VALIDATION REPORT

Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project in China

REPORT NO. 2009-9061

REVISION NO. 02

DET NORSKE VERITAS

VALIDATION REPORT

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CERTIFICATION AS

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Client: Camco International Limited	Client ref.: Wen Qisha

Project Name: Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project
Country: People's Republic of China
Methodology: ACM0015
Version: 1
GHG reducing Measure/Technology: Utilization of industrial waste CCR to replace the limestone in the production of cement clinker.
ER estimate: 239 556 tCO_2e/year
Size
☒ Large Scale
☐ Small Scale
Validation Phases:
☐ Desk Review
☐ Follow up interviews
☒ Resolution of outstanding issues
Validation Status
☐ Corrective Actions Requested
☐ Clarifications Requested
☒ Full Approval and submission for registration
☐ Rejected

In summary, it is DNV's opinion that the "Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project" in People's Republic of China, as described in the PDD of version 3 dated 12 April 2010, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0015. DNV thus requests the registration of the project as a CDM project activity.

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Report title:
Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project

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Key words:
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Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CCR	Calcium Carbide Residue: The major component of the CCR is $Ca(OH)_2$
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
EF	Emission Factor
EIA	Environmental Impact Assessment
EPB	Environmental Protection Bureau
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MP	Monitoring Plan
NCV	Net Calorific Value
NCV	Net Calorific Value
NDRC	National Development and Reform Committee
NGO	Non-governmental Organisation
NPV	Net Present Value
NWPG	Northwest China Power Grid
ODA	Official Development Assistance
OM	Operating Margin
PAR	Project Application Report
PDD	Project Design Document
RSL	Revenues due to the substitution of limestone and clay by non-carbonated calcium source
SCE	Standard coal equivalent
UNFCCC	United Nations Framework Convention on Climate Change

VALIDATION REPORT

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VALIDATION REPORT

1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the "Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project" in China. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host Party criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria.

The host Party is China and the Annex I Party is The United Kingdom of Great Britain and Northern Ireland. Both Parties fulfil the participation criteria and have approved the project and authorized the project participants. The DNA of China confirmed that the project assists in achieving sustainable development.

The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China.

The project correctly applies ACM0015, version 1: "Consolidated baseline and monitoring methodology for project activities using alternative raw materials that do not contain carbonates for clinker manufacturing in cement kilns".

By utilization of industrial waste calcium carbide residue (CCR) to replace limestone in the production of cement clinker, the project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 239 556 tCO_2e/year over the selected 10 year crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

The monitoring methodology ACM0015, version 1 has been correctly applied and the monitoring plan sufficiently provides for collection of data to determine the project's emission reductions.

Adequate training and monitoring procedures have been developed and will be implemented prior to start of the crediting period.

In summary, it is DNV's opinion that the "Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project" in China, as described in the PDD of version 3 dated 12 April 2010, meets all relevant UNFCCC requirements for the CDM and all relevant host Party criteria and correctly applies the baseline and monitoring methodology ACM0015, version 1. DNV thus requests the registration of the project as a CDM project activity.

2 INTRODUCTION

Camco International Limited has commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the "Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project" in China. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0015. The validation was based on the recommendations in the Validation and Verification Manual /8/.

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

3 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents

II follow-up interviews with project stakeholders

III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

3.1 Desk Review of the Project Design Documentation

The following table lists the documentation that was assessed during the validation:

/1/ Camco International Limited, PDD of Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project, version 1 dated 20 February 2009, version 2 dated 6 July 2009 and version 3 dated 12 April 2010.

/2/ Letter of approval, DNA of the Republic of China in October 2008.

/3/ Letter of approval, DNA of United Kingdom of Great Britain and Northern Ireland both for Camco International Limited and Camco Carbon Limited on 16 July 2009.

/4/ Xinjiang Building Materials Designing Institute: PAR (Project Application Report) completed in 13 February 2007 and PAR approved by Economic and Trade Commission of Xinjiang Uygur Autonomous Region on 27 April 2007.

/5/ Urumchi Institute of Environmental Protection Science and the Environmental Engineering R&D Centre of Petroleum University: EIA in March 2007 and its Approval letter to EIA by Environmental Protection Bureau of XinJiang Uighur Autonomous Region on 23 April 2007.

/6/ Xinjiang Building Materials Designing Institute: IRR spreadsheet 13 February 2007.

/7/ Xinjiang Building Materials Designing Institute: Financial comparison for the Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project and the same size clinker production line using lime as raw materials dated 13 February 2007.

/8/ EB 44 Report Annex 3: Validation and Verification Manual, version 1 http://cdm.unfccc.int/EB/044/eb44_repan03.pdf

/9/ ACM0015 Version 1, Consolidated baseline methodology for project activities using alternative raw materials that do not contain carbonates for clinker manufacturing in cement kilns.

/10/ CDM Executive Board, Tool for the demonstration and assessment of additionality, Version 05.2.

/11/ CDM Executive Board, Tool to calculate the emission factor for an electricity system (Version 01.1)

/12/ NDRC and the National Construction Committee, 2006, *Economic Evaluation Code and Parameter for Construction Project, Version 03*

/13/ CDM Executive Board: Guidance for request for deviation titled "Application of AM0005 and AMS-I.D in China" (http://cdm.unfccc.int/Projects/Deviations).

/14/ Chinese DNA's guidance for the determination of grid boundaries and emission factors dated 30 December 2008.
http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/2008/200887164119674.pdf
OM:http://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1888.pdf
BM:ttp://cdm.ccchina.gov.cn/WebSite/CDM/UpFile/File1875.pdf

/15/ China Electric Power Yearbook 2003-2007

/16/ China Energy Statistical Yearbooks 2005, 2006 and 2007

/17/ Board directors' decision of Xinjiang Tianshan Cement Co. Ltd.: CDM projects promotion plan Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project for dated 8 September 2006.

/18/ CDM consultant Agreement and ERPA between Xinjiang Tianshan Cement Co. Ltd. and Camco International Limited dated 26 January 2007.

/19/ Xinjiang Tianshan Cement Co. Ltd. and Sichuan mining Machine Co. Ltd.: Main equipment purchase contract dated 2 April 2007

/20/ TÜV SÜD Industrie Service GmbH: Pre-Validation of Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project dated 4 April 2007

/21/ Xinjiang Midong Tianshan Cement Co., Ltd, a company setting up by Zhongtai Chemical Limited and Xinjiang Tianshan Cement Co. Ltd. dated 24 April 20007

/22/ Construction start of Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project dated 22 May 2007

/23/ Xinjiang Midong Tianshan Cement Co., Ltd: The project commissioned on 28 May 2008

/24/ Xinjiang Midong Tianshan Cement Co., Ltd: The project put into operation on 28 August 2008

/25/ Xinjiang Building Materials Designing Institute: clarification of all 14 cement production plants (including the highest performance pre_calcining 2000 t/day cement production line of Xinjiang Tianshan Cement Co. Ltd.) completely using $CaCO_3$ as CaO sources in Xin Jiang Wuchang area, dated 12 March 2008.

/26/ 15 new dry technique cement lines in Xinjiang:
http://www.jingtaihe.com/show1.asp?id=775

/27/ Summary and answered questionnaire from a public meeting of stakeholders by Urumchi Institute of Environmental Protection Science and the Environmental Engineering R&D Centre of Petroleum University in March 2007.

/28/ Business license for Xinjiang Midong Tianshan Cement Co., Ltd whose stakeholder are Zhongtai Chemical Limited and Xinjiang Tunhe Cement Co. Ltd, setting up date of April 2007.

/29/ Zhongtai Chemical Limited: The document concerning 0.65 million tonnes CCR

capacity solely used for Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project dated March 2009

/30/ China Construction Materials Industry Society: Clinker of Portland cement JC/T 853-1999

/31/ China Construction Materials Industry Society: Certificate for 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd as the qualified laboratory validaty from 31 December 2004 to 30 December 2009

/32/ Cement Chemical Analysis Method: GB/T 176-1996

/33/ 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd: procedures for sampling and grinding of samples for raw mix, clinker and coal in 2007.

/34/ 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd: Repeatability and reproducibility test statistics for the period of 2007.

/35/ China Construction and Material Science and Research Institute: Reference Material for Component Analysis of Portland Cement and its clinker.

/36/ 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd: Chemical Analysis record for 2007.

/37/ 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd: Calibration certificate for balance No.35120094 (according to JJG-1990) for the period of 30 March 2007 and 1 April 2008.

/38/ 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd: Monthly production statistics log sheet of year 2007 from operation department.

/39/ Xinjiang Midong Tianshan Cement Co., Ltd: Monitoring manual in 2008

/40/ Training plan of Xinjiang Midong Tianshan Cement Co., Ltd dated May 2008

/41/ Xinjiang Midong Tianshan Cement Co., Ltd: Details for contract list of the proposed project up to 2007.

/42/ Mr. Wang Wei ,Summary of recent cement technologies and their future development in China

http://www.sinoicc.com/wangjie/ShowArticle.asp?ArticleID=25&Page=1

Main changes between the version of the PDD published for the 30 days stakeholder commenting period and the final version of the PDD submitted for registration:

- Changes related the EB39/41 Guidelines on financial analysis, project starting date and CDM consideration.
- New VVM of EB 44 Report Annex
- Financial comparison between proposed project and the same size capacity clinker production line with lime as the raw materials /7/
- Changes related to completeness check by EB secretariat.

3.2 Follow-up Interviews with Project Stakeholders

A site visit at Xinjiang Midong Tianshan Cement Co., Ltd was conducted by Zhang Xiaojun on 30 March-1 April 2009. During the site visit, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review.

	Date	Name	Organization	Topic
/43/	30 March -1 April 2009	Wen Qisha Wang Liqiang	Camco International Limited	➢ Applicability of selected methodology ACM0015 ➢ Baseline determination of the project ➢ Issues related to the additionality ➢ Common practice analysis ➢ Emission reductions calculation ➢ Emission reduction monitoring plan and project management
/44/	30 March -1 April 2009	Zhao Wen Xin Cao Changfu Zhang Fuqiang Li Yonghui (project laboratory) Yuan Hui (laboratory of baseline plant) Yin Juan(laboratory of baseline plant) Zhao Xianzhi(operation department of baseline plant)	Xinjiang Midong Tianshan Cement Co., Ltd 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd	➢ Information of project construction ➢ The development of CCR utilization projects in China ➢ Starting date of project and crediting period ➢ The approval status (incl. EIA approval, the feasibility study report approval, CDM project approval) ➢ Technology utilized ➢ Historical Production and Quality Control /Quality Assurance ➢ Risks and barriers for investment and technology ➢ Training and detailed procedures and records. ➢ Emission reduction monitoring plan and implementation ➢ Consulting process for stakeholders' comments

3.3 Resolution of Outstanding Issues

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables. The different columns in these tables are described in the figure below. The completed validation protocol for the Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) are issued, where:

(a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;

(b) The CDM requirements have not been met;

(c) There is a risk that emission reductions cannot be monitored or calculated.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities		
Requirement	***Reference***	***Conclusion***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (OK), a Corrective Action Request (CAR) of risk or non-compliance with stated requirements or a request for Clarification (CL) where further clarifications are needed.*

Validation Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 2 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the large-scale PDD template, version 03 - in effect as of: 28 July 2006. Each section is then further sub-divided.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a c**orrective action request (CAR)** due to non-compliance with the checklist question (See below). A request for clarification (CL) is used when the validation team has identified a need for further clarification.*

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

Figure 1 Validation protocol tables

3.4 Internal Quality Control

The validation report underwent a technical review performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3.5 Validation Team

Role/Qualification	*Last Name*	*First Name*	*Country*	*Type of involvement*

				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
Project Manager/ CDM validator/ technical team leader	Zhang	Xiaojun, Johnsen	China	√	√	√			
Sector expert	Godinez	Gloria	Mexico	√					√
Technical Reviewer (Applicant) (Draft Report)	Biswas	Soumik	India					√	
Technical Reviewer (Draft Report)	Chandrashekara	Kumaraswamy	India					√	
Technical Review (Final Report)	Biswas	Soumik	India					√	

The qualification of each individual validation team member is detailed in Appendix B to this report.

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.
The final validation findings relate to the project design as documented and described in the revised and resubmitted project design documentation of version 3 dated 12 April 2010 /1/.

4.1 Participation Requirements

The project participants are Xinjiang Midong Tianshan Cement Co., Ltd of China, Camco International Limited of the United Kingdom of Great Britain and Northern Ireland. The host Party China and the participating Annex I Party United Kingdom of Great Britain and Northern Ireland meet the requirements to participate in the CDM.

The letter of approval (LoA) /2/ from the DNA of China, authorizing Xinjiang Midong Tianshan Cement Co., Ltd as project participant, was issued in October 2008 and confirms that the project assists China in achieving sustainable development.

The letter of approval (LoA) /3/ from the DNA of the United Kingdom of Great Britain and Northern Ireland, authorizing Camco International Limited as project participant, was issued on 16 July 2009.

The letter of approval (LoA) /3/ from the DNA of the United Kingdom of Great Britain and Northern Ireland, authorizing Camco Carbon Limited as project participant, was issued on 16 July 2009.

The project does not involve public funding, and the validation did not reveal any information /28/ that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China.

4.2 Project Design

The proposed project is located in the Zhongtai Chemical Industrial Park, Urumqi City, Xinjiang Uygur Autonomous Region. The proposed project's exact geographical coordinates are east longitude 43°26´30" and north latitude 87°48´12".

The project operates newly built dry pre-calcinations cement clinker production line with a capacity of 1600 t/d of clinker (clinker capacity 0.48 million t/a) to produce low-emission clinker through applying 100% calcium carbide residue (CCR) to substitute traditional raw mix (limestone and clay). The CCR consumption by the proposed project matches the CCR, a waste material (0.43 million t CCR/a) from adjacent existing PVC plant owned by Zhongtai Chemical Limited. Since the Wuchang Region has a radius of more than 200 kms and 14 cement plants, the area is in line with the methodology ACM0015 by selecting a region. Prior to the implementation of the project, the CCR was disposed to a landfill as an industrial waste.

CCR (mainly $Ca(OH)_2$) is a non-carbonated calcium source in the raw mix for clinker processing and no decarbonisation reaction occurs, thus resulting in reduction of greenhouse gas emissions. In contrast, conventional clinker production using limestone ($CaCO_3$/ $MgCO_3$)

as the raw material will lead to the emission of a large amount of CO_2 during the decarbonisation reaction.

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 average GHG emission reduction of 239 556 tCO_2e/year over the 10 year crediting period. The baseline scenario is therefore to produce the same type and amount of clinker using limestone and clay as the only source of CaO and MgO.

The project activity start date has been verified by DNV corresponding to main equipment purchase contract between Xinjiang Tianshan Cement Co. Ltd. and Sichuan Mining Machine Co. Ltd. dated 2 April 2007 /19/ as project participant committed to expenditures to equipment purchase for the proposed project activity on this date.

The expected operational lifetime of the project activity is 19 years /5/. A fixed crediting period of 10 years has been chosen for the project, starting on 1 March 2010. The emission reductions are estimated to be on average 239 556 tCO_2e/year and 2 395 560 tCO_2e over fixed crediting period of 10 years.

4.3 Baseline Determination

The project applies the approved consolidated baseline methodology ACM0015 Version 1 "*Consolidated baseline methodology for project activities using alternative raw materials that do not contain carbonates for clinker manufacturing in cement kilns*" /9/ in combination with the Version 5.2 *of "Tool for the Demonstration and Assessment of Additionality"*/10/. The grid emission factor is determined in accordance with Version 1.1 of "*Tool for calculation of emission factor for electricity systems*"/11/.

DNV was able to verify that the project meets all applicability criteria of the baseline methodologies and the applicability of this methodology is justified since:

Approved methodology ACM0015 applicability criteria	Status of 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 type and quality of the produced clinker remain the same in both in baseline and project scenario according to Clinker of Portland cement JC/T 853-1999 /30/.	Applicable
Alternative raw materials have never been used in the clinker manufacturing facility prior to the implementation of the project activity	It was verified during the site visit on 30 March-1 April 2009 that the CCR sourced from Zhongtai Chemical Limited have not been used before /28/. 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 CCR generated in Wuchang Region has not been used before /4/. All of it was disposed and buried /28/. The CCR generated by Zhongtai Chemical Limited in Wuchang Region is already higher than the 1.5 of the proposed project's demand /26/.	Applicable

the project as well as other users of the alternative raw materials.		
There is sufficient historical information about the clinker manufacturing facility, the raw materials used, and energy performance of the kiln	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.	

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

To provide outputs or services of the same type and quality clinker comparable to the proposed project activity in the region using similar input/raw materials, and facing similar economic, market and technical circumstances, three realistic and credible alternatives are:

Scenario 1: Construction of a cement plant providing the same product and services using carbonated sources, in case of Greenfield project, a scenario where the company uses raw materials from carbonated sources;

Scenario 2: Construction of a cement plant providing the same product and services using non-carbonated sources substituting part of the carbonated sources.

Scenario 3: The proposed project itself, but undertaken without being registered as a CDM project activity.

All those three alternatives are 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

Substitution of conventional lime and clay by CCR is an innovative technology and the proposed project is the first application of this technology /25/ in the region defined by ACM0015.

Scenario 2) and 3), face the same barriers as one is technological barriers due to lack of skilled engineers and operators as this is the first line commencing in Xinjiang Uygur Autonomous Region and this insufficient training led to instable production. The financial barrier for the proposed project has been alleviated as the loan intention came only after another investor, Xinjiang Huatai Heavy Chemical Co., Ltd, the owner of Zhongtai Chemical Limited, having the intent for cooperation with the project owner /21/. And this conclusion is further substantiated by the financial analysis in 4.4 of this report.

Therefore, the only feasible alternative is the scenario 1) “the scenario where the company uses raw materials from carbonated sources.

The project being a Greenfield activity, the 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd has been used as a proxy for the baseline scenario since as required by the methodology, this plant has the “lowest CO_2 emission in the region”, namely the Wuchang Region which has a radius of 200 km around the project activity and includes 14 cement

plants. DNV was able to verify that the selection of the Wuchang region is in line with the methodology /25/ /4/.

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 NWPG including Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang Provincial Grid is defined as grid system according to the "Tool to calculate the emission factor for an electricity system" /11/ and "Notification on Determining Baseline Emission Factor of China's Grid" /14/.
For the coal consumption, electricity consumption, LHV of coal and specific kiln calorific consumption of 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd, it is obtained from monthly production statistics log sheet of year 2007 from operation department /38/.

The selected sources and gases are justified for the project activity. Emission sources and gases included in the project boundary are:

	Source	GHGs involved	Description
Baseline emissions	Calcinations of raw materials in the kiln	CO_2	Main emissions direct emitted from clinker kiln
	Use of fuels in the kiln, including main burner and precalcinator (coal)	CO_2	Main emissions direct emitted from clinker kiln.
	Use of fuel for the preparation of raw materials and fuels (e.g. drying of materials or fuels using external dryers)	CO_2	Consumption of fuel during fuel preparation, other parts use surplus heat.
	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	Grid connected electricity used by feeding system and preparation of materials.
Project emissions	Calcination of raw materials	CO_2	Main emissions direct emitted from clinker kiln.
	Use of fuels in the kiln, including main burner and precalcinator (fossil, alternative fossil and non-fossil)	CO_2	Main emissions direct emitted from clinker kiln.
	Use of fuel for the preparation of alternative raw materials and fuels (e.g. drying of materials or fuels using external dryers)	CO_2	Surplus heat is used in preparation of raw materials and fuel. Therefore, actually no emissions in this part.
	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	Grid connected electricity used by feeding system and preparation of materials, including transportation of CCR.

4.4 Additionality

The additionality of the project has been established using the "*Tool for the demonstration and assessment of additionality*" version 5.2 /10/ approved by the CDM-EB.

4.4.1 CDM consideration and continued action to secure CDM status

The project activity start date has been verified by DNV corresponding to main equipment purchase contract between Xinjiang Tianshan Cement Co. Ltd. and Sichuan mining Machine Co. Ltd. dated 2 April 2007 /19/ as project participant committed to expenditures related to purchase and it is the earliest date at which either the implementation or construction or real action of a programme activity begins. The construction start of Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project is 22 May 2007 which is later than above defined project activity start date/22/.

As the date of publication of the PDD for global stakeholder consultation was on 24 February 2009 was later than the start date of this project activity, DNV has assessed and verified the evidence for serious CDM consideration as a decisive factor in the decision to proceed with project activity as follows:

Time Sequence	Key Word	Refer.	Performing Entities
8 September 2006	Board Minutes	/17/	Xinjiang Midong Tianshan Cement Co., Ltd
26 January 2007	CDM Agreement	/18/	Project owner and Camco International Limited
27 April 2007	Project Application Report (PAR) approval and project is no viable without CDM revenues	/4/	Economic and Trade Commission of Xinjiang Uygur Autonomous Region
2 April 2007	Project activity Start Date	/19/	Tianshan Cement Co. Ltd. and Sichuan mining Machine Co. Ltd.

Project owner took continuing and real actions to secure CDM status for the proposed project in the parallel with its implementation demonstrated as:

Time Sequence	Key Word	Refer.	Performing Entities
4 April 2007	Pre-Validation using AM0033 Ver.01.	/20/	TÜV SÜD Industrie Service GmbH
9 August 2007	AM0033 updating to Ver. 2		EB
30 November 2007	Substitution AM0033 with ACM0015		EB
12 June 2008	Resubmission to get LoA		Camco International Limited
October 2008	LoA issuance	/2/	Chinese NDRC

DNV is thus of the opinion that CDM benefits were seriously considered in the decision to proceed with the project activity, and real and continuous actions were undertaken to secure CDM status in parallel with the implementation of the project in compliance with EB41 annex 46.

4.4.2 Identification of alternatives to the project activity

To provide the same type and quality clinker, three alternative baseline scenarios to the project have been identified and discussed.
These are:

Scenario 1: Construction of a cement plant providing the same product and services using carbonated sources, in case of Greenfield project, a scenario where the company uses raw materials from carbonated sources;
Scenario 2: Construction of a cement plant providing the same product and services using non-carbonated sources substituting part of the carbonated sources.
Scenario 3: The proposed project itself, but undertaken without being registered as a CDM project activity.

DNV considers the list of realistic and credible alternatives to be complete.

Scenario 2) and 3), face the same barriers as one is technological barriers due to lack of skilled engineers and operators, substantiated by instable production due to no qualified staff to operate the CCR cement production line, for this is the first line commencing in Xinjiang Uygur Autonomous Region; The financial barrier for the proposed project has been alleviated as the loan intention came only after the another investor, Xinjiang Huatai Heavy Chemical Co., Ltd, the owner of Zhongtai Chemical Limited, having the intent to invest as participant together with the project owner /21/. This conclusion is further substantiated by the financial analysis in 4.4 of this report.

As for alternative 1) and alternative 2); the financial comparison analysis was performed by Xinjiang Building Materials Designing Institute /7/ to calculate the financial costs (e.g. capital and variable costs) and account cost savings due to net energy gains, if any, from project activity.

The result of the comparison /7/ was that the NPV of alternative 1) is 24.32 million RMB, higher than that of that of alternative 2), which means that the alternative 1) is the baseline of the proposed project.

Based on the above discussion, DNV would like to indicate that the baseline scenario is the scenario 1) “the scenario where the company uses raw materials from carbonated sources, i.e. 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd /25/”.

4.4.3 Investment analysis: Choice of approach

The simple cost analysis (option I) is not applicable to the proposed project because the proposed project generates economic benefits other than the income from CERs through the sale of clinker as well as saving due to displacing limestone and savings due to lesser energy usage in the project scenario compared to the baseline scenario. Therefore, an investment comparison analysis (Option II) has been selected to identify whether the financial indicators, i.e. the net present value (NPV) of the proposed project, less attractive than that of the same capacity clinker production line using lime as raw material.

4.4.4 Investment analysis: Selection of Discount Rate for NPV Calculation

The financial result of the proposed project has been compared against the benchmark of NPV of zero at a discount rate of 11% (before tax). DNV was able to verify that according to the “*Project economic assessment and key parameters (version 3)*”, for projects involving investment in the cement sector in China, the proposed project will be financially acceptable when the NPV is positive at a discount rate of 11% /12/ and this 11 % (before tax) is the benchmark IRR typically applied by the cement industry in China. This benchmark is still valid and the most recent one.

4.4.5 Investment analysis: Input parameters

DNV compared the input parameters for the financial analysis included in the PDD with the parameters stated in the Project Application Report (PAR) and was able to confirm that the values applied are consistent with the value stated in the PAR. The NPV calculations have been verified by DNV and DNV has assessed the input parameters.

DNV compared and cross-checked the parameters used in the project-IRR spreadsheet and was able to confirm that the parameters used in the financial analysis were consistent with those listed in Table 3 *"Main parameters used to calculate the financial indicator of the project activity"* of the PDD, version 3 dated 12 April 2010. DNV was able to verify that these key input values are derived from the approved PAR.

Parameter	Unit		Data value	DNV checked/Source of date used
Capital cost	Million RMB	Proposed project	125	Line 6 from the bottom at page 84 section 17.3 of investment from PAR
		Baseline project	*100*	*Xinjiang Building Materials Designing Institute: Financial comparison /7/*
Annual O&M cost	Million RMB /year	Proposed project	50.538	Table : investment cash flow in table 1 of PAR
Price of limestone	RMB */t*	*Baseline project*	*20*	*Xinjiang Building Materials Designing Institute: Financial comparison /7/*
Price of carbide slag	RMB /t	Proposed project	12.601	*Xinjiang Building Materials Designing Institute: Financial comparison* /7/
Revenues due to the substitution of limestone by carbide slag	Million RMB /year	Proposed project	0.5	*Xinjiang Building Materials Designing Institute: Financial comparison* /7/
Cost saving due to net energy gains	Million RMB /year	Proposed project	0	/4/

DNV assessed the breakdown of the key input values, such as the investment requirements for raw material switching, the cost of CCR applied, and the cost savings in energy consumption due to the project activity. The validation of these key financial input values mainly focus on its validity and applicability at the time of the investment decision. DNV has verified all the input values used for the NPV calculations. It has been confirmed that the input values have been sourced from the Project Application Report (PAR) /4/. The financial calculations and assumptions have been assessed as:

1. Total static investment

Baseline project activity:

It was verified that the investment for a same size clinker production line using lime as raw materials is 100 million RMB, according to Xinjiang Building Materials Designing Institute /7/, a third party who has the competence to evaluate the feasibility report (including investment, etc.). And also validator checked the average unit investment for clinker production lines of the similar technologies; it was confirmed that, for new dry clinker

production process, the unit investment per tonne is indicated to be around 200 RMB/tonne to 220 RMB/tonne /42/. In terms of the production capacity (480 000 tonnes/a) of the baseline project scenario, the investment is around 96 million to 105.6 million for clink line using limestone. Thus, it is in the opinion of DNV that the static total investment of the clinker production line using limestone is appropriate.

The proposed project activity:

As part of the validation, the validation team of DNV confirmed that the values used in the financial analysis spreadsheet and the financial data in the PDD are fully consistent with those in the PAR /4/ with respect to equipment procurement investment, installation engineering investment, construction investment, and other investments.

The total static investment includes the construction, equipment purchase, installing and other relative expenses; DNV verified all those four sub costs to be able to give a conformation that the values used in the financial analysis spreadsheet and the financial data in the PDD are fully consistent with those in the PAR /4/. The unit production capacity cost is 260.4 RMB/t which is acceptable for similar size cement projects as indicated in the table below. The PAR was finalized by Xinjiang Building Materials Designing Institute who is an independent design entity authorized by NDRC and FSR got approval by Economic and Trade Commission of Xinjiang Uygur Autonomous Region /4/.

2. Price of carbide slag

DNV verified that 12.601 RMB/t is estimated by Xinjiang Building Materials Designing Institute in the financial comparison analysis /7/.

The transportation of CCR is by way of conveyer that delivers the wet fluid CCR, at the same time, the 80%~90% water contained CCR was filter pressed to 37% water contained CCR as designed in PAR /4/, and the costs assumed for this process was executed by accredited PAR developer, and those costs were verified by validation team to be in compliance with local standards and norms concerning the cement sector and was valid and applicable at the time of the investment decision taken by the project participant.

3. The cost of CCR applied due to the project activity

The cost saving has been reckoned as around RMB 500 000 per year by substituting limestone by CCR which was verified by validation team from the financial comparison analysis /7/.

4. Cost savings accounting fuel consumption reduction due to energy gains of a non-occurrence of some chemical reactions that were expected in the regular way of clinker processing

No cost saving was claimed in the PAR /4/ for the reason that the energy saving brought by less chemical reactions from adoption of CCR was offset by drying the water content in the wet CCR conveyed from the PVC plant.

5. Working capital

In the PAR /4/, 10 million RMB for working capital is assumed. The same value has been applied in PDD and spreadsheet.

6. Other parameters

- The period of financial assessment (project IRR) is 20 years; reflecting the period of expected technical lifetime;
- The fair value of the project activity is 4% of original vale of the fixed assets at the end of the assessment period and it is included as a cash inflow in the final year;
- The cost of financing expenditures (i.e. loan repayments and interest) is verified as not being included in the calculation of project IRR;
- Operating and maintenance cost reflect the local practice.
- All formulas used in this analysis be readable and all relevant cells be viewable and unprotected;
- The fluid capital (10 million RMB) is fully recovered at the end of the assessment period.

Cross-check the parameters used in the financial analysis by other appropriate manner

DNV was able to confirm that the costs which have been adopted from the FSR represent the current situation of Chinese cement sector including: total static investment per tonnes clinker; the yearly O&M cost per tonnes clinker; the investment requirements for raw material switching; the cost of CCR applied; and the cost savings in energy consumption due to the project activity being appropriate for a cement plant of this size.

For the similar clinker production project by using calcium carbide residue in the raw mix registered in UNFCCC (Ref No. 2194, 2134, 2196 and 2139), the parameters for the proposed project and the ranges of parameters for registered four projects are as the following table.

	Four registered projects	The proposed project
Tot. investment [RMB]/Tonnes Clinker	194.3 to 425.5	260.4
Yearly O&M[RMB]/ Tonnes Clinker	147.3 to 230.0	105.3
The costs of CCR[RMB]/ Tonnes Clinker	7.47 to 35.33	17.6
Electricity cost savings[RMB]/ Tonnes Clinker	-3.0 to 6.46	-1.3
Cost savings in energy consumption (in terms of cost of coal) [RMB]/ Tonnes Clinker	-28.8 to 5.6	-2.22

The actual contract list /41/ for equipments and construction etc. has been provided and the total actual investment are 319 RBM/tonnes of clinker and thus much higher than the estimate in the PAR /4/.

The costs of CCR for these four projects are from 7.47 to 35.33 RMB/t-clinker. The cost of CCR of the proposed project is 17.6 RMB/t-clinker, which is in the lower (conservative part of the) range of costs of CCR applied.

For the cost savings in energy consumption, the electricity cost savings in energy consumption of the other four projects are from -3 to 6.46 RMB/t-clinker and for the proposed project, the electricity cost saving in energy consumption is -1.3 RMB/t clinkers which prove that the proposed project is in the reasonable range as other similar projects in China.

The cost savings in energy consumption (in terms of cost of coal) of these four projects are from -28.76 RMB/t-clinker to 5.60 RMB/t-clinker and the cost saving in energy consumption of the proposed project is -2.22 RMB/t-clinker, which is reasonable to the validation team.

Approved PAR and the time of investment decision

Furthermore, DNV would also like to mention that PAR dated 13 February 2007 was developed by Xinjiang Building Materials Designing Institute who is accredited by Chinese NDRC and it is valid for 5 years from issuance date of 26 October 2003. An approval letter of PAR was issued on 27 April 2007 by Economic and Trade Commission of Xinjiang Uygur Autonomous Region after it passed the public assessment of the sector experts. A PAR can in DNV's opinion thus be regarded as an accurate and trustworthy report coming from a recognized entity. In addition, DNV has verified the key inputs values as elaborated above to be conservative and reflecting the situation in China at the point of investment decision.

The PAR was approved on 27 April 2007 and was in the same period with the decision to proceed with the project activity (i.e. the start date of the project) which was verified to be 2 April 2007 in accordance to EB 41 annex 46. Given the relative short period of time between approval of the PAR and the decision to proceed with the project activity, it is unlikely in the context of the project that the input values would have changed materially. It is thus reasonable to assume that the PAR has been the basis of the decision to proceed with the project investment.

4.4.6 Investment analysis: Calculation and conclusion

The NPV calculations were provided in a spreadsheet /6/. The calculations were verified and found to be correct by DNV. The assumptions used in the calculations were deemed to be correct by DNV. The project NPV without CDM revenues is -31.46 million RMB at the discount rate of 11% (before tax), which is negative showing the project activity is not economically feasible. With CER revenues the project NPV increases to 68.59 million RMB, which is above the benchmark.

4.4.7 Investment analysis: Sensitivity analysis

Moreover, a sensitivity analysis has been carried out for parameters contributing to more than 20% of the revenues or costs to check the robustness of the financial analysis. Reasonable variations of the revenues due to substitution, incremental investment and annual incremental O&M costs were checked by calculating the variation necessary to reach zero NPV under the benchmark discount rate as 11% and then discussing the likelihood for that to happen. None of the parameters in the sensitivity analysis are considered to have any significant positive correlation.

DNV was able to verify that the NPV becomes zero at the discount rate of 11% only if the above mentioned parameters change by values as mentioned below:

Key Indicators	***Variation of the parameter indicator needed to entail the NPV to be zero***
Revenues due to substitution	584%
Incremental investment	-113%
Incremental O&M cost (excluding revenue due to substitution)	-208%

Regarding those three variables, *Revenues due to substitution, Incremental investment Incremental O&M cost (excluding revenue due to substitution)*, variation beyond 100% is necessary for the NPV to become zero. Hence, the NPV analysis is robust for the proposed project in terms of variation of those parameters contributing to more than 20% of the revenues or costs.

According to the sensitivity analysis, it is unlikely that variables reach the threshold to make the NPV of the proposed project positive, which indicates that the proposed project is unlikely to be financially attractive.

In conclusion, the assessment of the arguments presented above is deemed to sufficiently demonstrate that the project activity itself is not a likely baseline scenario and that emission reductions resulting from the project are additional.

4.4.8 Common Practice Analysis

The proposed project activity is the first project /25/ in Xinjiang Uygur Autonomous Region to use carbide slag for clinker production.

In DNV's opinion, it is sufficiently demonstrated that the project is not a likely baseline scenario and that the proposed project is additional.

4.5 Monitoring

The monitoring methodology ACM0015 is correctly applied for the monitoring. The monitoring plan is in accordance with the monitoring methodology. The monitoring plan will give opportunity for real measurements of achieved emission reductions.

4.5.1 Parameters determined ex-ante

The use of carbide residue as a calcium source in the raw mix for cement processing project applies Approved consolidated baseline and monitoring methodology ACM0015 *"Consolidated baseline and monitoring methodology for project activities using alternative raw materials that do not contain carbonates for clinker manufacturing in cement kilns"*, version 1. The selected monitoring methodology is justifiably applicable for the project activity as it involves switching a part or all of the raw material used for clinker production to a non-carbonated calcium source from limestone and clay that would otherwise continue to be used during the crediting period. As the baseline plant of 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd was verified not to have bypass and CKD dust and no baseline self-generated electricity consumption due to kiln operation, so *ByPass and CKD dust leaving kiln system* (CKD_{BSL}) are neglected in the data and parameters determined ex-ante. Other parameters are as following table:

Type		Value	Data source
CaO content in the clinker produced in the baseline	$CaO_{CLNK, BSL}$	64.69%	It is determined base on 2007 data of 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd, as part of laboratory quality control procedure
MgO content in the clinker produced in the baseline	$MgO_{CLNK, BSL}$	2.24%	It is determined base on 2007 data of 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd, as part of laboratory quality control procedure
Annual production of	$CLNK_{BSL}$	601 309	It is determined base on 2007

clinker in the baseline (Tonnes)			production statistics data of 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd
Non-carbonated CaO content in the raw materials in the baseline	$CaO_{RM, BSL}$	0.69%	It is determined base on 2007 production statistics data of 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd
Non-carbonated MgO content in the raw materials in the baseline.	$MgO_{RM,BSL}$	0.42%	It is determined base on 2007 production statistics data of 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd
Annual consumption of raw materials in the base year	RM_{BSL}	992 800	It is determined base on 2007 production statistics data of 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd
Baseline grid electricity consumption for fuel feeding, due to raw materials grinding and due to kiln operation	$EC_{RM,Grid}$ $EC_{KO,Grid}$	16 011.73 MWh 25 126.42 MWh	It is determined base on 2007 data, as part of laboratory quality control procedure
Baseline grid-connected electricity consumption due to following cement blending process	$EC_{CTO,BSL}$	45.5 kWh/t cement	Baseline grid-connected electricity consumption due to following cement blending process.
Fossil fuel 'i' consumed for drying raw materials or fuel preparation in the baseline	$FC_{Dry,i}$	3 902.56 tonnes	It is determined base on 2007 data preceding the start of the project activity. The data is sourced from production control procedures.
CO_2 emission factor for the fossil fuel type *i*	$EF_{CO2,i}$	25.8 tC/GJ	IPCC2006
Weighted average net calorific value for fuel type *i*	NCV_i	29.27 GJ/t	"*China Energy Statistical Yearbook 2008*"
Oxidation factor of the fuel *i*	$OXID_i$	100%	Refer to the Table 1-4 in the 2006 IPCC Guidelines, Vol. 2, page 1.25, for default value.
CO_2 emission factor of NWCG	$EF_{CO2,Elec\_Grid,y}$ and $EF_{CO2,Elec\_Grid}$	0.8712 tCO_2/MWh	"*Notification on Determining Baseline Emission Factor of China's Grid*", Office of NCCCC, 2008-12-30
Specific Kiln Calorific Consumption for the baseline scenario	SKC_{BSL}	3.695	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}

How DNV has validated Lab analysis based on the raw material sample of the baseline scenario of 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd

The laboratory of 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd was certified by China Construction Materials Industry Society /31/.

The 2007 yearly historical information for chemical analysis /36/ was done according to Cement Chemical Analysis Method: GB/T 176-1996 and those data are repeatable and reproducible /34/ using reference material /35/ during the year previous to project implementation. The sampling for raw mix, clinker and coal was regulated by procedures in 2007 /33/ to guarantee the size and frequency of sampling for lab analysis to be statistically significant with a maximum uncertainty range of 20% at a 95% confidence level. Possible impurities in the raw materials was monitored and reported to guarantee that the difference in mass can be attributed to CO_2 emissions only, or corrected otherwise.

It is conservative to regard all the CaO and MgO sources other than limestone as Non-carbonated which is obtained from the analysis data of accredited Lab of the project owner.

4.5.2 Parameters monitored ex-post

As the project activity Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project was verified not to have bypass and CKD dust, no baseline self-generated electricity consumption due to kiln operation and no CCR transportation (the CCR is transported by conveyor), so *ByPass, CKD dust leaving kiln system* (CKD_{BSL}) and $ALTM_y$ are neglected in the data and parameters determined *ex-ante*. According to ACM0015 *"Consolidated baseline and monitoring methodology for project activities using alternative raw materials that do not contain carbonates for clinker manufacturing in cement kilns"*, version 1, the following data and parameters should be monitored:

Type		Data source
CaO content in the clinker produced in the year y	$CaO_{CLINK,y}$	It will be measured as part of laboratory quality control procedure
MgO content in the clinker produced in the year y	$MgO_{CLNK,y}$	It will be measured as part of laboratory quality control procedure
Annual production of clinker in the year y	$CLNK_y$	These data will be collected as part of normal plant level operations. QA/QC requirements according to ISO 9000 or similar quality systems
CaO content in the Black Shale in year "*y*".	$CaO_{,Black\ Shale,,\ y}$	It will be measured as part of laboratory quality control procedure
MgO content in the Black Shale in year "*y*".	$MgO_{,Black\ Shale,,\ y}$	It will be measured as part of laboratory quality control procedure
Annual consumption of dry Black Shale in year "*y*".	$RM_{Black\ Shale,\ y}$	It will be measured with autonomous electric record of conastant feeder and checked with inventories control procedure
Daily Specific Kiln Calorific Consumption in each 30 day of ex-ante monitoring	*Daily SKCex*	Calculated as part of ex-ante monitoring procedure
Specific Kiln Calorific Consumption measured in the year "y"	$SKC_{y,measured}$	Calculated as part of energy efficiency evaluation in year "y"
Specific Kiln Calorific	SKC_y	Select through comparative procedure as

Consumption for the year y		described in Diagram 1.1 of ACM0015
Specific Kiln Calorific Consumption measured in the year "y"	$SKC_{y,measured}$	Monthly sampled and analysed
Grid electricity consumption for the proposed project in year "*y*"	$EC_{,y}$	Measured by power meters and monthly recorded.
Fuel type *i* consumed for calcination in clinker production during the year *y*	$FC_{i,Calcin,y}$	Monitored by coal weight system and automatically recorded periodically.
Weighted average net calorific value for fuel type *i*	NCV_i	Monthly sampled and analysed
Grid electricity consumption for preparing raw materials of the proposed project in year "*y*"	$EC_{RM,Grid,y}$	Measured by power meters and monthly recorded
Grid electricity consumption for feeding the materials of the proposed project in year "*y*"	$EC_{Feed,Grid,y}$	Measured by power meters and monthly recorded
Grid electricity consumption for rotary kiln of the proposed project in year "*y*"	$EC_{KO,Grid,y}$	Measured by power meters and monthly recorded
Grid electricity consumption for the following cement blending in year "*y*"	$EC_{,CTO,y}$	Measured by power meters and monthly recorded.

DNV verified that $CaO_{RM,y}$ and $MgO_{RM,y}$ are calculated based on Page 9 and Page 31 of PAR. As the by product of chemical process, DNV is of opinion that copper residues and CCR contained minor carbonated CaO or MgO which can be ignored; for silica sand, SiO_2 covers the component of 96.26% and it is 2.5% in the batch, so carbonated CaO and MgO would be ignored for simplification. It is reasonable to consider only the black shale as the source for CaO and MgO and include that oxide to calculate project emission.

For $RM_{Black\ Shale,\ y}$, the assumption in the PDD is based on the theoretical feed consumption of the raw materials, referring to page 31 and 32 of the PAR, which is verified by validation team as correct.

$EC_{RM,Grid,y}$ $EC_{Feed,Grid,y}$, $EC_{KO,Grid,y}$ *and* $EC_{CTO,y}$ will be monitored by power meters and recorded monthly.

4.5.3 Management system and quality assurance

A CDM monitoring office and designate qualified staffs responsible for all relevant matters, including monitoring, data collection and archiving, QC/QA, and verification has been established to carry out the monitoring work. The office manager holds the overall responsibilities of all relevant matters with the monitoring activity. His/her role is to ensure that the data monitored are accurately recorded, properly archived, QA/QC procedure is timely carried out and the entire monitoring process is strictly in line with the CDM requirements.

The detailed contents have been elaborated in PDD /1/. These will be maintained and implemented to enable subsequent verification of emission reductions.

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.

Xinjiang Midong Tianshan Cement Co., Ltd has implemented quality management system which is certified to ISO9001 standards. The calibration of all metering equipments is a requirement of the quality management system implemented in the plant. All the meters will be calibrated and checked in accordance with the national and industry regulations and standards. And the laboratory of Xinjiang Midong Tianshan Cement Co., Ltd will be also checked annually according to relevant standards and regulations.

For data transfer and management, all data collected shall be kept 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.

The project management and operation manual contains procedures for tracking information. All paper-based information will be stored by the project owner. Detailed procedures are expected to be in place prior to the start of the crediting period to enable subsequent verification of emission reductions. The relevant documents will be kept for at least two years after the end of the crediting period.

The application of the monitoring methodology is transparent and DNV considers the project participants able to implement the monitoring plan.

4.6 Estimate of GHG Emissions

During the site visit dated 30 March-1 April 2009, DNV witnessed that main process of the proposed project activity as: CCR cakes was transported into the plant by belt conveyor and sent into the raw meal silo after being ground by the dryer crusher; the auxiliary materials was 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 was mixed with the ground CCR and then be separated by a separator. The separated raw meal was decomposed together with the ground and separated coal powder through a three-stage preheating precalciner and then, calcined in rotary kiln; the generated clinker was 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 ws used. All the powder and dust was recollected and reused. Apart from the dust emitted out with the waste gas, none of the powder and dust was emitted or discarded.

Baseline emission

The calculations documented were according to the approved methodology. As the baseline plant of 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd was verified not to have bypass and CKD dust and no baseline self-generated electricity consumption due to kiln operation.

Baseline emissions are simplified and calculated as follows:

$BE_y = BE_{Calcin} + BE_{FC\_Calcin} + BE_{FC\_Dry} + BE_{Elec\_Grid}$

Project emission

The calculations documented were according to the approved methodology. As the project activity Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project was verified not to have bypass and CKD dust, no additional fuel consumption for drying of raw material or fuel preparation, no baseline self-generated electricity consumption due to kiln operation and no CCR transportation (the CCR is transported by conveyor), project emissions are simplified and calculated as follows:

$PE_y = PE_{Calcin,y} + PE_{FC\_Calcin,y} + PE_{Elec\_Grid,y} + PE_{FC\_Dry,y}$

Leakage

On site survey of the proposed project, DNV investigated the clinker design of the CCR as raw material and BAU clinker sourced from stone, the production of clinker is according to the national standard /30/, no difference will occur between the clinker produced by the proposed project and the clinker produced by the baseline. Therefore, it is reasonable for not considering or calculating this part of leakage.

The GHG calculations are complete and transparent, and their accuracy has been verified.

4.7 Environmental Impacts

According to the Chinese requirements for EIA, the project has implemented the EIA and EIA report by Urumchi Institute of Environmental Protection Science and the Environmental Engineering R&D Centre of Petroleum University was completed in March 2007. The EIA report was approved by Environmental Protection Bureau of XinJiang Uighur Autonomous Region on 23 April 2007. DNV has checked and verified that the environmental impacts such as ambient air, noise, wastewater, solid waste and ecology impact of the project has been sufficiently addressed and documented.

4.8 Comments by Local Stakeholders

The project has performed the public consultation process according to the relevant local requirements. In March 2007, in order to confirm that the proposed project complies with sustainable development requirements, Urumchi Institute of Environmental Protection Science and the Environmental Engineering R&D Centre of Petroleum University entrusted by the project owner carried out a stakeholder survey for stakeholder consultation.

DNV verified summary and 50 answered questionnaire /27/ during the site visit from stakeholders of local governors, local company staffs from Xinjiang Midong Tianshan Cement Co., Ltd, workers and local residents from area of Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project and confirmed that no opposite comments on this project activity have been received.

In summary, DNV thinks the public consultation process is sufficient.

4.9 Comments by Parties, Stakeholders and NGOs

The PDD version 01 dated 20 February 2009 was made publicly available on UNFCCC's website and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 24 February 2009- 25 March 2009.

No comments were received.

APPENDIX A

CDM VALIDATION PROTOCOL

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

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	OK
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	OK ~~CAR 1~~
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK ~~CAR 1~~
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	N.A.
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
9. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7.	CDM Modalities and Procedures §31b	OK
About additionality		
10. Reduction in GHG emissions shall be additional to any that would occur in the	Kyoto Protocol Art. 12.5c,	OK

Requirement	Reference	Conclusion
absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	CDM Modalities and Procedures §43	
About forecast emission reductions and environmental impacts		
11. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
For large-scale projects only		
12. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK
About stakeholder involvement		
13. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	OK
14. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.	CDM Modalities and Procedures §40	OK
Other		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
16. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK ~~CL 2~~
17. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK

Requirement	Reference	Conclusion
18. The project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
19. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK ~~CL 11~~

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity *The project design is assessed.*					
A.1. Project Boundaries *Project Boundaries are the limits and borders defining the GHG emission reduction project.*					
A.1.1. Are the project's spatial boundaries (geographical) clearly defined?	/1/	DR I	The proposed project is located in the Zhongtai Chemical Industrial Park, Urumqi City, Xinjiang Uygur Autonomous Region. The proposed project's exact geographical coordinates are east longitude 43°26´30" and north latitude 87°48´12".		OK
A.1.2. Are the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	/1/	DR I	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 NWPG including Shaanxi, Gansu, Qinghai, Ningxia and Xinjiang Provincial Grid is defined as grid system according to the "Tool to calculate the emission factor for an electricity system" /11/ and "Notification on Determining Baseline Emission Factor of China's Grid" /14/.		OK
A.2. Participation Requirements *Referring to Part A, Annex 1 and 2 of the PDD as well as the CDM glossary with respect to the terms Party, Letter of Approval, Authorization and Project*					

* MoV = Means of Verification, DR= Document Review, I= Interview

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Participant.					
A.2.1. Which Parties and project participants are participating in the project?	/1/ /2/ /3/	DR	The project participants are Xinjiang Midong Tianshan Cement Co., Ltd of China, Camco International Limited of the United Kingdom of Great Britain and Northern Ireland. The host Party China and the participating Annex I Party United Kingdom of Great Britain and Northern Ireland meet the requirements to participate in the CDM.		OK
A.2.2. Have all involved Parties provided a valid and complete letter of approval and have all private/public project participants been authorized by an involved Party?	/1/ /2/ /3/	DR	Letters of Approval from DNA of China and DNA of United Kingdom of Great Britain and Northern Ireland have not been received.	~~CAR 1~~	OK
A.2.3. Do all participating Parties fulfil the participation requirements as follows: - Ratification of the Kyoto Protocol - Voluntary participation - Designated a National Authority	/1/ /2/ /3/	DR	Ratification of the KP: China ratified the Kyoto Protocol on August 30th, 2002, and United Kingdom of Great Britain and Northern Ireland and France ratified the Kyoto Protocol on May 31st, 2002 Voluntary Participation: China should confirm voluntary participation in the proposed project activity. United Kingdom of Great Britain and Northern Ireland: LoA is not issued yet. Designed National Authority: DNA China is under the National Development and Reform Commission of the People's Republic of China, while DNA, United Kingdom of Great Britain and Northern Ireland is under the	~~CAR 1~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Department for Environment, Food and Rural Affairs.		
A.2.4. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance.	/1/ /21/ /28/	DR	The validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards China.		OK
A.3. Technology to be employed *Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.*					
A.3.1. Does the project design engineering reflect current good practices?	/1/ /4/	DR	The project operates newly built dry pre-calcinations cement clinker production line with a capacity of 1600 t/d of clinker (clinker capacity 0.48 million t/a) to produce low-emission clinker through applying 100% calcium carbide residue (CCR) to substitute traditional raw mix (limestone and clay). The proposed project are in current government promotion category inventory 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. So the project design engineering reflects		OK

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			current good practices.		
A.3.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/ /4/	DR	According to the national industry policies, the "Development Policy of the Cement Industry" published and validated on 17 October 2006, the nation encourages local enterprises to develop new dry processing cement lines through eliminating low efficiency capacities using the old technique. The project use new dry processing cement line as state of the art technology than any commonly used technologies in region of Xinjiang in China.		OK
A.3.3. Does the project make provisions for meeting training and maintenance needs?	/1/ /40/	DR I	Yes. Training plan of Xinjiang Midong Tianshan Cement Co., Ltd dated May 2008.		OK
A.4. Contribution to Sustainable Development *The project's contribution to sustainable development is assessed.*					
A.4.1. Has the host country confirmed that the project assists it in achieving sustainable development?	/1/ /2/ /3/	DR I	This is not confirmed by the DNA of China yet.	~~CAR 1~~	OK
A.4.2. Will the project create other environmental or social benefits than GHG emission reductions?	/1/ /4/	DR	Yes. The project will also • Avoiding the potential environmental pollution that results from current CCR transportation and disposal; • Avoiding the potentially negative environmental impacts on the local region		OK

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			due to mining limestone; • Promoting the development of clean production and a circular economy in the cement industry in China; • Create employment; • Reducing pollution discharge in loccal community.		
B. Project Baseline *The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.*					
B.1. Baseline Methodology *It is assessed whether the project applies an appropriate baseline methodology.*					
B.1.1. Does the project apply an approved methodology and the correct version thereof?	/1/ /4/ /9/ /10/ /11/	DR	Yes. Project applies ACM0015 in version 01 with tools to calculate the emission factor for an electricity system, version 01.1 and tool for demonstration and assessment of additionality, version 05.2.		OK
B.1.2. Are the applicability criteria in the baseline methodology all fulfilled?	/1/ /4/	DR I	The project meets all the applicability requirements of ACM0015 as following: 1) The proposed project is a greenfield project; 2) The clinker produced by the project is the same as in baseline; 3) The CCR generated in Wuchang Region has not been used before. All of it was disposed and buried; 4) Historical data for the baseline scenario is	~~CL 1~~	OK

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			available; The clarification is requested that CCR generated by Zhongtai Chemical limited really 1.5 times of the proposed project's demand or the proposed project's CCR consumption matches the yearly waste produce from Zhongtai Chemical limited as the PAR /4/ depicts? The methodology defination of region by *a radius of 200 km around of te project activity including at least the ten cement plants nearest to the plant of the project activity*, clarification is request for the PP's consistent description of the region inherent to definition of methdology.		
B.2. Baseline Scenario Determination *The choice of the baseline scenario will be validated with focus on whether the baseline is a likely scenario, and whether the methodology to define the baseline scenario has been followed in a complete and transparent manner.*					
B.2.1. What is the baseline scenario?	/1/ /2/	DR I	Three alternative baseline scenarios to the project have been identified: Scenario 1: Construction of a cement plant providing the same product and services using carbonated sources, in case of Greenfield project, a scenario where the company uses raw materials from carbonated sources; Scenario 2: Construction of a cement plant providing the same product and services		OK

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			using non-carbonated sources substituting part of the carbonated sources. Scenario 3: The proposed project itself, but undertaken without being registered as a CDM project activity. DNV considers the list of realistic and credible alternatives to be complete.		
B.2.2. What other alternative scenarios have been considered and why is the selected scenario the most likely one?	/1/ /2/ /5/	DR	Scenario 2) and 3), face the same barriers as one is technological barriers due to lack of skilled engineers and operators and unstable and unpredicable market due to acceptance of customers for clinker or cement from this clinker. Based on the above discussion, DNV would like to indicate that the baseline scenario is the scenario 1) "the scenario where the company uses raw materials from carbonated sources, i.e. 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd /25/". Clarification is required as for argument of existing barriers as one is technological barriers due to lack of skilled engineers and operators and another is unstable and unpredicable market due to acceptance of customers for clinker and barriers of obtaining loan and investment.	~~CL 2~~	OK
B.2.3. Has the baseline scenario been determined according to the methodology?	/1/ /2/ /3/ /4/	DR	The discussion for the determination of the baseline basically follows the key methodological steps indicated by ACM0015.	~~CL 2~~	OK

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			Step 1. Identification of alternative scenarios to the proposed CDM project activity that are consistent with current laws and regulations Above three potential alternative scenarios 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*** Alternative 2) and Alternative 3) face the same barriers as technological and marketable circumantance. ***Step 3. Investment analysis*** This will be analysed in additioanality sector.		
B.2.4. Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /2/ /3/ /4/	DR	DNV was able to verify that in the vicinity of the proposed project location, Wuchang area is the defined region stick to methodology and it has 14 cement lines /25/ /4/ and 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd has the highest performance and with the lowest CO_2 emission in Wuchang region /25/. Clarification is requested as whether Wuchang region is in compliance with the requirement of "Region" 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.	~~CL 1~~	OK

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B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR I	All relevant national and sectoral policies, regulations and department rules and disciplines considered such as (*cement industrial development policy*) can be found and downloaded from the website of the National Development and Reform Commission (NDRC). http://www.sdpc.gov.cn/.		OK
B.2.6. Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/	DR I	See B.2.4.	~~CL 1~~	OK
B.2.7. Have the major risks to the baseline been identified?	/1/ /5/	DR I	There are no significant risks to the baseline because the baseline scenarios are identified in a conservative way and fixed through the whole crediting period.		OK
B.3. Additionality Determination *The assessment of additionality will be validated with focus on whether the project itself is not a likely baseline scenario.*					
B.3.1. Is the project additionality assessed according to the methodology?	/1/ /4/	DR	The methodology ACM0015 and additionality of the project is demonstrated by applying version 5.2 of the "*Tool for the demonstration and assessment of additionality*" approved by the CDM EB. Since the alternative does involve investments, justification is needed for not choosing comparison approach? Thus as per	~~CL 3~~	OK

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			methodology the cost analysis should contain only the investment required for raw material switching and savings due to raw material and energy savings. Only additional costs and revenues compared to the baseline should be considered in the investment analysis.		
B.3.2. Are all assumptions stated in a transparent and conservative manner?	1/ /4/	DR	DNV has verified all the input values used for the NPV calculations. It has been confirmed that the input values have been sourced from the Project Application Report (PAR) /4/. The financial calculations and assumptions have been assessed as: - *The period of financial assessment (project IRR) is 20 years; reflecting the period of expected technical lifetime;* - *The fair value of the project activity is 4% of original vale of the fixed assets at the end of the assessment period and it is included as a cash inflow in the final year;* - *The cost of financing expenditures (i.e. loan repayments and interest) is verified as not being included in the calculation of project IRR;* - *Operating and maintenance cost reflect the local practice.* - *All formulas used in this analysis be readable and all relevant cells be viewable and unprotected;* - *The fluid capital (10 million RMB) is fully recovered at the end of the assessment period.* Please clarify the following issues:	~~CL 4~~	OK

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			• Current price of CCR as claimed 12.601 RMB/t; • Revenues due to the substitution of limestone and clay by non-carbonated calcium source; • Cost savings accounting fuel consumption reduction due to energy gains of a non-occurrence of some chemical reactions that were expected in the regular way of clinker processing; • In the sensitivity analysis, input parameter's value at which the IRR will be equal to the benchmark and assess the likelihood of the parameter having this value to confirm that it is not likely that the IRR will become equal to the benchmark; • For the selection of parameters in sensitivity analysis, another parameter as price of limestone should be analysed as saving of limestone due to CCR replacement will have impact on cost; In common practice, PP's claim that proposed project is "first of its kind"	~~CL 5~~	
B.3.3. Is sufficient evidence provided to support the relevance of the arguments made?	1/ /4/ /5/	DR I	See B.3.1.	~~CL 4~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.3.4. If the starting date of the project activity is before the date of validation, has sufficient evidence been provided that the incentive from the CDM was seriously considered in the decision to proceed with the project activity?	/1/	DR I	The project activity start date has been verified by DNV corresponding to main equipment purchase contract between Xinjiang Tianshan Cement Co. Ltd. and Sichuan mining Machine Co. Ltd. dated 2 April 2007 /19/ as project participant committed to expenditures related to purchase and it is the earliest date at which either the implementation or construction or real action of a programme activity begins. The construction start of Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project is 22 May 2007 which is later than above defined project activity start date/22/. As the date of publication of the PDD for global stakeholder consultation was on 24 February 2009 was later than the start date of this project activity, DNV has assessed and verified the evidence for serious CDM consideration as a decisive factor in the decision to proceed with project activity as follows:	~~CL 6~~	OK

Time Sequence	Key Word	Refer.	Performing Entities
8 September 2006	Board Minutes	/17/	Xinjiang Midong Tianshan Cement Co., Ltd
26 January 2007	CDM Agreement	/18/	Project owner and Camco International Limited

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27 April 2007	Project Application Report (PAR) approval and project is no viable without CDM revenues	/4/	Economic and Trade Commission of Xinjiang Uygur Autonomous Region	
2 April 2007	Project activity Start Date	/19/	Tianshan Cement Co. Ltd. and Sichuan mining Machine Co. Ltd.	

Project owner took continuing and real actions to secure CDM status for the proposed project in the parallel with its implementation demonstrated as:

Time Sequence	Key Word	Refer.	Performing Entities
4 April 2007	Pre-Validation using AM0033 Ver.01.	/20/	TÜV SÜD Industrie Service GmbH
9 August 2007	AM0033 updating to Ver 2		EB
30 November 2007	Substitution AM0033 with ACM0015		EB
12 June 2008	Resubmission to get LoA		Camco International Limited
October 2008	LoA issuance	/2/	Chinese NDRC

DNV is thus of the opinion that CDM benefits were seriously considered in the decision to proceed with the project activity, and real and continuous actions were undertaken to secure CDM status in parallel with the implementation of the project in compliance with EB41 annex 46.

As the construction start date is not the defined real earliest action date for the project activity, the correction in PDD is

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			required to change the date from 22 May 2007 to 2 April 2007. If CDM was considered in 8 September 2006, why did the PP take more than two years and half (GSC dated 24 February 2009) to start validation? A justification needs to be provided. Regarding the EB41 requirement, evidence needs to be provided to demonstrate that the incentive from the CDM was seriously considered in the decision to proceed with the project activity and all CDM consideration arguments should be included in section B.5 of the PDD.		
B.4. Calculation of GHG Emission Reductions – Project emissions *It is assessed whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.4.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR I	The calculations documented were according to the approved methodology. As the project activity Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project was verified not to have bypass and CKD dust, no additional fuel consumption for drying of raw material or fuel preparation, no baseline self-generated electricity consumption due to kiln operation and no CCR transportation (the CCR is transported by conveyor), project	~~CL 7~~	OK

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			emissions are simplified and calculated as follows: $PE_y = PE_{Calcin,y} + PE_{FC\_Calcin,y} + PE_{Elec\_Grid,y}$ For data and parameters determined ex-post, clarification is requested as following: *Project emissions from Calcination of carbonates ($PE_{Calcin,y}$) were taken as zero by PP is not what methodology meant.* *The approach for obtaining $CaO_{RM,y}$ and $MgO_{RM,y}$, how to attribute those to Non-carbonated source merely;* *By which way the data RM_y was available? Caculated or measured with field instruments;* *For $EC_{Conv,y}$; $EC_{Feed,Grid,y}$; $EC_{KO,Grid,y}$; $EC_{RM,Grid,y}$, the pp is requested to clearly indicate whether those data could be obtained separately?* *whether SKC_{ex} of kiln was obtained when kiln operational variables are under total control;* *The PP does not provide any value for $EC_{CTO,BSL}$; Without this leakage calculation will not be possible.* How the PP demonstrate that the higher energy performance is only due to the utilization of alternative materials? Is $SKC_{y,measured}$ bigger than SKC_{BSL}?		

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B.4.2. Have conservative assumptions been used when calculating the project emissions?	/1/	DR	This can only be assessed after the response to CL 7.	~~CL 7~~	OK
B.4.3. Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Not uncertainty for project emission estimates.		OK
B.5. Calculation of GHG Emission Reductions – Baseline emissions *It is assessed whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.5.1. Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR I	The calculations documented were according to the approved methodology. As the baseline plant of 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd was verified not to have bypass and CKD dust and no baseline self-generated electricity consumption due to kiln operation. Baseline emissions are simplified and calculated as follows: $BE_y=BE_{Calcin}+BE_{FC\_Calcin}+BE_{FC\_Dry}+BE_{Elec\_Grid}$ For data and parameters determined ex-ante, clarification is requested as following: *The approach for obtaining $CaO_{RM, BSL}$ and $MgO_{RM,BSL}$, how to attribute those to Non-carbonated source merely;* *By which way the data RM_{BSL} was*	~~CL 8~~	OK

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			available? Caculated or measured with field instruments; *The basic data for calculating SKC_{BSL} and $FC_{Dry,i}$.* Is it conservative when BE_{FC_Dry} is a part of calculation for BE_y, Whereas for the project activity, there is no fuel consumption for drying of raw material or fuel preparation?		
B.5.2. Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	The laboratory of 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd was certified by China Construction Materials Industry Society /31/. The 2007 yearly historical information for chemical analysis /36/ was done according to Cement Chemical Analysis Method: GB/T 176-1996 and those data are repeatable and reproducible /34/ using reference material /35/ during the year previous to project implementation. The sampling for raw mix, clinker and coal was regulated by procedures dated 1 March 2007 to guarantee the size and frequency of sampling for lab analysis to be statistically significant with a maximum uncertainty range of 20% at a 95% confidence level. Possible impurities in the raw materials was monitored and reported to guarantee that the difference in mass can be attributed to CO_2 emissions only, or corrected otherwise.		OK

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B.5.3. Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	No significant uncertainties can be addressed for baseline emission.		OK
B.6. Calculation of GHG Emission Reductions – Leakage *It is assessed whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.*					
B.6.1. Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR I	For leakage, the following issues need more justification. *Leakage due to transportation of new alternative raw materials (LE_{trans})* *Leakage from electricity consumption for conveyors system ($LE_{ElecConv,y}$)* *Leakage calculation due to change in electricity consumption in cement grinding and production* *Leakage calculation of a potential higher consumption of clinker in cement production*	~~CL 9~~	OK
B.6.2. Have conservative assumptions been used when calculating the leakage emissions?			See B.6.1.	~~CL 9~~	OK
B.6.3. Are uncertainties in the leakage emission estimates properly addressed?			See B.6.1.	~~CL 9~~	OK
B.7. Emission Reductions *The emission reductions shall be real, measurable and give long-term benefits related to the mitigation*					

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of climate change.					
B.7.1. Are the emission reductions real, measurable and give long-term benefits related to the mitigation of climate change.	/1/	DR	It is expected that the implementation of the proposed project as planned would result in real, measurable and long-term benefits. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change. But updating of ER in ER spreadsheet and ER calculation in PDD should be made accordingly as brought by new basic data change.	~~CL 10~~	OK
B.8. Monitoring Methodology *It is assessed whether the project applies an appropriate monitoring methodology.*					
B.8.1. Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/	DR I	The monitoring plan is documented according to the approved methodology ACM0015 *"Consolidated baseline and monitoring methodology for project activities using alternative raw materials that do not contain carbonates for clinker manufacturing in cement kilns"*, version 1 and in a complete and transparent manner.		OK
B.8.2. Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR	All monitored data required for verification and issuance are required to be kept for two years after the end of the crediting period in the PDD.		OK
B.9. Monitoring of Project Emissions					

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
B.9.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	For data and parameters determined ex-post, clarification is requested as following: *Project emissions from Calcination of carbonates ($PE_{Calcin,y}$) were taken as zero by PP is not what methodology meant.* *The approach for obtaining $CaO_{RM,y}$ and $MgO_{RM,y}$, how to attribute those to Non-carbonated source merely;* *By which way the data RM_y was available? Caculated or measured with field instruments;* *For $EC_{Conv,y}$; $EC_{Feed,Grid,y}$; $EC_{KO,Grid,y}$; $EC_{RM,Grid,y}$, the pp is requested to clearly indicate whether those data could be obtained separately?* *whether SKC_{ex} of kiln was obtained when kiln operational variables are under total control;* How the PP demonstrate that the higher energy performance is only due to the utilization of alternative materials? Is $SKC_{y,measured}$ bigger than SKC_{BSL}?	~~CL 7~~	OK
B.9.2. Are the choices of project GHG indicators reasonable and conservative?	/1/	DR	The choices of the project indicators are conservative and deemed reasonable.		OK
B.9.3. Is the measurement method clearly stated for each	/1/	DR	The measurement method needs to be	~~CL 11~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
GHG value to be monitored and deemed appropriate?			clarified. In the PDD, under section B.7.1., for all the parameters in the table: • the part of "Description of measurement methods and procedures to be applied" needs be clarified according to the following requirements: *"Description of measurement methods and procedures to be applied" needs be clarified according to the following requirements:* *"specify the measurement methods and procedures, including a specification which accepted industry standards or national or international standards will be applied, which measurement equipment is used, how the measurement is undertaken, which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person/entity that should undertake the measurements and what is the measurement interval."* *"Any direct measurements with mass or volume meters at the plant site should be cross-checked with an annual energy balance that is based on purchased quantities and stock changes."*		
B.9.4. Is the measurement equipment described and deemed appropriate?	/1/	DR I	See B.9.3.	~~CL 11~~	OK
B.9.5. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on	/1/	DR	See B.9.3.	~~CL 11~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
how to deal with erroneous measurements?		I			
B.9.6. Is the measurement *interval* identified and deemed appropriate?	/1/	DR I	See B.9.3.	~~CL 11~~	OK
B.9.7. Is the *registration, monitoring, measurement* and *reporting* procedure defined?	/1/	DR I	Yes. These procedures are defined in the PDD properly.		OK
B.9.8. Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR I	For the calibration intervals determination, refer to ~~CL 11~~. Procedures are identified for *maintenance* of monitoring equipment and installations in the PDD.	~~CL 11~~	OK
B.9.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR I	These procedures are defined properly in the PDD.		OK
B.10. Monitoring of Baseline Emissions *It is established whether the monitoring plan provides for reliable and complete baseline emission data over time.*					
B.10.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR I	Yes. According to the monitoring plan, the project owner will monitor: (1) Annual production of clinker in the year y; (2) electricity consumption by the project. (3) Specific Kiln Calorific Consumption for the year y (4) Fuel type *i* consumed for calcination in clinker production during the year *y*		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.10.2. Are the choices of baseline GHG indicators reasonable and conservative?	/1/	DR	The choices of baseline GHG indicators are reasonable and conservative.		OK
B.10.3. Is the measurement method clearly stated for each baseline indicator to be monitored and also deemed appropriate?	/1/	DR I	Refer to CL 11.	~~CL 11~~	OK
B.10.4. Is the measurement *equipment* described and deemed appropriate?	/1/	DR I	The details of monitoring equipment should be provided, such as model, measuring accuracy etc.	~~CL 11~~	OK
B.10.5. Is the measurement *accuracy* addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements?	/1/	DR I	Refer to CL 11.	~~CL 11~~	OK
B.10.6. Is the measurement *interval* for baseline data identified and deemed appropriate?	/1/	DR I	Refer to CL 11.	~~CL 11~~	OK
B.10.7. Is the registration, *monitoring*, *measurement* and *reporting* procedure defined?	/1/	DR I	Yes.		OK
B.10.8. Are procedures identified for *maintenance* of monitoring equipment and installations? Are the calibration intervals being observed?	/1/	DR I	Yes.		OK
B.10.9. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR I	Yes.		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
B.11. Monitoring of Leakage *It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.*					
B.11.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	See B.6.1.	~~CL 9~~	OK
B.11.2. Are the choices of project leakage indicators reasonable and conservative?				N.A.	
B.11.3. Is the measurement method clearly stated for each leakage value to be monitored and deemed appropriate?				N.A.	
B.12. Monitoring of Sustainable Development Indicators/ Environmental Impacts *It is assessed whether choices of indicators are reasonable and complete to monitor sustainable performance over time.*					
B.12.1. Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/	DR I	DNA of China does not require collection and archiving of data related to environmental, social and economic impacts. The environmental impacts will be monitored by local environmental authority.		OK
B.12.2. Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR I	DNA of China does not require collection and archiving of data related to environmental, social and economic impacts. The environmental impacts will be monitored		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			by local environmental authority.		
B.12.3. Are the sustainable development indicators in line with stated national priorities in the Host Country?	/1/	DR I	Yes. This will be on local authority decision.		OK
B.13. Project Management Planning *It is checked that project implementation is properly prepared for and that critical arrangements are addressed.*					
B.13.1. Is the authority and responsibility of overall project management clearly described?	/1/	DR I	Yes. The authority and responsibility of overall project management is clearly described.		OK
B.13.2. Are procedures identified for training of monitoring personnel?	/1/	DR I	These procedures are defined in the PPD properly.		OK
B.13.3. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR I	No emergency situation which can cause unintended emissions is expected from the project.		OK
B.13.4. Are procedures identified for review of reported results/data?	/1/	DR I	These procedures are defined in the PPD properly.		OK
B.13.5. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR I	These procedures are defined in the PPD properly and this will be implemented as the ISO9001 requirement.		OK
C. Duration of the Project/ Crediting Period *It is assessed whether the temporary boundaries of the project are*					

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined and evidenced?	/1/	DR I	The project activity start date has been verified by DNV corresponding to main equipment purchase contract between Xinjiang Tianshan Cement Co. Ltd. and Sichuan mining Machine Co. Ltd. dated 2 April 2007 /19/ as project participant committed to expenditures related to purchase and it is the earliest date at which either the implementation or construction or real action of a programme activity begins. The project life time is clearly defined as 19 years and consistent with PAR.		OK
C.1.2. Is the start of the crediting period clearly defined and reasonable?	/1/	DR	Yes. The start of crediting period is 1 August 2009, which is reasonable.		OK
D. Environmental Impacts *Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.*					
D.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR I	Yes. The analysis of environmental impacts has been sufficiently described in the PDD and the project activity will have insignificant environmental impact.		OK
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR I	Yes. There are requirements for an EIA for such project in China. The project has performed the EIA and approved by Environmental Protection Bureau of XinJiang Uighur Autonomous Region in		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			March 2007.		
D.1.3. Will the project create any adverse environmental effects?	/1/	DR I	As per the results of EIA and the reply from the approval of Environmental Protection Bureau of XinJiang Uighur Autonomous Region, the total amount of dust and SOx outlet permission should be controlled by Xinjiang Midong Tianshan Cement Co., Ltd.		OK
D.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR I	No transboundary environmental impacts are identified according to the EIA report.		OK
D.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR I	Yes. The impacts related to dust, ambient air, wastewater andn solid waste and noise are properly addressed in the PDD.		OK
D.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR I	Yes. The project's EIA reports have been approved by Environmental Protection Bureau of XinJiang Uighur Autonomous Region in March 2007.		OK
E. Stakeholder Comments *The validator should ensure that stakeholder comments have been invited with appropriate media and that due account has been taken of any comments received.*					
E.1.1. Have relevant stakeholders been consulted?	/1/	DR I	In March 2007, in order to confirm that the proposed project complies with sustainable development requirements, Urumchi Institute of Environmental Protection Science and the Environmental Engineering R&D Centre of Petroleum University entrusted by the project owner carried out a stakeholder survey for		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			stakeholder consultation.		
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/ /27/	DR I	DNV verified summary and 50 answered questionnaire /27/ during the site visit from stakeholders of local governors, local company staffs from Xinjiang Midong Tianshan Cement Co., Ltd, workers and local residents from area of Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project and confirmed that no opposite comments on this project activity have been received.		OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR I	Even though stakeholder consultation process is required only for those projects which are thought having significant potential impacts to the environment, for this project, public comments have been invited to evaluate the proposed project during the environmental impact assessment stage. The consultation process was carried out in accordance with the relevant regulation and the EIA report was approved by local EPB.		OK
E.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR I	Yes. A summary of the stakeholder comments received described on the PDD.		OK
E.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR I	No negative comments were received .No project amendment needs to be conducted according to the public consultation.		OK

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Table 2b: Additional requirements checklist for VVM version 1 (EB 44)

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.5. Letter of approval					
A.5.1 Is the LoA received directly from the DNA or through the project participant.	/2/ /3/	DR	The LoA of the DNA of China /2/ and the LoA of United Kingdom of Great Britain and Northern Ireland /3/ are not available now	~~CAR 1~~	OK
A.6. Project design					
A.6.1 Does the PDD describe the CDM project activity with all relevant elements in a transparent and accurate way?	/1/ /4/	DR	It is by a transparent and accurate way to discribe the project activity such as project site, the capacity, the main facilities and their parameters and those are consistent with related information reflected in PAR.		OK
A.6.2 Has the CDM project activity at the start of the validation been constructed or does the CDM project activity use existing facilities or equipment?	/4/ /17/ /18/ /19/		The proposed project has been constructed at the start of the validation and CDM project activity doesn't use existing facilities or equipment.		OK
A.6.3 Is the project a large scale project, a small scale project with average annual emission reductions above 15 000 tonnes or a bundled small scale project? Has on-site visit been carried out?	/1/ /4/	DR	The project activity is a large scale project fully addressed in PAR and PDD; On on 30 March-1 April 2009, DNV performed site visit interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Baseline plant 2000t/d clinker line of Xinjiang Tianshan Cement Co. Ltd and project activity Xinjiang Midong Tianshan Cement Co. Ltd's 1600t/d Utilization Calcium Carbide for Cement Clinker Project of Xinjiang Midong Tianshan Cement Co.,		OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			Ltd were visited and relative personnel were interviewed.		
A.6.4 Does the project activity involved alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?	/1/ /4/	DR	No, the project activity is newly built wind farm.		OK
A.7. Project emissions not addressed by the methodology					
A.7.1 Does the methodology describe all project emission source for the project activity that contributes all 1% of the emission reductions? Sources that the methodology considers not to take into account are not relevant (e.g. cement and iron consumption for building hydropower plants).	/1/ /4/	DR	Project emissions: Calcination of raw materials; Use of fuels in the kiln, including main burner and precalcinator (fossil, alternative fossil and non-fossil); 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.).		OK
A.8. Documentation of baseline emissions					
A.8.1 Documentation of the baseline determination: • All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced. • All documentation is relevant as well as correctly quoted and interpreted. • Assumptions and data can be deemed reasonable • Relevant national and/or sectoral policies and circumstances are considered and listed in the	/1/ /4/ /9/ /10/ /11/ /34/ /35/ /36/	DR	- The 2007 yearly historical information for chemical analysis /36/ was done according to Cement Chemical Analysis Method: GB/T 176-1996 and those data are repeatable and reproducible /34/ using reference material /35/ during the year previous to project implementation. The sampling for raw mix, clinker and coal was regulated by procedures dated 1 March 2007 to guarantee the size and frequency of	~~CL 8~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
PDD. • The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity			sampling for lab analysis to be statistically significant with a maximum uncertainty range of 20% at a 95% confidence level; All documentation is relevant as well as correctly quoted and interpreted. Some of assumptions and data can not be deemed reasonable; Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD; To provide the same type and quality clinker, three alternative baseline scenarios to the project have been identified and discussed. These are: Scenario 1: Construction of a cement plant providing the same product and services using carbonated sources, in case of Greenfield project, a scenario where the company uses raw materials from carbonated sources; Scenario 2: Construction of a cement plant providing the same product and services using non-carbonated sources substituting part of the carbonated sources. Scenario 3: The proposed project itself, but undertaken without being registered as a CDM project activity. DNV considers the list of realistic and		

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			credible alternatives to be complete.		
A.9. Documentation of the calculations					
A.9.1 Algorithms and/or formulae used to determine emission reductions • All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced • All documentation is correctly quoted and interpreted. • All values used can be deemed reasonable in the context of the project activity • The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration.	/1/ /4/ /9/ /10/ /11/	DR	See B.4.1. See B.5.1. See B.7.1.	~~CL 7~~ ~~CL 8~~ ~~CL 9~~	OK
A.10. Implementation of the monitoring plan					
A.10.1 How were the plans for implementation of the monitoring plan, data management, QA/QC procedures assessed? To what extent can the emission reductions achieved by the project by monitored ex-post and verified later by a DOE?	/1/ /4/ /9/ /10/ /11/	DR	See B.9.3.	~~CL 11~~	OK
A.11. CDM consideration prior to starting date					
A.11.1 The prior consideration of CDM for the project activity complies with EB41 annex 46		DR	If CDM was considered in 8 September 2006, why did the PP take more than two years and half (GSC dated 24 February 2009) to start validation? A justification needs to be	~~CL 6~~	OK

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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			provided. Regarding the EB41 requirement, evidence needs to be provided to demonstrate that the incentive from the CDM was seriously considered in the decision to proceed with the project activity and all CDM consideration arguments should be included in section B.5 of the PDD.		

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Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CAR1 Letters of Approval from DNA of China and DNA of United Kingdom of Great Britain and Northern Ireland have not been received.	A.2.2. A.2.3. A.4.1. Table 2_ A.1.1.	Chinese LoA has been received in October 2008 UK LoA has been received on 16 July 2009	OK The CAR was closed.
CL1 The clarification is requested that CCR generated by Zhongtai Chemical limited really 1.5 times of the proposed project's demand or the proposed project's CCR consumption matches the yearly waste produce from Zhongtai Chemical limited as the PAR /4/ depicts? The methodology defination of region by *a radius of 200 km around of te project activity including at least the ten cement plants nearest to the plant of the project activity*, clarification is request for the PP's consistent description of the region inherent to defination of methdology.	B.1.2. B.2.4. B.2.6.	A proof from Zhongtai Chemical limited is identified that the CCR generation from its two PVC lines are 1.5 times of the proposed project demand. The Region was identified in Figure A-1 as including Changji Hui Autonomous Prefecture, Urumqi City and Urumqi County which is locally called Wuchang Region.	OK The CCR residue coming out of Zhongtai Chemical limited, will absolutely provide to the proposed project, as the proposed project is a one to one match cement production line designed to consume those residues and the capacity of Zhongtai Chemical limited is sufficient for supplying the residues the proposed project consume. It is clear that the Wuchang region can meet the methodology criteria as *a radius of 200 km around of the project activity including at least the ten cement plants nearest to the plant of the project activity.* The CL was closed.
CL2 Clarification is required as for argument of existing barriers as one is technological	B.2.2. B.2.3.	There are no staffs with work experience in a similar plant before. And the proposed project is only	OK The PP's justification of no qualified staff to operate the CCR cement

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
barriers due to lack of skilled engineers and operators and another is unstable and unpredicable market due to acceptance of customers for clinker and barriers of obtaining loan and investment.		operating with 70% efficiency from May 2008 until now. As the clinker produced by the proposed project is supplied to long-term co-operators other than on the market. And the technology of using CCR substituting limestone is applied to real manufacture only in recent years. Therefore, lack of market data. As a result, this argument is deleted from the PDD. The proposed project hasn't obtained any loan or loan intention letter from any banks. In April 2007, Xinjiang Huatai Heavy Chemical Co., Ltd signed a co-developing agreement with the project owner to jointly develop the proposed project.	production line, as this is the first line commencing in Xinjiang Uygur Autonomous Region and this insufficient training led to instable production. The PP deleted barrier due to acceptance of customers for clinkers as the project owner distributed the product for its existing customers. The financial barrier for the proposed project has been relieved as the loan intention came only after the evidence of another entity, Xinjiang Huatai Heavy Chemical Co., Ltd, the owner of Zhongtai Chemical Limited, for intent and signature for cooperation with the project owner. The CL was closed.
CL3 Since the alternative does involve investments, justification is needed for not choosing comparison approach? Thus as per methodology the cost analysis should contain only the investment required for raw material switching and savings due to raw material and	B.3.1.	The investment comparison analysis has been added into the PDD. The analysis is based on the Cost Comparison Analysis completed by Xinjiang Building Materials Designing Institute (Class A) on 13 February 2007. The results show that by using limestone,	OK. The comparison analysis has been performed by Xinjiang Building Materials Designing Institute to demonstrate that the lime stone as material scenario has better financial return than the CCR as material

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
energy savings. Only additional costs and revenues compared to the baseline should be considered in the investment analysis.		the investment and annual O&M cost for producing the same amount of clinker will be lower than the proposed project. A sensitivity analysis of the annual O&M cost on the variation of CCR unit cost, limestone price, power price and coal price within -10% to 10% also confirm that the clinker line using limestone is more financial attractive than the proposed project. The above analysis includes the investment required for raw material switching, savings due to raw material and energy savings and additional costs and revenues compared to the baseline.	scenario; so the conclusion is that the baseline is alternative 1) Scenario 1: Construction of a cement plant providing the same product and services using carbonated sources, in case of Greenfield project, a scenario where the company uses raw materials from carbonated sources; Also sensitivity analysis based on the variation of the CCR unit cost, limestone price, power price and coal price in the range of -10% to 10%, to confirm the robustness of conclusion of the comparison analysis. The CL was closed.
CL4 Please clarify the following issues: • Current price of CCR as claimed 12.601 RMB/t; • Revenues due to the substitution of limestone and clay by non-carbonated calcium source; • Cost savings accounting fuel consumption reduction due to energy gains of a non-occurrence of some chemical reactions that were expected in the regular way of	B.3.2.	• The PAR only provides the annual total cost for CCR. Correspondingly calculated price is 12.601 RMB/t for dry CCR. This is actually not price but cost. Because the CCR will be dehydrated by belt filter press from around 80%~90% water content to 37% water content and then pumped and conveyed to the proposed project. The investment of the dehydration process and operation cost are	OK • DNV verified that 12.601 RMB/t is estimated by Xinjiang Building Materials Designing Institute in the financial comparison analysis /7/.As the process of the transportation of CCR is by way of conveying the wet fluid CCR and filter pressed those 80%~90% water contained CCR to that of 37% designed PAR, and the assumptions for evaluating the cost for this process done by accredited

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
clinker processing; • In the sensitivity analysis, input parameter's value at which the IRR will be equal to the benchmark and assess the likelihood of the parameter having this value to confirm that it is not likely that the IRR will become equal to the benchmark; • For the selection of parameters in sensitivity analysis, another parameter as price of limestone should be analyzed as saving of limestone due to CCR replacement will have impact on cost.		considered as CCR expenditure when analyze financial applicability in the PAR. • The cost saving for raw materials is around RMB 500,000 per year by substituting limestone by CCR, and the saving of CCR disposing fee has already been reduced from the CCR Cost when calculating NPV. After including all these revenues, the NPV of the proposed project is still lower than the benchmark; • No cost saving accounting fuel consumption reduction because although the chemical reactions of CCR will save fuel comparing to the chemical reactions of limestone, the high water content of CCR cause higher coal consumption for drying. Therefore, totally, the fuel consumption for the proposed project is higher than the baseline scenario; • Has been revised in the PDD;	PAR developer is verified to be based on local standards and norms concerning the cement sector and was valid and applicable at the time of the investment decision taken by the project participant. • The cost saving has been reckon as around RMB 500,000 per year by substituting limestone by CCR which was verified by validation team from the financial comparison analysis /7/; • No cost saving was claimed in the PAR /4/ for the reason that the energy saving brought by less chemical reactions from adoption of CCR was offset by drying the water content in the wet CCR conveyed from the PVC plant. • OK, in PDD it has been updated according to the CL. • OK, in PDD it has been updated according to the CL.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		• Has been revised in the PDD.	The CL was closed.
CL5 In common practice, PP's claim that proposed project is "first of its kind" should be clarified.	B.3.2.	According to the list of clinker lines in Wuchang Region provided by Xinjiang Building Materials Designing Institute (Class A), the proposed project is "first of its kind" in Wuchang Region.	OK This has been corroborated by the clarification from Xinjiang Building Materials Designing Institute /25/. The CL was closed.
CL6 As the construction start date is not the defined real earliest action date for the project activity, the correction in PDD is required to change the date from 22 May 2007 to 2 April 2007. If CDM was considered in 8 September 2006, why did the PP take more than two years and half (GSC dated 24 February 2009) to start validation? A justification needs to be provided. Regarding the EB41 requirement, evidence needs to be provided to demonstrate that the incentive from the CDM was seriously considered in the decision to proceed with the project activity and all CDM consideration arguments should be included in section B.5 of the PDD.	B.3.4. Table 2_ A.7.1.	The Starting Date has been corrected. After considering CDM on 8 Sep. 2006, the CADA between project owner and Camco was signed on 24 Jan. 2007. In Feb. 2007, the PAR was completed. Then, Camco carried out a pre-validation with TUV-SUD of the proposed project. The Pre-validation report dated 04 Apr. 2007 indicated that some deviations need to be applied for the proposed project for using AM0033 Ver.01. On 09 Aug. 2007, the AM0033 was updated as Ver. 2. Then, within just 3 months, AM0033 was substituted by ACM0015 which is valid from 30 Nov. 2007. On 12 Jun. 2008, Camco submitted the proposed project to apply Chinese LoA. The Chinese LoA was received in Oct. 2008.	OK The project activity start date has been updated to the date as defined in accordance wit the CDM Glossary of terms. For the proposed project, it is originally designed for application of AM0033 on 4 April 2007 when pre-validated by TÜV SÜD /20/, as the methodology AM0033 was substituted by ACM0015, the PP spent long time to update the PDD in compliance with ACM0015. This substitution cost the PP more than 1 year which can be substantiated by the similar projects shifting from AM0033 to ACM0015. The CL was closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
CL7 For data and parameters determined ex-post, clarification is requested as following: *Project emissions from Calcination of carbonates ($PE_{Calcin,y}$) were taken as zero by PP is not what methodology meant.* *The approach for obtaining $CaO_{RM,y}$ and $MgO_{RM,y}$, how to attribute those to Non-carbonated source merely;* *By which way the data RM_y was available? Caculated or measured with field instruments;* *For $EC_{Conv,y}$; $EC_{Feed,Grid,y}$; $EC_{KO,Grid,y}$; $EC_{RM,Grid,y}$, the pp is requested to clearly indicate whether those data could be obtained separately?* *whether SKC_{ex} of kiln was obtained when kiln operational variables are under total control;* *The PP does not provide any value for $EC_{CTO,BSL}$; Without this leakage calculation will not be possible.* How the PP demonstrate that the higher energy performance is only due to the utilization of alternative materials? Is $SKC_{y,measured}$ bigger than SKC_{BSL}?	B.4.1. B.4.2. B.9.1. Table 2_ A.5.1.	$PE_{Calcin,y}$ was revised by including potential emission from other raw materials. The calculated $PE_{Calcin,y}$ is 8517.69 t/year. $CaO_{RM,y}$ and $MgO_{RM,y}$ are calculated based on Page 9 and Page 31 of PAR. 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. $RM_{Black\ Shale,\ y}$ in the PDD is calculated based on the theoretical feed consumption of the raw materials, referring to page 31 of the PAR. As no separated meters were or will be installed for $EC_{Conv,y}$, $EC_{Feed,Grid,y}$, $EC_{KO,Grid,y}$ and $EC_{RM,Grid,y}$, they couldn't be obtained separately. One metering system will be installed for whole plant electricity consumption. It is conservative because, other than the above consumption, the electricity using	OK DNV verified that $CaO_{RM,y}$ and $MgO_{RM,y}$ are calculated based on Page 9 and Page 31 of PAR. As the by product of chemical process, DNV is of opinion that copper residues and CCR contained minor carbonated CaO or MgO which can be ignored; for silica sand, SiO_2 covers the component of 96.26% and it is 2.5% in the batch, so carbonated CaO and MgO would be ignored for simplification. It is reasonable to consider only the black shale as the source for CaO and MgO and include that oxide to caculate project emission. For $RM_{Black\ Shale,\ y}$, the assumption in the PDD is based on the theoretical feed consumption of the raw materials, referring to page 31 and 32 of the PAR, which is verified by validation team as correct. By the site visit, validation team found that $EC_{Conv,y}$, $EC_{Feed,Grid,y}$, $EC_{KO,Grid,y}$ and $EC_{RM,Grid,y}$ couldn't be obtained separately. One metering system will be installed for whole plant electricity consumption. It is conservative in validator's mind that other than the

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		for living will be monitored as project emission. The SKC_{ex} is calculated based on the third month operation record of the proposed project after commissioning operation. The calculation has been revised by selecting the data at 95% confidence level. The result has been corrected in the PDD. According to the national standard, there is no difference between the clinker produced by the proposed project and the clinker produced by the baseline. Therefore, unnecessary of considering or calculating this part of leakage. The higher energy performance is due to utilizing CCR, also due to the technology used. Different from the normal technology, the proposed project uses only surplus heat from kiln to dry all the materials. Therefore, the *SKC* is very high. The $SKC_{y,measured}$ is bigger than $SKC_{BSL.}$	above consumption, the electricity using for living will also be monitored as project emission. On site survey of the proposed project, DNV investigated the clinker design of the CCR as raw material and BAU clinker sourced from stone, the production of clinker is according to the national standard /30/, no difference will occur between the clinker produced by the proposed project and the clinker produced by the baseline. Therefore, it is reasonable for not considering or calculating this part of leakage. The $SKC_{y,measured}$ is bigger than SKC_{BSL} was justified. The CL was closed.
CL8 For data and parameters determined ex-ante, clarification is requested as following:	B.5.1. Table 2_ A.4.1. Table 2_ A.5.1.	Conservatively considered, the raw materials of baseline except limestone are calculated as Non-carbonated source. The percentage of raw	OK It is conservative to regard all the CaO and MgO sources other than limestone

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
The approach for obtaining $CaO_{RM, BSL}$ and $MgO_{RM,BSL}$, how to attribute those to Non-carbonated source merely; *By which way the data RM_{BSL} was available? Caculated or measured with field instruments;* *The basic data for calculating SKCBSL and $FC_{Dry,i}$.* Is it conservative when BE_{FC_Dry} is a part of calculation for BE_y, Whereas for the project activity, there is no fuel consumption for drying of raw material or fuel preparation?		materials, CaO and MgO are obtained by lab-analysis. For different raw materials, the volumes are measured with field instruments. The $FC_{Dry,i}$ and $CLNK_{BSL}$ are measured and NCV_i is from *China Energy Statistical Yearbook.* Therefore, SKC_{BSL} is calculated. Actually as the proposed project using the surplus heat from kiln to dry the fuel and raw materials, it could be considered using fuel for drying. Therefore, it is reasonable to included BE_{FC_Dry} in BE_y because the $FC_{i,y}$ is high.	as Non-carbonated which is obtained from the analysis data of accredited Lab of the project owner. From on-site visit, validation team noticed weighing instruments for all raw materials. SKC_{BSL} is calculated according to the annex of methodology and FCDry, i and $CLNK_{BSL}$ were verified to get from measurement. It is really conservative to include the BE_{FC_Dry} in BE_y. The CL was closed.
CL9 For leakage, the following issues need more justification. *Leakage due to transportation of new alternative raw materials (LE_{trans})* *Leakage from electricity consumption for conveyors system ($LE_{ElecConv,y}$)* *Leakage calculation due to change in electricity consumption in cement grinding and production* *Leakage calculation of a potential higher consumption of clinker in cement production*	B.6.1. B.6.2. B.6.3. B.11.1. Table 2_ A.5.1.	As the nearest limestone mine is about 30 km away while the CCR is transported to the proposed project using conveyors and all these two resources are the main component of the baseline and the proposed project, comparing the baseline and the proposed project, emissions are reduced and fuel are saved by the transportation of materials of the proposed project. Therefore, no leakage should be considered. Without separated monitoring meters, electricity consumption has been	OK The leakage due to transportation of CCR is ignored as the CCR for substituted stone using conveyor which is less energy consumption than normally 30 km for transportation of stone. The $PE_{Elec\_Grid,y}$ includes the electricity consumption for cement grinding which is considered as emission in the ER calculation. No consideration of higher consumption of

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
		considered in $PE_{Elec\_Grid,y}$. Since, according to the industry regulation, a standard sample will be used by the laboratory to control the clinker type, the clinker produced by the proposed project will be the same as the baseline scenario because the same sample will be used. Therefore, no leakage of potential electricity consumption increase and clinker consumption increase need to be considered in the following cement blending process of the proposed project.	clinker in the cement production is justified by the same industrial norms are followed in the preparation of batch and no sinter process change from the BAU clinker production. The CL was closed.
CL10 Updating of ER in ER spreadsheet and ER calculation in PDD should be made accordingly as brought by new basic data change.	B.7.1.	The ER calculation has been revised.	OK This has been confirmed the validation team. The CL was closed.
CL11 The measurement method needs to be clarified. In the PDD, under section B.7.1., for all the parameters in the table: • the part of "Description of measurement methods and procedures to be applied" needs be clarified according to the following requirements:	B.9.3. B.9.4. B.9.5. B.9.6. B.9.8. B.10.3. B.10.4.	Revised in the PDD.	OK This has been checked by validation team and deemed sufficient. The CL was closed.

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 2	Summary of project owner response	Validation team conclusion
"Description of measurement methods and procedures to be applied" needs be clarified according to the following requirements: *"specify the measurement methods and procedures, including a specification which accepted industry standards or national or international standards will be applied, which measurement equipment is used, how the measurement is undertaken, which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person/entity that should undertake the measurements and what is the measurement interval."* *"Any direct measurements with mass or volume meters at the plant site should be cross-checked with an annual energy balance that is based on purchased quantities and stock changes."*	B.10.5. B.10.6. Table 2_ A.6.1.		

APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Xiaojun Johnsen Zhang

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJI-i1)

GHG Auditor:		Yes				
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas						
Renewables	*Hydro power*	Jan 2009				
	Wind power	Jan 2009				
	Other renewable					
Biomass						
Grid connection of isolated system						
Cement		Jan 2009				
Waste-heat / waste-gas recovery						
Efficiency of thermal power plants						
Coal mine methane		Aug 2009	Aug 2009			
Fuel switch						
Manure management						
Waste / wastewater treatment						
Energy efficiency						
N_2O						
HFCs						
Flare reduction						
PFCs						
Charcoal						
CO_2 recovery						
Transport						
Non-renewable biomass						
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 28 August 2009

Michael Lehmann

Technical Director, Climate Change Services

CERTIFICATE OF COMPETENCE

Soumik Biswas

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJI-i1)

GHG Auditor:		Yes				
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas		Jan 2009				
Renewables	*Hydro power*	Jan 2009	Sept 2009			
	Wind power	Jan 2009	Jan 2009			
	Other renewable		Sept 2009			
Biomass		Jan 2009	Jan 2009			
Grid connection of isolated system			Sept 2009			
Cement		Jan 2009	Jan 2009			Aug 2009
Waste-heat / waste-gas recovery		Jan 2009	Jan 2009			Aug 2009
Efficiency of thermal power plants			Sept 2009			
Coal mine methane						
Fuel switch			Sept 2009	Jan 2009		
Manure management						
Waste / wastewater treatment						
Energy efficiency		Jan 2009	Jan 2009			
N_2O						
HFCs						
Flare reduction						
PFCs						
Charcoal			Sept 2009			
CO_2 recovery			Sept 2009			
Transport						
Non-renewable biomass			Sept 2009			
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 1 September 2009

Michael Lehmann

Technical Director, Climate Change Services

CERTIFICATE OF COMPETENCE

Kumaraswamy Chandrashekara

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJI-i1)

GHG Auditor:		yes				
Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Renewables	*Hydro power*	Jan 2009	Jan 2009		Jan 2009	
	Wind power	Jan 2009	Jan 2009			
	Other renewable	Jan 2009	Jan 2009			
Biomass		Jan 2009	Jan 2009		Jan 2009	
Grid connection of isolated system		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Cement		Jan 2009	Jan 2009		Jan 2009	
Waste-heat / waste-gas recovery		Jan 2009	Jan 2009	Jan 2009	Jan 2009	
Efficiency of thermal power plants		Jan 2009	Jan 2009		Jan 2009	
Coal mine methane		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Fuel switch		Jan 2009	Jan 2009		Jan 2009	
Manure management		Jan 2009	Jan 2009		Jan 2009	
Waste / wastewater treatment		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Energy efficiency		Jan 2009	Jan 2009	Jan 2009	Jan 2009	
N_2O		Jan 2009	Jan 2009		Jan 2009	
HFCs		Jan 2009	Jan 2009	Jan 2009	Jan 2009	
Flare reduction		Jan 2009	Jan 2009		Jan 2009	
PFCs		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Charcoal		Jan 2009	Jan 2009	Jan 2009	Jan 2009	
CO_2 recovery		Jan 2009	Jan 2009	Jan 2009	Jan 2009	Jan 2009
Transport		Jan 2009	Jan 2009		Jan 2009	
Non-renewable biomass		Jan 2009	Jan 2009		Jan 2009	
Biofuel		Jan 2009	Jan 2009		Jan 2009	Jan 2009
Pipeline leakage reduction		Jan 2009	Jan 2009		Jan 2009	
SF_6		Jan 2009	Jan 2009		Jan 2009	Jan 2009

Høvik, 9 January 2009

Michael Lehmann

Technical Director, Climate Change Services

CERTIFICATE OF COMPETENCE

Gloria Godinez

Qualification in accordance with DNV's Qualification Scheme CDM/JI (ICP-8-1-CDMJI-i1))

GHG Auditor:	Yes

Technical Area		***CDM Validator***	***CDM Verifier***	***Sector Expert***	***Methodology Expert***	***Technical Reviewer***
Landfill gas			Sept 2009			
Renewables	*Hydro power*					
	Wind power					
	Other renewable					
Biomass						
Grid connection of isolated system						
Cement				July 2009		
Waste-heat / waste-gas recovery						
Efficiency of thermal power plants						
Coal mine methane						
Fuel switch						
Manure management			Aug 2009			
Waste / wastewater treatment			Sept 2009			
Energy efficiency						
N_2O						
HFCs						
Flare reduction						
PFCs						
Charcoal						
CO_2 recovery						
Transport						
Non-renewable biomass						
Biofuel						
Pipeline leakage reduction						
SF_6						

Høvik, 1 September 2009

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