBlend,y	Baseline benchmark of share of clinker per tonne of BC updated for year y	(tonne of clinker/tonne of BC)	0.7434
BEele_ADD_BC	Baseline electricity emissions for BC grinding and preparation of additives	(tCO2/tonne of BC)	0.0342
BEBC,y	Baseline CO2 emissions per tonne of blended cement type (BC)	tCO2/tonne BC	0.6791

E.2. Project emissions calculation

>>

Project Emissions:

PEBC,y = [PEclinker,y * PBlend,y] + PEele_ADD_BC,y ----------(5)

where:
PEBC,y = CO2 emissions per tonne of BC in the project activity plant in year y(tCO2/tonne BC)

PEclinker,y = CO2 emissions per tonne of clinker in the project activity plant in year y (t CO2/tonne clinker) and defined below
PBlend,y = Share of clinker per tonne of BC in year y (tonne of clinker/tonne of BC)
PEele_AD,D_BC,y = Electricity emissions for BC grinding and preparation of additives in year y (tCO2/tonne of BC)

Identification Details	Description	Unit	2009-10
PEBC,y	CO2 emissions per tonne of BC in the project activity plant in year y	tCO2/tonne BC	0.6563
PEclinker,y	CO2 emissions per tonne of clinker in the project activity plant in year y	(t CO2/tonne clinker)	0.9197
PBlend,y	Share of clinker per tonne of BC in year y	(tonne of clinker/tonne of BC)	0.6685
PEele_AD,D_BC,y	Electricity emissions for BC grinding and preparation of additives in year y	(tCO2/tonne of BC)	0.0414

PEclinker,y = PEcalcin,y + PEfossil_fuel,y + PEele_grid_CLNK,y + PEele_sg_CLNK,y (5.1)

where:

PEclinker,y = Emissions of CO2 per tonne of clinker in the project activity plant in year y (t CO2/tonne clinker)
PEcalcin,y = Emissions per tonne of clinker due to calcinations of calcium carbonate and magnesium carbonate in year y (t CO2/tonne clinker)
PEfossil_fuel,y = Emissions per tonne of clinker due to combustion of fossil fuels for clinker production in year y (t CO2/tonne clinker)
PEele_grid_CLNK,y = Grid electricity emissions for clinker production per tonne of clinker in year y (t CO2/tonne clinker)
PEele_sg_CLNK,y = Emissions from self-generated electricity per tonne of clinker production in year y (t CO2/tonne clinker)

Identification Details	Description	Unit	2009-10
PEclinker,y	CO2 emissions per tonne of clinker in the project activity plant in year y	(t CO2/tonne clinker)	0.9197
PEcalcin,y	Emissions from the calcinations of limestone	(t CO2/tonne clinker)	0.5228
PEfossil_fuel,y	per tonne of clinker due to combustion of fossil fuels for clinker production in year y	(t CO2/tonne clinker)	0.3038
PEele_grid_CLNK,y	Grid electricity emissions for clinker production per tonne of clinker in year y	(t CO2/tonne clinker)	0.0465
PEele_sg_CLNK,y	Emissions from self-generated electricity per tonne of clinker production in year y	(t CO2/tonne clinker)	0.0466

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

where:

PEcalcin,y = Emissions from the calcinations of limestone (tCO2/tonne clinker)
0.785 = Stoichiometric emission factor for CaO (tCO2/t CaO)
1.092 = Stoichiometric emission factor for MgO (tCO2/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	2009-10
PEcalcin,y	Emissions from the calcinations of limestone	(t CO2/tonne clinker)	0.5228
OutCaO - Year average	CaO content (%) of the clinker* clinker produced (tonnes)	Tones	1165848.9432
- Year average	CaO content (%) of the clinker	%	64.81
InCaO - Year average	CaO content (%) of the raw material * raw material quantity (tonnes)	Tones	0.0000
- Year average	CaO content (%) of the raw material	%	0.0000
- Year average	Quantity of Clinker raw material (tonnes)	Tones	3330000.0000
OutMgO - Year average	MgO content (%) of the clinker * clinker produced (tonnes)	Tones	23205.4488
- Year average	MgO content (%) of the clinker	%	1.29
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	1798.872

PEfossil_fuel, y = [‡”FFi_,y * EFFi] /CLNK,y * 1000 ----------(5.1.2)

where:
FFi_,y = Fossil fuel of type i consumed for clinker production in year y (tonnes of fuel i)
EFFi = Emission factor for fossil fuel i (tCO2/tonne of fuel)
CLNKy = Annual production of clinker in year y (kilotonnes of clinker)

Identification Details	Description	Unit	2009-10
PEfossil_fuel,y	tCO2 per tonne of clinker due to combustion of fossil fuels for clinker production in year y	(t CO2/tonne clinker)	0.3038

FFi_BSL	Fossil fuel of type i consumed for clinker production in the baseline (tonnes of fuel i)	tonnes of coal (dry basis)	296655.189
EFFi	Emission factor for fossil fuel i (t CO2/tonne of fuel)	(t CO2/tonne of fuel)	1.8419
FFi_BSL	Fuel 2 (Rice husk) consumed for clinker production	tonnes of Rice Husk	0.00000
EFFi	Emission factor for fossil fuel i (t CO2/tonne of rice husk)	(t CO2/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 CO2/tonne of Saw Dust)	(t CO2/tonne of Saw Dust)	0.00000
CLNKy	Annual production of clinker in year y	Kilo Tonnes	1798.8720

PEele_grid_CLNK,y = [PELEgrid_CLNK,y * EFgrid_y] / [CLNKy* 1000] (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 CO2/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 CO2e/ MWh (applicable for Devapur plant)
Western Grid – 0.984 t CO2e/ MWh (applicable for Jalgaon plant)
Ex-post Values:
South – 0.85 tCO2e/ MWh
NEWNE – 0.90 tCO2e/ MWh

PEelec_sg_CLNK,y = [PELEsg_CLNK ,y* EFsg_y] /[CLNKy * 1000] (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 CO2/MWh)
CLNKy = Annual production of clinker in year y (kilotonnes of clinker)

Identification Details	Description	Unit	2009-10
PEele_sg_CLNK,y	Emissions from self-generated electricity per tonne of clinker production in year y	(t CO2/tonne clinker)	0.0466
PELEsg_CLNK,y	Self generation of electricity for clinker production in year y	(MWh)	44207.8287
EFsg_y	Emission factor for self generated electricity in year y	(t CO2/MWh)	1.8958

CLNKy	Annual production of clinker in year y	Kilo Tonnes	1798.872

The emission factor for self generation (*EFsg,y*) is calculated as the generation-weighted average emissions per electricity unit (tCO2/MWh) of all self-generating sources in the project boundary serving the system.

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

Fi ,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,

COEFi,j y = CO2 emission coefficient of fuel *i* (tCO2 / 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
GENj,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)**	**Name and Quantity of Fuel 3 (Coal) consumed for self generation (KT)**	**CO2 emission coefficient of fuel HSD (tCO2/KL)**	**CO2 emission coefficient of fuel FO (tCO2/KL)**	**CO2 emission coefficient of fuel Coal (tCO2/tonne)**	**2009-10 Emission factor for self generated electricity in year y (tCO2/ Mwh)**
GENj,i	F_HSD	F_FO	F_Coal	COEF_HSD	COEF_FO	COEF_Coal	**EFsg_y**
69693.61	177.446	3538.61	101.825	2.70	2.92	1.1912	1.8958

PEele_ADD_BC,y = PEele_grid_BC,y + PEele_sg_BC,y + PEele_grid_ADD,y + PEele_sg_ADD,y (5.2)

where:
PEele_grid_BC = Grid electricity emissions for BC grinding in year y (tCO2/tonne of BC)
PEele_sg_BC = Emissions from self generated electricity for BC grinding in year y (tCO2/tonne of BC)
PEele_grid_ADD = Grid electricity emissions for additive preparation in year y (tCO2/tonne of BC)
PEele_sg_ADD = Emissions from self generated electricity additive preparation in year y (tCO2/tonne of BC)

Identification Details	**Description**	**Unit**	**2009-10**
PEele_AD,D_BC,y	Electricity emissions for BC grinding and preparation of additives in year y	(tCO2/tonne of BC)	0.0414
PEele_grid_BC,y	Grid electricity emissions for BC grinding in year y	(tCO2/tonne of BC)	0.0221

PEele_sg_BC,y	Emissions from self generated electricity for BC grinding in year y	(tCO2/tonne of BC)	0.0193
PEele_grid_ADD,y	Grid electricity emissions for additive preparation in year y	(tCO2/tonne of BC)	0.00000
PEele_sg_ADD,y	Emissions from self generated electricity additive preparation in year y	(tCO2/tonne of BC)	0.00000

PEele_grid_BC,y = [PELEgrid_BC,y * EFgrid_BSL,y] /[BCy* 1000] (5.2.1)

Where :
PELEgrid_BC,y = Baseline grid electricity for grinding BC (MWh)
EFgrid_y = Grid emission factor in year y(t CO2/MWh)
BCy = Annual production of BC in year y (kilotonnes of BC)

Identification Details	Description	Unit	2009-10
PEele_grid_BC,y	Grid electricity emissions for BC grinding in year y	(tCO2/tonne of BC	0.0221
PELEgrid_BC,y	grid electricity for grinding BC	(MWh)	
	Devapur	(MWh)	33124.5769
	Jalgaon	(MWh)	19866.1714
EFgrid_y	Grid emission factor in year y for SREB	(t CO2/MWh)	0.9880
EFgrid_y	Grid emission factor in year y for Western Grid	(t CO2/MWh)	0.9840
Bcy	Annual production of BC in year y	(kilo tonnes of BC)	2362.0180

PEelec_sg_BC,y = [PELEsg_BC,y * EFsg_y] / [BCy* 1000] (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 CO2/MWh)
BCy = Annual production of BC in year y (kilotonnes of BC)

Identification Details	Description	Unit	2009-10
PEele_sg_BC,y	Emissions from self generated electricity for BC grinding in year y	(tCO2/tonne of BC)	0.0193
PELEsg_BC,y	Self generated electricity for grinding BC in year y	(MWh)	17279.0141
EFsg_y	Emission factor for self generated electricity in year y	(t CO2/MWh)	1.8958
Bcy	Annual production of BC in year y	(kilotonnes of BC)	*1699.88

*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] (5.2.3)

Where:
BELEgrid_ADD = Baseline grid electricity for grinding additives (MWh)
EFgrid_y = Grid emission factor in year y(t CO2/MWh)
BCy = Annual production of BC in year y (kilotonnes of BC)

Identification Details	Description	Unit	2009-10
PEele_grid_ADD,y	Grid electricity emissions for additive preparation in year y	(tCO2/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 CO2/MWh)	NA
Bcy	Annual production of BC in year y	(kilotonnes of BC)	2362.018

PEelec_sg_ADD,y = [PELEsg_ADD,y * EFsg_y] / [BCy* 1000] (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 CO2/MWh)
BCy = Annual production of BC in year y (kilotonnes of BC)

Identification Details.	Description	Unit	2009-10
PEele_sg_ADD,y	Emissions from self generated electricity additive preparation in year y	(tCO2/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 CO2/MWh)	NA
Bcy	Annual production of BC in year y	(kilotonnes of BC)	*1699.88

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

E.3. Leakage calculation

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Leakages:

Ladd_trans = [(TFcons * Dadd_source * TEF)* 1/Qadd*1/1000 + (ELEconveyor_ADD * EFgrid)*1/ADDy] (2)

where:
Ladd_trans = Transport related emissions per tonne of additives (t CO2/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 CO2/kg of fuel)
ELEconveyor_ADD = Annual Electricity consumption for conveyor system for additives (MWh)
EFgrid = Grid electricity emission factor (tonnes of CO2/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	2009-10
Ladd_trans	Transport related emissions per tonne of additives	tonne CO2/tonne of additive	0.0080
TFcons	Fuel consumption for the vehicle per Kilo meter	kg fuel/km (3 km/l)	0.2831
Dadd_source	Distance between the source of additive and the project activity plant	km	114.900
TEF	Emission factor for transport fuel	(kg CO2/kg of fuel)	3.1772
ELEconveyor_ADD	Electricity consumption for conveyor system for additives	MWh	1483.721
EFgrid	Baseline grid emission factor of SREB	(t CO2/MWh)	0.9880
Qadd	Quantity of additive carried in one trip per vehicle	(tonnes of additive)	17.24
ADDy =	Annual consumption of additive	(tonnes of additives)	722364.714

And leakage emissions per tonne of BC due to additional additives are determined by
Ly = Ladd_trans * [Ablend,y – Pblend,y] * BCy (2.1)

where:

Ly = Leakage emissions for transport of additives (kilotonnes of CO2)
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	2009-10
Ly	Leakage emissions for transport of additives	kilotonnes of CO2	-1.4186
BCy	Production of BC in year y	(kilotonnes of BC)	2362.018
Pblend,y	Share of additives per tonne of BC in year y	(tonne of additives/tonne of BC)	0.3314
Ablend,y	Baseline benchmark share of additives per tonne of BC updated for year y	(tonne of additives/tonne of BC)	0.2566

E.4. Emission reductions calculation / table

>>
As per the methodology ACM0005, version 2, 28 November, 2005, there are 3 possibilities in determining the emissions reduction and they are:

(i) emissions per tonne of clinker during the crediting period are less than baseline emissions

per tonne of clinker ($PE_{clinker,y} < BE_{clinker}$); or
(ii) baseline and year y emissions per tonne of clinker are equal ($PE_{clinker,y} = BE_{clinker}$); or
(iii) emissions per tonne of clinker in year y are greater than the baseline emissions per tonne of clinker ($PE_{clinker,y} > BE_{clinker}$).

In our case for present monitoring period option iii) is applicable since $PE_{clinker,y} > BE_{clinker}$.
However Project activity emissions is less than baseline emissions and the net emission reduction is positive as detailed below.

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***	***2009-2010***
	ERy	thousand tonnes of CO2	47.3440
	BEBC, y	(t CO2/tonnes of BC)	0.6791
	PEBC,y	(t CO2/tonnes of BC)	0.6563
	BCy	(thousand tones)	2138.9815
	Ly	kilotonnes of CO2	-1.4186
	αy	Ratio	0

In year 2009-10, PPC production was 2362018 tonnes which includes the purchase clinker also, however for conservativeness in ER the actual BC production considered 2138981.47 tonnes which is based on own clinker production.

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

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Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO_2e)	**118886**	**47344**

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

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Actual emission reduction in 2009-10 is much lesser than one estimated during PDD registration as mentioned above. This is due to higher project emission in this monitoring period in comparison to the one estimated in registered PDD. Higher project emission in 2009-10 is due to higher value of emission factor of electricity {(from in-house CPP) used in the present crediting period in comparison to one considered during estimation in registered PDD (Grid emission factor)}. This is because, a part of electricity consumed in project scenario is from in house coal fired CPP, instead of sourcing from grid as was envisaged in the registered PDD. This higher value of emission factor of electricity from coal fired CPP, against electricity from grid, has ultimately laid to significant reduction in actual emission reduction figure in 2009-10 with respect to estimated emission reduction figure arrived at registered PDD. Detail emission reduction as well as blended cement production comparison has been provided under "CER cal." sheet in the CER calculation Excel file.

History of the document

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

Annexure 1: Measuring & Monitoring Equipments Identification and calibration Details:

Table A. Measuring Equipments Calibration details								
Sl. No	Parameter used in calculation	Name of Measuring instrument	Identification Code/ Tag No.	Accuracy class +/-	Calibration date covering period 2009-2010	Calibration freq. (Months)	Location	Function
Devapur Plant:								
1	**Quantity of Lime stone** used in the clinkerisation unit in base line as well as project	Lime stone weigh feeder RM-1	1RM-5-WI01	0.25 TPH	12.06.2010 14.12.2009 16.06.2009 18.12.2008	6	Raw Mill-1	Measurement and feeding of Lime stone material to Raw Mill- I
2	To measure InCaO % & InMgO % for baseline as well as project to calculate **BEcalcin & PEcalcin,y**	Bauxite weigh feeder – RM-1	1RM-5-WI02	3.0 TPH	15.06.2010 17.12.2009 19.06.2009 21.12.2008	6	Raw Mill-1	Measurement and feeding of Bauxite material to Raw Mill- I
3	To measure InCaO % & In MgO % for baseline as well as project to calculate **BEcalcin & PEcalcin,y**	Laterite weigh feeder – RM-1	1RM-5-WI03	0.25 TPH	15.06.2010 17.12.2009 19.06.2009 21.12.2008	6	Raw Mill-1	Measurement and feeding of Laterite material to Raw Mill- I
4	**Quantity of Lime stone** used in the clinkerisation unit in base line as well as project	Lime stone weigh feeder RM-2	2RM-5-WI01	3.0 TPH	13.07.2010 15.01.2010 17.07.2009 19.01.2009	6	Raw Mill-2	Measurement and feeding of Lime stone material to Raw Mill- 2
5	To measure InCaO % & In MgO % for baseline as well as project to calculate **BEcalcin & PEcalcin,y**	Bauxite weigh feeder – RM-2	2RM-5-WI02	0.25 TPH	15.07.2010 17.01.2010 19.07.2009 21.01.2009	6	Raw Mill-2	Measurement and feeding of Bauxite material to Raw Mill- 2
6	To measure InCaO % & In MgO % for baseline as well as project to calculate **BEcalcin & PEcalcin,y**	Laterite weigh feeder – RM-2	2RM-5-WI03	0.15 TPH	15.07.2010 17.01.2010 19.07.2009 21.01.2009	6	Raw Mill-2	Measurement and feeding of Laterite material to Raw Mill- 2
7	Annual production of clinker in base line as well as project – **CLNKBSL & CLNKy**	PC solid flow feeder	1KL-2-WI02	2.0 TPH	27.05.2010 29.11.2009 01.06.2009 12.12.2008	6	Kiln I	Measurement and feeding of raw material to kiln I
8	Annual production of clinker in base line as well as project – **CLNKBSL & CLNKy**	Kiln solid flow feeder	1KL-2-WI01	2.0 TPH	27.05.2010 29.11.2009 01.06.2009 12.12.2008	6	Kiln I	Measurement and feeding of raw material to kiln I

9	Annual production of clinker in base line as well as project – **CLNKBSL & CLNKy**	Kiln solid flow feeder	2KL-2-IB01	1 %	21.10.2009 23.04.2009 24.10.2008	12	Kiln II	Measurement and feeding of raw material to kiln II
10	Fossil Fuel (Coal) used for clinkerisaion production in base line as well as project **FFi_BSL FFi_y**	PC loss in weight	1KL-2-WI03	0.1 TPH	05.04.2010 07.10.2009 09.04.2009	6	Kiln I	Measurement and feeding of Coal to PC kiln I
11	Fossil Fuel (Coal) used for clinkerisaion production in base line as well as project **FFi_BSL FFi_y**	Kiln side Coal feeder	1KL-SC	2 %	28.10.2009 02.12.2008	12	Kiln I	Measurement and feeding of Coal to kiln I
12	Fossil Fuel (Coal) used for clinkerisaion production in base line as well as project **FFi_BSL FFi_y**	Solid flow feeder/LIW system coal feeder - PC	2KL-5-SF02	0.1 TPH	08.04.2010 09.10.2009 10.04.2009	6	Kiln II	Measurement and feeding of Coal to PC kiln II
13	Fossil Fuel (Coal) used for clinkerisaion production in base line as well as project **FFi_BSL FFi_y**	Solid flow feeder/LIW system coal feeder - Kiln	2KL-5-SF01	0.1 TPH	08.04.2010 09.10.2009 10.04.2009	6	Kiln II	Measurement and feeding of Coal to kiln II
14	Quantity of flyash used for PPC production in base line as well as project **ADDy**	Fly ash flow feeder	1CM-3-WI04	1.0 TPH	31.03.2010 02.10.2009 04.04.2009	6	Cement mill 1	Measurement and feeding of Fly ash to Cement Mill I
15	Quantity of clinker used for PPC production **$CLNK_{BSL}$ $CLNK_y$**	Clinker Weigh feeder	1CM-3-WI01	2.0 TPH	03.08.2010 05.02.2010 07.08.2009 09.02.2009	6	Cement mill 1	Measurement and feeding of Clinker to Cement Mill I
16	Production of BC	Gypsum Weigh feeder	1CM-3-WI02	0.25 TPH	03.08.2010 05.02.2010 07.08.2009 09.02.2009	6	Cement mill 1	Measurement and feeding of Gypsum to Cement Mill I
17	Quantity of flyash used for PPC production in base line as well as project	Flyash flow feeder	2CM-3-WI08	1.0 TPH	02.06.2010 04.12.2009 06.06.2009	6	Cement mill 2	Measurement and feeding of Fly ash to Cement Mill II

	ADDy							
18	Production of BC	Gypsum Weigh feeder	2CM-3-WI07	0.4 TPH	28.07.2010 30.01.2010 01.08.2009 03.02.2009	6	Cement mill 2	Measurement and feeding of Gypsum to Cement Mill II
19	Quantity of clinker used for PPC production $\mathbf{CLNK_{BSL}}$ $\mathbf{CLNK_y}$	Clinker Weigh feeder	2CM-3-WI06	2.0 TPH	27.07.2010 29.01.2010 31.07.2009 02.02.2009	6	Cement mill 2	Measurement and feeding of Clinker to Cement Mill II
20	Incoming and out going raw materials and finished product weighment	WEIGH Bridge For Truck	EB01W244 & B9611048	Class-III	31.03.2010 19.03.2009	12	Plant	Measurement of incoming/outgoing truck(Loaded/ Empty)
21	Out going finished product weighment	WEIGH Bridge For Wagon	EB025291	Class-III	31.03.2010 19.03.2009	12	Plant	Measurement of incoming/outgoing wagon(Loaded /Empty)
Jalgaon Plant:								
1	Quantity of clinker used for PPC production $\mathbf{CLNK_{BSL}}$ $\mathbf{CLNK_y}$	Clinker Weigh feeder	PCM-2-WI-001	2.0 TPH	01.06.2010 01.12.2009 01.06.2009 01.12.2008	6	Cement Mill -1 Jalgaon	Measurement and feeding of Clinker to Cement Mill
2	Production of BC	Gypsum Weigh feeder	PCM-2-WI-002	0.4 TPH	02.06.2010 02.12.2009 02.06.2009 02.12.2008	6	Cement Mill -1 Jalgaon	Measurement and feeding of Gypsum to Cement Mill
3	Quantity of flyash used for PPC production in base line as well as project **ADDy**	Solid flow feeder	PCM-6-WI-003	0.1 TPH	05.01.2010 05.12.2009 05.09.2009 05.06.2009 05.03.2009	3	Cement Mill -1 Jalgaon	Measurement and feeding of Fly ash to Cement Mill

Table B. Energy Meter Calibration Detail							
Sl. No.	Data variable.	Identification Code / Tag No	Location	Make	Accuracy Class	Purpose	Calibration Date
DEVAPUR PLANT							

1	BELEgrid_CLNK, $_{BSL}$ BELEsg_CLNK, $_{BSL}$ PELE_CLNK, $_{y}$ PELEgrid_CLNK, $_{y}$ PELEsg_CLNK, $_{y}$	EM – 3	MRSS	SOCOMEC	+/- 1.0	Total KWH of RM-1 MM area	15.03.20101 9.03.2009
2		EM – 4	MRSS	SOCOMEC	+/- 1.0	Total KWH of RM-2 MM & Aux.	15.03.20101 9.03.2009
3		EM – 5	MRSS	SOCOMEC	+/- 1.0	Total KWH of Kiln-2 area	15.03.20101 9.03.2009
4		EM – 6	MRSS	SOCOMEC	+/- 1.0	Total KWH of Kiln-1 area	15.03.20101 9.03.2009
5		EM – 7	MRSS	SOCOMEC	+/- 1.0	KWH of VRM (MM & D/C fan) Add to Kiln-1	15.03.20101 9.03.2009
6	BELEgrid_BC, $_{BSL}$ BELEsg_BC, $_{BSL}$ PELE_BC, $_{y}$ PELEgrid_BC, $_{y}$ PELEsg_BC, $_{y}$	EM – 8	MRSS	SOCOMEC	+/- 1.0	CM-2 Roller Press	15.03.20101 9.03.2009
7		EM – 9	MRSS	SOCOMEC	+/- 1.0	CM-02 Main Motor & Aux.	15.03.20101 9.03.2009
8	BELEgrid_CLNK, $_{BSL}$ BELEsg_CLNK, $_{BSL}$ PELE_CLNK, $_{y}$ PELEgrid_CLNK, $_{y}$ PELEsg_CLNK, $_{y}$	EM – 10	MRSS	SOCOMEC	+/- 1.0	Total KWH of PBSR area	15.03.20101 9.03.2009
9		EM – 11	MRSS	SOCOMEC	+/- 1.0	Total KWH of Mines Crusher	15.03.20101 8.03.2009
10	BELEgrid_BC BELEsg_BC PELE_BC,y PELEgrid_BC,y PELEsg_BC,y	EM – 12	MRSS	SOCOMEC	+/- 1.0	KWH of CM-1 MM (E&W)	15.03.20101 8.03.2009
11	BELEgrid_CLNK, $_{BSL}$ BELEsg_CLNK, $_{BSL}$ PELE_CLNK, $_{y}$ PELEgrid_CLNK, $_{y}$ PELEsg_CLNK, $_{y}$	EM – 14	MRSS	SOCOMEC	+/- 1.0	Work Shop power	15.03.20102 2.03.2009
12		EM – 15	RM-1	SOCOMEC	+/- 1.0	RM - 1 Lighting	16.03.20102 3.03.2009
13		EM – 30	RM- 2	SOCOMEC	+/- 1.0	Plant Lighting	16.03.20102 1.03.2009
14		EM – 36	Kiln – 2	SOCOMEC	+/- 1.0	Colony Power supply	21.03.20102 0.03.2009
15		EM – 37	Kiln – 2	SOCOMEC	+/- 1.0	Pump House - 2 PDB	21.03.20102 0.03.2009
16		EM – 44	Kiln – 1	SOCOMEC	+/- 1.0	Kiln -01 Lighting	21.03.20102 2.03.2009
17	BELEgrid_BC BELEsg_BC PELE_BC,y PELEgrid_BC,y PELEsg_BC,y	EM – 49	CM – 2	SOCOMEC	+/- 1.0	Compressor - 2 MCC – 30PDB	19.03.20102 1.03.2009
18		EM – 50	CM – 2	SOCOMEC	+/- 1.0	Packing Plant 03 MCC 31/2	19.03.20102 1.03.2009
19		EM – 51	CM – 2	SOCOMEC	+/- 1.0	Packing Plant 04 MCC 31/1 PBD	19.03.20102 1.03.2009
20	BELEgrid_BC BELEsg_BC PELE_BC,y PELEgrid_BC,y PELEsg_BC,y	EM – 55	CM – 1	SOCOMEC	+/- 1.0	Lighting ADM Building	19.03.20102 2.03.2009
21		EM – 56	CM – 1	SOCOMEC	+/- 1.0	F. Compressor MCC – 16	19.03.20102 2.03.2009

22		EM – 57	CM – 1	SOCOMEC	+/- 1.0	Pump House - 1	19.03.20102 2.03.2009
23		EM – 58	CM – 1	SOCOMEC	+/- 1.0	Packing Plant 1 MCC 15 A	19.03.20102 2.03.2009
24		EM – 59	CM – 1	SOCOMEC	+/- 1.0	Packing Plant 2 MCC 15 B	19.03.20102 2.03.2009
25		EM – 60	CM – 1	SOCOMEC	+/- 1.0	CM - 1 Aux. MCC 14	19.03.20102 1.03.2009
26	BELEgrid_CLNK, BSL BELEsg_CLNK, BSL PELE_CLNK, y PELEgrid_CLNK, y PELEsg_CLNK, y	EM – 61	Kiln – 1	SOCOMEC	+/- 1.0	Chilling plant power MCC 10PDB	21.03.20102 2.03.2009
27	BELEgrid_BC BELEsg_BC PELE_BC,y PELEgrid_BC,y PELEsg_BC,y	EM – 62	P. Plant	SOCOMEC	+/- 1.0	Lighting Packing Plant	21.03.20102 3.03.2009
28	BELEgrid_CLNK, BSL BELEsg_CLNK, BSL	EM – 63	PBSR	SOCOMEC	+/- 1.0	Garage lighting	22.03.20102 2.03.2009
29	PELE_CLNK, y PELEgrid_CLNK, y PELEsg_CLNK, y	EM – 64	RM-1	SOCOMEC	+/- 1.0	Kiln - 1 Comp. House MCC-5	21.03.20102 3.03.2009
30	BELEgrid_BC BELEsg_BC PELE_BC,y PELEgrid_BC,y PELEsg_BC,y	EM – 66	CM-1	SOCOMEC	+/- 1.0	CM-1 Separator MCC	19.03.20102 1.03.2009
31		DG – 1	DG House	ABB	+/- 1.0	DG - 1 Power generation	17.03.20102 0.03.2009
32		DG – 3	DG House	ABB	+/- 1.0	DG - 3 Power generation	17.03.20101 9.03.2009
33	SG	DG – 4	DG House	ABB	+/- 1.0	DG - 4 Power generation	17.03.20102 2.03.2009
34		DG – 5	DG House	ABB	+/- 1.0	DG - 5 Power generation	17.03.20102 0.03.2009
35		DG – O/G	DG House	ABB	+/- 1.0	Plant use power consumption.	17.03.20102 2.03.2009
36		EM - 67	Cement Mill	SOCOMEC	+/- 1.0	Fly ash unloading compressor 1	20.03.20102 2.03.2009
37	ELEconveyor_ADD	EM - 68	Cement Mill	SOCOMEC	+/- 1.0	Fly ash unloading compressor 2	20.03.20102 2.03.2009
38		EM - 69	Cement Mill	SOCOMEC	+/- 1.0	Fly ash unloading compressor -3	19.03.20102 2.03.2009
JALGAON PLANT							
1	BELEgrid_BC PELEgrid_BC,y	PP7316	Substation	KRYKARD	0.5	Energy measurement Load Center2	03.09.20090 9.09.2008

2		PP7317	Substation	KRYKARD	0.5	Energy measurement of Sepol Fan Motor	05.09.20091 1.09.2008
3	BELEgrid_BC PELEgrid_BC,y	PP7318	Substation	KRYKARD	0.5	Energy measurement Load Center1	03.09.20090 9.09.2008
4	Incomer Power from Grid	PP7319	Substation	KRYKARD	0.5	Energy measurement for 33Kv incomer	09.09.20091 0.09.2008
5	BELEgrid_BC PELEgrid_BC,y	PP7321	Substation	KRYKARD	0.5	Energy measurement of Cement Mill Motor	05.09.20091 1.09.2008
6		PP7322	Substation	KRYKARD	0.5	Energy measurement of Polycom Fixed Motor	05.09.20091 1.09.2008
7		PP7323	Substation	KRYKARD	0.5	Energy measurement Load Center3	03.09.20091 0.09.2008
8		PP7324	Substation	KRYKARD	0.5	Energy measurement of Polycom Moving Motor	05.09.20091 1.09.2008
9	ELEconveyor_ADD	PP7320	Substation	KRYKARD	0.5	Energy measurement for fly ash compressor motor	05.09.2009 11.09.2008
10		1K104093	PMCC-2N	HPL-SOCOMEC	+/- 1.0	Energy measurement for fly ash compressor motor	07.09.20090 9.09.2008

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

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