CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

CONTENTS

SECTION A. General description of project activity

A.1. Title of the project activity:

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Xinjiang Midong Tianshan Cement Co.Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project
Version: 03
Date: 12/04/2010

A.2. Description of the project activity:

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The proposed project is to build a new calcium carbide residue (CCR) based clinker plant that employs a new dry process clinker line with a capacity of 1600 tonnes of clinker per day. The proposed project is located in the Zhongtai Chemical Industrial Park, Urumqi City, Xinjiang Uygur Autonomous Region and the project owner is Xinjiang Midong Tianshan Cement Co. Ltd. The objectives of the proposed project are to produce low-emission clinker through 100% substitution of the limestone and clay, traditionally used in clinker manufacture, with CCR to meet the even-increasing demand in the local area and to realize sustainable usage of resources. The proposed project is "the first of this kind" in Wuchang Region, including Changji Hui Autonomous Prefecture, Urumqi City and Urumqi County. Therefore, its implementation will improve the new technology where 100% CCR is used instead of limestone and clay in a new dry process clinker line. Moreover, the implementation of the proposed project will also promote sustainable development and the utilisation of synthetic resources.

According to the Statistic Data of Cement Plants in Wuchang Region, all the existed clinker lines in Wuchang Region use the traditional technology of producing clinker. The traditional clinker processing technology mixes and heats limestone and clay to generate clinker. As the limestone is mainly made up of $CaCO_3$, the process will emit a lot of CO_2. And, because that the decomposition heat of $CaCO_3$ is higher than $Ca(OH)_2$ which is the main component of CCR, the traditional technology will consume more fossil fuel and generate more CO_2. Therefore, the proposed project will realize GHG emission reduction by 100% substitution of limestone and clay with CCR. When the proposed project is put into operation, it is expected to realize an annual GHG emission reduction of 239,556 tCO_2e. The baseline scenario is therefore to produce the same type and amount of clinker using limestone and clay as the only resource of CaO and MgO.

Compared with the basline scenario, besides reducing GHG emissions, the proposed project will contribute to sustainable development in the local community and host country though the following:

- ♦ Avoiding the potential environmental pollution that results from current CCR transportation and disposal;
- ♦ Avoiding the potentially negative environmental impacts on the local region due to mining limestone;
- ♦ Promoting the development of clean production and a circular economy in the cement industry in China;
- ♦ Improving the financial situation of project owner;
- ♦ Providing new job opportunities including 180 permanent job opportunities;
- ♦ Promoting the development and popularization of advanced cement production technology in China;
- ♦ Reducing pollution discharge in the cement industry.

A.3. 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)
People's Republic of China (host)	Xinjiang Midong Tianshan Cement Co., Ltd	No
United Kingdom of Great Britain and Northern Ireland	Camco International Limited	No
United Kingdom of Great Britain and Northern Ireland	Camco Carbon Limited	No

See Annex 1 for details

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

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People's Republic of China

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

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Xinjiang Uygur Autonomous Region

A.4.1.3. City/Town/Community etc.:

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Urumqi City

A.4.1.4. Details of physical location, including information allowing the unique identification of this project activity (maximum one page):

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The proposed project is located in the Zhongtai Chemical Industrial Park, Urumqi City, Xinjiang Uygur Autonomous Region. The site is at the northeast side of the Zhongtai Chemical Industrial Park, 5 km west to Urumqi City, 3 km north to Miquan City and 30 km to Jichang City. The Shihua Road passes by 0.4 km northwest to the project site which is only 1 km away from the 216 National Route. On the east side of the proposed project is a railway specially used for the petrifaction industry. The proposed project's exact geographical coordinates are East longitude 43° 26´30" and North latitude 87° 48´12". The location is shown as below:

According to ACM0015, the "Region" is indentified as the geographic area defined by a radius of 200 km around the project activity including at least the ten cement plants nearest to the plant of the project activity. Therefore, as show in Figure A-1, the region including Changji Hui Autonomous Prefecture, Urumqi City and Urumqi County which is locally called Wuchang Region is selected as the Region of the proposed project. Urumqi City and Urumqi County is around 153 km long from south to north and 190 km broad from east to west; Changji Hui Autonomous Prefecture is about 285 km long from south to north and 541 km broad from east to west. Although the northeast part of the Region is a little not wide enough, as shown in the second figure, Tianshan Mountain Chain cross this area, it is reasonable to ignore this small part.

Figure A-1 the geological location of the proposed project

A.4.2. Category(ies) of project activity:

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The proposed project is relevant to sectoral scope 4 – manufacture.

A.4.3. Technology to be employed by the project activity:

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Baseline Scenario

According to the Statistic Data of Cement Plants in Wuchang Region, there are all in all 14 cement entities in the Wuchang Region and all of them use limestone and clay as the only source of CaO and MgO for producing clinker. Therefore, without the proposed project, the same type and amount of clinker will be produced by constructing a new traditional clinker line with the same capacity or bigger capacity. As among the 14 cement entities, the 2000t/d clinker line of Xinjiang Tianshan Cement Co.Ltd is proved by Xinjiang Building Materials Designing Institute (Class A) to be the existing clinker line with the lowest GHG emission. Therefore, the baseline of the proposed project is to construct a new cement plant providing the same produces and services using carbonated sources and the 2000t/d clinker line of Xinjiang Tianshan Cement Co.Ltd is selected, in accordance with ACM0015, to calculate the baseline emission.

Project Scenario

The proposed project will build a 1600t/d new dry processing clinker line using off-kiln decomposition technique. The clinker line will annually produce 480,000 tonnes of clinker under full efficiency. The proposed project uses 100% CCR substituting traditionally used limestone and clay with black shale, silica sands, coal gangues and copper scraps to make clinker. Bituminous coal is used as a fuel. Compared with the traditionally used wet process, wet-grinding and dry-burning process and normal dry process, the new dry process will have a higher efficiency, will be better quality and consume less energy[1].

Up to 2007, there were only 15 cement lines in Xinjiang using the new dry technique[2] and there were no new dry processing clinker lines substituting all the limestone and clay with CCR either in the project region or China. Therefore, the proposed project is the "first of its kind" in Wuchang Region. The proposed project was designed by Xinjiang Building Materials Designing Institute (Class A) and will apply for a patent soon.

The main process: CCR cakes will be transported into the plant by belt conveyor and sent into the raw meal silo after being ground by the dryer crusher; the auxiliary materials will be transported by vehicles and sent to individual silos after being ground by a hammer crusher. After being ground again by a raw mill, the auxiliary materials will be mixed with the ground CCR and then be separated by a separator. The separated raw meal will be decomposed together with the ground and separated coal powder through a three-stage preheating precalciner and then, calcined in rotary kiln; the generated clinker will be stored in clink silo after cooling by reciprocating grate cooler.

All the dry processes including drying CCR, auxiliary materials and coal all use surplus heat generated during decomposition and calcination, no other fuel will be used. All the powder and dust will be recollected and reused. Apart from the dust emitted out with the waste gas, none of the powder and dust will be emitted or discarded.

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[1] http://www.xbsn.com/news/ShowArticle.asp?ArticleID=19241

[2] http://www.jingtaihe.com/show1.asp?id=775

The flow chart of the proposed project is as following:

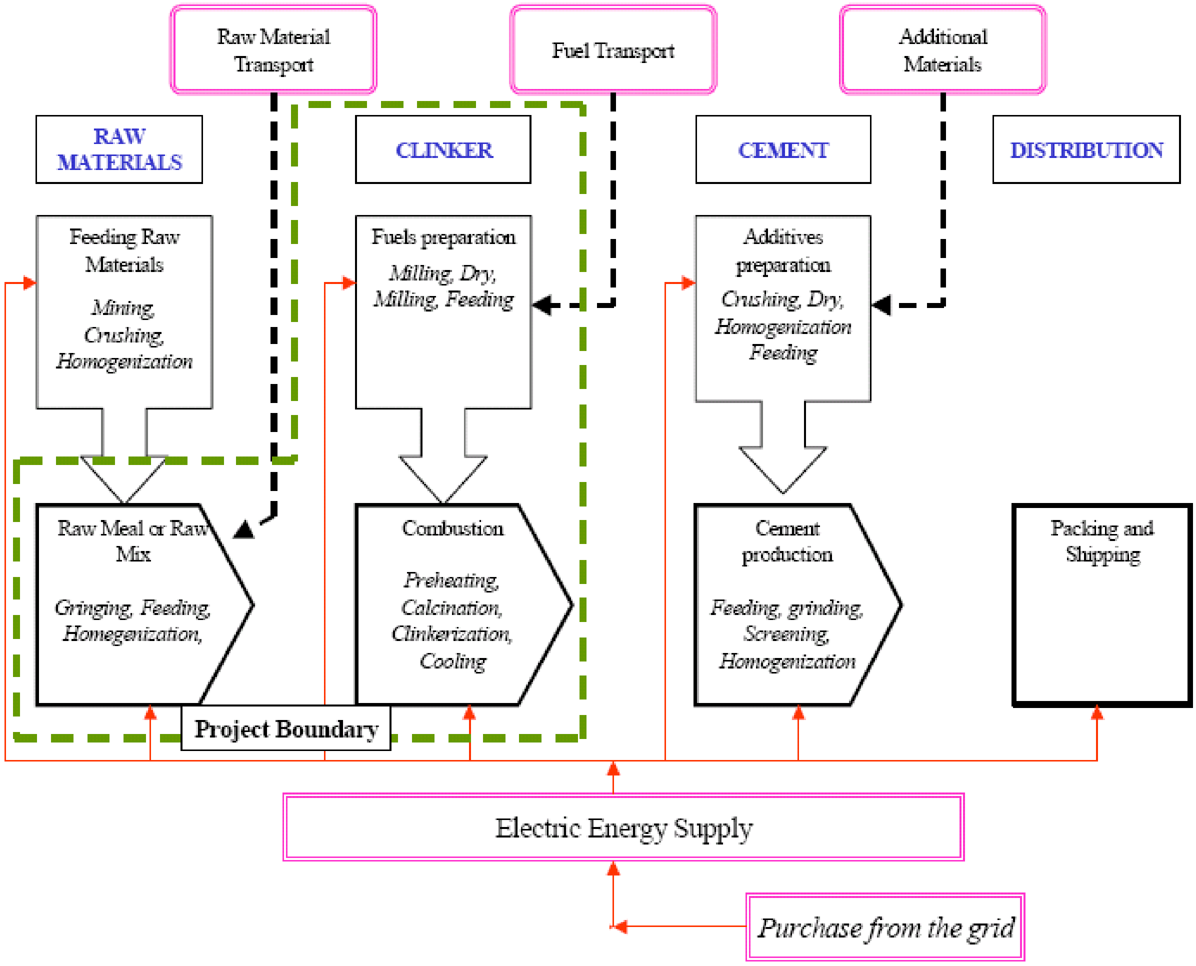

Figure A-2 the flow chart of entire clinker production process

The main characteristics of the project and equipment used are shown in Table A-1 and Table A-2:

Table A-1, The main characteristics of the entire clinker production line

No.	Key indicators	Unit	Value
1	Clinker production capacity	t/a	480,000
2	CCR (dry) consumption capacity	t/a	430,000
3	SKC	kJ/kg clinker	3,595
4	Unit standard coal consumption	kg/t clinker	123
5	Unit electricity consumption	kWh/t clinker	69

Table A-2, The characters of the main equipments

No.	Name	Type, scale, capability	Unit	Annual utilization rate
1	Preheater and precalciner	Three-stage preheater and pipe precaliner	1	82.1%

		C1 - 1×Φ5.45m C2 - 1×Φ5.7m C3 - 1×Φ6m precalinerΦ4.6×27.5m		
2	Rotary kiln	Φ3.5×54M Pitch 4% Rotate speed 0.4 ~ 4.01r/min Capacity: 1600t/d	1	82.1%
3	Reciprocating grate cooler	Flow controlling type reciprocating grate cooler Efficient area of the gate bed: 43.6 m^2 Input temperature: 1400℃ Output temperature: 65℃ +ET Capacity: 1600t/d	1	82.1%

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

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The project uses a fixed crediting period of 10 years. The starting date of the crediting period for the project is 01/03/2010. During the crediting period, estimated emission reductions by the project will be 2,395,560 tCO_2e. The emission reductions for each year are shown in the table below.

Table 2 Estimation of emission reductions of the project

Years	***Annual estimation of emission reductions in tonnes of CO_2e***
2010 (Mar. - Dec.)	*199,630*
2011	*239,556*
2012	*239,556*
2013	*239,556*
2014	*239,556*
2015	*239,556*
2016	*239,556*
2017	*239,556*
2018	*239,556*
2018	*239,556*
2020 (Jan. – Feb)	*39,926*
Total estimated reductions (tonnes of CO_2e)	*2,395,560*
Total number of crediting years	*10*
Annual average over the crediting period of estimated reductions *(tonnes of CO_2e)*	*239,556*

A.4.5. Public funding of the project activity:

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There is no public funding for the proposed project.

SECTION B. Application of a baseline and monitoring methodology

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

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1. ACM0015: “Consolidated baseline methodology for project activities using alternative raw materials that do not contain carbonates for clinker manufacturing in cement kilns”, version 01, in effect as of 30 Nov., 2007;
2. “Tool for the demonstration and assessment of additionality”, version 05.2.
3. “Tool to calculate the emission factor for an electricity system, version 01.1.

For more information regarding the methodology, please refer to the link:

http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html

B.2. Justification of the choice of the methodology and why it is applicable to the project activity:

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According to the applicability requirements, the approved methodology ACM0015 is applicable to project activities that use alternative raw materials that do not contain carbonates (AMC) in cement kilns for the production of clinker. The AMC partially or fully substitutes raw materials that contain calcium and/or magnesium carbonates (e.g. limestone) and that would otherwise be used in the kilns.

In accordance with the applicability conditions of the methodology ACM0015, the description of relevant situation of the proposed project and the corresponding conclusions are shown as follows:

According to approved methodology AM0015, it is applicable under the following conditions:	The relevant situation of the proposed project activity	Conclusion
Use of alternative materials shall increase neither the capacity of clinker production nor the lifetime of equipment;	The proposed project is a greenfield project.	Applicable
The methodology is applicable to existing as well as to greenfield plants;	The proposed project is a greenfield project.	Applicable
Type and quality of produced clinker remain the same in both baseline and project case;	The clinker produced by the project is the same as in the baseline.	Applicable
Alternative raw materials have never been used in the clinker manufacturing facility prior to the implementation of the project activity;	The CCR generated in Wuchang Region has not been used before. All of it was disposed and buried.	Applicable

The quantity of AMC available shall be at least 1.5 times the quantity required for meeting the demand of all existing users, including other uses than in the cement industry, consuming the same AMC in the project area, i.e. the total quantity required for the project as well as other users of the alternative raw materials. Project area in this context is defined as the area defined by a radius of 200 km around the project activity including at least the ten cement plants nearest to the plant of the project activity;	The CCR generated in Wuchang Region has not been used before. All of it was disposed and buried. The CCR generated by Zhongtai Chemical limited in Wuchang Region is already higher than the 1.5 of the proposed project's demand.	Applicable
There is sufficient historical information about the clinker manufacturing facility, the raw materials used, and energy performance of the kiln;	The proposed project is a greenfield project. Historical data for the baseline scenario is available.	Applicable
The methodology is not applicable for energy efficiency initiatives for improvements in process equipment and fuel switching.	The proposed project uses domestic equipment, which is as the same as the other new dry processing projects. The proposed project will use bituminous coal, which is also used in baseline scenario.	
Conclusion: the proposed project is applicable to approved methodology AM0015		

B.3. Description of the sources and gases included in the project boundary:

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According to ACM0015, the project boundary is defined as including all process units related to the manufacturing of clinker in the cement kiln, from reception of raw materials and fuel to the delivery of clinker to the cooler.

The proposed project and the identified baseline scenario both use electricity from grid. According to the "Tool to calculate the emission factor for an electricity system" and "*Notification on Determining Baseline Emission Factor of China's Grid*[3] ", the grid system is defined to be the Northwest China Grid, including Shaanxi Provincial Grid, Gansu Provincial Grid, Qinghai Provincial Grid, Ningxia Provincial Grid and Xinjiang Provincial Grid.

The table below shows gases and sources included in the project boundary.

	Source	Gas	Included?	*Justification /Explanation*
Baseline	Calcination of raw materials in the kiln	CO_2	Yes	Main emissions direct emitted from clinker kiln.
		CH_4	No	Emission negligible, excluded for simplification
		N_2O	No	Emission negligible, excluded for simplification

[3] http://cdm.ccchina.gov.cn/web/NewsInfo.asp?NewsId=2875

	Use of fuels in the kiln, including main burner and precalcinator (fossil, alternative fossil and non-fossil)	CO_2	Yes	Main emissions direct emitted from clinker kiln.
		CH_4	No	Emission negligible, excluded for simplification
		N_2O	No	Emission negligible, excluded for simplification
	Use of fuel for the preparation of alternative raw materials and fuels (e.g. drying of materials or fuels using external dryers)	CO_2	Yes	Consumption of fuel during fuel preparation, other parts use surplus heat.
		CH_4	No	Emission negligible, excluded for simplification
		N_2O	No	Emission negligible, excluded for simplification
	Use of electricity (grid and self generated) for the preparation of raw materials and fuels, and for the operation of equipments related to the kiln (engines, compressors, fans, etc.)	CO_2	Yes	Grid connected electricity used by feeding system and preparation of materials.
		CH_4	No	Emission negligible, excluded for simplification
		N_2O	No	Emission negligible, excluded for simplification
Project Activity	Calculation of raw materials	CO_2	Yes	Main emissions direct emitted from clinker kiln.
		CH_4	No	Emission negligible, excluded for simplification
		N_2O	No	Emission negligible, excluded for simplification
	Use of fuels in the kiln, including main burner and precalcinator (fossil, alternative fossil and non-fossil)	CO_2	Yes	Main emissions direct emitted from clinker kiln.
		CH_4	No	Emission negligible, excluded for simplification
		N_2O	No	Emission negligible, excluded for simplification
	Use of fuel for the preparation of alternative raw materials and fuels (e.g. drying of materials or fuels using external dryers)	CO_2	Yes	Surplus heat is used in preparation of raw materials and fuel. Therefore, actually no emissions in this part.
		CH_4	No	Emission negligible, excluded for simplification
		N_2O	No	Emission negligible, excluded for simplification
	Use of electricity (grid and self generated) for the preparation of raw materials and fuels, and for the operation of equipments related to the kiln (engines, compressors, fans, etc.)	CO_2	Yes	Grid connected electricity used by feeding system and preparation of materials, including transportation of CCR.
		CH_4	No	Emission negligible, excluded for simplification
		N_2O	No	Emission negligible, excluded for simplification

B.4. **Description of how the baseline scenario is identified and description of the identified baseline scenario:**

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Step 1. Identification of alternative scenarios to the proposed CDM project activity that are consistent with current laws and regulations

According to ACM0015, the realistic and credible alternatives available to the proposed project that provide outputs or services comparable to the proposed project activity include:

1) Construction of a cement plant providing the same produces and services using carbonated sources;
2) Construction of a cement plant providing the same produces and services using non-carbonated sources substituting part of the carbonated sources;
3) The proposed project itself, but undertaken without being registered as a CDM project activity.

The above three potential alternatives are all consistent with current mandatory laws and regulations in cement sector of China.

Step 2. Barrier analysis to eliminate alternatives to the project activity that face prohibitive barriers

As the technology implemented in the proposed project is an innovative technology and the proposed project is the first application of this technology in Wuchang Region, the proposed project faces a lot of barriers for finance, technology and implementation.

For the Alternative 2), because there is no such kind of project existing or under construction in the project region and this technology is just starting to be used in China, the Alternative 2) will face the same barriers as the proposed project.

Therefore, the only feasible alternative is the Alternative 1) "Construction of a cement plant providing the same produces and services using carbonated sources".

Barriers		Alternative 1)	Alternative 2)	Alternative 3)
Investment barriers	Because the predicted NPV of the project is lower than 0 and the implementation is anticipated to be difficult, the project faces barriers of obtaining loan and investment.	Hasn't	Has	Has
Technological barriers	Lack of skilled engineers and operators.	Hasn't	Has	Has
	The technology could fail.	Hasn't	Hasn't	Has
Barriers due to prevailing practice	The project is the first new dry processing clinker line using CCR 100% substituting limestone.	Hasn't	Hasn't	Has

Step 3. Investment analysis

In order to confirm the result of ***Step 2***, an investment analysis between Alternative 1) and Alternative 3), as Alternative 1) and Alternative 2) facing the similar situation, is taken to confirm the baseline scenario as following:

According to the methodology, the analysis should follow the additional instructions as:

- *Calculate the financial costs (e.g. capital and variable costs) and account cost savings due to net energy gains, if any, from project activity.*
- *A sensitivity analysis should be performed to assess the robustness of the selection of the most likely future scenario to reasonable variations in critical assumptions and to establish that the project is not the baseline scenario. The financial indicator is calculated conservatively if*

assumptions tend to make the CDM project's indicators more attractive and the alternatives' indicators less attractive.

- *The baseline scenario should take into account relevant national/local and sectorol policies and circumstances, and the proponent should demonstrate that the key factors, assumptions and parameters of the baseline scenario are conservative*

Therefore, the Project Application Report (PAR) and the Cost Comparison Analysis (CCA)[4] are used to do the analysis. The analysis results are as following:

Table B-1 Comparison of NPV

Item	Alternative 3)	Benchmark	Alternative 1)	With CDM
NPV (million)	-31.46	0	18.75	68.59

As the static total investment of both Alternative 1) and Alternative 3) are assumed based on the same year economic situation and both Alternative 1) and Alternative 3) generate the same clinker. The static total investment and the clinker price are considered not sensitive for comparison analysis. Therefore, the most significant parameters – Annual O&M Cost is selected for sensitivity analysis.

Table B-2 Comparison and Sensitivity analysis of Annual O&M Cost (Baseline scenario and project activity)

Variable	Annual O&M Cost (million)					
	-10%		0%		10%	
CCR unit cost	49.69	46.54	50.54	46.54	51.39	46.54
Limestone price	50.54	45.39	50.54	46.54	50.54	47.69
Coal price	49.66	45.76	50.54	46.54	51.42	47.32
Power price	49.49	45.56	50.54	46.54	51.58	47.52

Alternative 3) (green cells)

Alternative 1) (blue cells)

Form the Table B-2, it is obvious that the Annual O&M Cost of Alternative 3) is always lower than Alternative 1) even under the variation of critical parameters.

In conclusion, the only feasible alternative is Alternative 1) "Construction of a cement plant providing the same produces and services using carbonated sources". Therefore, Alternative 1) is selected to be the baseline scenario of the proposed project.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):

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The project owner began to consider constructing the proposed project in the middle of 2006. The initial

[4] *Cost Comparison Analysis*, Xinjiang Building Materials Designing Institute, 13 February 2007

version of the Project Application Report (PAR) for the project showed that the profit of the project is below average. Therefore, the project owner decided to develop the project as a CDM project and signed a CDM Consultation Agreement ("CADA") with Camco International Co.Ltd. The proposed project planed to get 35% of investment from bank loan. But the loan applications were refused by several banks. Finally, in April 2007, after the Term Sheet was signed by the project owner and Camco International Limited, Xinjiang Huatai Heavy Chemical Co., Ltd accepted to invest into the proposed project and signed a co-developing agreement with the project owner. The final PAR was completed in February, 2007 and, then, was approved on Apr. 27, 2007 by Economic and Trade Commission of Xinjiang Uygur Autonomous Region. In April 2007, a pre-validation report was completed by TUV-SUD for analyzing whether the proposed project could qualify for CDM.

This shows that developing the proposed project as a CDM project was the most important factor in making the project owner decide to invest in and construct the proposed project.

Time	Events
26/01/2007	CADA and Term Sheet
02/2007	Project Application Report (PAR) and Cost Comparison Analysis (CCA)
03/2007	EIA completed
02/04/2007	Kiln contract signed
04/04/2007	Pre-validation report by TUV-SUD
23/04/2007	EIA approval
27/04/2007	PAR approval by NDRC
22/05/2007	Start construction
01/08/2008	Start operation

According to ACM0015, the additionality of the proposed project is demonstrated by using the "Tool for the Demonstration and Assessment of Additionality" (Version 5.2) approved by the CDM EB.

Step 1. Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a. Define alternatives to the project activity:

Realistic and credible alternatives available to the proposed project that provide outputs or services comparable to the proposed project activity include:

1) Construction of a cement plant providing the same produces and services using carbonated sources;
2) Construction of a cement plant providing the same produces and services using non-carbonated sources substituting part of the carbonated sources;
3) The proposed project itself, but undertaken without being registered as a CDM project activity.

Outcomes of sub-step 1a:

Considering the resources and technology, the above 3 alternatives are all possible. Therefore, after sub-step 1a, the alternative 1), 2), 3) are all potential realistic and credible alternatives to the proposed project.

Sub-step 1b. Consistency with mandatory laws and regulations:

According to the national industry policies, the “Development Policy of the Cement Industry” published and validated on Oct. 17th, 2006 indicated that “the nation encourages local enterprises to develop new dry processing cement lines through eliminating low efficiency capacities using the old technique. And especially, encourages building new dry processing cement lines with a capacity of or above 4000t/d in the area with resources, build large clinker production bases and build large cement grinding stations in the near downtown area. …the nation encourages enterprises to implement measures to reduce emissions of air pollution, lower environmental pollution, saving energy and reducing resources consumption, comprehensively utilizing industry waste and improve the utilization of fuel with low consumption to rise the utilization rate of resources. The nation also encourages the cement enterprises to develop the industry by saving energy and to reach the clean production requirements.…”

Outcomes of sub-step 1b:
Alternative 1), alternative 2) and alternative 3) are consistent with all mandatory applicable legal and regulatory requirements and encouraged by the government. Therefore, through sub-step 1b, all three alternatives are potential feasible alternatives of the proposed project and will be analyzed in the following Step 2 and Step 3 as potential baseline alternatives.

Step 2. Investment Analysis

Sub-step 2a. Determine appropriate analysis method

The “Tool for the Demonstration and Assessment of Additionality” recommends three analysis methods: simple cost analysis, investment comparison analysis or benchmark analysis.

Other than CDM related income, the proposed project produces economic benefit through the sale of clinker. Therefore, the simple cost analysis cannot be used. Hence, the investment comparison analysis is chosen and the Net Present Value (NPV) is used to assess the financial viability of the project activity in accordance with ACM0015.

Sub-step 2b. Option III. Apply Investment Comparison Analysis

As required by ACM0015, the project is regarded additional when its NPV < 0. The standard discount rate of cement industry – 11% (before tax) is selected to complete the calculation[5].

Sub-step 2c. Calculation and comparison of financial indicators

1) Parameters required for NPV calculation

According to the relevant documents of the proposed project, parameters needed for calculation of NPV of the proposed project are given in Table B-3. And according to CCA, parameters for calculation of NPV of the baseline scenario are given in Table B-4

Table B-3 Main parameters used to calculate the financial indicator of the project activity

Item	Unit	Value	Reference
Annual clinker production	Million ton	0.48	Project Application Report

[5] Project Economic Assessment and Key Parameters (Version 3)

			(PAR)
Annual CCR utilization	Million ton (dry)	0.43	PAR
Clinker sale price	RMB/t	132	PAR
Static total investment	Million RMB	125	PAR
Working capital	Million RMB	10	PAR
Income tax	%	33	PAR
Income tax for the first 5 years	%	15	PAR
Rate of residual value	%	4	PAR
Depreciation year			PAR
House	years	30	PAR
Equipment	years	10	PAR
Operational life	years	19	PAR
Annual O&M cost	Million (RMB)	50.538	PAR
Expected CERs price	EUR/tCO_2e	8	

Table B-4 Main parameters used to calculate the financial indicator of the baseline scenario

Item	Unit	Value	Reference
Annual clinker production	Million ton	0.48	Project Application Report (PAR)
Annual limestone utilization	Million ton (dry)	0.57	CCA
Clinker sale price	RMB/t	132	PAR
Static total investment	Million RMB	100	CCA
Working capital	Million RMB	10	PAR
VAT	%	17	Common practice
Additional tax	%	7	Common practice
Income tax	%	33	PAR
Rate of residual value	%	4	PAR
Depreciation year			PAR
House	years	30	PAR
Equipment	years	10	PAR
Operational life	years	19	PAR
Annual O&M cost	Million (RMB)	46.54	CCA

2) Comparison of the NPV

In accordance with the requirement of ACM0015, if the NPV of the proposed project is lower than zero, the proposed project is not considered to be financially attractive and then, additional.

Table B-1 shows the project NPV with and without the income from sales of Certified Emission Reductions (CERs), and also the project NPV of the baseline scenario. Without the sales of CERs, the project NPV is -31.46 million which is lower than the financial benchmark. While the project NPV of baseline scenario as 18.75 million is higher than the financial benchmark. Thus the proposed project is not financially acceptable. Taking into account the CDM revenues, the project NPV is 68.59 million and higher than the financial benchmark. Therefore, the CDM revenues enable the project to overcome the investment barrier.

Also regarding the proposed project as a retrofit project, comparing to the baseline scenario, the NPV based on the difference of revenues, costs and investment is calculated to be -101.95 million, which obviously indicates the proposed project is not financially attractiveness comparing to the baseline scenario. The main parameters for calculating the incremental NPV is listed in Table B-5. Since the CCA, the resource of financial data of baseline scenario, only listed the investment and the O&M cost of the potential baseline scenario, other parameters are assumed to be the same between the proposed project and the baseline scenario, including operational lifetime, working capital, rate of residual value, depreciation method and discount rate.

Table B-5 Main parameters used to calculate the incremental NPV

Item	Unit	Value	Reference
Incremental investment	Million RMB	25.03	FSR and CCA
Incremental O&M cost (excluding revenue due to substitution)	Million RMB	7.04	FSR and CCA
Revenues due to substitution	Million RMB	3.05	FSR and CCA

Sub-step 2d. Sensitivity analysis

As the change of clinker price will equally impact both the proposed project and the baseline, this change will not be considered. Therefore, for the proposed project, the following 3 parameters were selected as sensitivity factors to analyse difference of the financial attractiveness between baseline scenario and the proposed project:

1) Revenues due to substitution
2) Incremental investment
3) Incremental O&M cost (excluding revenue due to substitution)

Table B-5 summarizes the results of the sensitivity analysis, showing the necessary variation of each parameter for reaching zero NPV under the benchmark discount rate as 11%:

Table B-4 Results of the sensitivity analysis

Parameter	Necessary variation of the parameter
Revenues due to substitution	584%
Incremental investment	-113%
Incremental O&M cost (excluding revenue due to substitution)	-208%

According to Table B-4 when the revenues due to substitution increases by 584%, the incremental investment decrease by 113% and the incremental O&M cost (excluding revenue due to substitution) decreases by 208%, the NPV based on the difference between the proposed project and the baseline scenario will then reach zero. However, these variations which are all beyond the ±100% range definitely do not reflect a realistic range of the parameters.

Outcomes of step 2:
Based on the investment analysis above, the proposed project is not financially attractive without the revenues generated from CER sales. Thus, alternative 3) of the proposed project is not feasible unless it is registered as a CDM project activity.

Step 4 Common practice analysis

Sub-step 4a. Analyze other activities similar to the proposed project activity
As the proposed project is the "first of its kind" – using CCR 100% substituting the limestone and clay in new dry processing clinker line, there is no similar project in the project region[6].

Sub-step 4b. Discuss any similar options that are occurring:
Since there is no similar project in Wuchang Region, the proposed project is not a common practice.

In conclusion, the proposed project activity is additional. Without the income from CER, the proposed project couldn't be selected. The project owner will construct a clinker plan using carbonated materials supplying similar service and produces. If the proposed project couldn't register as a CDM project, the GHG emission reduction mentioned in B.6 will not be realized.

[6] http://www.dcement.com/Article/200806/66326.html

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

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According to ACM0015, the following steps are used to calculate the GHG emission reduction comparing to the selected baseline scenario.

Step 1. Calculating Baseline Emissions, BE_y

$$BE_y = BE_{Calcin} + BE_{FC\_Calcin} + BE_{Dust} + BE_{FC\_Dry} + BE_{Elec\_Grid} + BE_{Elec\_SG} \quad (1)$$

Where:

BE_y = Baseline emissions for the year *y* (tCO_2).

BE_{Calcin} = Baseline CO_2 emissions from calcination of calcium carbonate and magnesium carbonate (tCO_2).

BE_{FC_Calcin} = Baseline CO_2 emissions factor for combustion of fuels in clinker production (tCO_2).

BE_{Dust} = Baseline CO_2 emissions factor due to discarded dust from bypass and dedusting units (CDK) system (tCO_2).

BE_{FC_Dry} = Baseline CO_2 emissions factor due to fuel consumption for drying of raw materials or fuel preparation (tCO_2).

BE_{Elec_Grid} = Baseline CO_2 emissions factor for the grid electricity consumption for clinker production (tCO_2).

BE_{Elec_SG} = Baseline CO_2 emissions for self-generated electricity used for clinker production (tCO_2).

a) Baseline CO_2 emissions from Calcination of carbonates (BE_{Calcin}):

For estimation of CO_2 emissions resulting from calcination, only the proportion of calcium oxides and magnesium oxides present in the produced clinker will be considered. Measured values of CaO and MgO contents, corrected for the non-carbonate sources (for example, deducting any calcium that comes from use of calcium silicates or fly ash used as raw materials) shall be used. CO_2 emissions from calcination with correction for non-carbonate sources shall be determined as follows:

$$BE_{Calcin} = \frac{CLNK_y}{CLNK_{BSL}} \cdot (0.785 \cdot (CaO_{CLNK,BSL} \cdot CLNK_{BSL} - CaO_{RM,BSL} \cdot RM_{BSL}) + 1.092 \cdot (MgO_{CLNK,BSL} - MgO_{RM,BSL} \cdot RM_{BSL})) \quad (2)$$

Where:

BE_{Calcin} = Baseline CO_2 emissions from calcination of calcium carbonate and magnesium carbonate (tCO_2).

0.785 = Stoichiometric emission factor for CaO (tCO2/tonnes of CaO).

1.092 = Stoichiometric emission factor for MgO (tCO2/tonnes of MgO).

$CaO_{RM,BSL}$ = Non-carbonated CaO content in the raw materials in the baseline (tonnes of CaO/tonnes of raw material). These non-carbonated sources must be different from the non-carbonated materials used in the project activity.

$CaO_{CLNK,BSL}$ = CaO content in the clinker produced in the baseline (tonnes of CaO/tonnes of clinker).

$MgO_{RM,BSL}$ = Non-carbonated MgO content in the raw materials in the baseline (tonnes of MgO/tonnes of raw material). These non-carbonated sources must be different from the non-carbonated materials used in the project activity.

$MgO_{CLNK,BSL}$ = MgO content in the clinker produced in the baseline (tonnes of MgO/tonnes of raw material).
RM_{BSL} = Annual consumption of raw materials in the baseline (tonnes).
$CLNK_{BSL}$ = Annual production of clinker in the baseline (tonnes).
$CLNK_y$ = Annual production of clinker in the year y (tonnes).

For greenfield projects, the calculation shall be based on sampling using one of the following approaches:

Option 1: Lab analysis based on the raw material sample obtained in the region in the baseline scenario
Under this Option, samples, to obtain the values taken from the clinker production line (which may be owned by the same owner) with the lowest CO_2 emission in the region. The clinker production line sampled should use the same raw materials (limestone and clay) that is commonly used in the region and as in the identified baseline scenario and produces the same type and quality of clinker as done by the project activity. "Region" is defined as the geographic area defined by a radius of 200 km around the project activity including at least the ten cement plants nearest to the plant of the project activity.

The historical information during the year previous to project implementation (previous to the proposed project implementation, at least twelve monthly measurements) shall be used if available. Alternatively, the ex post monitoring is carried out. The size and frequency of sampling for this lab analysis should be statistically significant with a maximum uncertainty range of 20% at a 95% confidence level. Possible impurities in the raw materials should be monitored and reported so as to guarantee that the difference in mass can be attributed to CO_2 emissions only, or corrected otherwise.

The analysis of the samples is as per established standards.

Option 2: Lab analysis based on the sample obtained through authorized information
The content is estimated as the average of value from clinker production lines whose performance are among the top 5 or the top 20% and which has been put into operation most recently in the defined region. The non-carbonate CaO and MgO for each clinker production line is based on sampling procedure as defined above. "Region" is defined as the geographic area defined by a radius of 200 km around the project activity including at least the ten cement plants nearest to the plant of the project activity. The properties of the clinker production lines are based on the recently published information provided by authorized or official documents.

The lab analysis shall be carried out by an independent authorized entity. It shall be ensured that the composition of the sample of raw materials taken for each clinker production line is the same as that identified in the baseline scenario. The size and frequency of sampling for each production line should be statistically significant with a maximum uncertainty range of 20% at a 95% confidence level. Possible impurities in the raw materials should be monitored and reported so as to guarantee that the difference in mass can be attributed to CO_2 emissions only, or corrected otherwise. The values are established before the project implementation and will not be changed during the crediting period.

Option 1 is adopted in this PDD and the historical information during the year previous to project implementation is used. According to ACM0015, as the proposed project is constructed on the boundary of Urumqi City and Changji Hui Autonomous Prefecture (Urumqi City is 153km long from south to north and 190 km broad from east to west; Changji Hui Autonomous Prefecture is 285 km long from south to north and 541 km broad from east to west) and there are 14 clinker plans within this area, the project

region is defined as Urumqi and Changji. Based on the statistical data in the region[7], the 2000t/d clinker line of Second Branch of East Xinjiang Division of Xinjiang Tianshan Cement Co.Ltd is selected as baseline because it is the one with highest performance and lowest emission in the region, therefore the historic information in 2007 of it shall be adopted in this PDD.

b) Baseline CO2 emissions from combustion of fuels in the kiln for calcination (BE_{FC_Calcin}):

In order to calculate the CO_2 emissions related to fuel consumption, the historical kiln energy consumption performance values shall be used.

$$BE_{FC\_Calcin} = SKF_{BSL} \frac{\sum (FC_{I,Calcin,y} \cdot NCV_i \cdot EF_{CO2,i})}{\sum (FC_{i,Calcin,y} \cdot NCV_i)} \cdot CLNK_y \qquad (3)$$

Where:
$\boldsymbol{BE_{FC\_Calcin}}$ = Baseline CO_2 emissions factor for combustion of fuels in clinker production (tCO_2)
$\boldsymbol{SKC_{BSL}}$ = Specific Kiln Calorific Consumption for the baseline scenario (GJ/tonnes of clinker)
$\boldsymbol{FC_{i,Calcin,y}}$ = Fuel type *i* consumed for calcination in clinker production during the year *y* (mass or volume units)
$\boldsymbol{EF_{CO2,i}}$ = CO_2 emission factor for fuel type *i* (tCO_2/GJ)
$\boldsymbol{CLNK_y}$ = Annual production of clinker in the year *y* (tonnes)
$\boldsymbol{NCV_i}$ = Net calorific value of the fuel type *i* (GJ/mass or volume units)

In order to ensure that emission reductions for fuel switching measures, if any, undertaken during the project activity are not claimed, the types of fuel used during project activity are used to estimate $\boldsymbol{BE_{FC\_Calcin}}$.

c) Baseline emissions due to discarded dust from bypass and dedusting units (CDK) system (BE_{Dust}):

If there is a discarded dust from the bypass and dedusting unit (CDK), the baseline emissions due to discarded dust shall be considered. But as new dry processing line doesn't have bypass system and will reuse all the dust collected by dedusting system, the baseline scenario will not produce any GHG emission through bypass and dedusting unit (CDK).

d) Baseline emissions from fuel consumption for drying of raw material or fuel preparation (BE_{FC_Dry}):

$$BE_{FC\_Dry} = \frac{\sum (FC_{Dry,i} \cdot NCV_i \cdot EF_{CO2,i})}{CLNK_{BSL}} \cdot CLNK_y \qquad (4)$$

Where:
$\boldsymbol{BE_{FC\_Dry}}$ = Baseline CO_2 emissions factor due to fuel consumption for drying of raw materials or fuel preparation (tCO_2).
$\boldsymbol{FC_{Dry,i}}$ = Fossil fuel 'i' consumed for drying raw materials or fuel preparation in the baseline (tonnes).
$\boldsymbol{EF_{CO2,i}}$ = CO_2 emission factor for fuel type *i* (tCO_2/GJ).
$\boldsymbol{NCV_i}$ = Net calorific value of the fuel type *i* (GJ/mass or volume units).
$\boldsymbol{CLNK_{BSL}}$ = Annual production of clinker in the baseline (tonnes).
$\boldsymbol{CLNK_y}$ = Annual production of clinker in the year y (tonnes).

[7] Evidence from the Xinjiang Building Materials Designing Institute (Class A)

e) Baseline emissions from grid electricity consumption for clinker production (BE_{Elec_Grid}):

$$BE_{Elec\_Grid} = \frac{(EC_{RM,Grid} + EC_{Feed,Grid} + EC_{KO,Grid}) \cdot EF_{CO2,Elec\_Grid}}{CLNK_{BSL}} \cdot CLNK_y \qquad (5)$$

Where:
BE_{Elec_Grid} = Baseline CO_2 emissions factor for the grid electricity consumption for clinker production (tCO_2).
$EC_{RM,Grid}$ = Baseline grid electricity consumption for raw materials grinding (MWh).
$EC_{Feed,Grid}$ = Baseline grid electricity consumption for fuel feeding (MWh).
$EC_{KO,Grid}$ = Baseline grid electricity consumption for kiln operation (MWh).
$EF_{CO2,Elec\_Grid}$ = CO_2 emission factor of the grid (t CO_2/MWh).
$CLNK_{BSL}$ = Annual production of clinker in the baseline (tonnes).
$CLNK_y$ = Annual production of clinker in the year y (tonnes).

As the baseline scenario is connected to Xinjiang Provincial Grid which is part of Northwest China Grid, the CO_2 emission factor of Northwest China Grid given by Chinese DNA[8] shall be used to calculate BE_{Elec_Grid}.

f) Baseline emissions from self-generation of electricity for clinker production (BE_{Elec_SG}):

Since the baseline scenario uses electricity from the grid, $BE_{Elec\_SG} = 0$.

Step 2. Calculating Project Emissions, PE_y

Similar to the baseline emissions, project activity emissions shall be expressed as CO_2 emission factor per ton of clinker produced, as follows:

$$PE_y = PE_{Calcin} + PE_{FC\_Calcin} + PE_{Dust} + PE_{FC\_Dry} + PE_{Elec\_Grid} + PE_{Elec\_SG} \qquad (6)$$

Where:
PE_y = Project emissions in the year *y* (tCO_2).
$PE_{Calcin,y}$ = Project CO_2 emissions from calcination of calcium carbonate and magnesium carbonate in the year *y* (tCO_2).
$PE_{FC\_Calcin,y}$ = Project CO_2 emissions factor for combustion of fuels in clinker production in the year *y* (tCO_2).
$PE_{Dust,y}$ = Project CO_2 emissions factor due to discarded dust from bypass and dedusting units (CDK) system in the year *y* (tCO_2).
$PE_{FC\_Dry,y}$ = Project CO_2 emissions factor due to fuel consumption for drying of raw material or fuel preparation in the year *y* (tCO_2).
$PE_{Elec\_Grid,y}$ = Project CO_2 emissions factor for the grid electricity consumption for clinker production in the year *y* (tCO_2).
$PE_{Elec\_SG,y}$ = Project CO_2 emissions for self-generated electricity used for clinker production in the year *y* (t CO_2).

a) Project emissions from Calcination of carbonates ($PE_{Calcin,y}$):

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[8] "*Notification on Determining Baseline Emission Factor of China's Grid*", Office of NCCCC, 2008-12-30

The proposed project uses CCR 100% substituting the traditionally used limestone,As CCR and Copper Residues are wastes from chemical procedure, no carbonated CaO or MgO could be stably included, and, according to the characteristic of Silica Sand, also no carbonated CaO and MgO would be in it. Therefore, conservatively, consider all the CaO and MgO in the Black Shale are carbonated and include them into Project Emission.

$$PE_{Calcin} = 0.785 \cdot (CaO_{CLNK,y} \cdot CLNK_y - CaO_{RM,y} \cdot RM_y) + 1.092 \cdot (MgO_{CLNK,y} - MgO_{RM,y} \cdot RM_y) \quad (7)$$

b) Project emissions from combustion of fuels in the kiln for calcination ($PE_{FC\_Calcin,y}$):

$$PE_{FC\_Calcin,y} = SKF_y \frac{\sum (FC_{i,Calcin,y} \cdot NCV_i \cdot EF_{CO2,i})}{\sum (FC_{i,Calcin,y} \cdot NCV_i)} \cdot CLNK_y \quad (8)$$

Where:

$PE_{FC\_Calcin,y}$ = Project CO_2 emissions factor for combustion of fuels in clinker production in the year *y* (tCO_2).

SKC_y = Specific Kiln Calorific Consumption for the year y (GJ/tonnes of clinker).

$FC_{i,Calcin,y}$ = Fuel type *i* consumed for calcination in clinker production during the year *y* (mass or volume units).

$EF_{CO2,i}$ = CO_2 emission factor for fuel type *i* (tCO_2/GJ).

$CLNK_y$ = Annual production of clinker in the year y (tonnes).

NCV_i = Net calorific value of the fuel type *i* (GJ/mass or volume units).

As this methodology is restricted to the use of new alternative material for clinker manufacturing and not to efficiency improvement measures that could take place at the same time as the project activity, therefore, compare the $SKC_{y,measured}$, SKC_{BSL} and SKC_{ex} in accordance with the procedure shown in Diagram 1.1 of ACM0015 to select the value used for calculation. The SKC_{ex} is calculated based on the ex-ante monitoring procedure described in Annex of ACM0015. The *SKC* value used in CER calculation will be updated based on the yearly monitoring data.

According to the 30-day ex-ante monitoring results, the *"%AMC*" $\%AMC_{ex}$ *optimal range"*, the *"*SKC_{ex} *optimal"* and the SKC_{ex} are monitored and calculated. See Annex 4 for details. In this PDD, in order to simplify the calculation, designed SKC[9] for the proposed project is used for calculating $PE_{FC\_Calcin,y}$. $PE_{FC\_Calcin,y}$ will be update during verification in accordance with the monitoring results.

c) Project emissions due to discarded dust from bypass and dedusting units (*CDK*) system ($PE_{Dust,y}$):

If there is a discarded dust from the bypass and dedusting unit (CDK), the baseline emissions due to discarded dust shall be considered. But as new dry processing line doesn't have bypass system and will reuse all the dust collected by dedusting system, the proposed project will not produce any GHG emission through bypass and dedusting unit (CDK).

d) Project emissions from fuel consumption for drying of raw material or fuel preparation ($PE_{FC\_Dry,y}$):

The proposed project uses surplus heat generated in rotary kiln and reciprocating grate cooler to dry raw

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[9] The Project Application Report of the proposed project

material and prepare fuel, therefore, the proposed project will not generate GHG emission by drying of raw material or fuel preparation.

e) Project emissions from grid electricity consumption for clinker production ($PE_{Elec\_Grid,y}$):

$$PE_{Elec\_Grid,y} = \left(EC_{RM,Grid,y} + EC_{Feed,Grid,y} + EC_{KO,Grid,y}\right) \cdot EF_{CO2,Elec\_Grid,y} \quad (9)$$

Where:
$\boldsymbol{PE_{Elec\_Grid,y}}$ = Project CO_2 emissions factor for the grid electricity consumption for clinker production in the year *y* (tCO_2).
$\boldsymbol{EC_{RM,Grid,y}}$ = Grid electricity consumption for raw materials grinding (MWh).
$\boldsymbol{EC_{Feed,Grid,y}}$ = Grid electricity consumption for fuel feeding (MWh).
$\boldsymbol{EC_{KO,Grid,y}}$ = Grid electricity consumption for kiln operation (MWh).
$\boldsymbol{EF_{CO2,\ Elec\_Grid,y}}$ = CO_2 emission factor of the grid (tCO_2/MWh).

As the proposed project is connected to Xinjiang Provincial Grid which is part of Northwest China Grid, the CO_2 emission factor of Northwest China Grid given by Chinese DNA shall be used to calculate $PE_{Elec\_Grid,y}$.

As this methodology is restricted to the use of new alternative raw materials only for clinker manufacturing and not for any reduction in electricity energy consumption for raw materials or kiln operations, the higher value between BE_{Elec_Grid} and the measured $PE_{Elec\_Grid,y}$ should be used in calculation and yearly updated. In this PDD, the historical baseline data and designed data of the proposed project were used to pre-evaluate $PE_{Elec\_Grid,y}$.

f) Project emissions from self-generation of electricity for clinker production ($PE_{Elec\_SG,y}$):

Since the proposed project uses electricity from the grid,. $PE_{Elec\_SG,y} = 0$.

Step 3. Calculating Leakage, LE_y

The following emission sources shall be considered as leakage under this methodology:

- Any incremental increase in transportation of clinker raw material (limestone, clay and iron ore), fuels (fossil fuels and alternative fuels) and new alternative materials (blast furnace slag, fly ash, waste ash from fuel combustion in thermal power plants, gypsum and others) from offsite locations to the project plant site. Any decrease in transport-related emissions for existing clinker raw materials and fuels change shall not be accounted;
- Emissions due to transport of alternative raw materials will be accounted as leakage;
- Emissions from grid electricity consumption for conveyor system for alternative materials;
- Electricity consumption in cement raw material grinding, preparation and feeding for blended cement manufacture, due to indirect effects of the change of clinker conditions in cement production (i.e., the clinker could be harder to grind; therefore, the cement grinding needs more electricity consumption in order to produce the same quality of common-practice blended cement);
- Changes in clinker proportion in cement manufacture due to the same effects of the potential changes in the physical and mineralogical condition of clinker, in common-practice blended cement production (i.e. the proponents could need more or less clinker in order to produce the same quality of

common-practice blended cement).

Another possible leakage is due to the diversion of alternative raw materials from existing uses. As the CCR generated in the project region is already 1.5 higher than the CCR required in the region, and, before the proposed project, the CCR in the region has not been used. Therefore, there is no leakage due to the diversion of CCR from existing uses.

The leakage from the project activity is expressed as

$$LE_y = LE_{trans,y} + LE_{Elec\_Conv,y} + LE_{ele\_cto,y} + LE_{Cto,y} \qquad (10)$$

Where:
LE_y = CO_2 emissions due to leakage during the year *y* (tCO_2).
$LE_{trans,y}$ = CO_2 leakage due to transportation of new materials during the year *y* (tCO_2).
$LE_{Elec\_Conv,y}$ = CO_2 emissions from electricity consumption for conveyor systems for alternative materials during the year *y* (tCO_2).
$LE_{ele\_cto,y}$ = CO_2 leakage due to additional electricity consumption in blended cements grinding during the year *y* (tCO_2).
$LE_{Cto,y}$ = CO_2 leakage due to lower clinker consumption in blended cements during the year *y* (tCO_2).

As the proposed project uses CCR totally substituting the limestone and the CCR will be conveyed to the project site by belt conveyor within sealed pipeline, comparing to the baseline scenario, the raw materials that need to be transported by vehicles are much lower in the proposed project than in the baseline scenario. Therefore, the emissions caused by vehicles are much lower for the proposed project. In addition, the electricity used by the conveyor system is included in the plant power consumption which would be measured and used to calculate the $PE_{Elec\_Grid,y}$. Based on conservative consideration, this part of difference is ignored.

As the proposed project will use one monitoring system to record the whole electricity consumed by the plane, the emission caused by the electricity used in conveyor system has already been included in $PE_{Elec\_Grid,y}$ and this is conservative.

As the components and each percentage of the clinker produced by the project are the same as the baseline scenario, there would be no change in electricity consumption and no change in percentage of clinker in cement blending line. In China, for clinker, a standard sample with certain percentage of components will be used for analyzing clinker type.[10] The clinker of the proposed project is the same as the baseline scenario because they use the same standard and the uncertainties of the different components are stipulated by the standard. Therefore, the leakage due to additional electricity consumption in blended cements grinding and higher clinker consumption in blended cements are zero.

Step 4. Calculating Emission Reductions, ER_y
Quantification of CO_2 emission reductions for year "y" following project implementation is calculated as follows:

$$ER_y = BE_y - PE_y - LE_y \qquad (11)$$

Where:

[10] http://www.gbw114.org/d_21337.htm

$\boldsymbol{ER_y}$ = Emission reductions in year "*y*" due to project activity (tCO_2).
$\boldsymbol{BE_y}$ = Baseline emissions of CO_2 in the project activity plant (tCO_2/tonnes of clinker).
$\boldsymbol{PE_y}$ = Emissions of CO_2 in the project activity plant in year "y" (tCO_2/tonnes of clinker).
$\boldsymbol{LE_y}$ = CO_2 emissions due to leakage (tCO_2).

The proposed project selects fixed crediting period for 10 years.

B.6.2. Data and parameters that are available at validation:

Data / Parameter:	$CaO_{CLNK,BSL}$
Data unit:	tonnes of CaO/tonnes of clinker
Description:	CaO content in the clinker produced in the baseline
Source of data used:	Historical recorded data
Value applied:	64.69%
Justification of the choice of data or description of measurement methods and procedures actually applied :	The 2000t/d new dry clinker line recorded data for year 2007
Any comment:	

Data / Parameter:	$CaO_{RM,BSL}$
Data unit:	tonnes of CaO/tonnes of raw material
Description:	Non-carbonated CaO content in the raw materials in the baseline (tonnes of CaO/tonnes of raw material).
Source of data used:	Calculated based on historical data
Value applied:	0.69%
Justification of the choice of data or description of measurement methods and procedures actually applied :	The 2000t/d new dry clinker line recorded data for year 2007
Any comment:	

Data / Parameter:	$CLNK_{BSL}$
Data unit:	tonnes
Description:	Annual production of clinker in the baseline
Source of data used:	Historical recorded data
Value applied:	601,309
Justification of the choice of data or description of measurement methods and procedures actually applied :	The 2000t/d new dry clinker line recorded data for year 2007

Any comment:	

Data / Parameter:	$EC_{RM,Grid}$
Data unit:	MWh
Description:	Baseline grid-connected electricity consumption due to raw materials grinding
Source of data used:	Historical recorded data
Value applied:	16,011.73
Justification of the choice of data or description of measurement methods and procedures actually applied :	The 2000t/d new dry clinker line recorded data for year 2007
Any comment:	Including the electricity consumption by related feed in system

Data / Parameter:	$EC_{KO,Grid}$
Data unit:	MWh
Description:	Baseline grid-connected electricity consumption due to kiln operation
Source of data used:	Historical recorded data
Value applied:	25,126.42
Justification of the choice of data or description of measurement methods and procedures actually applied :	The 2000t/d new dry clinker line recorded data for year 2007
Any comment:	Including the electricity consumption by related feed in system

Data / Parameter:	$EC_{CTO,BSL}$
Data unit:	MWh
Description:	Baseline grid-connected electricity consumption due to following cement blending process
Source of data used:	Historical recorded data
Value applied:	45.5 kWh/t cement
Justification of the choice of data or description of measurement methods and procedures actually applied :	The line recorded data for the cement blending process of 2000t/d new dry clinker
Any comment:	

Data / Parameter:	$MgO_{CLNK,BSL}$
Data unit:	tonnes of MgO/tonnes of raw material
Description:	MgO content in the clinker produced in the baseline
Source of data used:	Historical recorded data

Value applied:	2.24%
Justification of the choice of data or description of measurement methods and procedures actually applied :	The 2000t/d new dry clinker line recorded data for year 2007
Any comment:	

Data / Parameter:	$MgO_{RM,BSL}$
Data unit:	tonnes of MgO/tonnes of raw material
Description:	Non-carbonated MgO content in the raw materials in the baseline (tonnes of CaO/tonnes of raw material).
Source of data used:	Calculated based on historical data
Value applied:	0.42%
Justification of the choice of data or description of measurement methods and procedures actually applied :	The 2000t/d new dry clinker line recorded data for year 2007
Any comment:	

Data / Parameter:	RM_{BSL}
Data unit:	tonnes
Description:	Annual consumption of raw materials in the baseline.
Source of data used:	Historical recorded data
Value applied:	922,800
Justification of the choice of data or description of measurement methods and procedures actually applied :	The 2000t/d new dry clinker line recorded data for year 2007
Any comment:	

Data / Parameter:	SKC_{BSL}
Data unit:	GJ/tonnes
Description:	Specific Kiln Calorific Consumption for the baseline scenario
Source of data used:	Calculated based on historical data
Value applied:	3.695
Justification of the choice of data or description of measurement methods and procedures actually applied :	The 2000t/d new dry clinker line recorded data for year 2007. For conservative consideration, as the proposed project using surplus heat from kiln to dry materials, heat combusted for both kiln and pre-drying in baseline scenario is included in calculating SKC_{BSL}

Any comment:	

Data / Parameter:	$FC_{Dry,i}$
Data unit:	tonnes
Description:	Fossil fuel ‘i’ consumed for drying raw materials or fuel preparation in the baseline
Source of data used:	Historical recorded data
Value applied:	3,902.56
Justification of the choice of data or description of measurement methods and procedures actually applied :	The 2000t/d new dry clinker line recorded data for year 2007
Any comment:	

Data / Parameter:	$EF_{CO2,i}$
Data unit:	tC/GJ
Description:	CO_2 emission factor for the fossil fuel type *i*
Source of data used:	IPCC2006
Value applied:	25.8
Justification of the choice of data or description of measurement methods and procedures actually applied :	IPCC2006
Any comment:	

Data / Parameter:	NCV_i
Data unit:	GJ/t
Description:	Weighted average net calorific value for fuel type *i*
Source of data used:	National default values
Value applied:	29.27
Justification of the choice of data or description of measurement methods and procedures actually applied :	“*China Energy Statistical Yearbook 2008*”,
Any comment:	

Data / Parameter:	$EF_{CO2,Elec\_Grid,y}$ and $EF_{CO2,Elec\_Grid}$
Data unit:	tCO_2/MWh
Description:	Description: CO_2 emission factor of NWCG

Source of data used:	National default values
Value applied:	0.8712
Justification of the choice of data or description of measurement methods and procedures actually applied :	[1] "*Notification on Determining Baseline Emission Factor of China's Grid*", Office of NCCCC, 2008-12-30
Any comment:	

Data / Parameter:	SKC_{ex}
Data unit:	GJ/tonne clinker
Description:	Arithmetic mean of Specific Kiln Calorific Consumption during ex-ante monitoring.
Source of data used:	30-day monitoring data
Value applied:	4.392
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the 30-day monitoring data monitored according to Annex of ACM0015. in order to reach 95% confidence level, 12 days' records among the 30-day monitoring data are selected for calculation.
Any comment:	

Data / Parameter:	$\%AMC_{ex}$
Data unit:	%
Description:	Arithmetic mean of %AMC in the raw materials during ex-ante monitoring.
Source of data used:	30-day monitoring data
Value applied:	76.49
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the 30-day monitoring data monitored according to Annex of ACM0015. in order to reach 95% confidence level, 12 days' records among the 30-day monitoring data are selected for calculation.
Any comment:	

Data / Parameter:	$\%AMC_{ex}$ *optimal range*
Data unit:	% (interval)
Description:	Interval of 95% of confidence for AMC content in the raw materials during ex-ante monitoring.
Source of data used:	30-day monitoring data
Value applied:	74.36 ~78.62
Justification of the choice of data or description of	Calculated based on the 30-day monitoring data monitored according to Annex of ACM0015. in order to reach 95% confidence level, 12 days' records among the 30-day monitoring data are selected for calculation.

measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	*SKC_{ex} optimal range*
Data unit:	GJ/tonne clinker
Description:	Interval of 95% of confidence for specific kiln calorific consumption during ex-ante monitoring (GJ/tonne clinker).
Source of data used:	30-day monitoring data
Value applied:	4.34 ~ 4.44
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the 30-day monitoring data monitored according to Annex of ACM0015. in order to reach 95% confidence level, 12 days' records among the 30-day monitoring data are selected for calculation.
Any comment:	

Data / Parameter:	*Daily $CLNK_{ex}$*
Data unit:	Tonne of clinker produced/day
Description:	Daily clinker production in 30 days of continuous operation
Source of data used:	30-day monitoring data
Value applied:	See 30-day monitoring data for details
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the 30-day monitoring data monitored according to Annex of ACM0015. in order to reach 95% confidence level, 12 days' records among the 30-day monitoring data are selected for calculation.
Any comment:	

Data / Parameter:	*Daily SKC_{ex}*
Data unit:	GJ/tonne clinker produced/day
Description:	Daily Specific Kiln Calorific Consumption in each 30 day of ex-ante monitoring
Source of data used:	30-day monitoring data
Value applied:	See 30-day monitoring data for details
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the 30-day monitoring data monitored according to Annex of ACM0015. in order to reach 95% confidence level, 12 days' records among the 30-day monitoring data are selected for calculation.
Any comment:	

Data / Parameter:	*Daily $\%AMC_{ex}$*

Data unit:	%
Description:	Daily percentage of alternative material composition in clinker production due to the implementation of project activity in 30 days of continuous operation. The %AMC could be %SO_3 or %(SO_3 and CaF_2) or Lime Saturation Factor (LSF) or raw materials particle size (fineness)
Source of data used:	30-day monitoring data
Value applied:	See 30-day monitoring data for details
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the 30-day monitoring data monitored according to Annex of ACM0015. in order to reach 95% confidence level, 12 days' records among the 30-day monitoring data are sleeted for calculation.
Any comment:	

Data / Parameter:	*Daily* $EF_{ex,i}$
Data unit:	tonne fuel/day
Description:	Daily consumption of fuel type i 30 days of continuous operation
Source of data used:	30-day monitoring data
Value applied:	See 30-day monitoring data for details
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated based on the 30-day monitoring data monitored according to Annex of ACM0015. in order to reach 95% confidence level, 12 days' records among the 30-day monitoring data are selected for calculation.
Any comment:	.

B.6.3. Ex-ante calculation of emission reductions:

>>

Step1. Calculating Baseline Emissions, BE_y

a) Baseline CO_2 emissions from Calcination of carbonates (BE_{Calcin}):

$$BE_{Calcin} = \frac{CLNK_y}{CLNK_{BSL}} \cdot (0.785 \cdot (CaO_{CLNK,BSL} \cdot CLNK_{BSL} - CaO_{RM,BSL} \cdot RM_{BSL}) + 1.092 \cdot (MgO_{CLNK,BSL} - MgO_{RM,BSL} \cdot RM_{BSL})) = 248{,}073.8 tCO_2e$$

b) Baseline CO2 emissions from combustion of fuels in the kiln for calcination (BE_{FC_Calcin}):

$$BE_{FC\_Calcin} = SKF_{BSL} \frac{\sum (FC_{I,Calcin,y} \cdot NCV_i \cdot EF_{CO2,i})}{\sum (FC_{i,Calcin,y} \cdot NCV_i)} \cdot CLNK_y = 159{,}167.8 \text{ tCO}_2\text{e}$$

c) Baseline emissions due to discarded dust from bypass and dedusting units (CDK) system (BE_{Dust}):

The baseline is a new dry processing line which doesn't have bypass system and will reuse all the dust collected by dedusting system. Therefore, it will not produce any GHG emission through bypass and dedusting unit (CDK).

BE_{Dust} = 0 tCO_2e

d) Baseline emissions from fuel consumption for drying of raw material or fuel preparation (BE_{FC_Dry}):

$$BE_{FC\_Dry} = \frac{\sum (FC_{Dry,i} \cdot NCV_i \cdot EF_{CO2,i})}{CLNK_{BSL}} \cdot CLNK_y = 8{,}626.13 \text{ tCO}_2\text{e}$$

e) Baseline emissions from grid electricity consumption for clinker production (BE_{Elec_Grid}):

$$BE_{Elec\_Grid} = \frac{(EC_{RM,Grid} + EC_{Feed,Grid} + EC_{KO,Grid}) \cdot EF_{CO2,Elec\_Grid}}{CLNK_{BSL}} \cdot CLNK_y = 28{,}609.2 \text{ tCO}_2\text{e}$$

f) Baseline emissions from self-generation of electricity for clinker production (BE_{Elec_SG}):

The baseline scenario uses electricity totally from connected grid.

BE_{Elec_SG} = 0 tCO_2e

In conclusion:

$$BE_y = BE_{Calcin} + BE_{FC\_Calcin} + BE_{FC\_Dry} + BE_{Elec\_Grid} = 444{,}477 tCO_2e$$

Step 2. Calculating Project Emissions, PE_y

a) Project emissions from Calcination of carbonates ($PE_{Calcin,y}$):

As Copper Residues and CCR are wastes from chemical procedure, no carbonated CaO or MgO could be stably included, and, according to the characteristic of Silica Sand, also no carbonated CaO and MgO would be in it. Therefore, conservatively, consider all the CaO and MgO in the Black Shale are carbonated and include them into Project Emission.

$$PE_{Calcin} = 0.785 \cdot (CaO_{CLNK,y} \cdot CLNK_y - CaO_{RM,y} \cdot RM_y) + 1.092 \cdot (MgO_{CLNK,y} - MgO_{RM,y} \cdot RM_y) = 8{,}517.69 \text{ tCO}_2\text{e}$$

b) Project emissions from combustion of fuels in the kiln for calcination ($PE_{FC\_Calcin,y}$):

$$PE_{FC\_Calcin,y} = SKF_y \frac{\sum (FC_{i,Calcin,y} \cdot NCV_i \cdot EF_{CO2,i})}{\sum (FC_{i,Calcin,y} \cdot NCV_i)} \cdot CLNK_y$$

According to the project PAR and the historical recorded data of the baseline:

SCK_y = 3.595 GJ/t≤SCK_{BSL} = 3.695 GJ/t

Therefore, using the designed *SCK* as SCK_y to calculate $PE_{FC\_Calcin,y}$ as following:

$$PE_{FC,y} = \sum (FC_{i,y} \cdot EF_{CO2,i} \cdot NCV_i) = BE_{FC\_Calcin} + BE_{FC\_Dry} = 167{,}793.9 tCO_2e$$

c) Project emissions due to discarded dust from bypass and dedusting units (*CDK*) system ($PE_{Dust,y}$):

The proposed project is a new dry processing line which doesn't have bypass system and will reuse all the dust collected by dedusting system. Therefore, it will not produce any GHG emission through bypass and dedusting unit (CDK).

$\boldsymbol{PE_{Dust,y}}$ = 0 tCO_2e

d) Project emissions from fuel consumption for drying of raw material or fuel preparation ($PE_{FC\_Dry,y}$):

The proposed project uses surplus heat generated in rotary kiln and reciprocating grate cooler to dry raw material and prepare fuel, therefore, the proposed project will not generate GHG emission by drying of raw material or fuel preparation.

$\boldsymbol{PE_{FC\_Dry,y}}$ = 0 tCO_2e

e) Project emissions from grid electricity consumption for clinker production ($PE_{Elec\_Grid,y}$):

$$PE_{Elec\_Grid,y} = \left(EC_{RM,Grid,y} + EC_{Feed,Grid,y} + EC_{KO,Grid,y}\right) \cdot EF_{CO2,Elec\_Grid,y}$$

According to the PAR of the proposed project, the designed synthetic power consumption rate is 69 kWh/t (clinker) which is lower than the average value of 77.91 kWh/t (clinker) based on the one-year

recorded data for the baseline scenario. Therefore, according to ACM0015, the $PE_{Elec\_Grid,y}$ is calculated as following:

$$PE_{Elec\_Grid,y} = BE_{Elec\_Grid,y} = 28,609.2tCO_2e$$

f) Project emissions from self-generation of electricity for clinker production ($PE_{Elec\_SG,y}$):

The proposed project will use electricity totally from connected grid.

$$PE_{Elec\_SG,y} = 0 \text{ tCO}_2\text{e}$$

In conclusion:

$$PE_y = PE_{FC\_Calcin} + PE_{FC\_Dry} + PE_{Elec\_Grid} = 204,920.9\ tCO_2e$$

Step 3. Calculating Leakage, LE_y

The proposed project will use belt conveyor to transport CCR to the project site. This part of emissions caused by electricity consumption are included in the $PE_{Elec\_Grid,y}$.

Step 4. Calculating Emission Reductions, ER_y

$$ER_y = BE_y - PE_y - LE_y = 239,556.2 \text{ tCO}_2\text{e}$$

B.6.4 Summary of the ex-ante estimation of emission reductions:

>>

Year	Estimation of project activity emissions (tonnes of CO_2e)	Estimation of baseline emissions (tonnes of CO_2e)	Estimation of leakage (tonnes of CO_2e)	Estimation of overall emission reductions (tonnes of CO_2e)
2010 (Mar.-Dec.)	*170,768*	*370,398*	*0*	*199,630*
2011	*204,921*	*444,477*	*0*	*239,556*
2012	*204,921*	*444,477*	*0*	*239,556*
2013	*204,921*	*444,477*	*0*	*239,556*
2014	*204,921*	*444,477*	*0*	*239,556*
2015	*204,921*	*444,477*	*0*	*239,556*
2016	*204,921*	*444,477*	*0*	*239,556*
2017	*204,921*	*444,477*	*0*	*239,556*
2018	*204,921*	*444,477*	*0*	*239,556*
2019	*204,921*	*444,477*	*0*	*239,556*
2020 (Jan.- Feb.)	*34,153*	*74,079*	*0*	*39,926*
Total (tonnes of CO_2e)	*2,049,210*	*4,444,770*	*0*	*2,395,560*

B.7. Application of the monitoring methodology and description of the monitoring plan:

B.7.1 Data and parameters monitored:

Data / Parameter:	SKC_j
Data unit:	GJ/tonne clinker
Description:	Average of specific kiln calorific consumption following project activity prior to the year "y". Label "j" is a counter that runs from 1 to "y-1". If y = 1, SKC_j = SKC_{BSL}
Source of data to be used:	Calculated
Value of data applied for the purpose of calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	Calculated based on the recorded data
QA/QC procedures to be applied:	The DSC system and all the related metering equipments will be installed, operated, maintained and justified in accordance with the related national industry standards.
Any comment:	

Data / Parameter:	$CLNK_{,y}$
Data unit:	tonnes of clinker
Description:	clinker production in the year "*y*"
Source of data to be used:	Records of production
Value of data applied for the purpose of calculating expected emission reductions in section B.5	480,000t
Description of measurement methods and procedures to be applied:	Record the operation data of the clinker line.
QA/QC procedures to be applied:	The daily operation and maintenance follow the related industry standards. The relative monitoring equipments will be calibrated by a qualified party annually.
Any comment:	

Data / Parameter:	$RM_{Black\ Shale,\ y}$
Data unit:	tonnes of dry Black Shale
Description:	Annual consumption of dry Black Shale in year "*y*".
Source of data to be	Records of production

used:	
Value of data applied for the purpose of calculating expected emission reductions in section B.5	106,272t
Description of measurement methods and procedures to be applied:	Autonomous electric record of Conastant Feeder.
QA/QC procedures to be applied:	The daily operation and maintenance follow the related industry standards. The relative monitoring equipments will be calibrated by a qualified party annually.
Any comment:	

Data / Parameter:	$CaO_{Black\ Shale,,\ y}$
Data unit:	tonnes of CaO/tonnes of Black Shale
Description:	CaO content in the Black Shale in year "*y*".
Source of data to be used:	Records of production. The lab analysis data.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	1.06%
Description of measurement methods and procedures to be applied:	Analyzed and recorded by the project Laboratory.
QA/QC procedures to be applied:	The daily operation and maintenance follow the related industry standards. The relative monitoring equipments will be calibrated by a qualified party annually.
Any comment:	

Data / Parameter:	$MgO_{Black\ Shale,,\ y}$
Data unit:	tonnes of MgO/tonnes of Black Shale
Description:	MgO content in the Black Shale in year "*y*".
Source of data to be used:	Records of production. The lab analysis data.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.56%
Description of measurement methods and procedures to be applied:	Analyzed and recorded by the project Laboratory.
QA/QC procedures to	The daily operation and maintenance follow the related industry standards. The

be applied:	relative monitoring equipments will be calibrated by a qualified party annually.
Any comment:	

Data / Parameter:	$EC_{RM,Grid,y}$
Data unit:	MWh
Description:	Grid electricity consumption for preparing raw materials of the proposed project in year "*y*"
Source of data to be used:	Records of Operation
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Part of 69 kWh/t clinker as the designed electricity consumption data for the whole line
Description of measurement methods and procedures to be applied:	Measured by power meters and monthly recorded.
QA/QC procedures to be applied:	The power meters should be installed, operated, maintained and justified in accordance with the related national standards. The data will be cross-checked with electricity invoice.
Any comment:	.

Data / Parameter:	$EC_{Feed,Grid,y}$
Data unit:	MWh
Description:	Grid electricity consumption for feeding the materials of the proposed project in year "*y*"
Source of data to be used:	Records of Operation
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Part of 69 kWh/t clinker as the designed electricity consumption data for the whole line
Description of measurement methods and procedures to be applied:	Measured by power meters and monthly recorded.
QA/QC procedures to be applied:	The power meters should be installed, operated, maintained and justified in accordance with the related national standards. The data will be cross-checked with electricity invoice.
Any comment:	

Data / Parameter:	$EC_{KO,Grid,y}$
Data unit:	MWh
Description:	Grid electricity consumption for rotary kiln of the proposed project in year "*y*"
Source of data to be	Records of Operation

used:	
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Part of 69 kWh/t clinker as the designed electricity consumption data for the whole line
Description of measurement methods and procedures to be applied:	Measured by power meters and monthly recorded.
QA/QC procedures to be applied:	The power meters should be installed, operated, maintained and justified in accordance with the related national standards. The data will be cross-checked with electricity invoice.
Any comment:	

Data / Parameter:	$EC_{,CTO,y}$
Data unit:	MWh
Description:	Grid electricity consumption for the following cement blending in year "*y*"
Source of data to be used:	Records of Operation
Value of data applied for the purpose of calculating expected emission reductions in section B.5	45.5 kWh/t cement which is equal to the baseline.
Description of measurement methods and procedures to be applied:	Measured by power meters and monthly recorded.
QA/QC procedures to be applied:	The power meters should be installed, operated, maintained and justified in accordance with the related national standards. The data will be cross-checked with electricity invoice.
Any comment:	

Data / Parameter:	$FC_{i,Calcin,y}$
Data unit:	tonnes
Description:	Fuel type *i* consumed for calcination in clinker production during the year *y*
Source of data to be used:	Records of Operation
Value of data applied for the purpose of calculating expected emission reductions in section B.5	59,040 (standard coal)
Description of measurement methods	Monitored by coal weight system and automatically recorded periodically.

and procedures to be applied:	
QA/QC procedures to be applied:	All the related monitoring equipments will be installed, operated, maintained and justified in accordance with the related industry standards.
Any comment:	

Data / Parameter:	NCV_i
Data unit:	GJ/t
Description:	Weighted average net calorific value for fuel type *i*
Source of data used:	Monthly sampled and analysed
Value applied:	
QA/QC procedures to be applied:	The qualified analysis department will sample and analyse according to the related industry standards.
Any comment:	

Data / Parameter:	SKC_y
Data unit:	GJ/tonnes of clinker
Description:	Specific Kiln Calorific Consumption for the year y
Source of data to be used:	Select through comparative procedure as described in Diagram 1.1 of ACM0015
Value of data applied for the purpose of calculating expected emission reductions in section B.5	3.695 GJ/t clinck (baseline scenario)
Description of measurement methods and procedures to be applied:	Selected in accordance with the procedure as Diagram 1.1 of ACM0015
QA/QC procedures to be applied:	All the related metering equipments will be installed, operated, maintained and justified in accordance with the related industry standards..
Any comment:	

Data / Parameter:	$SKC_{y,measured}$
Data unit:	GJ/tonnes of clinker
Description:	Specific Kiln Calorific Consumption measured in the year "y"
Source of data to be used:	Records of Operation
Value of data applied for the purpose of calculating expected emission reductions in section B.5	3.595 GJ/t clinck
Description of measurement methods and procedures to be applied:	Monthly sampled and analysed

QA/QC procedures to be applied:	All the related monitoring equipments will be installed, operated, maintained and justified in accordance with the related industry standards
Any comment:	

B.7.2. Description of the monitoring plan:

>>

The monitoring plan is to ensure that all the emission reductions can be successfully monitored during the crediting period, and will mainly be implemented by the project owner. The ex-ante monitoring has been completed in accordance with Annex 1 of ACM0015. See Annex 4 for details. A more detailed Monitoring and Management Manual of the proposed project will be completed before the verification. The contents of the Monitoring and Management Manual are highlighted as follows:

1、 Monitoring organization

In order to obtain effective monitored data, the project owner will establish a CDM Monitoring Office and designate qualified staffs responsible for all relevant matters, including monitoring, data collection and archiving, QC/QA, and verification. The structure of the CDM Monitoring Office is outlined in Figure B–3.

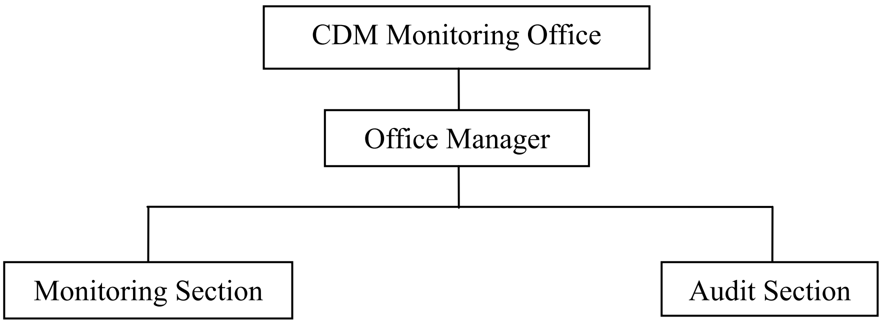

Figure B-3 Organization Chart of the CDM Project Management Office

The responsibilities of the sections are briefly described as following:

- Office Manager: Manage the work of CDM Monitoring Office; in charge of all relevant matters with the monitoring activity.
- Monitoring Section: Monitor, collect and archive the data according to the Monitoring and Management Manual.
- Audit Section: Audit the work of Monitoring Section and execute the QC/QA procedures according to the Monitoring and Management Manual.

2、 Monitoring data

The data is laid out in B.7.1. According to the ex-ante monitoring process, the *"$\%AMC_{ex}$ optimal range"* is 74.36% ~ 78.62%; the *"SKC_{ex} optimal"* is 4.34 ~ 4.44GJ/t and the SKC_{ex} is 4.392 GJ/t. See Annex 4 for details. SKC_y used for calculating the project emission when verification will be selected in accordance with Diagram 1.1 of ACM0015.

3、 Monitoring instruments and installation

The Computer Distributed Control System (DSC) will be used to monitor, control and manage the processing line. The parameters including temperature, pressure, flow rate, material level, components, power, current, voltage, and so on will be monitored by different equipments such as electric weighbridge,

solid flow meter and so on. All these data will use analog signal of 4~20 Ma and digital signal of 220 VAC to be recorded and controlled by DSC.

Each raw material will be added by fixed quantity feeder when mixing. The coal powder will be added into kiln head and kiln tail through two pfister balance. The produced clinker will be monitored by electronic balance.

All the monitoring equipments were selected and installed in accordance with the relevant national and industry regulations and standards and the accuracy is not less than 5%. For some main process, advanced foreign monitoring equipments are used.

The characteristic indicators, such as the components of raw materials and clinker, are monitored by project laboratory analysis. The project laboratory will be equipped and operated under *Fundamental Requirements of Laboratory of Cement Company*. In order to control the clinker quality, the generated clinker will be continually sampled and analyzed against standard clinker sample – GBW 03201a. Corresponding adjustment will be done alone the clinker line to ensure the stable quality.

4、 Data Collection

（1） All the data of energy consumption, proportion, feeding amount of every step are measured and recorded by DSC.

（2） The proportion of the raw materials and the clinker will be regularly analyzed by the project laboratory.

（3） The monitoring section will be responsible for collecting and recording the above data and calculate the related data.

（4） The supplier of raw material, buyer of clinker production, and Grid Corporation shall offer the material data and invoice.

（5） The project owner will provide all the data measured and calculated to the DOE.

If the reading of the measure meter is not precise, exceeds the allowed error range, or if the meter functions is abnormal, the data of the meters are confirmed as follows:

（6） Correct the abnormal meters by calculation based on material balance and energy balance.

（7） If the checking result is not acceptable, the project owner, the raw material suppliers and the clinker buyer should design a reasonably conservative method to estimate the reading together, and explain how it’s reasonable and conservative to the DOE during the Verification site visit.

（8） If still no agreement achieved, arbitration shall be held in order to ensure continue and conservative calculation.

5、 Calibration

The project owner has already got the qualification of ISO9000 and ISO14000. All the meters will be calibrated and checked in accordance with the national and industry regulations and standards. And the project laboratory will be also checked annually according to relevant standards and regulations.

6、 Data Management

The management of data records should be undertaken as follows: All data collected shall be kept both in soft copy and archived at the end of every month, and printed and saved as hard copy documents. All electricity sell/purchase invoices shall also be kept. Other hard copy documents, such as maps, forms, the EIA report, etc., should be used to support the monitoring plan to check the authenticity of data. In order to expediently obtain the relevant documentation and all project information for the Verification DOE, the project owner shall provide an index of relevant materials and monitoring reports. All hard copy data and information should be kept in the archives by the CDM group, and all documents should have one copy as back-up. All data should be saved for 2 years after the crediting period.

7、 Training

Training includes technical training and CDM training. The technical training focuses on principles and basics of thermal engines, maintenance and repair, power generation operation. CDM training includes an introduction to the CDM and its reporting requirements and procedures.

B.8. Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies):

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Date of completion of the application of the methodology to the project activity study: 20/02/2009

Contact information of person/entity in charge of application of the baseline methodology and the monitoring methodology to the project activity	**Is organisation a Project Participant *Yes/No***
Qisha Wen CAMCO International limited 14th floor, Lucky Tower A, No. 3 North Road, East 3rd Ring Road, Chaoyang District, Beijing 100027, China Tel: (86 10) 8448 3025/3049/1385/1623 Fax：(86 10) 8448 2499/2432 email: wen.qisha@camcoglobal.com.cn Website: www.camcoglobal.com	Yes

SECTION C. Duration of the project activity / crediting period

C.1. Duration of the project activity:

C.1.1. Starting date of the project activity:

>>

02/04/2007 (kiln contract)

C.1.2. Expected operational lifetime of the project activity:

>>

19 years

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

C.2.1. Renewable crediting period:

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

>>

C.2.1.2. Length of the first crediting period:

>>

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>

01/03/2010 or the date of registration whichever is later.

C.2.2.2. Length:

>>

10 years 0 month

SECTION D. Environmental impacts

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D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

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The Project Activity owner entrusted the Urumchi Institute of Environmental Protection Science and the Environmental Engineering R&D Centre of Petroleum University to develop an Environmental Impact Assessment (EIA) for the Project Activity in March 2007 in line with the requirements of the Chinese Government. The main conclusions are as follows:

Ambient air impact

Dust will be the main source of air pollution in the operational period. But the concentration of the pollutant in every test point will be consistent with the national standard. Besides, there are no sensitive points like residences within 500m of the project activity. The project owner will undertake a series of effective measures such as regular sprinkling water, covering with dustproof materials and closed transporting to control the dust pollution in the construction period to a minimal level.

Noise impact

The noise controlling measurements would be taken to limit the noise impact generated by the apparatus. The sound environment would reach the national standards. Moreover there is no noise sensitive object like residences within 1km of the project activity, so the noise impact of the project is very small.

Wastewater impact

Production wastewater and domestic wastewater will be the main wastewater produced in the project activity. The process water will be reused so the discharge of it will be only 1.85% of the total discharge. The domestic wastewater will be pretreated in septic tank then drained into wastewater station with production wastewater, finally drained into Miquan City wastewater plant for further treatment through drainage network. So the wastewater impact of the project is very small.

Solid waste impact

Solid waste will be only produced in the construction period, and will consist of construction solid waste and domestic solid waste. Reuse, collection, transportation outside and other measurements will be taken to control and manage the solid waste pollution. So the solid waste impact of the project is small.

Ecology impact

The impact of project on district economy could be neglected since the project is in an industrial district and the project owner will use landscape engineering to improve the environment of the plant district.

Therefore the project activity will have insignificant environmental impact.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

>>

According to the Environmental Impact Assessment (EIA), the project activity will not affect the environment significantly. The proposed project obtained the official approval (Xinhuanjianhan [2007] No.131) issued by the Environmental Protection Bureau of XinJiang Uighur Autonomous Region on 23rd April 2007, which is available for review.

SECTION E. Stakeholders' comments

>>

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

>>

In March 2007, in order to confirm that the proposed project complies with sustainable development requirements, the project owner carried out a stakeholder survey with the Urumchi Institute of Environmental Protection Science and the Environmental Engineering R&D Centre of Petroleum University, in the near area.

The stakeholders were informed through proclamations published on the Announcement Board and surveys. Questionnaires were used to survey and record the comments. The invited responders included local governors, local company staffs, workers and local residents.

A detailed introduction of the proposed project, the EIA and related protection measurements were introduced firstly, and then all the participants were invited to give their comments.

The main questions in the questionnaire are as following:

- What is the main environmental problem of the project activity itself?
- What environmental problems will the construction of project activity bring?
- Is the project owner able to figure out the environmental problem it self?
- Do you think the project will improve the local economy?
- Do you support the project?
- Is it a reasonable location for the project?

E.2. Summary of the comments received:

>>

50 questionnaires were distributed and received. Comments received from the survey are summarized as follows:

Table E-1 summary of the responders

No.	Item	Result
1	Number of valid questionnaire	50
2	Sex	Male: 52% and Female: 48%
3	Age	Below 30: 20%; 30 – 40: 58%; 41 – 50:16%; above 50: 6%
4	Education level	Above Bachelor degree: 38%; Diploma: 52%; high school: 10%; elementary school: 0%

Table E-1 Summary form of stakeholder opinion

1	What is the main environmental problem of the project activity itself?	Air pollution	Noise pollution	Water pollution	others
		96%	4%		
2	What environmental	Water	Air	Sound	Solid

	problem will the construction of project activity bring?	environment	environment	environment	waste
		2%	90%	8%	
3	Is the project owner able to figure out the environmental problem it self?	Completely yes	Basically yes	Can not	No idea
		66%	24%		
4	Do you think the project will improve the local economy?	yes	Yes. but a little	No	No idea
		94%			6%
5	Do you support the project?	yes	no		No idea
		82%			18%
6	Is it reasonable location for the project?	completely	basically	unreasonable	No idea
		22%	54%		14%

The outcome of the survey indicated that it is generally believed that the construction of the project will contribute to the local environment and to the development of the local economy. Stakeholders wish the project could be put into operation as soon as possible.

The main concern about the environment are impacts on air quality (90%) and noise pollution (8%). But 90% think the project owner can figure out the environmental problem by itself. More over, 94% think the project will improve the local economy and 82% show support for the project without anyone opposing it.

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

>>

The stakeholder's survey of the project activity was one part of the EIA which has already considered all the public's comments completely. The project owner will strictly follow the environmental protection measurements that were developed in the Environmental Impact Assessment, and cooperate with the supervising authority to complete the implementation of all measures to monitor emissions.

The measurements that would be carried out to avoid and minimize the influence raised as in E.2 are listed as following:

- ♦ The proposed project will install dedusting units at 36 dust points and then organize them to release the waste gas with a very little dust through 18 emission points. Dust Collectors with high efficiency will be used to reduce dust emissions, including Electrostatic Precipitator and Bag Filter.
- ♦ During construction, the project owner will try to avoid emissions through efficiently organizing work to reduce construction period, excavation volume and transportation. Also materials with low emissions will be used.
- ♦ The proposed project will select equipment with low noise levels and set up sound insulation covers and muffles to reduce the influence. The workers will be equipped with earplugs and ear covers to avoid the impact.
- ♦ During construction, the project owner will strictly control the working time, use instruments with low noise and protect workers with sound insulation equipments to avoid the influence.

Annex 1

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

There is no public funding for the proposed project.

Annex 3

BASELINE INFORMATION

Annex 4

MONITORING INFORMATION

Ex-ante determination of Specific Kiln Calorific Consumption

According to the PAR, the proposed project is the first of its kind in China to use CCR 100% substituting limestone and clay in producing clinker by new dry process. The line is designed by Xinjiang Building Materials Designing Institute. The designed SKC of the rotary kiln is about 3.595 GJ/t clinker.

Based on the 30-day ex-ante monitoring of the proposed project, the SKCex, "%AMCex optimal range" and "SKCex optimal range" are calculated as follows:

"%AMCex optimal range" is $\overline{\%AMC_{ex}} \pm 1.96 \frac{\sigma}{\sqrt{30}} = 74.36\% \sim 78.62\%$

"SKCex optimal range" is $\overline{SKC_{ex}} \pm 1.96 \frac{\sigma}{\sqrt{30}} = 4.342 GJ/t \sim 4.442 GJ/t$

$\overline{SKC_{ex}}$ is 4.392 GJ/t