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Validation Report

VALIDATION OF THE CDM-PROJECT:
WASTE HEAT RECOVERY AND UTILIZATION FOR
POWER GENERATION AT LUCKY CEMENT LIMITED
PEZU PLANT

REPORT NO. 1368942

07 December, 2011

TÜV SÜD Industrie Service GmbH
Carbon Management Service
Westendstr. 199 - 80686 Munich – GERMANY

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1368942	29-07-2011	4	07-12-2011	-

Subject: Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant			
Accredited TÜV SÜD Unit: TÜV SÜD Industrie Service GmbH Certification Body “climate and energy” Westendstr. 199 80686 Munich Germany		TÜV SÜD Contract Partner: TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199 80686 Munich Germany	
Project Participants: 1. Lucky Cement Limited A. Aziz Hashim, Tabba Street, 6-A M. Ali Housing Society, Sindh, Karachi, Pakistan 2. Carbon Services Private Limited 19 Davis Road 2nd Floor, Al Maalik, Lahore, Punjab, Pakistan 3. First Climate (Switzerland) AG Stauffacherstr.45, Zurich, 8004, Switzerland		Project Site(s): Lucky Cement Factory, Pezu, District Lakki Marwat, Khyber Pakhtunkhwa (formerly NWFP), Pakistan GPS coordinates are as follows; Latitude: 32° 17´ 43" N Longitude: 70° 44´ 00" E	
Project Title: Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant			
Applied Methodology / Version:		AMS.III.Q/Version4	Scope(s): 4 Technical Area(s): 4.1
First PDD Version (GSP): Date of issuance: 10-07-2009 Version No.: 01 Starting Date of GSP 06-08-2009 Start date of Re-GSP 25-06-2011 Date of issuance: 23-06-2011 Version No.: 05		Final PDD version: Date of issuance: 30-11-2011 Version No.: 08	
Estimated Annual Emission Reduction:		29918 tCO ₂ e	
Assessment Team Leader: Khalid Mahmood Assessment Team Members: Robert Mitterwallner Auer Paula * Georgios Agrafiotis		Technical Reviewer: Thomas Kleiser, Nikunj Agarwal Responsible Certification Body Members: Thomas Kleiser	

*: The TA's of this project were covered during the on-site mission by Ms. Paula Auer as per the appointments valid at that time. She is not appointed yet as per new accreditation system.

Summary of the Validation Opinion:

- ☒ The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence for the determination of the project's fulfilment of all stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM. Therefore, TÜV SÜD recommends the project for registration by the CDM Executive Board if the letters of approval of all Parties involved will be available before the expiring date of the applied methodology (ies) or the applied methodology version respectively.
- ☐ The review of the project design documentation and the subsequent follow-up interviews have not provided TÜV SÜD with sufficient evidence for the determination of the project's fulfilment of all stated criteria. Therefore, TÜV SÜD will not recommend the project for registration by the CDM Executive Board and will inform the project participants and the CDM Executive Board of this decision.

Abbreviations

ACM	Approved Consolidated Methodology
AM	Approved Methodology
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction
CM	Combined Margin
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
CR / CL	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission Reduction
FSR	Feasibility Study Report
GHG	Green House Gas(es)
IPCC	Intergovernmental Panel on Climate Change
IRL	Information Reference List
IRR	Internal Rate of Return
KP	Kyoto Protocol
MP	Monitoring Plan
NGO	Non Governmental Organisation
OM	Operational Margin
PDD	Project Design Document
PP	Project Participant
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual
WECM	Waste Energy Carrying Medium

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1 INTRODUCTION

1.1 Objective

The objective of the validation process is to provide an independent assessment, by a third party (Designated Operational Entity = DOE), of a proposed project activity. The assessment involves the evaluation of the project basis and design identified in the Project Design Document (PDD) using the defined criteria outlined by the registration under the Clean Development Mechanism (CDM). Validation is part of the CDM project cycle and results in a conclusion by the executing DOE on whether a project activity is valid to be submitted for registration to the CDM Executive Board (CDM-EB). The ultimate decision on the registration of a proposed project activity rests with the CDM-EB and the Parties involved.

The project addressed in this validation report has been submitted under the project title:

Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant

1.2 Scope

The scope of any assessment is defined by the underlying legislation, regulation and guidance given by relevant entities or authorities. In the case of CDM project activities, the scope is set by:

- The Kyoto Protocol, in particular § 12 and modalities and procedures for the CDM
- Decision 2/CMP1 and Decision 3/CMP.1 (Marrakech Accords)
- Further COP/MOP decisions with reference to the CDM (e.g. decisions 4 – 8/CMP.1)
- Decisions and specific guidance outlined by the EB which are published under <http://cdm.unfccc.int>
- Guidelines for Completing the Project Design Document (CDM-PDD), and the Proposed New Baseline and Monitoring Methodology (CDM-NM)
- Baselines and monitoring methodologies (including GHG inventories)
- Management systems and auditing methods
- Environmental issues relevant to the sectoral scope applied for
- Applicable environmental and social impacts, and aspects of CDM project activity
- Sector specific technologies and their applications
- Current technical and operational knowledge of the specific sectoral scope and information on best practice

The validation process is not meant to provide any form of consulting for the project participant (PP). However, stated requests for clarifications, corrective actions, and/or forward actions may provide input for improvement of the project design.

Once TÜV SÜD receives a first PDD version, it is made publicly available on the UNFCCC website and on TÜV SÜD's website, which initiates 30 day global stakeholder consultation process (GSP), in special circumstances, such as when certain conditions allow the GSP to be repeated, a request to

revise the PDD will be processed. The original PDD and the modified PDD form the basis for the final evaluation. Information on both PDD's is presented on page 1 of this report.

The purpose of a validation is to demonstrate compliance or non-compliance of the project with all stated and valid CDM requirements. Additionally, the purpose of validation is to enable the registration of CDM projects, which is only a part of the total CDM project cycle.

2 METHODOLOGY

The project assessment is based on the "Clean Development Mechanism Validation and Verification Manual" version 1.2 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s) and relevant host country experience for evaluating the CDM project activity are appointed. Once the project is made available for the stakeholder consultation process, members of the team carry out the desk review, follow-up actions, resolution of issues identified, and finally the preparation of the validation report. The prepared validation report and other supporting documents then undergo an internal quality control by the CB "climate and energy" before being submitted to the CDM-EB.

In order to ensure transparency, assumptions must be clear and explicitly stated and background material must also be clearly referenced. TÜV SÜD developed a methodology-specific protocol customized for the project. The protocol demonstrates, in a transparent manner, the project criteria (requirements), discussion on each criterion by the assessment team, and the results from validating the identified criteria.

The validation protocol serves the following purposes:

- The organization of details and provision of clarifications on the requirements a CDM project is expected to meet;
- Transparency of the validation process where the Validator has to document how a particular requirement has been validated, as well as the results of the validation and any adjustments, if any, made to the project design.

The validation protocol consists of three tables. The different columns in these tables are described in the tables below.

Validation Protocol Table 1: Conformity of Project Activity and PDD				
Checklist Topic / Question	Reference	Comments	PDD in GSP	Final PDD
<i>The checklist is organised in sections following the arrangement of the applied PDD version. Each section</i>	<i>The section gives reference to documents in which the answer</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to</i>	<i>The section is used to present conclusions based on the assessment of the first PDD version. The PDD is either acceptable based on evidence provided <input checked="" type="checkbox"/> or a Corrective Action Request (CAR) is issued</i>	<i>In this section, conclusions are presented in the same manner based on the assessment of the final PDD version and further</i>

<i>is then further sub-divided. The lowest level constitutes a checklist question / criterion.</i>	<i>to the checklist question or item is found in case the comment refers to documents other than the PDD.</i>	<i>explain the conclusions reached. In some cases sub-checklists are applied indicating yes/no decisions on the compliance with the stated criterion. Any Request has to be substantiated within this column.</i>	<i>due to non-compliance with the checklist question (See below). Clarification Request (CR) is used when the validation team has identified a need for further clarification. Forward Action Request is issued to highlight issues related to project implementation that require review during the first verification.</i>	<i>documents including assumptions presented in the documentation.</i>
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Validation Protocol Table 2: Resolution of Corrective Action and Clarification Requests			
Clarifications and corrective action requests	Ref. to table 1	Summary of project owner response	Validation team conclusion
<i>If the conclusions from table 1 are either a Corrective Action, a Clarification or a Forward Action Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 1 where the issue is explained.</i>	<i>The responses given by the client or other project participants during communication with the validation team should be summarised in this section.</i>	<i>This section should summarise the discussion on and revision to project documentation together with the validation team's responses and final conclusions. The conclusions should be reflected in Table 1, under "Final PDD".</i>

In case of a denial of the project activity more detailed information on this decision will be presented in Table 3.

Validation Protocol Table 3: Unresolved Corrective Action and Clarification Requests		
Clarifications and corrective action requests	Id. of CAR/CR	Explanation of the Conclusion for Denial
<i>If the final conclusions from table 2 results in a denial, the referenced request should be listed in this section.</i>	<i>Identifier of the Request.</i>	<i>This section should present a detailed explanation on why the project is finally considered not to be in compliance with a criterion providing a clear reference to the requirement which is not complied with.</i>

The completed validation protocol is enclosed in Annex 1 to this report.

2.1 Appointment of the Assessment Team

According to the technical scopes and experiences in the sectoral or national business environment, TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV SÜD certification body "climate and energy".

The composition of an assessment team has to be approved by the Certification Body (CB) to assure that the required skills are covered by the team. The CB TÜV SÜD operates four qualification levels for team members that are assigned by formal appointment rules:

- Assessment Team Leader (ATL)
- Greenhouse Gas Validator (GHG-A)
- Greenhouse Gas Validator Trainee (T)
- Experts (E)

It is required that the sectoral scope/s and the technical area/s linked to the methodology and project have to be covered by the assessment team.

Name	Qualification	Coverage of scope	Coverage of technical area	Coverage of financial aspects	Host country experience
Khalid Mahmood	ATL				<input checked="" type="checkbox"/>
Robert Mitterwallner	GHG-A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (4.1)		
Ms. Auer Paula*	GHG-A				
Georgios Agrafiotis	GHG-T			<input checked="" type="checkbox"/>	

*: The TA's of this project were covered during the on-site mission by Ms. Paula Auer as per the appointments valid at that time. She is not appointed yet as per new accreditation system.

Technical Reviewer:

- Thomas Kleiser, Nikunj Agarwal

2.2 Review of Documents

The first version of the PDD was submitted to DOE in July 22nd, 2009 with AM0024 but later during the validation process, the PPs changed the methodology and submitted the PDD in May 2011 again for the repeat GSP. It became clear during the validation that existing captive power plant used more than one type of fuels for which AM0024 was not applicable. The PP kept waiting for result of revision request AM_REV_0141 for AM0024 (covering multiple fuels) until November 2010. The decision was taken to merge AM0024 with ACM0012. However, the revision draft for ACM0012, did not address the issue of multiple fuel consumption in the captive power plant. Consequently, the PP decided to switch over to small scale methodology. A request for revision of AMS III Q V3 (SSC_497) was submitted in December 2010 which was finally approved (as AMS III Q Version 4) in EB 60 meeting and became effective on April 15, 2011. The PP submitted the revised SSC PDD for the project activity to TÜV SÜD on May 26, 2011 which became available for repeat GSP on June 23, 2011. The PDD and additional background documents related to the project design and baseline have been reviewed to verify the correctness, credibility, and interpretation of the presented information. The repeat GSP PDD does not affect the project description, project boundary or additionality aspects of the project activity which stay the same both in first GSP PDD and repeat GSP PDD

Furthermore, a cross-check between information provided and information from other sources has been done as an initial step of the validation process. A complete list of all documents and evidence material reviewed is attached as annex 2 to this report.

2.3 Follow-up Interviews

The previous validation of the project activity under AM0024 covered already on-site interviews and telephone conferences from 2009 to 2010. During 24/05/2011 to 05/07/2011, TÜV SÜD performed interviews, telephone conferences, and physical site inspections (12/05/2010) with project stakeholders to confirm relevant information, and to resolve issues identified in the first document review. The project discussion was done on September 30th, 2009 in head quarter of Lucky Cement Limited in Karachi but due to security situation in Pakistan, it was not possible for TÜV SÜD to perform the onsite. During the discussion part, Project proponent presented video and audio description of plant. The onsite interview was done later in May 12th, 2010 (because the security situation in the project area was better).

The following table provides a list of all persons interviewed in this process.

Persons Interviewed:

Name	Organisation
Qazi Sabir	Senior Project Manager (Carbon Services (Private) Limited Pakistan)
Feroz Baig	Project Engineer (Carbon Services (Private) Limited Pakistan)
Mohammad Qutubuddin Baig	Technical Director (Lucky Cement Limited)
Intisar Haqqi	Director Power Generation (Lucky Cement Limited)
Hassan Mazhar	Deputy General Manager, Power generation (Lucky Cement Limited)
Muhammad Shahid Patel	Deputy Manager , costing and budgeting (Lucky Cement Limited)
Muhammad Faisal Panawala	Senior Account officer (Lucky Cement Limited)

2.4 Cross-check

During the validation process the team has made reference to available information related to similar projects or technologies as the CDM project activity. Project documentation has also been reviewed against the approved methodology/ies applied to confirm the appropriateness of formulae and correctness of calculations.

2.5 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve the requests for corrective actions, clarifications, and any other outstanding issues which needed to be clarified for TÜV SÜD's conclusion on the project design. The CARs and CRs raised by TÜV SÜD were resolved during communication between the client and TÜV SÜD. To guarantee the transparency of the validation process, the con-

cerns raised and responses that have been given are documented in more detail in the validation protocol in annex 1.

The final PDD version submitted November 2011 serves as the basis for the final assessment presented. Further changes to the project during the validation process are not considered to be significant with respect to the main CDM objectives. The two CDM main objectives are the reduction of anthropogenic GHG emissions and the contribution to the host country sustainable development.

2.6 Internal Quality Control

Internal quality control is the final step of the validation process and involves the internal quality control check by the CB “climate and energy” of the final documentation, which includes the validation report and annexes. The completion of the quality control indicates that each report submitted has been approved either by the head of the CB or the deputy (a veto person can be used if necessary). In projects where either the Head of the CB or his/her deputy is part of the assessment team, the approval is given by the one not serving on the project.

After confirmation by the PP, the validation opinion and relevant documents are submitted to the EB through the UNFCCC web-platform.

3 SUMMARY

The assessment work and the main results are described below in accordance with the VVM version 1.2 reporting requirements. The reference documents indicated in this section and annex 1 are stated in annex 2.

3.1 Approval

The project participants are Lucky Cement Limited & Carbon Service Limited of the Islamic Republic of Pakistan and First Climate (Switzerland) AG of Switzerland. The host Party Pakistan and further participant party Switzerland meet the requirements to participate in the CDM.

The DNA of Pakistan has issued a LoA (IRL 42) on August 26th, 2011 authorizing Lucky Cement Limited (Pakistan), Carbon Services Private Limited (Pakistan), and First Climate (Switzerland) AG as project participants. The DNA of Switzerland has also issued a LoA (IRL 43) on November 25th, 2011, authorizing First Climate (Switzerland) AG (Switzerland) as a project participant. TÜV SÜD received these letters from the project participants directly and considers the provided letters as authentic.

The Pakistan LoA has further been double-checked with the CDM project webpage sponsored by the Ministry of Environment, Government of Pakistan, in this way further confirming the approval of this CDM project by the host country (http://cdmpakistan.gov.pk/cdm_pjtapproval.html).

Furthermore, after checking the provided LoAs, TÜV SÜD confirms that both letters refer to the precise proposed CDM project activity title in line with the title in the PDD “Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant”.

Both LoA letters also indicate that each participating Party is a Party to the Kyoto Protocol, and that the participation in the Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant project is voluntary. The Pakistan LoA also confirms that the proposed CDM

project activity contributes to the sustainable development of Pakistan (host country). Based on the information given in these letters, TÜV SÜD considers the approval as unconditional with respect to these items.

Both LoAs have been issued by the respective Party's DNA, the Ministry of Environment of Pakistan and the Federal Office for the Environment of Switzerland.

TÜV SÜD considers that the requirements of VVM (§§ 45-48) have been met.

The LoAs do not specify a version number of the PDD or validation report. The corresponding references included in LoA, PDD and validation report are consistent.

3.2 Participation

The participants of the project activity have been approved by the corresponding Parties, which is confirmed by the issued LoAs.

The means of validation used are similar to the ones described in section 3.1, specifically in regard to the approval process of the project activity.

3.3 Project design document

The PDD is compliant with relevant form and guidance as provided by UNFCCC.

The most recent version of the PDD form was used.

TÜV SÜD considers that the guidelines for the completion of the PDD in their most recent version have been followed. Relevant information was provided by the participants in the applicable PDD sections. Completeness was assessed through the checklist included in annex 1 of this report.

3.4 Project description

The following description of the project as per PDD was verified during the on-site audit:

The objective of the project is to generate electricity by using waste heat from clinker production lines at the Lucky Cement Limited Pezu Plant (LCL) in Khyber Pakhtunkhwa, formerly NWFP, Pakistan. The waste heat will come from two dry clinker production lines (Kiln C and D) with a capacity of 3300 tons per day (TPD) for each line. To utilize the recovered waste heat, the Project activity involves installation of four Heat Steam Recovery Generator (HRSGs) two on each kiln (one at the pre-heater end and one at the cooler end of kiln and a steam turbine having a rated power output capacity of 10MW. . Lucky Cement Limited pezu plant has no grid connection for electricity import or export. Waste heat from the kilns is released to the atmosphere prior to the implementation of the project activity. Apart from the small share of waste heat that is used to pre-heat the raw meal, the waste heat from clinker kilns is as well released into the atmosphere prior to the project implementation. Although, paragraph 3 of AMS-III.Q, version 04 requires that “no waste heat was recovered from the project activity source prior to the implementation of the project activity”, it has been clarified by Annex 20 of EB61 report that project activities that recover waste heat in the baseline are eligible to AMS-III.Q anyway subject that “the current practice of recovering small amounts of waste energy continues during the crediting period”. Hence, the project activity on hand is eligible for AMS-III.Q, version 04.

The electricity generated by the Project activity will displace the electricity which would have been produced by the existing Captive Power plant. The cement plant has captive power plant which has 10 dual fuel wartisila generator sets consuming natural gas , HFO (Heavy Fuel Oil) and diesel. The

proposed project will lead to net electricity production (gross power generation - auxiliary consumption) of 58,291 MWh per year and expected to reduced the 29,918 tCO₂.

The project will contribute to sustainable development by improving energy efficiency of the cement industry in Khyber Pakhtunkhwa province, formerly NWFP. , reducing global emissions of greenhouse gases and creating employment opportunities for local residents.

The above described features of the project activity have been confirmed by on-site interviews with stakeholders and PP in September 2009 (discussion part) and during physical on-site inspection in May 2010. The information presented in the PDD on the technical design is consistent with the actual planning and implementation of the project activity as confirmed by:

- Review of data and information (see annex 2 e.g. equipment capacity and performance/lifetime).
- An on-site visit has been performed and relevant stakeholder and personnel with knowledge of the project were interviewed.
- Finally, information related to similar projects or technologies as the CDM project activity e.g. load factor of the project, electricity and thermal energy indicators have been used to validate the accuracy and completeness of the project description.

In conclusion, TÜV SÜD confirms that the project description, as included in the PDD, is sufficiently accurate and complete in order to comply with the requirements of the CDM.

3.5 Baseline and monitoring methodology

3.5.1 Applicability of the selected methodology

The used version 4 of the selected baseline and monitoring methodology AMS.III.Q is valid. In respect to this version, no specific EB guidance has been identified." Compliance with each applicability condition as listed in the chosen baseline and monitoring methodology AMS-III.Q Version 4 and relevant tools have been demonstrated:

- Corresponding section of ACM0012 (version 04.0.0, to estimate the capping factor)

The project uses the waste heat to generate electricity. The recovery of waste heat in the Project activity is new initiative. Historically major portion of the waste heat was vented to the atmosphere with a small portion recovered to pre-heat raw materials for clinker production. After the implementation of the WHR project the raw material shall be pre-heated with the waste heat. Although, paragraph 3 of AMS-III.Q, version 04 requires that "no waste heat was recovered from the project activity source prior to the implementation of the project activity", it has been clarified by Annex 20 of EB61 report that project activities that recover waste heat in the baseline are eligible to AMS-III.Q anyway with subject to the condition that "the current practice of recovering small amounts of waste energy continues during the crediting period". Hence, the project activity on hand is eligible for AMS-III.Q, version 04.

The assessment was carried out for each applicability criteria and included, among other checks, the compliance check of the local project setting with the applicability conditions in regard to baseline setting and eligible project measures. This assessment also included the review of secondary sources, which further demonstrate that applicability conditions have been complied with the methodology specific protocol, included in the annex 1, documents the assessment process. The protocol also includes the steps taken in the assessment process. The results of the compliance check as well as relevant evidence are detailed in annex 1.

TÜV SÜD confirms that the chosen baseline and monitoring methodology is applicable and valid for the project activity.

Emission sources, which are not addressed by the applied methodology, and which are expected to contribute more than 1% of the overall expected average annual emission reductions, have not been identified.

3.5.2 Project boundary

The project boundary was assessed in the context of physical site inspection, interviews and secondary evidence received on the design of the project.

According to the applied methodology (AMS III.Q version 04) the project boundary is defined as the physical, geographical site of the facility where the waste heat is produced and transformed into useful energy.

In the project activity under validation, the facilities that involve fuel consumption and electricity generation by the captive power plant, clinker production process at kilns (Kiln C and D) and electricity generated by the waste heat recovery project are part of project boundary. The project boundary is in compliance with paragraph 7a of AMS.III.Q version 4.

The most relevant documents assessed in order to confirm the project boundary are the following:

- "Initial Environmental Examination Report" prepared by Environmental Consultancy and Services (IRL 15).
- Decision on Initial Environment Examination (IEE), issued by Environment Protection Department, Government of the Khyber Pakhtunkhwa, formerly NWFP, Peshawar (IRL18);
- Equipment purchase contract of Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant between Sinoma Energy conservation Ltd & Lucky Cement Limited (IRL 27)

Details and observations are listed in Annex 1.

The documents have been validated during the validation process using standard audit techniques. Further details of any observation are transparently presented in Annex1.

Therefore, TÜV SÜD confirms that the identified boundary, the selected sources and gases as documented in the PDD are justified for the project activity and fully in line with the requirements set by the applied methodology.

3.5.3 Baseline identification

The baseline scenario equals the scenario prior to the implementation of this project activity. This scenario involves the continued venting of the waste heat into the atmosphere by the pre-heater and the clinker cooler of the kilns and production of electricity in the Captive power plant by using diesel, Heavy Fuel Oil and natural gas as fuel. It has been clarified by Annex 20 of EB 61 report that project activities that recover waste heat in the baseline are eligible to AMS-III.Q anyway subject that "the current practice of recovering small amounts of waste energy continues during the crediting period". Hence, the project activity on hand is eligible for AMS-III.Q, version 04.

During the on-site visit it was checked and confirmed by the audit team that there is a captive power plant and there is no waste heat recovery from the kilns except the common practice of utilizing a small portion of it for preheating the raw material in the raw mill and preheating the coal.

The information presented in the PDD has been validated by an initial document review of all data related to baseline (i. e. historical data of three years for emission reduction calculation from October 2004 to September 2007 (IRL 19, 28, 29, 45, 46); Further confirmation of baseline scenario validated as per para 5h, (iii) of AMS.III. Q version 04 has been made based on the on-site visit (confirmation of raw mill and coal preheating and no existing waste heat recovery) and a review of information from similar projects technologies. TÜV SÜD confirms that no reasonable alternative scenario has been excluded and that the continuation of the current practice; venting of waste heat from the clinker production process to atmosphere and supply of electricity by the existing capacity of captive power plant is the most plausible baseline scenario in the absence of proposed CDM project activity.

Based on the validated assumptions used for project activity calculations, TÜV SÜD considers that the identified baseline scenario is reasonable.

Taking the definition of the baseline scenario into account, TÜV SÜD confirms that all relevant CDM requirements, including relevant and sectoral policies and circumstances, have been identified correctly in the project PDD.

A verifiable description of the baseline scenario has been included in the PDD.

In regard to item 87 of VVM, TÜV SÜD confirms the following statements:

- (a) All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- (b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- (c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence, and can be deemed reasonable;
- (d) Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD;
- (e) The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario, and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

3.5.4 Algorithm and/or formulae used to determine emission reductions

TÜV SÜD has assessed the calculations of baseline emissions and emission reductions. Corresponding calculations have been carried out based on calculation spreadsheets (IRL 37). The parameters and equations presented in the PDD, and further documentation have been compared with the information and requirements presented in the methodology and respective tools. The equation comparison has been made explicitly following all the formulae presented in the calculation files

The assumptions and data used to determine the emission reductions are listed in the PDD and all the sources have been checked. Based on the information reviewed it can be confirmed that the sources used are correctly quoted and interpreted in the PDD.

The values presented in the PDD are considered reasonable based on the documentation reviewed, further references and the results of the interviews. The baseline methodology has been applied correctly according to requirements. The estimated baseline emissions can be confirmed, as the same have been replicated by the audit team using the information provided.

More detailed information on the verification of the parameters used in the emission reduction calculations can be found in Annex 1 of this report. The algorithms for the determination of the baseline, project, and leakage emissions are discussed in the following sections.

3.5.4.1 Baseline Emissions

TÜV SÜD has assessed the calculations of project emissions, baseline emissions and leakage a de-mission reductions. Corresponding calculations were carried out based on calculation spreadsheets. The parameters and equations presented in the PDD and further documentation have been compared with the information and requirements presented in the methodology and respective tools. The equation comparison has been made explicitly following all the formulae presented in the calculation files. The calculation of the baseline emissions have been conducted using procedures described in the methodology AMS.III.Q, Version 04.

"The waste heat from the clinker production process has been released to the atmosphere with only a small portion utilized for preheating the incoming raw material and coal".

The situation has been confirmed by audit team during on site visit (IRL 3 & 3a).

According to the methodology baseline emissions for year y are calculated as:

The formula is

$$BE_{elec,y} = f_{cap} * f_{wcm} * \sum_j \sum_i (EG_{i,j,y} * EF_{Elec,i,j,y})$$

Where:

$BE_{elec,y}$	Baseline emissions due to displacement of electricity during the year y in tons of CO ₂
$EG_{i,j,y}$	The quantity of electricity supplied to the recipient j by generator, that in the absence of the project activity would have been sourced from i th source (in the project activity i is existing captive power plant) during the year y in MWh
$EF_{elec,i,j,y}$	The CO ₂ emission factor for the electricity source, displaced due to the project activity, during the year y in tons CO ₂ /MWh
f_{wcm}	Fraction of total electricity generated by the project activity using waste energy. For the project activity this fraction is 1 because the electricity generation is purely from the use of waste heat
f_{cap}	Capping factor to exclude increased waste energy utilization in the project year y due to increased level of activity of the plant, relative to the level of activity in the base years before the project start. The ratio is 1 if the waste energy generated in the project year y is same or less than generated in base years. F_{cap} will be estimated according to the corresponding section of ACM0012.

As the baseline generation source is an identified existing plant, the parameter $EG_{i,j,y}$ corresponds to $EG_{is,y}$ and the emission factor $EF_{elec,i,j,y}$ corresponds to $EF_{Elec,is,y}$. The CO₂ emission factor shall be determined as follows:

$$EF_{Elec,is,j,y} = \frac{EF_{CO2,i,j}}{\eta_{Plant,j}} \times 3.6 * 10^{-3}$$

Where:

$EF_{CO_2,i,j}$ The CO₂ emission factor per unit of energy of the fossil fuel used in the baseline generation source i in (tCO₂/TJ), obtained from reliable local or national data if available, otherwise, taken from the country specific IPCC default emission factors

$\eta_{Plant,j}$ The overall efficiency of the existing plant that would be used by j^{th} recipient in the absence of the project activity

3.6×10^{-3} Conversion factor, expressed as TJ/MWh

In the baseline, the captive power plant consumes more than one type of fossil fuel (HFO, NG, and diesel) therefore CO₂ emission factor per unit of energy of the fossil fuels used in the baseline shall be weighted emission factor calculated by using the following equation;

$$EF_{CO_2,i,j} = \frac{\sum_i (FC_{i,y} \times NCV_i \times COEF_i)}{\sum_i (FC_{i,y} \times NCV_i)}$$

Where:

$EF_{CO_2,i,j}$ The CO₂ emission factor per unit of energy of the fossil fuels used in the baseline generation source i in (tCO₂/TJ), obtained from reliable local or national data if available, otherwise, taken from the country specific IPCC default emission factors

$FC_{i,y}$ Consumption of fossil fuel (mass or volume unit) in project situation at captive power plant

NCV_i Net calorific value (energy content per unit mass or energy content per unit volume units) of fossil fuel used in baseline

$COEF_i$ Coefficient of fossil fuel (tCO₂/TJ) used in baseline situation

i Fossil fuel type

According to AMS-III.Q / Version 04, efficiency of the power plant ($\eta_{plant,j}$) has been determined using option (i) of paragraph 8(a) as provided below.

- Assume a constant efficiency of the captive plant and determine the efficiency, as a conservative approach, for optimal operation conditions i.e., design fuel, optimal load, optimal oxygen content in flue gases, adequate fuel conditioning (temperature, viscosity, moisture, size/mesh etc.), representative or favourable ambient conditions (ambient temperature and humidity).

The existing captive power plant has two types of gensets as listed in Table B.4.2.2 of PDD. The highest designed efficiency (44.12%) between the two types of gensets is of Wartsila Gensets. As a conservative approach, a constant efficiency of 44.12% for the captive power plant is selected as per option (i) for efficiency of power plant. Hence $\eta_{plant,j} = 44.12\%$.

Calculation of f_{wcm}

According to the methodology $f_{wcm} = 1$ because the electricity generation of the project is from use of waste heat.

Calculation of f_{cap}

Since there is no historical data on parameters of the waste energy from the cement clinker production and it's not possible to measure it due to different technical reasons Method-3 for f_{cap} calculation was chosen. Since there are heat exchangers in the project scenario where waste energy is transferred from WECM to water for steam generation and further production of electricity case 1 of Method-3 for f_{cap} calculation has been chosen. Due to information, method 1 and 2 are not applicable. The detail description has been provided in PDD.

equation. 40 of ACM0012 version 4 has been used to determine f_{cap} :

$$f_{cap} = \frac{Q_{OE,BL}}{Q_{OE,y}}$$

Where

$Q_{OE,BL}$ "Output/intermediate energy that can be produced (TJ), to be determined on the basis of maximum energy that could be recovered from the WECM (MER), which would have been released (or WECM would have been flared or energy content of WECM would have been wasted) in the absence of CDM project activity"..

$Q_{OE,y}$ Quantity of actual output/intermediate energy during year y (TJ)

According to feasibility study report (28); in the proposed project, the theoretical electricity output $Q_{OE,BL}$ is 63,360 MWh/year with 80% PLF. The actual output electricity $Q_{OE,y}$ will be determined ex post by actual measurement. For ex-ante calculation, the value of $Q_{OE,y}$ has been assumed to be the same as $Q_{OE,BL}$. As the project activity does not envisage increased level of activity of the cement plant, this is a reasonable assumption.

The method selected for the calculation of f_{cap} was thoroughly discussed during onsite validation and parameters used for its determination were verified against historical plant operational days and project plant capacity (IRL 14). Historical operational days of plant can be calculated from historical clinker production reports (IRL 20). Kilns C & D at Lucky Cement pezu plant have the *same clinker production capacity of 3300 tons per day (TPD)*. The method selected for calculation of f_{cap} (Case 1 of Method 3), which is based on **Final Output Energy (electrical MWh)** of the project plant, does not require calculation of f_{cap} for each kiln.

As for our experience with clinker production plants 330 days per year operation of the project plant estimated by the project proponent is quite realistic and reasonable. This can be verified against number of operational days considered by similar Cement Sector CDM projects of Pakistan in section 3.6.3 below of this validation report.

f_{cap} is calculated as by Case 1 of Method 3:

$$Q_{OE,BL} = 10 * 330 * 24 * 80\% = 63,360 \text{ MWh/yr} = 228,096 \text{ TJ}$$

There are several projects already registered which use similar approach like UNFCCC No, 4208, 3564, 3674.

Based on its local and sectoral expertise, TÜV SÜD confirms that f_{cap} is in line with corresponding section of ACM0012 version 4 and paragraph 89-92 of VVM v1.2.

3.5.5 Project emissions

For the project emission, the paragraph 13 & 14 of AMS-III.Q / Version 04 has been considered.

There is no auxiliary fuel combusted in the project activity to supplement waste gas and the waste heat recovery system consumes its own electricity for auxiliary needs.

Similarly, the project activity does not incinerate any waste gas to generate energy. Therefore, the project emissions are considered zero and there are no project emissions due to the Project activity. (PE = 0).

3.5.6 Leakage

The equipments being used in the project activity are not transferred from outside the boundary and the installed equipments are brand new (IRL 27). Therefore; there is no leakage by the Project activity. (LE = 0).

3.5.7 Emission Reductions

In summary, the calculation of the baseline emissions, project emissions, leakage, and the emission reductions can be considered correct. All the calculations regarding baseline emissions, project emissions, leakages and the emission reductiona are explained in detail in emissions reduction calculation spreadsheet (IRL 37).

3.6 Additionality

The additionality of the project has been presented in the PDD using following approach:

As per Attachment A to Appendix B of the simplified modalities and procedures for small scale CDM project activity categories, the PP has chosen Investment Barrier to demonstrate the financial unattractiveness of the project activity.

The approach used in the PDD has been assessed initially through the document review, during which the following documents were reviewed:

- Feasibility Study Report of Lucky Cement Limited Pezu Waste heat Recovery Plant (FSR) (IRL 28),
- IRR calculation spreadsheet (IRL 13)
- Letter from All Pakistan Cement Manufacturer's Association confirming that waste heat recovery is a not common practice in the cement industry (IRL 35)

On site, the additionality was discussed principally with Mr Qazi Sabir, Senior Project Manager Carbon Services (Private) Limited Pakistan and Mr Intisar Haqqi, Director Power Generation at Lucky Cement Limited. Further documents have been reviewed on-site (for details see Information Reference List in Annex 2).

Finally, the data, rationales, assumptions, justifications, and documentation provided have been verified using local knowledge as well as sectoral and financial expertise. The same has been cross checked against:

- The Board meeting (October 22nd, 2007) of high officials of Lucky Cement Limited, to make decision to proceed with the approval procedure under CDM revenue's support (IRL 40).

- CDM consulting Contract of Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited, between Lucky Cement Limited and First climate (Switzerland) AG (formerly Factor Consulting + Management AG) (IRL 39)
- Email confirmation from DNA Pakistan that Waste Heat Recovery Based Power Generation is not a Common Practice in cement Industry of Pakistan (IRL 46).

Based on the aforementioned approach, TÜV SÜD confirms that the documentation provided is appropriate for this project.

3.6.1 Prior consideration of the clean development mechanism

The starting date of the project activity is May 7th 2008 which is determined by signing of purchasing contract for major equipment of the project activity (IRL 27), when the first real action for expenditure was done which is in line with **Glossary of CDM terms**. In order to confirm the same, the assessment team has reviewed the following documents.

- Equipment purchase contract of Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited, Pezu Plant (IRL 27)

In addition, the assessment team cross checked this information with Mr Qazi Sabir, Senior Project Manager Carbon Services (Private) Limited Pakistan and Mr Intisar Haqqi, Director Power Generation of Lucky Cement Limited during various discussions on site.

The starting date of the project activity is determined to be 7th May, 2008 which is before 02 August 2008, as well as prior to the GSP (06 August, 2009) The PPs presented the following information to the assessment team:

- E-mail introduction of Carbon Services Private Limited on 3rd February 2007 about Income Potential from Carbon credits (IRL 7)
- The Board meeting (October 22nd, 2007) of high officials of Lucky Cement Limited (IRL 40) indicates that the project participant was aware of the CDM prior to the starting date, and that the benefits of the CDM were a decisive factor in the decision to proceed with this project. This fulfill the requirement of EB 62 Annex 13 page 1 § 6 a

The original of the documentation presented have been reviewed and crosschecked based on interviews with Mr Qazi Sabir, Senior Project Manager Carbon Services (Private) Limited Pakistan and Mr Intisar Haqqi, Director Power Generation of Lucky Cement Limited. Hence the documents are considered credible to confirm the prior consideration of CDM. Additionally, in order to confirm that the PP has taken real actions to continue the activity as CDM and the following timeline has been reviewed against the respective documents presented in the table below.

Date	Activity	Document	Auditor conclusion
3 February 2007	CDM awareness	Copy of E-mail introduction of Carbon Services Private Limited to Lucky Cement Limited about Income Potential from Carbon credits (IRL 7)	TÜV SÜD has checked the authenticity of CDM awareness email. TÜV SÜD confirms that this is in line with EB 62, Annex 13 paragraph 6 (b).
22 October 2007	Investment Decision	Extract of Minutes of the Board Directors meeting of Lucky Cement Limited (IRL	Project approval at the highest management level, well before the starting date. TÜV

		40)	SÜD has checked the authenticity of investment decision. TÜV SÜD confirms that this is in line with EB 62, Annex 13 paragraph 6 (b).
07 May 2008	Starting date of the project activity	Equipment purchase contract for Pezu plant between Lucky Cement Limited and Sinoma Energy Conservation Ltd (IRL 27)	Document is plausible and complete and in accordance with the definition of a project starting date in the "CDM Glossary of Terms". TÜV SÜD has checked the authenticity of equipment purchase contract. TÜV SÜD confirms that this is in line with EB 62, Annex 13 paragraph 6 (b).
12 August 2009	Start of Civil Works	Copy of Inter office Memo of Lucky Cement Limited. (IRL 49)	Document meets the requirements for evidence of "continued action" according to EB62, Annex 13. TÜV SÜD has checked the authenticity of start of civil work. TÜV SÜD confirms that this is in line with EB 62, Annex 13 paragraph 6 (b)
10 July 2009	Validation contract with TÜV SÜD	Validation Contract (IRL 41)	Document meets the requirements for evidence of "continued action" according to EB62, Annex 13 Paragraph 6(b).
25 July 2009	Start of the Global Stakeholder Process on UNFCCC website	UNFCCC website	-
14 October 2009	LoA Pakistan for Lucky Cement Limited Pezu Plant	Copy of Letter of approval (IRL 42)	Document meets the requirements for evidence of "continued action" according to EB62, Annex 13 paragraph 6(b). TÜV SÜD has checked the authenticity of LoA. TÜV SÜD confirms that this is in line with EB 62, Annex 13 paragraph 6 (b)
25 November 2010	LoA Swiss for Lucky Cement Limited Pezu Plant	Copy of Letter of approval (IRL 43)	Document meets the requirements for evidence of "continued action" according to EB62, Annex 13. TÜV SÜD has checked the authenticity of LoA. TÜV SÜD confirms that this is in line with EB 62, Annex 13 paragraph 6 (b).

25 June 2011	Start of the repeated Global Stakeholder Process with new applied methodology AMS.III.Q version 4 on UNFCCC website	UNFCCC website	-
26 August 2011	Updated LoA Pakistan for Lucky Cement Limited Pezu Plant (Updating of LoA was required because in old version of LoA, the name of the project title and PP was not consistent with PDD).	Copy of Letter of approval (IRL 42)	Document meets the requirements for evidence of "continued action" according to EB62, Annex 13 paragraph 6(b). TÜV SÜD has checked the authenticity of LoA. TÜV SÜD confirms that this is in line with EB 62, Annex 13 paragraph 6 (b)

This confirms that the project complies with the requirements to demonstrate the prior consideration of the CDM.

3.6.2 Investment analysis

The PP uses the investment barrier to demonstrate the additionality.

The financial returns of the proposed project without CDM revenues are insufficient to justify the investment.

The parameters used in the financial calculations have been validated based on a review of the sources presented in the PDD, inter alia: Feasibility Study Report (FSR; IRL 28), investment costs, O&M costs, electricity generation (load factor) and have been cross checked on site.

The FSR has been the basis of the decision to proceed with the investment in the project, the period of time between the finalization of the FSR (October 10th, 2007) and the investment decision (October 22nd, 2007) is sufficiently short for the DOE to confirm that it is unlikely in the context of the underlying project activity that the input values would have materially changed.

The IRR presented in the GSP-PDD was 7.95% while the IRR in repeated GSP-PDD is 7.73% while the IRR in FSR is 7.73%. The difference in IRR values of GSP-PDD (with AM0024) and in repeated GSP was due to different input values applied in IRR spread sheet and PDD. The correction has been made and the IRR indicated in the Repeated GSP (with AMS.III.Q), in final PDD and IRR spreadsheet is 7.73% which are fully consistent with the IRR values in FSR.

The values used in the PDD and associated annexes are fully consistent with the FSR and fulfils the requirement of VVM v 1.2 paragraph 113 (b). The input values applied for the investment analysis were further cross checked with following documents in order to evaluate their plausibility and appropriateness.

- IRR calculation spreadsheet (IRL 13)
- Equipment purchase contract between Lucky Cement Limited / Sinoma Energy Conservation Limited for Pezu Plant on May 7th, 2008 (IRL 27)

- Quarterly Report of the State bank of Pakistan (Financial Year 2004) that shows that KIBOR was also introduced as a reference rate for corporate lending in February 2004 (IRL 9)
<http://sbp.org.pk/reports/quarterly/fy04/thirdQtr/Money%20Market.pdf>
<http://sbp.org.pk/ecodata/kibor/2007/>
- Financial information was requested by PP by Citi Bank Pakistan about the benchmark, Karachi Inter Bank offer rates (KIBOR) and basis point (IRL 10)

The input parameters used in the financial analysis were compared with the data reported for other similar WHR CDM projects in Pakistan under validation* as shown in Table, comparing investment costs, percentage of O&M costs relative to total investment costs and the plant load factor.

Table 1: Cement WHR projects (with the available data) comparison in Pakistan

Project Name	MW	Investment Cost	O&M costs O&M-I [%]	Plant Load Factor
DGKCC Waste Heat Recovery and Utilization for 10.4 MW Power Generation at Dera Ghazi Khan Plant http://cdm.unfccc.int/Projects/Validation/DB/XDNBLIDFFBLQR11A0SD86KIXIF5KUM/view.html	10.4MW	1,563,000,000	78,150,000.00 (5% of total investment cost)	85%
Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited, Karachi Plant http://cdm.unfccc.int/Projects/Validation/DB/JZDZOGOA8Z0GM9JZYUINLHLIRU2IN/view.html	15MW	1,301,778,622	65,088,931 (5% of total investment cost)	80%
Waste Heat Recovery and Utilization for Power Generation at Cherat Cement Company Limited, Nowshera, Pakistan http://cdm.unfccc.int/Projects/Validation/DB/XN4SGWEQVUD7QMVCZW9KRWCI6D97D4/view.html	7MW	966,090,433	48,304,521.64 (5% of total investment cost)	70%
Waste Heat Recovery based 15 MW Power Generation Project at Bestway Cement Limited, Chakwal, Pakistan (UNFCCC Registration no. 3555 *) http://cdm.unfccc.int/Projects/Validation/DB/DLZHSFAMK6BA3FCS3SCCTDCIGSIKN/view.html	15MW	-	-	82%
Waste Heat Recovery and Utilization for Power Generation at Maple Leaf Cement Factory Limited, Iskanderabad, Pakistan http://cdm.unfccc.int/Projects/Validation/DB/P740TN7NRBRKEWN9AM3RM0L6BN0CXU/view.html	13.9MW	2,016,210,843	104,400,000 (5.1% of total investment cost)	90%
Waste Heat Recovery Power Plant at Fecto Cement Limited http://cdm.unfccc.int/Projects/Validation/DB/BRBHLN7AWUFXK6Q16JXXFNNOEE9Y14/view.html	6MW	7183200 USD= Equivalent to 610,572000 PKR	Information not available-	-

Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant http://cdm.unfccc.int/Projects/Validation/DB/5THY9Y15CIN_FMYJXYV51WVXMFRHX83/view.html	10MW	960,000,000	48,000,000 (5% of total investment cost)	80%
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**: there is only one WHR CDM registered project but that was first of its kind.*

Project Investment Cost

The investment costs mentioned of the project are 960,000,000 PKR (Pakistani Rupees) which includes machinery and material, training, management and technical services, duties, taxes and freight charges as well as local costs. The depreciation period of 20 years has been used in project and the fair value of the project investments will be 0 at the end of the analysis period. Depreciation and financial expenses are only used for tax calculation and added back to net profits for the calculation of the project IRR. During the course of validation, the project investment cost was validated based on the formal presentation by project proponent and cross verified against equipment purchase contract for Pezu Plant signed between Lucky Cement Limited and Sinoma Energy Conservation Limited on May 7th, 2008 (IRL 27), Civil work contract (IRL 49) and bank loan offer (IRL 8) .

Project Basic Information

	Value in PKR	Source of data
Project Investment (machinery and material, training, management and technical services, duties, taxes and freight charges and local costs)	960,000,000	Feasibility Study Report (IRL 28) Equipment purchase contract (IRL 27) Loan offer from Bank (IRL 8)
Commercial Lending Rate	11.73%	KiBOR rates (IRL 53) Loan offer from Bank (IRL 8)
Project Loan period	5 years	Loan offer from Bank (IRL 8)
O&M Cost	48,000,000 5% of total investment every per year)	Equipment purchase contract (IRL 27) An independent Consultants Letter, PITCO Letter (21)
O&M Overhaul Cost	28,800,000 (3% of total investment every five years)	An independent Consultants Letter, PITCO Letter (21)
Tax on net income	35% per year	Income Tax Ordinance issued by Government of Pakistan (IRL 52)
Technical life time of plant	20 years	Feasibility Study Report (IRL28)

Actual total investment costs

The project investment costs estimated in FSR were 960 million PKR. These have been crosschecked against the actual equipment purchase contract costs (Imported plant & Machinery-Sinoma China) (IRL 5) and Freight, Duties, Taxes & Others costs (IRL 61) which amounts to 1035 million PKR. Costs like civil work, mechanical works & material cost, electrical and instrumentation, pre-production overheads are still not included in the actual project investment of 1035 million. So it is clear that the project investment costs estimated in FSR are lower and therefore conservative compared to the real investment costs).

Operational & Maintenance Cost and Major Overhaul costs

The operational & maintenance cost and major overhaul cost estimated in Feasibility Study Report (IRL 28) are based on information provided by PITCO (Third party Consultancy Firm) (IRL 21). According to the consultancy firm the operational and maintenance cost in WHR projects in Cement Industry in Pakistan are 5 to 7 % of CAPEX (Investment) while overhaul cost are 3-5% of CAPEX while the frequency of Overhaul cost is every 4-5 years. Based on information from "Consultancy Firm" the project participants selected the operational and maintenance cost of 5 instead of 7% which is conservative value while the overhaul cost are considered 3% instead of 5% which is conservative value. The Operation and Maintenance Costs 48,000,000 PKR considered for the project activity are 5% of the total investment costs with an annual increase of 10%. This increase is due to rapidly increasing labour wages and costs associated with technical services. According to technology supplier (Sinoma Energy Conservation Limited) (IRL 27), after every 5 years, an overhaul of the installed equipment is necessary which will cost 28,800,000 PKR which are 3% of the investment costs indexed by the annual increase of 10% of the Operation and Maintenance Costs. According to DOE experience with similar projects in the host country (Pakistan), 5% of O & M costs compared to the total investment costs is a rather conservative figure and hence, deemed reasonable. The operational & maintenance cost 5 % and major overhaul costs of 3% every five years have been cross checked against the letter provided by PITCO (An independent third party consultancy) (IRL 21).

- Operational and maintenance cost information provided by PITCO (Consultancy firm) (IRL 21), according to the Consultancy firm the Operational and maintenance cost in WHR projects in Cement Industry are 5 to 7 % of CAPEX while overhaul cost are 3-5% of CAPEX while the frequency of Overhaul cost is every 4-5 years. PITCO has been providing services in Energy, Enegeering & Environmental Consulting services since 1938 and PITCO has been a leader in Pakistan's energy sector. PITCO provide a range of products and services to different clients, which include Government Utilities, Independent Power Producers, Private Industrial Companies, Government and Semi-Government Organizations.
<http://www.pitcopk.com/index.htm>

It is mentioned on page 130 of third party audit report prepared by KPMG Taseer Hadi & Corporation for year 2011; the total annaul operational and maintenance costs of lucky Cement plants (Lucky karachi plant & Lucky Pezu plant) were 2171 million PKR (IRL 64). It is discussed and confirmed by PP during onsite visit that the operational and maintenace costs cover the individual sub-items: Salaries, wages and benefits, Insurance, Store and spares consumed and Repair and Maintenance (IRL 62); accordig to evidence submitted by Lucky Cement Limited (IRL 62), the total operational and mainatenance costs for nine months after operation of the project activity from October 2010 till june 2011 were 38.61 Million PKR and after complete year the O&M costs will be higher than the estimated operational and maintenance costs (48 million PKR) in Feasibility Study Report (IRL 28). By comparing the total operational and maientence cost of lucky WHR project pezu plant project verses total investment costs; the O&M costs of nine months are 3.73% of total investment cost of project activity. Based on its local and sectoral expertise, TÜV SÜD confirms that the estimated 5% operational and maintenance costs in FSR for proposed project are realistic.

Based on its local and sectoral expertise, TÜV SÜD confirms that financial calculations are in line with VVM version 1.2 § 111, a, b & c.

Operational Hours, Electricity production & Auxiliary Consumption

During the onsite visit, the operational hours, Electricity production & Auxiliary Consumption were discussed in detail. According to historical data of the Lucky Cement pezu Plant, Number of operational days depends upon market demand of cement in the local and international market which is variable in year. According to Feasibility Study Report (IRL 28) in the project situation, Lucky Ce-

ment Limited plans to run the cement manufacturing plant for 330 days which is quite realistic and achievable production plan. 330 days operational of lucky cement plant means the plant load factor of 80%. According to DOE experience with similar projects, this is a rather conservative figure in terms of additionality.

Operational Characteristics of Steam Turbo-Generator	
Operational days per annum	330
Operational hours per day	24
Average load factor	80%
Gross electricity generation (MWh/year)	$10 \times 330 \times 24 \times 80\% = 63,360$
Auxiliary consumption (MWh/year)	$63,360 \times 8\% = 5,069$
Net electricity generation (MWh/year)	$63,360 - 5,069 = 58,291$

Comparison of plant loaf factor of different WHR projects in Pakistan

Sr No.	Project Name	Plant Load Factor
1	DGKCC Waste Heat Recovery and Utilization for 10.4 MW Power Generation at Dera Ghazi Khan Plant	85%
2	Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited, Karachi Plant	80%
3	Waste Heat Recovery and Utilization for Power Generation at Cherat Cement Company Limited, Nowshera, Pakistan	70%
4	Waste Heat Recovery based 15 MW Power Generation Project at Bestway Cement Limited, Chakwal, Pakistan (UNFCCC Registration no. 3555)	82%
5	Waste Heat Recovery and Utilization for Power Generation at Maple Leaf Cement Factory Limited, Iskanderabad, Pakistan	90%
6	Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant	80%

Based on it local and sectoral expertise, TÜV SÜD confirms that the estimated load factor, Gross electricity generation and auxiliary consumption of electricity are realistic and plausible.

Income Tax

The tax rate considered in the proposed project for calculation of investment analysis is 35% which is in line with the Government of Pakistan Income Tax Regulation (IRL 52).

Benchmark

The applied benchmark in the PDD and IRR Spread sheet of proposed project is 11.73 % which is based on;

- Karachi Inter-bank Offered Rate (KIBOR)
- Credit spread over the KIBOR charged by the local bank.

KIBOR was officially introduced by State Bank of Pakistan as a reference rate for all corporate in Pakistan in February 2004 by state bank of Pakistan (third party). KIBOR is always determined by State Bank of Pakistan. The credit spread calculation is performed by local banks in Pakistan which determine it based on various project specific risks or characteristics of a project type.

- KIBOR rate of 2007 are available at the website of State Bank of Pakistan (IRL 53): <http://sbp.org.pk/ecodata/kibor/2007/>
- Press release by State Bank of Pakistan: <http://www.sbp.org.pk/press/2004/jan-21-04.pdf> (IRL 54)
- Third Quarterly report of State Bank of Pakistan FY04 (IRL 55): <http://sbp.org.pk/reports/quarterly/fy04/thirdQtr/Money%20Market.pdf>

The commercial lending rate is determined by taking the average of three month KIBOR for September 2007 which is 9.73% and adding to it a credit spread of 200 basis points which is based on offer by Habib Metropolitan Bank Limited, a local bank in Pakistan (IRL 8). The benchmark thus evaluated was $(9.73\% + 2.0\%) 11.73\%$.

The applied benchmark is in compliance with the requirements of EB 62, Annex 5. It is discussed in detail during onsite visit of lucky cement Pezu plant that the project activity could be implemented by another entity instead of Lucky Cement Limited like any Energy Service Company (ESCO) that would bear all the project related costs and recover its investment by claiming a portion of savings generated by the project activity. As the KIBOR and average spread are determined by the third party State Bank of Pakistan & Local Bank respectively, it is clear that the approach used for the calculation of benchmark (KIBOR + basis point) is appropriate.

Benchmark determined by relevant National Authority

It has been discussed by TÜV SÜD that there is no benchmark established by the Government of Pakistan for WHR based power projects. There are some benchmarks established by Government of Pakistan but only for hydropower and thermal power projects which are irrelevant in the context of the current project activity. Based on its local and sectoral expertise, TÜV SÜD confirms that there is no benchmark available in Pakistan for WHR based power projects.

Comparison of the Chosen Benchmark with Other Benchmarks

According to "Pakistan Cement Sector Review 2007" prepared by IGI Securities (IRL 32) which is a well renowned private company in Pakistan. The calculated WACC for financial year 2007 for Lucky Cement by IGI Securities is 13.10%. As per guidance provided in *Annex 5 to EB62*, Weighted Average Costs of Capital (WACC) and benchmark determined by relevant national authority are also appropriate benchmarks for a project IRR which could be used to conduct the investment analysis for the project activity.

The benchmark mentioned in EB 62 annex 5 as default values of the expected return on equity is 15.5%. So the applied benchmark in the project activity 11.73% is conservative than 15.5%.

Based on discussion above; TÜV SÜD considers that the applied benchmark of 11.73% used in the proposed project is conservative as compared to WACC rate of 13.10% and the default expected return on equity rate of 15.5%.

Sensitivity analysis

The sensitivity analysis was analyzed in detail and TÜV SÜD confirms that the underlying assumptions, parameters and chosen values are appropriate and that the calculations have been performed correctly. Sensitivity analysis was performed on the project investment cost, O&M cost, HFO cost, NG cost and Load factor of steam Turbine.

In the sensitivity analysis test, variation of $\pm 10\%$ has been considered. 10% is the latest guidance from EB as indicated in the guidance on the investment analysis from EB 62 (Annex 5). It deems reasonable to use the applied variables, they present well realistic variations of these key parameters.

The main results of investment analysis show that IRR for Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant has been calculated with and without CDM revenues.

The project IRR without CDM revenues is 7.73% which means that the proposed project is economically unattractive and fulfils the requirement of additionality. The IRR of the proposed project with taking into account the income of selling CERs the IRR increases to 11.96% which is higher than the benchmark IRR of 11.73%. So the proposed project is economically attractive with CDM revenues. The sensitivity analysis shows that the results are robust, even a variation of $\pm 10\%$ in the above mentioned parameters does not make the project economically additional without the CDM benefits. For the project investment, the limit of financial viability is situated at a total investment cost decrease of 16.58%. This is highly unlikely in the present project. Likewise, an increase of more than 24.35% in HFO price, an increase of more than 30.30% in NG price or a decrease of 29.70% in O&M costs would turn the project additional. Based on its local and sectoral expertise, TÜV SÜD confirms that such a high variation in the input parameters is unlikely to happen. The approach taken is fully in line with the given requirements and the minimum required range of $\pm 10\%$ is fully covered. The results indicate that it is highly unlikely that the project IRR would overcome the benchmark IRR. The assessment team was able to verify the results of the sensitivity analysis and confirms that the necessary increase and decrease in these parameters in order to overcome the benchmark is impossible.

The financial calculations have been verified and no mistakes have been found.

3.6.3 Barrier analysis

Barrier analysis was not applied for this project

3.6.4 Common practice analysis

Common practice analysis is not required for small scale project.

3.7 Monitoring plan

The monitoring plan presented in the PDD complies with the requirements of the applicable methodology AMS.III.Q version 4. The assessment team has verified all parameters in the monitoring plan against the requirements of the methodology; no relevant deviations have been found.

The procedures have been reviewed by the assessment team through document review and interviews with the relevant personnel. This information, together with a physical site inspection, allows the assessment team to confirm that the proposed monitoring plan is feasible, and in line with the project design. The major parameters to be monitored have been discussed with the PPs, in particu-

lar with regard to the location of meters, data management, and the quality assurance and quality control procedures to be implemented in the context of the project.

According to the monitoring plan in the PDD, the net quantity of electricity supplied by the project activity to the recipient plant as for para 17a, EGi,j,y [MWh], will be measured continuously by an energy meter. Para 18 of AMS-III.Q is not applicable here since generated power is not exported to other facilities or to the grid. The QA/QC procedure planned is to cross check the results of the direct measurements with annual energy balances. The assessment team checked that QOE, y is a monitoring parameter in the MP as for para 19 of AMS-III.Q. Para 20 of AMS-III.Q is not applicable here. Furthermore, the applicable requirements specified in “General Guidelines to SSC CDM methodologies” as of para 21 of AMS-III.Q are deemed to be fulfilled by the MP. Therefore, the PPs will be able to implement the monitoring plan and the achieved emission reductions can be reported ex-post and verified

3.8 Sustainable development

The project will lead to sustainable development through employment generation, generation of clean energy, and introduction of energy efficient technologies to the host country. The project has received the host country approval letter which also indicates that the project will contribute to the sustainable development in Pakistan (IRL 42).

3.9 Local stakeholder consultation

The relevant local stakeholders meeting have been invited through advertising in newspaper (Daily Subhah, Thursday, January 20th, 2009). The evidence for the invitation is IRL 16 and IRL 17 for the meeting. The assessment team has reviewed the documentation in order to validate the inclusion of relevant stakeholders. Using local expertise it can be confirmed that the communication method used to invite the stakeholders is appropriate. The summary of comments presented in the PDD has been cross checked with the documentation of the stakeholder consultation and it is found to be complete.

The relevant comments presented by the local stakeholders have been taken into due account by the PP; the same has been cross checked with the information obtained during the interviews. As a result, TÜV SÜD considers the applied process for the local stakeholder consultation as adequate and appropriate.

3.10 Environmental impacts

The project participants undertook an analysis of environmental impacts of the project. An EIA as for item 161 of the VVM was not required for this project in accordance with the host country requirements (IRL 48, (Pakistan Environmental Protection Agency (Review of IEE and EIA) Regulations). No significant negative impacts are caused by the project activity. The assessment team reviewed the documentation of the presented information. IRL 18 confirms the correctness of the approach used by the PP (IRL 18, Environmental Approval, issued by Environment Protection Department, Government of the Khyber Pakhtunkhwa, formerly NWFP Peshawar, Pakistan). We conclude that the PP followed the requirements of the host country in regard to environmental impacts.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TÜV SÜD published the project documents on the UNFCCC website, and invited comments by affected Parties, stakeholders, and non-governmental organisations during a 30 day period.

The following table presents all gathered key information:

website: http://www.netinform.de/KE/Wegweiser/Guide2_1.aspx?ID=6271&Ebene1_ID=26&Ebene2_ID=2042&mode=1 https://cdm.unfccc.int/Projects/Validation/DB/95H1A0HXY2G5482CYRPB2WJM8ITS1V/view.html	
Starting date of the global stakeholder consultation process: 2009-08-06	
Comment submitted by: None	Issues raised: -
Response by TÜV SÜD: -	

Re-GSP Comments

website: http://www.netinform.de/KE/Wegweiser/Guide2_1.aspx?ID=7249&Ebene1_ID=26&Ebene2_ID=2420&mode=1 https://cdm.unfccc.int/Projects/Validation/DB/5THY9Y15CINFMYJXYV51WVXMFRHX83/view.html		
Starting date of the global stakeholder consultation process: 2011-06-25		
Comment submitted by:	Issues raised: -	
Comments	PP responses	TÜV SÜD response
TÜV SÜD received the comment during the re-GSP of the project stated below. Please clarify the below comments. Comment No:1 1. DOE to ensure that the PDD values are consistent and ensure that the CDM project is a genuine project. 2. DoE to check the Detailed Project Report and Feasibility Report which is submitted to the other agencies	1. All the comments are quite generic. It seems that the author did not really analyze the PDD of the project, as he is presenting various cases (see the sentence where it is	Comment No 1. 1. During the onsite visit of the project activity; TÜV SÜD discussed and checked the input parameter that applied in FSR, PDD and IRR spreadsheet. The DOE conclusions about in-

<p>and Banks by Project owner and ensure that the values match with the DPR/FR submitted to DoE also.</p> <p>3. Careful study must be done so that the DPR/FR is not in different versions made and submitted with different purposes to different agencies, which is totally unacceptable, illegal and unethical.</p> <p>4. Project owner should show some undertaking letter from bank manager to DoE stating that both DPR's are same. These kinds of letters should not be accepted and entertained by DoE at face value, but must be checked independently. While collecting the DPR/FR from banks and other agencies, all DPR/FR pages should be counter signed by Banks and other agencies so that the real DPR/FR given to other parties by the PP/Consultant is same as the one submitted to DOE.</p> <p>5. DPR/FR values must be probed fully. DOE must take a written undertaking from the PP/Consultant about the list of parties to whom this DPR/FR is submitted and for what purposes. Then DOE should cross check with all the parties and confirm that the same DPR/FR is submitted to all the parties correctly without any changes. DOE must not accept any reports and undertakings from PP/Consultant. DOE must make independent evaluation and use totally different parties without informing the PP or Consultant to cross check the facts.</p> <p>6. DOE to write to the party who prepared the DPR/FR which is submitted to the banks and other agencies and the same is verified against the one submitted to the DOE by PP/Consultant.</p> <p>7. DOE must not entertain this project any more if found the DPR/FR is tampered with at any point in time. PP can not give different DPR's and FR's. They must submit only the one given to Banks and other agencies while obtaining loans and decision making time.</p> <p>8. Has the PP considered the CDM revenues while envisaging the project? Without CDM the project was not viable, is it right? This project is having a debt component? Then how bankers or lenders gave the loan? Have the bankers or lenders considered the CDM revenues</p>	<p>said "This project is having a debt component?" and a bit below "If the project is fully equity project then...", which clearly show that the comment is generic, and the author did not even check which case (debt or equity) specifically applies to this project.</p> <p>Above all, rather than finding any substantial issue with the project activity itself, the author seems to be suggesting a sort of "guidelines" for the DOE as to how to do conduct the validation. The PP believes that Validation and Verification Manual issued by UNFCCC provides a comprehensive guidance in this regard; hence, the comments put forward by the author are redundant.</p> <p>Furthermore, it is pertinent to mention here that during the course of validation the PP has provided the DOE with all the requisite supporting documents, evidences and information (which are reliable, transparent, verifiable and authentic) and based on these the DOE has conducted the requisite checks/cross-checks to verify the authenticity or genuineness of all the claims made in the PDD with regard to FSR, Investment Analysis Emission Reduction Calculations (and the input parameters used therein), CDM awareness, seriousness of CDM consideration, starting date of the project activity, equipment purchase agreement, baseline and project data, etc.</p> <p>2. See response provided in point 4 above</p> <p>3. See response provided in point 4 above</p> <p>4. See response provided in point 4 above</p> <p>5. See response provided in</p>	<p>put parameters has been provided in chapter 3.6 of this validation report (please see above). There is no PDR of project. It was also discussed during onsite and PP confirms that FSR was prepared internally and was never shared with any other institutions or departments.</p> <p>2. TÜV SÜD has discussed with PP and checked the FSR; there is no PDR of project. FSR of the project activity was never submitted to any other agencies for any purpose.</p> <p>3. TÜV SÜD has checked the FSR and there is no PDR of project and that the submitted FSR to DOE is same that was discussed onsite.</p> <p>4. TÜV SÜD has checked the credibility of FSR which is prepared by PP and input parameters have been discussed and checked during onsite, more detail has been provided in chapter 3.6 of validation report above. No approval of FSR is required in host country from government authorities.</p> <p>5. TÜV SÜD has discussed during onsite visit and PP confirmed that FSR was prepared internally and was never shared with other intuitions or departments. The deatail description of additionality of project has been discussed in Chapter 3.6 of this report (please see above).</p> <p>6. During the onsite of the project activity TÜV SÜD discussed and checked that FSR was prepared internally and was never shared with other intuitions or departments. There is no PDR of project activity.</p> <p>7. During the onsite of the project activity TÜV SÜD discussed and checked and crosschecked the input parameter that applied in FSR, PDD and IRR spreadsheet. The DOE conclusions about input parameters has been provided in chapter 3.6 of this validation report (please see above). There is no PDR of project. It was also discussed during onsite and PP confirms that FSR was prepared internally and was never shared with other intuitions or departments.</p> <p>8. Detail discussion how the additionality of project has been validated has been discussed in chapter 3.6 of this</p>
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<p>while agreeing to give loan to this projects? If not this project should be rejected right away by DOE by terminating the contract forthwith. If yes, where is the proof? What is the date of the evidence document from bank? Is this document printed now a days or earlier. DOE to independently check the same. If the document is available from Bank it must be checked from all angles so that it is genuine and not forged and date changed by putting back dated. This is normally done, DOE to be aware of this please. Please check the communication the PP had during that time with banks, emails and postal receipts and the weights and dates mentioned on the receipts. Do not believe in courier bills and receipts since these can be cooked up easily. Insist on government owned postal service receipts only. If the project is fully equity project then on what basis the PP has invested full equity in to the project while considering the CDM revenue? DOE to check the same in detail and bring out the facts. Is there any past record of this PP to invest or not to invest at returns what he is talking about in this project? Proper evidences must be reviewed and digged out by the DOE and take decision on the project based on established facts. Do not ask documents from PP, DOE to collect the same from different sources to do independent evaluation.</p> <p>9. Is the project equipment purchased second hand equipment or sourced from cheap foreign sources? If yes, the issue must be probed by DOE since invoices will invariably be inflated and forged. Total project costs mentioned by PP will not be the same as originals. Hence no additionality. These facts must be probed in full by DOE by checking all documents and money transactions along with bank statements and certified accounts by a legally acceptable financial analyst.</p> <p>10. From DOE side which auditor has done marketing and business development for acquiring this business of validating this project? With whom he or she was co-ordinating at PP or CER buyer? The same person who has done the marketing and business development to ac-</p>	<p>point 4 above</p> <p>6. See response provided in point 4 above</p> <p>7. See response provided in point 4 above</p> <p>8. See response provided in point 4 above</p> <p>9. See response provided in point 4 above</p> <p>10. See response provided in point 4 above</p> <p>11. See response provided in point 4 above</p> <p>12. See response provided in point 4 above</p> <p>13. See response provided in point 4 above</p>	<p>validation report.</p> <p>9. DOE has checked the equipment purchase contract and date of signing of equipment purchase contract is the start date of the project activity clearly proof that installed equipment is brand new, this has been discussed in details in chapter 3.6.1 and 3.6.2 of this validation report.</p> <p>10. TÜV SÜD confirms that audit team was never involve in any marketing activity. The audit team has no conflict of interest with PPs.</p>
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<p>quire the business do validation or participate in any manner what so ever in the validation process? One cannot do like that. It is against the accreditation rules and norms followed since ages. DOE should send auditors from different offices or countries to do this validation audit. DOE must take care of impartiality and accreditation rules. Due to the targets set by the DOE managements auditors are doing marketing and meeting clients and giving promises that the project will be taken care. Is it acceptable and fair? This must be stopped. No auditor should do marketing. Only non-auditing staff should do marketing. DOE to ensure the same please.</p> <p>11. If applicable only: Is these machines, equipment was a part of any bundle of CDM activity envisaged and developed earlier. DOE to check the same through independent sources also. Once some bundles are non-additional and getting negative validation from a DOE, PP is rolling out the same project as an individual project which is not a CDM project at all. DOE to verify the same from independent sources and also take undertaking in the form of an affidavit from the PP's that any misrepresentation or false statement with respect this would attract strict legal action from UNFCCC and DOE. Furthermore the registered project must be de-registered in case of any future findings contradicting the submissions made by the project owner.</p> <p>12. DOE to be more careful so that this is a genuine CDM project. What is the exact project cost? The project cost is covering what? Each value considered must be validated with proof. The machinery is second hand purchased or fresh and new from an OEM? In either case DOE to check all the quotations, proposals, purchase orders, invoices, way bills, transport bills, proof of payments like bank statements. DOE to check with banks by way of written confirmation the amount transacted, to whom the money is paid, when the money is paid, is the party paid is the correct party as shown in the purchase orders. It may so happen that the values, party names, dates are fabricated and misrepresented</p>		<p>11. TÜV SÜD checked onsite and confirms that installed equipment of project activity is brand new. For more details, please see chapter 3.6 of this validation report above.</p> <p>12. DOE has described the cost of project in chapter 3.6 of this validation report. For more details regarding additionality, please see chapter 3.6 of this validation report above.</p>
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<p>in this project. DOE should terminate their contract for this project immediately. This is the only way out to protect the value of CDM process. If the PP is purchasing second hand or second quality equipment and inflating the purchase order values and invoices, this must be probed thoroughly and real values to taken for additionality calculation. Then I'm sure the additionality is not there at all in such a situation.</p> <p>13. How is the base line defined in this project? Is Base line hypothetically defined with no proper evidences and proper justification? In such case, DOE cannot take the base line as suggested by the PDD. Please check that there are real emission reductions beyond the real and factual base line. It may so happen that this project qualifies for no CER's. DOE cannot assume values and things as giving by this PP. Whatever values are considered throughout the project in all documents including the real DPR (not the one prepared for CDM, the one given to the banks and others), they must be validated, verified and double checked. Do not ask PP for DPR. Ask the parties who have been given DPR by the PP. Get directly from the bank and others by each page of the DPR and Feasibility report signed. Such document can be considered as a real DPR or FR. UNFCCC CDM process cannot be degraded by fabricating and misinterpreting the project base line and additionality.</p> <p>Submitted by: sud, sudcdm2@gmail.com</p> <p>Comment No 2:</p> <p>DOE to be more careful so that this is a genuine CDM project. What is the exact project cost? The project cost is covering what? Each value considered must be validated with proof. The machinery is second hand purchased or fresh and new from an OEM? In either case DOE to check all the quotations, proposals, purchase orders, invoices, way bills, transport bills, proof of payments like bank statements. DOE to check with</p>		<p>13. The baseline of the project activity has been discussed in detail in chapter 3.5.3 of this validation report above.</p> <p>Comment No. 2</p> <ul style="list-style-type: none"> - TÜV SÜD discussed and checked and crosschecked the input parameter that applied in FSR, PDD and IRR spreadsheet. The DOE conclusions about input parameters has been provided in chapter 3.6 of this validation report (please see above). There is no PDR of project. It was also discussed during onsite and PP confirms that FSR was prepared internally and was never shared with other intuitions or departments.
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<p>banks by way of written confirmation the amount transacted, to whom the money is paid, when the money is paid, is the party paid is the correct party as shown in the purchase orders. It may so happen that the values, party names, dates are fabricated and misrepresented in this project. DOE should terminate their contract for this project immediately. This is the only way out to protect the value of CDM process. If the PP is purchasing second hand or second quality equipment and inflating the purchase order values and invoices, this must be probed thoroughly and real values to taken for additionality calculation. Then I'm sure the additionality is not there at all in such a situation.</p> <p>How is the base line defined in this project? Is Base line hypothetically defined with no proper evidences and proper justification? In such case, DOE cannot take the base line as suggested by the PDD. Please check that there are real emission reductions beyond the real and factual base line. It may so happen that this project qualifies for no CER's. DOE cannot assume values and things as giving by this PP. Whatever values are considered throughout the project in all documents including the real DPR (not the one prepared for CDM, the one given to the banks and others), they must be validated, verified and double checked. Do not ask PP for DPR. Ask the parties who have been given DPR by the PP. Get directly from the bank and others by each page of the DPR and Feasibility report signed. Such document can be considered as a real DPR or FR. UNFCCC CDM process cannot be degraded by fabricating and misinterpreting the project base line and additionality.</p> <p>Has the PP considered the CDM revenues while envisaging the project? Without CDM the project was not viable, is it right? This project is having a debt component? Then how bankers or lenders gave the loan? Have the bankers or lenders considered the CDM revenues while agreeing to give loan to this projects? If not this project should be rejected right away by DOE by terminating the contract forthwith. If yes, where is the proof? What is the date of</p>	<p><u>Under Comment No: 2</u>, the author just repeats verbatim the comments that he provided under Comment No: 1, using slightly different e-mail address. He just changed the order of the comments appearing under Comment No: 1 and new sequence turns out to be:</p> <p>12, 13, 8, 9, 10, 11, 1, 2, 3, 4, 5, 6, 7</p> <p>Therefore, no separate response is provided for the sub-comments appearing under Comment No:2</p>	<ul style="list-style-type: none"> - The baseline of the project activity has been discussed in detail in chapter 3.5.3 of this validation report above. - Detail discussion how the additionality of project has been validated has been discussed in chapter 3.6 of this validation report.
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<p>the evidence document from bank? Is this document printed now a days or earlier. DOE to independently check the same. If the document is available from Bank it must be checked from all angles so that it is genuine and not forged and date changed by putting back dated. This is normally done, DOE to be aware of this please. Please check the communication the PP had during that time with banks, emails and postal receipts and the weights and dates mentioned on the receipts. Do not believe in courier bills and receipts since these can be cooked up easily. Insist on government owned postal service receipts only. If the project is fully equity project then on what basis the PP has invested full equity in to the project while considering the CDM revenue? DOE to check the same in detail and bring out the facts. Is there any past record of this PP to invest or not to invest at returns what he is talking about in this project? Proper evidences must be reviewed and digged out by the DOE and take decision on the project based on established facts. Do not ask documents from PP, DOE to collect the same from different sources to do independent evaluation.</p> <p>Is the project equipment purchased second hand equipment or sourced from cheap foreign sources? If yes, the issue must be probed by DOE since invoices will invariably be inflated and forged. Total project costs mentioned by PP will not be the same as originals. Hence no additionality. These facts must be probed in full by DOE by checking all documents and money transactions along with bank statements and certified accounts by a legally acceptable financial analyst.</p> <p>From DOE side which auditor has done marketing and business development for acquiring this business of validating this project? With whom he or she was co-ordinating at PP or CER buyer? The same person who has done the marketing and business development to acquire the business do validation or participate in any manner what so ever in the validation process? One cannot do like that. It is against the accreditation rules and norms followed since ages. DOE should send auditors from different offices or countries to do this validation</p>		<ul style="list-style-type: none"> - DOE has checked the equipment purchase contract and date of signing of equipment purchase contract is the start date of the project activity, this has been discussed in details in chapter 3.6.1 and 3.6.2 of this validation report. - TÜV SÜD confirms that audit team was not involve in any marketiing activity.
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<p>audit. DOE must take care of impartiality and accreditation rules. Due to the targets set by the DOE managements auditors are doing marketing and meeting clients and giving promises that the project will be taken care. Is it acceptable and fair? This must be stopped. No auditor should do marketing. Only non-auditing staff should do marketing. DOE to ensure the same please.</p> <p>If applicable only: Is these machines, equipment was a part of any bundle of CDM activity envisaged and developed earlier. DOE to check the same through independent sources also. Once some bundles are non-additional and getting negative validation from a DOE, PP is rolling out the same project as an individual project which is not a CDM project at all. DOE to verify the same from independent sources and also take undertaking in the form of an affidavit from the PP's that any misrepresentation or false statement with respect this would attract strict legal action from UNFCCC and DOE. Furthermore the registered project must be de-registered in case of any future findings contradicting the submissions made by the project owner.</p> <p>DOE to ensure that the PDD values are consistent and ensure that the CDM project is a genuine project</p> <p>DoE to check the Detailed Project Report and Feasibility Report which is submitted to the other agencies and Banks by Project owner and ensure that the values match with the DPR/FR submitted to DoE also.</p> <p>Careful study must be done so that the DPR/FR is not in different versions made and submitted with different purposes to different agencies, which is totally unacceptable, illegal and unethical.</p> <p>Project owner should show some undertaking letter from bank manager to DoE stating that both DPR's are same. These kinds of letters should not be accepted and entertained by DoE at face</p>		<p>- TÜV SÜD confirms that project activity is not bundled project</p> <p>- DOE has discussed the additionality of project in chapter 3.6 of this validation report.</p> <p>- TÜV SUD has discussed during onsite visit and PP confirmed that FSR was prepared internally and was never shared with other intuitions or departments.</p> <p>- During the onsite of the project activity TÜV SÜD discussed and checked that FSR was prepared internally and was never shared with other intuitions or departments. There is no PDR of project activity.</p> <p>- DOE has discussed the additionality of project in chapter 3.6 of this validation report.</p>
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<p>value, but must be checked independently. While collecting the DPR/FR from banks and other agencies, all DPR/FR pages should be counter signed by Banks and other agencies so that the real DPR/FR given to other parties by the PP/Consultant is same as the one submitted to DOE.</p> <p>DPR/FR values must be probed fully. DOE must take a written undertaking from the PP/Consultant about the list of parties to whom this DPR/FR is submitted and for what purposes. Then DOE should cross check with all the parties and confirm that the same DPR/FR is submitted to all the parties correctly without any changes. DOE must not accept any reports and undertakings from PP/Consultant. DOE must make independent evaluation and use totally different parties without informing the PP or Consultant to cross check the facts.</p> <p>DOE to write to the party who prepared the DPR/FR which is submitted to the banks and other agencies and the same is verified against the one submitted to the DOE by PP/Consultant.</p> <p>DOE must not entertain this project any more if found the DPR/FR is tampered with at any point in time. PP can not give different DPR's and FR's. They must submit only the one given to Banks and other agencies while obtaining loans and decision making time.</p> <p>Submitted by: sud, sudcdm3@gmail.com</p> <p>Comment No 3:</p> <p>Careful study must be done so that the DPR/FR is not in different versions made and submitted with different purposes to different agencies, which is totally unacceptable, illegal and unethical.</p> <ul style="list-style-type: none"> • Project owner should show some undertaking letter from bank manager to 		<ul style="list-style-type: none"> - DOE has discussed the additionality of project in chapter 3.6 of this validation report. - During the onsite of the project activity TÜV SÜD discussed and checked that FSR was prepared internally and was never shared with other intuitions or departments. There is no PDR of project activity. - During the onsite of the project activity TÜV SÜD discussed and checked that FSR was prepared internally and was never shared with other intuitions or departments. There is no PDR of project activity. <p>Comments No. 3</p> <ul style="list-style-type: none"> - During the onsite of the project activity TÜV SÜD discussed and checked that FSR was prepared internally and was never shared with other intuitions or departments. There is no PDR of project activity. - DOE has discussed the additionality of project in chapter 3.6 of this validation report.
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<p>DoE stating that both DPR's are same. These kinds of letters should not be accepted and entertained by DoE at face value, but must be checked independently. While collecting the DPR/FR from banks and other agencies, all DPR/FR pages should be counter signed by Banks and other agencies so that the real DPR/FR given to other parties by the PP/Consultant is same as the one submitted to DOE.</p> <ul style="list-style-type: none"> • DPR/FR values must be probed fully. DOE must take a written undertaking from the PP/Consultant about the list of parties to whom this DPR/FR is submitted and for what purposes. Then DOE should cross check with all the parties and confirm that the same DPR/FR is submitted to all the parties correctly without any changes. DOE must not accept any reports and undertakings from PP/Consultant. DOE must make independent evaluation and use totally different parties without informing the PP or Consultant to cross check the facts. • DOE to write to the party who prepared the DPR/FR which is submitted to the banks and other agencies and the same is verified against the one submitted to the DOE by PP/Consultant. • DOE must not entertain this project any more if found the DPR/FR is tampered with at any point in time. PP can not give different DPR's and FR's. They must submit only the one given to Banks and other agencies while obtaining loans and decision making time. • DOE to ensure that the PDD values are consistent and ensure that the CDM project is a genuine project • DoE to check the Detailed Project Report and Feasibility Report which is submitted to the other agencies and Banks by Project owner and ensure that the values match with the DPR/FR submitted to DoE also. 		<ul style="list-style-type: none"> - During the onsite of the project activity TÜV SÜD discussed and checked that FSR was prepared internally by PP and was never shared with other intuitions or departments. There is no PDR of project activity. - During the onsite of the project activity TÜV SÜD discussed and checked that FSR was prepared internally by PP and was never shared with other intuitions or departments. There is no PDR of project activity. - During the onsite of the project activity TÜV SÜD discussed and checked that FSR was prepared internally by PP and was never shared with other intuitions or departments. There is no PDR of project activity. - DOE has discussed the additionality of project in chapter 3.6 of this validation report. - During the onsite of the project activity TÜV SÜD discussed and checked that FSR was prepared internally by PP and was never shared with other intuitions or departments. There is no PDR of project activity. - DOE has discussed the additionality of project in chapter 3.6 of this validation report.
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<ul style="list-style-type: none"> Has the PP considered the CDM revenues while envisaging the project? Without CDM the project was not viable, is it right? This project is having a debt component? Then how bankers or lenders gave the loan? Have the bankers or lenders considered the CDM revenues while agreeing to give loan to this projects? If not this project should be rejected right away by DOE by terminating the contract forthwith. If yes, where is the proof? What is the date of the evidence document from bank? Is this document printed now a days or earlier. DOE to independently check the same. If the document is available from Bank it must be checked from all angles so that it is genuine and not forged and date changed by putting back dated. This is normally done, DOE to be aware of this please. Please check the communication the PP had during that time with banks, emails and postal receipts and the weights and dates mentioned on the receipts. Do not believe in courier bills and receipts since these can be cooked up easily. Insist on government owned postal service receipts only. If the project is fully equity project then on what basis the PP has invested full equity in to the project while considering the CDM revenue? DOE to check the same in detail and bring out the facts. Is there any past record of this PP to invest or not to invest at returns what he is talking about in this project? Proper evidences must be reviewed and digged out by the DOE and take decision on the project based on established facts. Do not ask documents from PP, DOE to collect the same from different sources to do independent evaluation. Is the project equipment purchased second hand equipment or sourced from cheap foreign sources? If yes, the issue must be probed by DOE since invoices will invariably be inflated and forged. Total project costs mentioned by PP will not be the same as originals. Hence no additionality. These facts must be probed in full by DOE by checking all documents and money transactions along with bank statements and certified accounts by a legally acceptable financial analyst. How is the base line defined in this project? Is Base line hypothetically 	<p>Again <u>Under Comment No: 3</u>, the author just repeats verbatim the comments that he provided under Comment No: 1, using slightly different e-mail address. He just changed the order of the comments appearing under Comment No: 1 and new sequence turns out to be:</p> <p>3, 4, 5, 6, 7, 1, 2, 8, 9, 13, 10, 11, 12.</p> <p>Therefore, no separate response is provided for the sub-comments appearing under Comment No:3</p>	<ul style="list-style-type: none"> DOE has checked the equipment purchase contract and date of signing of equipment purchase contract is the start date of the project activity, this has been discussed in details in chapter 3.6.1 and 3.6.2 of this validation report.
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<p>defined with no proper evidences and proper justification? In such case, DOE cannot take the base line as suggested by the PDD. Please check that there are real emission reductions beyond the real and factual base line. It may so happen that this project qualifies for no CER's. DOE cannot assume values and things as giving by this PP. Whatever values are considered throughout the project in all documents including the real DPR (not the one prepared for CDM, the one given to the banks and others), they must be validated, verified and double checked. Do not ask PP for DPR. Ask the parties who have been given DPR by the PP. Get directly from the bank and others by each page of the DPR and Feasibility report signed. Such document can be considered as a real DPR or FR. UNFCCC CDM process cannot be degraded by fabricating and misinterpreting the project base line and additionality.</p> <ul style="list-style-type: none"> From DOE side which auditor has done marketing and business development for acquiring this business of validating this project? With whom he or she was co-ordinating at PP or CER buyer? The same person who has done the marketing and business development to acquire the business do validation or participate in any manner what so ever in the validation process? One cannot do like that. It is against the accreditation rules and norms followed since ages. DOE should send auditors from different offices or countries to do this validation audit. DOE must take care of impartiality and accreditation rules. Due to the targets set by the DOE managements auditors are doing marketing and meeting clients and giving promises that the project will be taken care. Is it acceptable and fair? This must be stopped. No auditor should do marketing. Only non-auditing staff should do marketing. DOE to ensure the same please. If applicable only: Is these machines, equipment was a part of any bundle of CDM activity envisaged and developed earlier. DOE to check the same through independent sources also. Once some bundles are non-additional and getting negative validation from a 		<p>14. TÜV SÜD confirms that audit team was not involve in any marketiing activity.</p> <p>- TÜV SÜD checked onsite and confirms that installed equip-ment of project activity is brand new. For more details, please see chapter 3.6 of this valida-tion report above.</p>
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<p>DOE, PP is rolling out the same project as an individual project which is not a CDM project at all. DOE to verify the same from independent sources and also take undertaking in the form of an affidavit from the PP's that any misrepresentation or false statement with respect this would attract strict legal action from UNFCCC and DOE. Furthermore the registered project must be de-registered in case of any future findings contradicting the submissions made by the project owner.</p> <ul style="list-style-type: none"> • DOE to be more careful so that this is a genuine CDM project. What is the exact project cost? The project cost is covering what? Each value considered must be validated with proof. The machinery is second hand purchased or fresh and new from an OEM? In either case DOE to check all the quotations, proposals, purchase orders, invoices, way bills, transport bills, proof of payments like bank statements. DOE to check with banks by way of written confirmation the amount transacted, to whom the money is paid, when the money is paid, is the party paid is the correct party as shown in the purchase orders. It may so happen that the values, party names, dates are fabricated and misrepresented in this project. DOE should terminate their contract for this project immediately. This is the only way out to protect the value of CDM process. If the PP is purchasing second hand or second quality equipment and inflating the purchase order values and invoices, this must be probed thoroughly and real values to taken for additionality calculation. Then I'm sure the additionality is not there at all in such a situation. <p>Submitted by: sud, sudcdm1@gmail.com</p>		<ul style="list-style-type: none"> - DOE has discussed the additionality of project in chapter 3.6 of this validation report
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5 VALIDATION OPINION

TÜV SÜD has performed a validation of the following proposed CDM project activity:

Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant

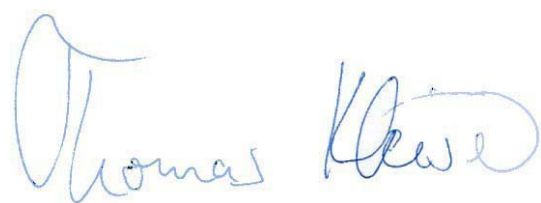
Standard auditing techniques have been used for the validation of the project. Methodology-specific customized checklists and a protocol for the project have been prepared to carry out the audit in order to present the outcome in a transparent and comprehensive manner.

The review of the project design documentation, subsequent follow-up interviews and further verification of references have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria in the protocol. In our opinion, the project meets all relevant UNFCCC requirements for the CDM if the underlying assumptions do not change. TÜV SÜD will recommend the project for registration by the CDM Executive Board.

An analysis, as provided by the applied methodology, demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of 29,918 tCO₂e and a total estimated of 299,180 tCO₂e emission reductions as specified within the final PDD version.

The validation is based on the information made available to us, as well as the engagement conditions detailed in this report. The validation has been performed following the VVM requirements. The single purpose of this report is its use during the registration process as part of the CDM project cycle. Based on the work described in this report, nothing has come to our attention that causes us to believe that any project component or issue has not been covered by the validation process.

Munich, 07-12-2011



Thomas Kleiser

Certification Body "climate and energy"
TÜV SÜD Industrie Service GmbH

Munich, 07-12-2011



Khalid Mahmood

Assessment Team Leader
TÜV SÜD Industrie Service GmbH

Validation of the CDM Project:
Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited
Pezu Plant



Annex 1: Validation Protocol

Validation Protocol

Project Title: Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant

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CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD
A. General description of project activity				
A.1. Title of the project activity				
A.1.1. Does the used project title clearly enable to identify the unique CDM activity?	1	Yes, The used project title "Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant" clearly identifies the CDM activity.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.1.2. Are there any indication concerning the revision number and the date of the revision?	1	Yes, They are. The PDD in GSP is version 01 submitted in July 2009 with applied methodology AM0024. During the validation of the project the client changed the applied methodology and submitted the PDD version 5 for re-GSP final with AMS.III.Q version 4 in June 2011. The change of methodology was due to Reply to AM_REV_0141 (methodology to be merged with ACM0012, but issues regarding the multiple fuel usage in baseline not addressed).	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.1.3. Is this consistent with the time line of the project's history?	1	Yes, The date of the version of PDD is consistent with the time line of the project's history.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.2. Description of the project activity				
A.2.1. Is the description delivering a transparent overview of the project activities?		The project activity involves installation of waste heat recovery systems for power generation HRSGs (Heat Recovery Steam Generators) & steam turbo-generator at Unit II of Pezu plant. Pezu plant came into existence in 1996 with a daily production capacity of 4200 TPD. Later in 1999, the capacity of plant was increased to 4800 TPD and it (Kilns A & B with 2400 TPD each) is known as Unit I. During year 2005/06, Unit II of the plant was	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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		<p>commissioned comprising Kiln C & D having capacity of 3300 TPD each. The project activity involves installation of four HRSGs (two on each kiln) of total capacity 47.34 TPH and one steam turbo-generator (10MW).</p> <p>Currently at Lucky Pezu Plant, almost all the waste heat from the clinker production process is vented to atmosphere; only a small portion of the waste heat from the feed ends of clinker production kilns is recovered and recycled to heat up incoming raw material. Power demand is met by captive power plant; there is no grid connection for electricity imports/exports. The captive power plant constitutes 10 dual fuels (HFO and NG) with installed power total-ly 69.358MW.</p> <p>It is mentioned in PDD that the project activity has been commis-sioned in September 2010; net electricity generated by the project activity (58,291 MWh per year) will displace captive electricity and result in 29,918 tonnes of CO₂ equivalent emissions reduction per annum. No fuel will be used at HRSGs for steam production.</p> <p>In the absence of project activity, Lucky Cement Limited will con-tinue to get all of its power demand from the dual fuel based cap-tive power plant because this comes out to be the most plausible baseline scenario.</p>		
A.2.2. What proofs are available demonstrat-ing that the project description is in com-pliance with the actual situation or planning?	1,2	<p>According the PDD, following documents was presented to DOE.</p> <ul style="list-style-type: none"> - February 2007 Letter from the (later on contracted) CDM consultant Carbon Services) to the to the Technical Direc-tor of Lucky Cement Limited (awareness of CDM) - August 2007 CDM consulting contract was signed be-tween First Climate (Earlier Factor Consulting + Man-agement AG) and Lucky Cement Limited 	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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		<ul style="list-style-type: none"> - October 2007 Extracts from the minutes of the board meeting of Lucky Cement Limited. In Karachi regarding the WHR project, Board of Director discussed the financial matters (feasibility Study Report based on the preliminary quotations provided by technology supplier) of WHR project at Lucky Pezu plant and decided that without CDM benefits, the project is not feasible to proceed. Board of directors of Lucky Cement Limited decided to proceed the WHR project as CDM project so that extra CDM revenues will help the project overcome the financial barriers. • May 2008 Contract Equipment purchase contract was signed for WHR power plant between Lucky Cement Limited and Sinoma International Engineering Co.,Ltd. (supplier for WHR equipment). • November 2008 Start of civil works of WHR project • November 2009, Project pre-commissioning • December 2009, full commissioning of project is expected. 		
A.2.3. Is the information provided by these proofs consistent with the information provided by the PDD?	1,2	Yes. The provided information in evidences is consistent with information provided in PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.2.4. Is all information presented consistent	1,2	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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with details provided by further chapters of the PDD?				
A.3. Project participants				
A.3.1. Is the form required for the indication of project participants correctly applied?	1	Yes, The form for the indication of PPs is correctly applied. The exact location of the project activity in geographical coordinates is: Latitude: 32° 17' 43" N Longitude: 70° 44' 00" E	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.3.2. Is the participation of the listed entities or Parties confirmed by each one of them?	1	Clarification Request No. 1. – The LoA of the parties involved have to be provided to the DOE. – Please provide the Modalities of Communication (MoC).	CR1	<input checked="" type="checkbox"/>
A.3.3. Is all information on participants / Parties provided in consistency with details provided by further chapters of the PDD (in particular annex 1)?	1	See Annex 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4. Technical description of the project activity				
<i>A.4.1. Location of the project activity</i>				
A.4.1.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)?	1,5	Yes, The geographical coordinates of the project have been provided in chapter A.4 of the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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A.4.1.2. How is it ensured and/or demonstrated, that the project proponents can implement the project at this site (ownership, licenses, contracts etc.)?	1,5	Clarification Request No. 2. Proofs of operation license of cement plant and construction license of the project activity have to be provided to the DOE.	CR2	<input checked="" type="checkbox"/>
A.4.2. Category(ies) of project activity				
A.4.2.1. To which category(ies) does the project activity belonging to? Is the category correctly identified and indicated?	1,2	The project activity belongs to sectoral scopes <ul style="list-style-type: none"> Sectoral Scope 4 – Manufacturing industries Both are correctly indicated in the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3. Technology to be employed by the project activity				
A.4.3.1. Does the technical design of the project activity reflect current good practices?	1,2,5	The PDD figure for electricity (58,291 MWh/yr) supply of the existing captive power plant has been cross checked with power generation from 2004 to 2007.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.2. Does the description of the technology to be applied provide sufficient and transparent input/ information to evaluate its impact on the greenhouse gas balance?	1,2,5	Yes, The description of the technology to be applied provides sufficient and transparent information to evaluate its impact on the greenhouse gas balance.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.3. Does the implementation of the project activity require any technology transfer from annex-I-countries to the host country(ies)?	1,2,5	Yes, The technology is transferred from China to the Pakistan.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.4. Is the technology implemented by the project activity environmentally safe?	1,2,5	Yes, Technology implemented by the project activity is environmentally safe.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.5. Is the information provided in compliance with actual situation or planning?	1,2,5	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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A.4.3.6. Does the project use state of the art technology and / or does the technology result in a significantly better performance than any commonly used technologies in the host country?	1,2,5 27, 35	Yes, It is clear from the equipment purchase that the project uses state of the art technology because project activity involves installation of new equipment which is not common in Pakistan as well (IRL 27, 35).	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.7. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1,2,5	The project activity uses the start of art technology and it is clear that project technology will not likely to be substituted by other or more efficient technologies within the project period.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.8. Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period?	1,2,5	The evidences regarding initial training and maintenance for the implementation and operation of the project activity has been provided to the DOE.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.9. Is information available on the demand and requirements for training and maintenance?	1,2,5	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.3.10. Is a schedule available for the implementation of the project and are there any risks for delays?	1,2,5	Yes, The project timeline is indicated in a table in chapter B.5 of the PDD, risks for delays of implementation.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.4. Estimated amount of emission reductions over the chosen crediting period				
A.4.4.1. Is the form required for the indication of projected emission reductions correctly applied?	1,37	Yes, The form for the indication of projected emission reductions is correctly applied.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.4.2. Are the figures provided consistent with other data presented in the PDD?	1,37	<u>Corrective Action Request No.1.</u> - For all default figures provided in the ER excel file calcula-	CAR1	<input checked="" type="checkbox"/>

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CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD
		tion sheet appropriate sources have to be indicated in order to trace these figures.		
A.4.5. Public funding of the project activity				
A.4.5.1. Is the information provided on public funding provided in compliance with the actual situation or planning as available by the project participants?	1,6	A written statement that public funding is excluded for this project has been submitted to the DOE.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.5.2. Is all information provided consistent with the details given in remaining chapters of the PDD (in particular annex 2)?	1,6	Yes, all information provided is consistent with the details given in remaining chapters of the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A.4.6. Confirmation that the small-scale project activity is not a debundled component of a large scale project activity				
A.4.6.1. Is there a registered small-scale CDM project activity or an application to register another small-scale CDM project activity: with the following characteristics:		Debundling checklist	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		The same project participants?		
		In the same project category and technology/measure?		
		Registered within previous two years? Or in registration process?		
		Whose boundary is within 1 km of the project boundary of the small scale project activity under consideration?		
A.4.6.2. If the answer to all the above question is 'Yes' then: Does the total size of the small scale project activity combined with previously registered small scale CDM project activity exceeds the limits of small scale CDM project activities?		N/A, The proposed project is not a debundled component of a larger project activity.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD								
B. Application of a baseline and monitoring methodology												
B.1. Title and reference of the approved baseline and monitoring methodology												
B.1.1.1. Are reference number, version number, and title of the baseline and monitoring methodology clearly indicated?	1,2	Yes, the applicable Small Scale baseline methodology is AMS-III.Q, Waste Energy Recovery (gas/heat/pressure) Projects (version 04.	☑	☑								
B.1.1.2. Is the applied version the most recent one and / or is this version still applicable?	1,2	Yes, at the time of re-GSP uploading, AMS-III.Q (version 4) has been the most recent one.	☑	☑								
B.2. Justification of the choice of the methodology and why it is applicable to the project activity												
B.2.1.1. Is the applied methodology considered the most appropriate one?	1,2	Yes, At the time of second GSP; the applied methodology AMS.III.Q version 4 is the most appropriate and recent one.	☑	☑								
Integrate the required amount of sub-checklists on the applicability criteria as given by the applied methodology and comment on at least every line answered with “No”;												
B.2.1. Criterion 1: The applicability is limited to project activities that use waste heat generated in clinker making process to produce electricity. The category is for project activities that utilize waste gas and/or waste heat at existing facilities as an energy source for: a) Cogeneration; or b) Generation of electricity; or c) Direct use as process heat; or d) Generation of heat in elemental process (e.g. steam, hot water, hot oil, hot air); or	1,2	<table><tr><th>Applicability checklist</th><th>Yes / No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Compliance provable?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table> The audit team confirms by Document Review (IRL-No.1& 59) and on-site visit (IRL-No. 3 and 3a) that project activity utilizes waste heat from existing kilns as energy source of generation of electricity which is case b according to methodology applicability criteria 1.	Applicability checklist	Yes / No	Criterion discussed in the PDD?	Yes	Compliance provable?	Yes	Compliance verified?	Yes	☑	☑
Applicability checklist	Yes / No											
Criterion discussed in the PDD?	Yes											
Compliance provable?	Yes											
Compliance verified?	Yes											

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CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD								
e) Generation of mechanical energy												
B.2.2. Criterion 2: The category is also applicable to project activities that use waste pressure to generate electricity at existing facilities.	1,2	<table><tr><th>Applicability checklist</th><th>Yes / No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table> <p>The project involves use of waste heat only.</p>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	NA	Compliance provable?	NA	Compliance verified?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No											
Criterion discussed in the PDD?	NA											
Compliance provable?	NA											
Compliance verified?	NA											
B.2.3. Criterion 3: The recovery of waste gas/heat/pressure should be a new initiative (no waste gas/heat/pressure was recovered from the project activity source prior to the implementation of the project activity).	1,2 IRL 3a	<table><tr><th>Applicability checklist</th><th>Yes / No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Compliance provable?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table> <p>Apart from the small share of waste heat that is used to pre-heat the raw meal, the waste heat from clinker kilns is as well released into the atmosphere prior to the project implementation. This has been confirmed by on-site visit (IRL 3a). Although, para 3 of AMS-III.Q, version 04 requires that “no waste heat was recovered from the project activity source prior to the implementation of the project activity”, it has been clarified by Annex 20 of EB61 report that project activities that recover waste heat in the baseline are eligible to AMS-III.Q anyway subject that “the current practice of recovering small amounts of waste energy continues during the crediting period”. Hence, the project activity on hand is eligible for AMS-III.Q, version 04.</p>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	Yes	Compliance provable?	Yes	Compliance verified?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No											
Criterion discussed in the PDD?	Yes											
Compliance provable?	Yes											
Compliance verified?	Yes											

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CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD								
B.2.4. Criterion 4: Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO2 equivalent annually;	1,2	<table><tr><td>Applicability checklist</td><td>Yes / No</td></tr><tr><td>Criterion discussed in the PDD?</td><td>yesNA</td></tr><tr><td>Compliance provable?</td><td>yesNA</td></tr><tr><td>Compliance verified?</td><td>yesNA</td></tr></table> <p>It is estimated that the project activity results in emission reductions 29.918 kt CO2 equivalent annually which is less than 60 kt CO₂</p>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	yesNA	Compliance provable?	yesNA	Compliance verified?	yesNA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No											
Criterion discussed in the PDD?	yesNA											
Compliance provable?	yesNA											
Compliance verified?	yesNA											
B.2.5. Criterion 5: a) The energy produced with the recovered waste gas/heat/or waste pressure should be measurable;	1,2	<table><tr><td>Applicability checklist</td><td>Yes / No</td></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Compliance provable?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table> <p>The energy that is produced from waste heat is electricity and it is measurable (Monitoring Parameter).</p>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	Yes	Compliance provable?	Yes	Compliance verified?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No											
Criterion discussed in the PDD?	Yes											
Compliance provable?	Yes											
Compliance verified?	Yes											
B.2.6. Criterion 5: b) Energy generated in the project activity may be used within the industrial facility or exported to other industrial facilities (included in the project boundary);	1,2	<p>It is obvious that the power generated by the project substitutes partly the power generated by the existing captive power plant. It has been confirmed during onsite that the industrial facility has no grid connection. Furthermore, no other potential consumers outside the boundary have been identified during on-site visit. Hence, it is obvious that the power generated by the project activity will be used within the project boundary by consumers of the cement manufacturing plant.</p> <table><tr><td>Applicability checklist</td><td>Yes / No</td></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr></table>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
Applicability checklist	Yes / No											
Criterion discussed in the PDD?	Yes											

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		<table><tr><td>Compliance provable?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table>		Compliance provable?	Yes	Compliance verified?	Yes						
Compliance provable?	Yes												
Compliance verified?	Yes												
B.2.7. Criterion 5: c) Electricity generated in the project activity may be exported to the grid or used for captive purposes; However, the methodology is not applicable to projects where the waste gas/heat/pressure recovery project is implemented in a single-cycle power plant (e.g. gas turbine or diesel generator) where heat (energy) generated on site is not utilizable for any other purposes on-site except to generate power. Such project activities shall consider AMS-III.AL “Conversion from single cycle to combined cycle power generation”. The projects recovering waste energy from such power plants for the purpose of generation of heat only can apply this methodology;	1,2	<table><tr><td>Applicability checklist</td><td>Yes / No</td></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table> <p>The WHR project is not implemented in a single cycle power plant but utilizes the waste heat of the kilns of the cement plant.</p>		Applicability checklist	Yes / No	Criterion discussed in the PDD?	NA	Compliance provable?	NA	Compliance verified?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No												
Criterion discussed in the PDD?	NA												
Compliance provable?	NA												
Compliance verified?	NA												

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<p>B.2.8. Criterion 5:</p> <p>d) For a project activity which recovers waste gas/heat/pressure for power generation from multiple sources (e.g. kiln and single-cycle power plant), this methodology can be used in combination with AMS-III.AL provided that:</p> <p>(i) Within the project activity it is possible to distinguish two distinct waste energy sources such that:</p> <ul style="list-style-type: none">Waste energy source-I (e.g. kiln) belongs to such waste heat sources which are eligible under AMS-III.Q;Waste energy source-II (e.g. single-cycle power unit) belongs to such waste heat sources which are eligible under AMS-III.AL; <p>(i) It is possible, for each waste energy source, to determine the baseline according to the specific methodology referred to;</p> <p>(ii) It is possible to objectively allocate the electricity produced in the project activity to each waste energy source, by means of one of the following methods:</p> <ul style="list-style-type: none">Through separate measurements of the electricity produced by utilizing waste energy from each waste energy source; orThrough separate measurements of the energy content of the waste energy carrying medium (WECM) streams used for electricity production; orThrough separate measurements of the energy content of the waste energy streams that are associated with each waste energy source and used for electricity production or for the WECM generation in a common waste heat recovery system (e.g. if steam is generated by waste heat from a kiln and waste heat from an internal combustion engine in a common waste heat recovery boiler);	1,2	<p>See comments to Criterion 5c).</p> <table><tr><th>Applicability checklist</th><th>Yes / No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	NA	Compliance provable?	NA	Compliance verified?	NA	<input checked="" type="checkbox"/>	
Applicability checklist	Yes / No											
Criterion discussed in the PDD?	NA											
Compliance provable?	NA											
Compliance verified?	NA											

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B.2.9. Criterion 5: e) The emission reductions are claimed by the generator of energy using waste energy;	1,2	<div>The generator of the power is the project participant of the host country.</div> <table><tr><td>Applicability checklist</td><td>Yes / No</td></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Compliance provable?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	Yes	Compliance provable?	Yes	Compliance verified?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No											
Criterion discussed in the PDD?	Yes											
Compliance provable?	Yes											
Compliance verified?	Yes											
B.2.10. Criterion 5: f). in cases where the energy is exported to other facilities (included in the project boundary), the following are required: (i) All historical information from the recipient plants; (ii) An official agreement exists between the owners of the project energy generation plant (henceforth referred to as generator, unless specified otherwise) with the recipient plant(s) that the emission reductions would not be claimed by the recipient plant(s) for using a zero-emission energy source;	1,2 IRL 3a	<div>As information has been gathered during physical onsite visit, apart from the facilities allocated to the cement manufacturing process, there are no other facilities within the project boundary.</div> <table><tr><td>Applicability checklist</td><td>Yes / No</td></tr><tr><td>Criterion discussed in the PDD?</td><td>NA</td></tr><tr><td>Compliance provable?</td><td>NA</td></tr><tr><td>Compliance verified?</td><td>NA</td></tr></table> <div>DOE concluded that it is obvious that the electricity that is generated from the WHR plant is not exported to other facilities but is used within the cement plant. Hence, this criterion is not applicable for the project activity.</div>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	NA	Compliance provable?	NA	Compliance verified?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No											
Criterion discussed in the PDD?	NA											
Compliance provable?	NA											
Compliance verified?	NA											

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<p>B.2.11. Criterion 5:</p> <p>(g) For those facilities and recipients included in the project boundary, that prior to implementation of the project activity (current situation) generated energy on-site (sources of energy in the baseline), the credits can be claimed for minimum of the following time periods:</p> <p>I. The remaining lifetime of equipments currently being used; and</p> <p>II. Crediting period;</p>	1,2 3a, 45 46 59	<table><tr><td>Applicability checklist</td><td>Yes / No</td></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Compliance provable?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table> <p>The only facility that generates energy within the project boundary produced and in the baseline is the existing Captive power plant). The remaining lifetime as stated in the available evidences is 20 years which deemed to be reasonable. Hence, DOE concludes that criterion 5g is fully applicable for the project activity.</p>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	Yes	Compliance provable?	Yes	Compliance verified?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No											
Criterion discussed in the PDD?	Yes											
Compliance provable?	Yes											
Compliance verified?	Yes											

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<p>B.2.12. Criterion 5:</p> <p>(h) The waste gas/heat/pressure utilized in the project activity would have been flared or released into the atmosphere in the absence of the project activity. This shall be proven by one of the following options:</p> <p>(i) By direct measurements of energy content and amount of the waste gas/heat/pressure for at least three years prior to the start of the project activity;</p> <p>(ii) Energy balance of relevant sections of the plant to prove that the waste gas/heat/pressure was not a source of energy before the implementation of the project activity. For the energy balance the representative process parameters are required. The energy balance shall demonstrate that the waste gas/heat/pressure was not used and also provide conservative estimations of the energy content and amount of waste gas/heat/pressure released;</p> <p>(iii) Energy bills (electricity, fossil fuel) to demonstrate that all the energy required for the process (e.g. based on specific energy consumption specified by the manufacturer) has been procured commercially. Project participants are required to demonstrate through the financial documents (e.g. balance sheets, profit and loss statement) that no energy was generated by waste gas/heat/pressure and sold to other facilities and/or the grid. The bills and financial statements should be audited by competent authorities;</p> <p>(iv) Process plant manufacturers' original specification/information, schemes and diagrams from the construction of the facility could be used as an estimate of quantity and energy content of waste gas/heat/pressure produced for rated plant capacity per unit of product produced.</p>	1,2 IRL 58	<table><tr><th>Applicability checklist</th><th>Yes / No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Compliance provable?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table> <p>The fact that waste heat was released to the atmosphere unused prior to the project is proved by energy bills. These evidences (IRL 58) have been prepared by third party auditors “Ernst & Young Ford Rhodes Sidat Hyder”. In addition to this, cost accounts are audited by the cost auditors under the provisions of the Companies (Audit of Cost Accounts) Rules, 1998. The name of present cost auditing company is “KPMG Taseer Hadi & Company”. All the audits are done under the provisions of International Accounting Standards issued by the International Accounting Standard Board. All evidences (IRL 59) have been checked by the audit team and, hence, are deemed to be credible.</p>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	Yes	Compliance provable?	Yes	Compliance verified?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No											
Criterion discussed in the PDD?	Yes											
Compliance provable?	Yes											
Compliance verified?	Yes											

Table 1 is applicable to AMS.III.Q, version 04

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B.2.13. Criterion 6: For the purpose of this category waste energy is defined as: a by-product gas/heat/pressure from machines and industrial processes having potential to provide usable energy, for which it can be demonstrated that it was wasted. For example gas flared or released into the atmosphere, the heat or pressure not recovered (therefore wasted). Gases that have intrinsic value in a spot market as energy carrier or chemical (e.g., natural gas, hydrogen, liquefied petroleum gas, or their substitutes) are not eligible under this category.	1,2	<table><tr><td>Applicability checklist</td><td>Yes / No</td></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Compliance provable?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table> <p>The project activity utilizes waste energy (heat) from the clinker manufacturing kilns (industrial process).</p>	Applicability checklist	Yes / No	Criterion discussed in the PDD?	Yes	Compliance provable?	Yes	Compliance verified?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Applicability checklist	Yes / No											
Criterion discussed in the PDD?	Yes											
Compliance provable?	Yes											
Compliance verified?	Yes											
B.3. Description of the project boundary												
B.3.1. Does the project boundary include physical, geographical site where the project activity takes place? In detail, does the project boundary include: <ul style="list-style-type: none">- The facility where the waste energy (heat/gas/steam) occurs?- The facility where the waste energy is transformed to useful energy?- The facility where the produced energy from the WHR plant is being used?	1,2	The project boundary of the Project activity includes Lucky cement plant where the waste heat is produced as well as electricity is produced using the recovered waste heat.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								
B.3.2. Do the spatial and technological boundaries as verified on-site comply with the discussion provided by / indication included to the PDD?	1,2	Yes. It has been checked onsite by audit team that spatial and technological boundaries of the project comply with the discussion provided in the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>								

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B.3.3. Is a flow diagram of the project boundary, physically delineating the project activity, based on the description provided in section "A.4.3 to be employed by the project activity" presented?	1,2	Yes. The flow diagram of the project physical boundary cover kilns <u>CE</u> , <u>F</u> & <u>DG</u> where the waste heat is generated, the entire cement plant where the electricity is consumed and the waste heat recovery system are to be included in the project boundary.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.4. Description of how the baseline and its development				
B.4.1. Have all technically feasible baseline scenario alternatives to the project activity been identified and discussed in the PDD? Why can this list be considered as being complete?	1,2 3a	<p>The PDD states that:</p> <ul style="list-style-type: none"> – The current use of waste heat from the kiln is to use a small part for the preheating of raw material and fuel and then venting the remaining waste heat into the atmosphere. – There is no other demand of waste heat as part of the baseline. – The residential area is approximately 10 km away from the project facility and climatic conditions are not favorable to supply waste heat for district heating. – The use of waste heat for the preheating of raw material and fuel is part of the clinker making process and, thus, within the boundary. <p>The information has been gathered during physical onsite visit by audit team and confirms that above mentioned points are correct (IRL 3a).</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.4.2. Does the project identifies correctly and excludes those options not in line with regulatory or legal requirements?	1,2 18	<p>See chapter D for more information.</p> <p>There are no legal and other requirements to implement the project activity (IRL 18).</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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B.4.3. Have applicable regulatory or legal requirements been identified?	1,2	See chapter D for more information.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.4.4. Does the PDD identify the most likely baseline scenario in absence of the project activity?	1,2	Yes, The baseline scenario is identified as release of waste heat to the atmosphere.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.4.5. Is this identification supported by official and/or verifiable documents (e.g. studies, web pages, certificates, etc)?	1,2	See section B.2.10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.4.6. Is the identified baseline scenario in line with regulatory or legal requirements?	1,2	See chapter D for more information.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.4.7. Is the identified baseline scenario in accordance with the selected baseline methodology?	1,2	See section B.2.10	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):				
B.5.1. In case of applying step 2 / investment analysis of the additionality tool: Is the analysis method identified appropriately (step 2a)?	1,2	The additionality of the project activity is demonstrated according to Attachment A to Appendix B of the simplified modalities and procedures for small scale CDM project activity categories, "project participants shall provide an explanation to show that the project activity. n/a. The project does not apply the additionality tool.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.2. In case of Option I (simple cost analysis): Is it demonstrated that the activity produces no economic benefits other than CDM income?	1,2	Not applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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B.5.3. In case of Option II (investment comparison analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)?	1,2	n/a The project does not apply the additionality tool.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.4. In case of Option III (benchmark analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)?	1,2	n/a The project does not apply the additionality tool.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.5. In case of Option II or Option III: Is the calculation of financial figures for this indicator correctly done for all alternatives and the project activity?	1,2	n/a The project does not apply the additionality tool.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.6. In case of Option II or Option III: Is the analysis presented in a transparent manner including publicly available proofs for the utilized data?	1,2	n/a The project does not apply the additionality tool.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.7. In case of applying step 3 (barrier analysis) of the additionality tool: Is a complete list of barriers developed that prevent the different alternatives to occur?	1,2	n/a The project does not apply the additionality tool.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.8. In case of applying step 3 (barrier analysis): Is transparent and documented evidence provided on the existence and significance of these barriers?	1,2	n/a The project does not apply the additionality tool.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.9. In case of applying step 3 (barrier analysis): Is it transparently shown that the execution of at least one of the alternatives is not prevented by the identified barriers?	1,2,5,9,12,13	Yes, <u>It is clear that the execution of at least one of the alternatives is not prevented by the identified barriers (investment barrier applied in project activity).</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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B.5.10. Have other activities in the host country / region similar to the project activity been identified and are these activities appropriately analyzed by the PDD (step 4a)?	1,2,5 ,9,12 ,13	Not applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.11. If similar activities are occurring: Is it demonstrated that in spite of these similarities the project activity would not be implemented without the CDM component (step 4b)?	1,2,5 ,9,12 ,13	Not applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.5.12. Is it appropriately explained how the approval of the project activity will help to overcome the economic and financial hurdles or other identified barriers (step 5)?	1,2,5 ,9,12 ,13	Not applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
If the additionality tool has not been used please answer B.5.13 to B.5.18				
B.5.13. If the starting date of the project activity is before the date of validation, is evidence available to prove that incentive from the CDM was seriously considered in the decision to proceed with the project activity?	1,5,9 ,12, 13, 40, 27	<ul style="list-style-type: none"> – The evidence of early CDM consideration has been submitted to DOE (E-mail introduction of Carbon Services (Private) Limited to Lucky Cement Limited about the CDM Project benefits) (IRL 7). – The starting date of the project is May 7th, 2008 which is the date of equipment purchase contract between Lucky Cement Limited and Sinoma Energy Conservation Ltd. This is before the start of validation. The equipment purchase contract has been submitted to DOE (IRL 27). – Extract of Minutes of the Board Directors meeting of Lucky Cement Limited (IRL 40). <p>So it is evident that the PP were aware of CDM revenues before the start date of the project and it is also clear from Board Decision that CDM revenues were the decisive factor to proceed with the project act CDM project.</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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B.5.14. Is a complete list of barriers developed that prevents the project activity to occur?	1,5,9,12,13	Investment analysis is chosen to demonstrate the additionality.	☑	☑															
B.5.15. Does this list include at least one of the following barriers?	1,5,9,12,13	<table><tr><th>Barrier</th><th>Discussed?</th><th>Verified?</th></tr><tr><td>Investment</td><td>Yes</td><td>Yes</td></tr><tr><td>Technology</td><td>NA</td><td>NA</td></tr><tr><td>Due to prevailing practice</td><td>NA</td><td>NA</td></tr><tr><td>others</td><td>NA</td><td>NA</td></tr></table>	Barrier	Discussed?	Verified?	Investment	Yes	Yes	Technology	NA	NA	Due to prevailing practice	NA	NA	others	NA	NA	☑	☑
Barrier	Discussed?	Verified?																	
Investment	Yes	Yes																	
Technology	NA	NA																	
Due to prevailing practice	NA	NA																	
others	NA	NA																	
B.5.16. Does the discussion sufficiently take into account relevant national and/or sectoral policies?	1,5,9,12,13	Yes.	☑	☑															
B.5.17. Is transparent and documented evidence provided on the existence and significance of these barriers?	1,5,9,12,13	<p>The investment analysis is done in line with the Attachment A to Appendix B of the simplified modalities and procedures for small scale CDM project activity categories and chosen the investment barrier to demonstrate the additionality of the project. The investment analysis is conducted in line with the “Guidance on the Investment Analysis” by EB 61 Report annex 13. The investment analysis is based on the calculation of project IRR.</p> <p><u>Benchmark.</u></p> <p>According to EB 61 annex 13, Project IRR is calculated to demonstrate additionality and has been compared against local commercial lending rate in Pakistan.</p> <p>The local lending and borrowing rates in Pakistan are based on Karachi Inter-bank Offered Rate (KIBOR) plus the credit spread over the KIBOR charged by the local bank. The credit spread calculation is left to local banks as it depends on number of factors</p>	CR 3	☑															

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		<p>which vary widely for different corporate borrowers. For instance, the spread can range between 200 to 350 basis points depending on various criteria that determine the Credit Risk Rating (CRR) of the loan recipient; these include its inherent risk, annual profitability, cash flow position, debt ratio, gearing ratio (ratio of interest bearing liability to net worth), industry cycle, etc. For this project activity, LCL considered a three month tenor average KIBOR of 9.73 % for September 2007 and adopted 200 basis points as reasonable credit spread. The benchmark thus evaluated was $(9.73\% + 2.0\%) = 11.73\%$.</p> <p><u>Clarification Request No. 3.</u></p> <p>Please clarify the following questions.</p> <ul style="list-style-type: none"> - Who decides the KIBOR and basis points? - Why 200 basis points are considered and at what time project participants considered 200 basis points? - The project IRR value presented in FSR is 7.73% while IRR in GSP PDD is 7.95% and same value is in the repeated GSP. Please clarify why the project IRR presented in PDD is different from IRR value presented in FSR. - Please provide all the relevant evidence related to benchmark, Investment Cost, operational & Maintenance cost, 		
B.5.18. Is it appropriately explained how the approval of the project activity will help to overcome the identified barriers?	1,5,12,13	Yes. Project IRR with CER is calculated and it exceeds the benchmark.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6. Emissions reductions				
<i>B.6.1. Explanation of methodological choices</i>				
B.6.1.1. Is it explained how the procedures pro-	1,2,	Yes, the procedure follows the approved applied methodology.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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vided in the methodology are applied by the proposed project activity?	37									
B.6.1.2. Is every selection of options offered by the methodology correctly justified and is this justification in line with the situation verified on-site?	1,2, 37	Yes, the procedure follows the approved methodology and justified in PDD.	☑	☑						
B.6.1.3. Determination of project emissions (Comment on any line answered “No”)										
B.6.1.4. Component 1: emissions from use of fossil fuel		<table><tr><td>Project emission checklist</td><td>Yes / No</td></tr><tr><td>Component discussed in the PDD?</td><td>Yes</td></tr><tr><td>Formulae correctly applied?</td><td>Yes</td></tr></table> The project emissions are zero.	Project emission checklist	Yes / No	Component discussed in the PDD?	Yes	Formulae correctly applied?	Yes	☑	☑
Project emission checklist	Yes / No									
Component discussed in the PDD?	Yes									
Formulae correctly applied?	Yes									
B.6.1.5.Are the formulae required for the determination of baseline emissions correctly presented, enabling a complete identification of parameters to be used and / or monitored?		Yes, the formulae required for the determination of baseline emissions is correctly applied.		☑						
B.6.1.6.Are the formulae required for the determination of leakage emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	1,2, 37	The project activity involves the brand new technology and that is why the leakage are considered as zero.	☑	☑						
B.6.1.7.Are the formulae required for the determination of emission reductions correctly presented?	1,2, 37	Yes, The formulae required for the determination of emission reductions is correctly applied.	☑	☑						
B.6.2. Data and parameters that are available at validation										

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B.6.2.1. Is the list of parameters presented in chapter B.6.2 considered to be complete with regard to the requirements of the applied methodology?	1,2, 37	Yes, The list of parameters presented in chapter B.6.2 considered complete with regard to the requirements of the applied methodology.	☑	☑																		
B.6.2.2. Integrate the required amount of sub-checklists for monitoring parameter and comment on any line answered with “No”																						
B.6.2.3. Parameter Title: Annual electricity supplied to the grid prior to retrofit (applicable only for retrofit and modification activities)	1,2, 37	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table>	Data Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided?	NA	Has this value been verified?	NA	Choice of data correctly justified?	NA	Measurement method correctly described?	NA	☑	☑
Data Checklist	Yes / No																					
Title in line with methodology?	NA																					
Data unit correctly expressed?	NA																					
Appropriate description of parameter?	NA																					
Source clearly referenced?	NA																					
Correct value provided?	NA																					
Has this value been verified?	NA																					
Choice of data correctly justified?	NA																					
Measurement method correctly described?	NA																					
B.6.2.4. Parameter Title: Emission factor of the grid (CM) Note: CM should be calculated as per the procedures described in the “Tool to calculate the emission factor for an electricity system”	1,2, 37	<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table>	Data Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided?	NA	Has this value been verified?	NA	Choice of data correctly justified?	NA	Measurement method correctly described?	NA	☑	☑
Data Checklist	Yes / No																					
Title in line with methodology?	NA																					
Data unit correctly expressed?	NA																					
Appropriate description of parameter?	NA																					
Source clearly referenced?	NA																					
Correct value provided?	NA																					
Has this value been verified?	NA																					
Choice of data correctly justified?	NA																					
Measurement method correctly described?	NA																					
B.6.2.5. Parameter Title: Operating margin (OM) emission factor of the grid	1,2, 37		☑	☑																		

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Note: OM should be calculated as per the procedures described in the "Tool to calculate the emission factor for an electricity system"		Data Checklist	Yes / No		
		Title in line with methodology?	NA		
		Data unit correctly expressed?	NA		
		Appropriate description of parameter?	NA		
		Source clearly referenced?	NA		
		Correct value provided?	NA		
		Has this value been verified?	NA		
		Choice of data correctly justified?	NA		
		Measurement method correctly described?	NA		
B.6.2.6. Parameter Title: fuel consumption of each power source	1,2, 37	Data Checklist	Yes / No	☑	☑
		Title in line with methodology?	NA		
		Data unit correctly expressed?	NA		
		Appropriate description of parameter?	NA		
		Source clearly referenced?	NA		
		Correct value provided?	NA		
		Has this value been verified?	NA		
		Choice of data correctly justified?	NA		
		Measurement method correctly described?	NA		
B.6.2.7. Parameter Title: emission coefficient of each fuel		Data Checklist	Yes / No	☑	☑
		Title in line with methodology?	NA		
		Data unit correctly expressed?	NA		
		Appropriate description of parameter?	NA		
		Source clearly referenced?	NA		
		Correct value provided?	NA		
		Has this value been verified?	NA		
		Choice of data correctly justified?	NA		
		Measurement method correctly described?	NA		

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B.6.2.8. <u>Parameter Title:</u> electricity generation of each power source		<table><tr><th>Data Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table>		Data Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided?	NA	Has this value been verified?	NA	Choice of data correctly justified?	NA	Measurement method correctly described?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No																						
Title in line with methodology?	NA																						
Data unit correctly expressed?	NA																						
Appropriate description of parameter?	NA																						
Source clearly referenced?	NA																						
Correct value provided?	NA																						
Has this value been verified?	NA																						
Choice of data correctly justified?	NA																						
Measurement method correctly described?	NA																						
B.6.2.9. <u>Parameter Title:</u> fraction of time with low costs /must run plant at the margin (for simple adjusted OM only)		<table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Choice of data correctly justified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr></table>		Data Checklist	Yes / No / NA	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided?	NA	Has this value been verified?	NA	Choice of data correctly justified?	NA	Measurement method correctly described?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No / NA																						
Title in line with methodology?	NA																						
Data unit correctly expressed?	NA																						
Appropriate description of parameter?	NA																						
Source clearly referenced?	NA																						
Correct value provided?	NA																						
Has this value been verified?	NA																						
Choice of data correctly justified?	NA																						
Measurement method correctly described?	NA																						
B.6.2.10. <u>Parameter Title:</u> Electricity imports		<table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>N/A</td></tr><tr><td>Data unit correctly expressed?</td><td>N/A</td></tr><tr><td>Appropriate description of parameter?</td><td>N/A</td></tr><tr><td>Source clearly referenced?</td><td>N/A</td></tr><tr><td>Correct value provided?</td><td>N/A</td></tr></table>		Data Checklist	Yes / No / NA	Title in line with methodology?	N/A	Data unit correctly expressed?	N/A	Appropriate description of parameter?	N/A	Source clearly referenced?	N/A	Correct value provided?	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						
Data Checklist	Yes / No / NA																						
Title in line with methodology?	N/A																						
Data unit correctly expressed?	N/A																						
Appropriate description of parameter?	N/A																						
Source clearly referenced?	N/A																						
Correct value provided?	N/A																						

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		Has this value been verified?	N/A		
		Choice of data correctly justified?	N/A		
		Measurement method correctly described?	N/A		
B.6.2.11. <u>Parameter Title:</u> CO ₂ emission coefficient of fuels used in connected grids		Data Checklist	Yes / No / NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Title in line with methodology?	N/A		
		Data unit correctly expressed?	N/A		
		Appropriate description of parameter?	N/A		
		Source clearly referenced?	N/A		
		Correct value provided?	N/A		
		Has this value been verified?	N/A		
		Choice of data correctly justified?	N/A		
		Measurement method correctly described?	N/A		
B.6.2.12. $EG_{i,j,y}$ The <u>quantity of electricity</u> supplied to the recipient j by generator, that in the absence of the project activity would have been sourced from i th source (i can be either grid or identified source) during the year y in MWh,		Data Checklist	Yes / No / NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Title in line with methodology?	Yes		
		Data unit correctly expressed?	Yes		
		Appropriate description of parameter?	Yes		
		Source clearly referenced?	Yes		
		Correct value provided?	Yes		
		Has this value been verified?	Yes		
		Choice of data correctly justified?	Yes		

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		Measurement method correctly described?	Yes			
If the baseline generation source is an identified existing plant.						
B.6.2.13. NCV _{HFO} : Net Calorific value of Heavy Fuel Oil (HFO).					☑	☑
		Data Checklist		Yes / No / NA		
		Title in line with methodology?		Yes		
		Data unit correctly expressed?		Yes		
		Appropriate description of parameter?		Yes		
		Source clearly referenced?		Yes		
		Correct value provided?		Yes		
		Has this value been verified?		Yes		
		Choice of data correctly justified?		Yes		
		Measurement method correctly described?		Yes		
B.6.2.14. NCV _{NG} : Net Calorific value of Natural Gas (NG).					☑	☑
		Data Checklist		Yes / No / NA		
		Title in line with methodology?		Yes		
		Data unit correctly expressed?		Yes		
		Appropriate description of parameter?		Yes		
		Source clearly referenced?		Yes		
		Correct value provided?		Yes		
		Has this value been verified?		Yes		
		Choice of data correctly justified?		Yes		
		Measurement method correctly described?		Yes		

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B.6.2.15. NCVdiesel: Net Calorific value of diesel (DI).		<table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table>	Data Checklist	Yes / No / NA	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	Correct value provided?	Yes	Has this value been verified?	Yes	Choice of data correctly justified?	Yes	Measurement method correctly described?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No / NA																					
Title in line with methodology?	Yes																					
Data unit correctly expressed?	Yes																					
Appropriate description of parameter?	Yes																					
Source clearly referenced?	Yes																					
Correct value provided?	Yes																					
Has this value been verified?	Yes																					
Choice of data correctly justified?	Yes																					
Measurement method correctly described?	Yes																					
B.6.2.16. E _{HFO, historical} : Electricity generated on HFO at captive power plant in historical year		<table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table>	Data Checklist	Yes / No / NA	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	Correct value provided?	Yes	Has this value been verified?	Yes	Choice of data correctly justified?	Yes	Measurement method correctly described?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No / NA																					
Title in line with methodology?	Yes																					
Data unit correctly expressed?	Yes																					
Appropriate description of parameter?	Yes																					
Source clearly referenced?	Yes																					
Correct value provided?	Yes																					
Has this value been verified?	Yes																					
Choice of data correctly justified?	Yes																					
Measurement method correctly described?	Yes																					
B.6.2.17. FC _{HFO, historical} : HFO consumption for electricity generation at captive power plant in historical year		<table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr></table>	Data Checklist	Yes / No / NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																
Data Checklist	Yes / No / NA																					

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		Title in line with methodology?	Yes		
		Data unit correctly expressed?	Yes		
		Appropriate description of parameter?	Yes		
		Source clearly referenced?	Yes		
		Correct value provided?	Yes		
		Has this value been verified?	Yes		
		Choice of data correctly justified?	Yes		
		Measurement method correctly described?	Yes		
B.6.2.18. E _{NG, historical} : Electricity generated on Natural gas at captive power plant in historical year				☑	☑
		Data Checklist	Yes / No / NA		
		Title in line with methodology?	Yes		
		Data unit correctly expressed?	Yes		
		Appropriate description of parameter?	Yes		
		Source clearly referenced?	Yes		
		Correct value provided?	Yes		
		Has this value been verified?	Yes		
		Choice of data correctly justified?	Yes		
		Measurement method correctly described?	Yes		

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B.6.2.19. FC _{NG, historical} : Natural gas consumption for electricity generation at captive power plant in historical year				CR4	<input checked="" type="checkbox"/>
		Data Checklist	Yes / No / NA		
		Title in line with methodology?	No		
		Data unit correctly expressed?	No		
		Appropriate description of parameter?	No		
		Source clearly referenced?	No		
		Correct value provided?	No		
		Has this value been verified?	No		
		Choice of data correctly justified?	No		
		Measurement method correctly described?	No		
		Clarification Request No. 4. Please clarify why the parameter FC _{NG, historical} : Natural gas consumption for electricity generation at captive power plant in historical year has not been considered.			
B.6.2.20. FC _{diesel, historical} : Diesel consumption at captive power plant in historical year		Data Checklist	Yes / No / NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Title in line with methodology?	Yes		
		Data unit correctly expressed?	Yes		
		Appropriate description of parameter?	Yes		
		Source clearly referenced?	Yes		
		Correct value provided?	Yes		
		Has this value been verified?	Yes		
		Choice of data correctly justified?	Yes		
		Measurement method correctly described?	Yes		

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B.6.2.21. COEF _{HFO} : Emission Coefficient of HFO		<table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table>		Data Checklist	Yes / No / NA	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	Correct value provided?	Yes	Has this value been verified?	Yes	Choice of data correctly justified?	Yes	Measurement method correctly described?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No / NA																						
Title in line with methodology?	Yes																						
Data unit correctly expressed?	Yes																						
Appropriate description of parameter?	Yes																						
Source clearly referenced?	Yes																						
Correct value provided?	Yes																						
Has this value been verified?	Yes																						
Choice of data correctly justified?	Yes																						
Measurement method correctly described?	Yes																						
B.6.2.22. COEF _{diesel} : Emission Coefficient of diesel		<table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table>		Data Checklist	Yes / No / NA	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	Correct value provided?	Yes	Has this value been verified?	Yes	Choice of data correctly justified?	Yes	Measurement method correctly described?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No / NA																						
Title in line with methodology?	Yes																						
Data unit correctly expressed?	Yes																						
Appropriate description of parameter?	Yes																						
Source clearly referenced?	Yes																						
Correct value provided?	Yes																						
Has this value been verified?	Yes																						
Choice of data correctly justified?	Yes																						
Measurement method correctly described?	Yes																						

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B.6.2.23. COEF _{NG} : Emission Coefficient of natural gas		<table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table>	Data Checklist	Yes / No / NA	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	Correct value provided?	Yes	Has this value been verified?	Yes	Choice of data correctly justified?	Yes	Measurement method correctly described?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Checklist	Yes / No / NA																					
Title in line with methodology?	Yes																					
Data unit correctly expressed?	Yes																					
Appropriate description of parameter?	Yes																					
Source clearly referenced?	Yes																					
Correct value provided?	Yes																					
Has this value been verified?	Yes																					
Choice of data correctly justified?	Yes																					
Measurement method correctly described?	Yes																					
Baseline emissions from electricity (BE _{elec} , y) to provide mechanical energy generated by waste energy.																						
B.6.2.1. In case, in the baseline situation, more than one type of fossil fuel is used in the captive plant, the relative contribution to the total output of each fossil fuel shall be considered and the formulas for baseline emissions shall be adjusted accordingly. Efficiency of the power plant ($\eta_{Plant,j}$) shall be one of the following:		<p>The Lucky Cement Pezu Plant used more than one type of fossil fuel in the captive plant in the baseline scenario. To consider the relative contribution to the total output of each fossil fuel shall be considered and the formulas for baseline emissions shall be adjusted accordingly.</p> <p>Clarification Request No. 5.</p> <p>Please clarify in detail how the efficiency of the power plant (η_{Plant}).</p>	CR5	<input checked="" type="checkbox"/>																		

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<p>(i) Assume a constant efficiency of the captive plant and determine the efficiency, as a conservative approach, for optimal operation conditions i.e. design fuel, optimal load, optimal oxygen content in flue gases, adequate fuel conditioning (temperature, viscosity, moisture, size/mesh etc.), representative or favourable ambient conditions (ambient temperature and humidity); or</p> <p>(ii) Highest of the efficiency values provided by two or more manufacturers for power plants with specifications similar to that which would have been required to supply the recipient with the electricity that it receives from the project activity; or</p> <p>(iii) Assume a captive power generation efficiency of 60% based on the net calorific values as a conservative approach.</p>		j) has been calculated.		
B.6.2.2. HG _{j,y} , Net quantity of heat supplied to the recipient plant j		Not Applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.2.3. What parameters are given to calculated f_{WCM} ?		See section B.6.2.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.2.4. How has f_{WCM} been calculated?		The parameter is set to 1 because, according to the methodology, the electricity generation is purely from use of waste energy.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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B.6.2.5. What parameters are given to calculated f_{CAP} ?		See section B.6.2.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.2.6. How has f_{CAP} been calculated? Is that in line with ACM0012?		<u>Clarification Request No. 6.</u> <ul style="list-style-type: none"> - Please clarify which method is used to calculate the Fcap of the plant. - Please clarify why Fcap has not been calculated for each clinker production line. - Please clarify the use of the waste heat to meet the internal energy demand of the clinker production lines - Please clarify the total energy demand of the industrial facility - Please clarify the specific energy consumption of the clinker production 	CAR6	<input checked="" type="checkbox"/>
B.6.3. Ex-ante estimation of emission reductions				
B.6.3.1. Is the projection based on the same procedures as used for future monitoring?		Yes, The same procedures are used for future monitoring which only considers the baseline emissions, no project emissions and no leakage.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.3.2. Are the GHG calculations documented in a complete and transparent manner?		Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.3.3. If there is more than one component of the project activity, then, are emission reduction calculations provided separately for each component?		Not Applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.3.4. Is the data provided in this section consistent with data as presented in other chap-		Yes,	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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ters of the PDD?		The data provided is consistent with data presented in other chapters of the PDD.		
B.6.4. Summary of the ex-ante estimation of emission reductions				
B.6.4.1. Will the project result in fewer GHG emissions than the baseline scenario?		The project definitely will result in fewer GHG emissions than the baseline scenario.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.4.2. Is the form/table required for the indication of projected emission reductions correctly applied?		Yes, The form is correctly applied according to the PDD template.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.4.3. If the project activity involves more than one component, is separate table included for each of the component.		Not Applicable	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.4.4. Do these values comply with small-scale criteria for every year?		Yes, since the estimated emission reductions are less than 60,000 tCO ₂ .		<input checked="" type="checkbox"/>
B.6.4.5. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?		Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.6.4.6. Is the data provided in this section in consistency with data as presented in other chapters of the PDD?		Yes, The data provided is consistent with data presented in other chapters of the PDD.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.7. Application of the monitoring methodology and description of the monitoring plan				
B.7.1. Data and parameters monitored				
B.7.1.1. Is the list of parameters presented in chapter B.7.1 considered to be complete with regard to the requirements of the applied me-	1,2	Yes. The list presented is complete.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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thodology?																												
B.7.1.2. Comment on any line answered with “No”																												
B.7.1.3. <u>Parameter Title</u> : Thermal and/or electrical energy produced $Q_{OE,y}$	1,2	<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided for estimation?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr><tr><td>Correct reference to standards?</td><td>Yes</td></tr><tr><td>Indication of accuracy provided?</td><td>Yes</td></tr><tr><td>QA/QC procedures described?</td><td>Yes</td></tr><tr><td>QA/QC procedures appropriate?</td><td>Yes</td></tr></table>	Monitoring Checklist	Yes / No	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	Correct value provided for estimation?	Yes	Has this value been verified?	Yes	Measurement method correctly described?	Yes	Correct reference to standards?	Yes	Indication of accuracy provided?	Yes	QA/QC procedures described?	Yes	QA/QC procedures appropriate?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Monitoring Checklist	Yes / No																											
Title in line with methodology?	Yes																											
Data unit correctly expressed?	Yes																											
Appropriate description of parameter?	Yes																											
Source clearly referenced?	Yes																											
Correct value provided for estimation?	Yes																											
Has this value been verified?	Yes																											
Measurement method correctly described?	Yes																											
Correct reference to standards?	Yes																											
Indication of accuracy provided?	Yes																											
QA/QC procedures described?	Yes																											
QA/QC procedures appropriate?	Yes																											
B.7.1.4. <u>Parameter Title</u> : COEF _{HFO} Emission coefficient of HFO		<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr></table>	Monitoring Checklist	Yes / No	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>														
Monitoring Checklist	Yes / No																											
Title in line with methodology?	Yes																											
Data unit correctly expressed?	Yes																											
Appropriate description of parameter?	Yes																											
Source clearly referenced?	Yes																											

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		Correct value provided for estimation?	Yes		
		Has this value been verified?	Yes		
		Measurement method correctly described?	Yes		
		Correct reference to standards?	Yes		
		Indication of accuracy provided?	Yes		
		QA/QC procedures described?	Yes		
		QA/QC procedures appropriate?	Yes		
B.7.1.5. <u>Parameter Title:</u> COEF_{NG} Emission coefficient of natural gas				☑	☑
		Monitoring Checklist			
		Yes / No			
		Title in line with methodology?	Yes		
		Data unit correctly expressed?	Yes		
		Appropriate description of parameter?	Yes		
		Source clearly referenced?	Yes		
		Correct value provided for estimation?	Yes		
		Has this value been verified?	Yes		
		Measurement method correctly described?	Yes		
		Correct reference to standards?	Yes		
		Indication of accuracy provided?	Yes		
QA/QC procedures described?	Yes				

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		QA/QC procedures appropriate?	Yes																										
B.7.1.6. <u>Parameter Title:</u> COEF _{diesel} Emission coefficient of diesel		<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided for estimation?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr><tr><td>Correct reference to standards?</td><td>Yes</td></tr><tr><td>Indication of accuracy provided?</td><td>Yes</td></tr><tr><td>QA/QC procedures described?</td><td>Yes</td></tr><tr><td>QA/QC procedures appropriate?</td><td>Yes</td></tr></table>		Monitoring Checklist	Yes / No	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	Correct value provided for estimation?	Yes	Has this value been verified?	Yes	Measurement method correctly described?	Yes	Correct reference to standards?	Yes	Indication of accuracy provided?	Yes	QA/QC procedures described?	Yes	QA/QC procedures appropriate?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Monitoring Checklist	Yes / No																												
Title in line with methodology?	Yes																												
Data unit correctly expressed?	Yes																												
Appropriate description of parameter?	Yes																												
Source clearly referenced?	Yes																												
Correct value provided for estimation?	Yes																												
Has this value been verified?	Yes																												
Measurement method correctly described?	Yes																												
Correct reference to standards?	Yes																												
Indication of accuracy provided?	Yes																												
QA/QC procedures described?	Yes																												
QA/QC procedures appropriate?	Yes																												
B.7.1.7. <u>Parameter Title:</u> NCV _{HFO} Net Calorific value of HFO to be used in kiln and at captive power plant		<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr></table>		Monitoring Checklist	Yes / No	Title in line with methodology?	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																				
Monitoring Checklist	Yes / No																												
Title in line with methodology?	Yes																												

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		Data unit correctly expressed?	Yes		
		Appropriate description of parameter?	Yes		
		Source clearly referenced?	Yes		
		Correct value provided for estimation?	Yes		
		Has this value been verified?	Yes		
		Measurement method correctly described?	Yes		
		Correct reference to standards?	Yes		
		Indication of accuracy provided?	Yes		
		QA/QC procedures described?	Yes		
		QA/QC procedures appropriate?	Yes		
B.7.1.8. <u>Parameter Title:</u> NCV _{NG} Net Calorific value of NG				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Monitoring Checklist	Yes / No		
		Title in line with methodology?	Yes		
		Data unit correctly expressed?	Yes		
		Appropriate description of parameter?	Yes		
		Source clearly referenced?	Yes		
		Correct value provided for estimation?	Yes		
		Has this value been verified?	Yes		
		Measurement method correctly described?	Yes		
		Correct reference to standards?	Yes		
		Indication of accuracy provided?	Yes		

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		QA/QC procedures described?	Yes																											
		QA/QC procedures appropriate?	Yes																											
B.7.1.9. <u>Parameter Title:</u> NCV _{diesel} Net Calorific value of diesel		<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr><tr><td>Correct value provided for estimation?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr><tr><td>Correct reference to standards?</td><td>Yes</td></tr><tr><td>Indication of accuracy provided?</td><td>Yes</td></tr><tr><td>QA/QC procedures described?</td><td>Yes</td></tr><tr><td>QA/QC procedures appropriate?</td><td>Yes</td></tr></table>			Monitoring Checklist	Yes / No	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	Correct value provided for estimation?	Yes	Has this value been verified?	Yes	Measurement method correctly described?	Yes	Correct reference to standards?	Yes	Indication of accuracy provided?	Yes	QA/QC procedures described?	Yes	QA/QC procedures appropriate?	Yes	☑	☑
Monitoring Checklist	Yes / No																													
Title in line with methodology?	Yes																													
Data unit correctly expressed?	Yes																													
Appropriate description of parameter?	Yes																													
Source clearly referenced?	Yes																													
Correct value provided for estimation?	Yes																													
Has this value been verified?	Yes																													
Measurement method correctly described?	Yes																													
Correct reference to standards?	Yes																													
Indication of accuracy provided?	Yes																													
QA/QC procedures described?	Yes																													
QA/QC procedures appropriate?	Yes																													
B.7.1.10. <u>Parameter Title:</u> EG _{i, j, γ} Net electricity generated by waste heat re- covery based steam turbo-generator		<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr><tr><td>Source clearly referenced?</td><td>Yes</td></tr></table>			Monitoring Checklist	Yes / No	Title in line with methodology?	Yes	Data unit correctly expressed?	Yes	Appropriate description of parameter?	Yes	Source clearly referenced?	Yes	☑	☑														
Monitoring Checklist	Yes / No																													
Title in line with methodology?	Yes																													
Data unit correctly expressed?	Yes																													
Appropriate description of parameter?	Yes																													
Source clearly referenced?	Yes																													

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		Correct value provided for estimation?	Yes			
		Has this value been verified?	Yes			
		Measurement method correctly described?	Yes			
		Correct reference to standards?	Yes			
		Indication of accuracy provided?	Yes			
		QA/QC procedures described?	Yes			
		QA/QC procedures appropriate?	Yes			
B.7.1.11. <u>Parameter Title:</u> FC_{NG, Y} Natural gas consumption by captive power plant					☑	☑
			</			

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HFO consumption by captive power plant		Monitoring Checklist	Yes / No		
		Title in line with methodology?	Yes		
		Data unit correctly expressed?	Yes		
		Appropriate description of parameter?	Yes		
		Source clearly referenced?	Yes		
		Correct value provided for estimation?	Yes		
		Has this value been verified?	Yes		
		Measurement method correctly described?	Yes		
		Correct reference to standards?	Yes		
		Indication of accuracy provided?	Yes		
		QA/QC procedures described?	Yes		
		QA/QC procedures appropriate?	Yes		
B.7.1.13. <u>Parameter Title:</u> $FC_{\text{diesel}, Y}$ diesel consumption by captive power plant		Monitoring Checklist	Yes / No	☑	☑
		Title in line with methodology?	Yes		
		Data unit correctly expressed?	Yes		
		Appropriate description of parameter?	Yes		
		Source clearly referenced?	Yes		
		Correct value provided for estimation?	Yes		
		Has this value been verified?	Yes		
		Measurement method correctly described?	Yes		

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		Correct reference to standards?	Yes			
		Indication of accuracy provided?	Yes			
		QA/QC procedures described?	Yes			
		QA/QC procedures appropriate?	Yes			
B.7.1.14. <u>Parameter Title:</u> Density_{diesel} Density of diesel					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Monitoring Checklist	Yes / No			
		Title in line with methodology?	Yes			
		Data unit correctly expressed?	Yes			
		Appropriate description of parameter?	Yes			
		Source clearly referenced?	Yes			
		Correct value provided for estimation?	Yes			
		Has this value been verified?	Yes			
		Measurement method correctly described?	Yes			
		Correct reference to standards?	Yes			
		Indication of accuracy provided?	Yes			
		QA/QC procedures described?	Yes			
		QA/QC procedures appropriate?	Yes			
B.7.1.15. <u>Parameter Title:</u> In case of thermal energy: the enthalpy of the thermal energy output stream like hot water/ steam should be monitored.	1,2				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Monitoring Checklist	Yes / No			
		Title in line with methodology?	NA			
		Data unit correctly expressed?	NA			

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		Appropriate description of parameter?	NA																									
		Source clearly referenced?	NA																									
		Correct value provided for estimation?	NA																									
		Has this value been verified?	NA																									
		Measurement method correctly described?	NA																									
		Correct reference to standards?	NA																									
		Indication of accuracy provided?	NA																									
		QA/QC procedures described?	NA																									
		QA/QC procedures appropriate?	NA																									
B.7.1.16. <u>Parameter Title:</u> Amount of waste gas or the amount of energy contained in the waste heat or waste pressure.	1,2 IRL 22, 23, 24,	<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NO</td></tr><tr><td>Data unit correctly expressed?</td><td>NO</td></tr><tr><td>Appropriate description of parameter?</td><td>NO</td></tr><tr><td>Source clearly referenced?</td><td>NO</td></tr><tr><td>Correct value provided for estimation?</td><td>NO</td></tr><tr><td>Has this value been verified?</td><td>NO</td></tr><tr><td>Measurement method correctly described?</td><td>NO</td></tr><tr><td>Correct reference to standards?</td><td>NO</td></tr><tr><td>Indication of accuracy provided?</td><td>NO</td></tr><tr><td>QA/QC procedures described?</td><td>NO</td></tr></table>			Monitoring Checklist	Yes / No	Title in line with methodology?	NO	Data unit correctly expressed?	NO	Appropriate description of parameter?	NO	Source clearly referenced?	NO	Correct value provided for estimation?	NO	Has this value been verified?	NO	Measurement method correctly described?	NO	Correct reference to standards?	NO	Indication of accuracy provided?	NO	QA/QC procedures described?	NO	CAR	☑
Monitoring Checklist	Yes / No																											
Title in line with methodology?	NO																											
Data unit correctly expressed?	NO																											
Appropriate description of parameter?	NO																											
Source clearly referenced?	NO																											
Correct value provided for estimation?	NO																											
Has this value been verified?	NO																											
Measurement method correctly described?	NO																											
Correct reference to standards?	NO																											
Indication of accuracy provided?	NO																											
QA/QC procedures described?	NO																											

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		QA/QC procedures appropriate?	NO																										
		<u>Corrective Action Request No.2.</u> Please clarify the quantity and energy content of the waste energy produced for the rated plant capacity/per unit of product produced.																											
B.7.1.17. <u>Parameter Title:</u> Metering the amount of mechanical energy generated /supplied	1,2	<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>NA</td></tr><tr><td>Data unit correctly expressed?</td><td>NA</td></tr><tr><td>Appropriate description of parameter?</td><td>NA</td></tr><tr><td>Source clearly referenced?</td><td>NA</td></tr><tr><td>Correct value provided for estimation?</td><td>NA</td></tr><tr><td>Has this value been verified?</td><td>NA</td></tr><tr><td>Measurement method correctly described?</td><td>NA</td></tr><tr><td>Correct reference to standards?</td><td>NA</td></tr><tr><td>Indication of accuracy provided?</td><td>NA</td></tr><tr><td>QA/QC procedures described?</td><td>NA</td></tr><tr><td>QA/QC procedures appropriate?</td><td>NA</td></tr></table>		Monitoring Checklist	Yes / No	Title in line with methodology?	NA	Data unit correctly expressed?	NA	Appropriate description of parameter?	NA	Source clearly referenced?	NA	Correct value provided for estimation?	NA	Has this value been verified?	NA	Measurement method correctly described?	NA	Correct reference to standards?	NA	Indication of accuracy provided?	NA	QA/QC procedures described?	NA	QA/QC procedures appropriate?	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Monitoring Checklist	Yes / No																												
Title in line with methodology?	NA																												
Data unit correctly expressed?	NA																												
Appropriate description of parameter?	NA																												
Source clearly referenced?	NA																												
Correct value provided for estimation?	NA																												
Has this value been verified?	NA																												
Measurement method correctly described?	NA																												
Correct reference to standards?	NA																												
Indication of accuracy provided?	NA																												
QA/QC procedures described?	NA																												
QA/QC procedures appropriate?	NA																												
B.7.1.18. <u>Parameter Title:</u> Metering the temperature and pressure of WECM	1,2	<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr></table>		Monitoring Checklist	Yes / No	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>																						
Monitoring Checklist	Yes / No																												

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		Title in line with methodology?	NA			
		Data unit correctly expressed?	NA			
		Appropriate description of parameter?	NA			
		Source clearly referenced?	NA			
		Correct value provided for estimation?	NA			
		Has this value been verified?	NA			
		Measurement method correctly described?	NA			
		Correct reference to standards?	NA			
		Indication of accuracy provided?	NA			
		QA/QC procedures described?	NA			
		QA/QC procedures appropriate?	NA			
B.7.1.19. <u>Parameter Title: f_{cap}</u>	1,2				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
		Monitoring Checklist	Yes / No			
		Title in line with methodology?	No			
		Data unit correctly expressed?	No			
		Appropriate description of parameter?	No			
		Source clearly referenced?	No			
		Correct value provided for estimation?	No			
		Has this value been verified?	No			
		Measurement method correctly described?	No			

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		Correct reference to standards?		No		
		Indication of accuracy provided?		No		
		QA/QC procedures described?		No		
		QA/QC procedures appropriate?		No		
		See section B.7.1.1 Fcap calculated based on Method 3, Case 1 of ACM00012 version 4 is applied based on the pre-calculated $Q_{OE,BL}$ and the monitored $Q_{OE,y}$.				
B.7.2. Description of the monitoring plan						
B.7.2.1. Is the operational and management structure clearly described and in compliance with the envisioned situation?	1,2	Yes, Operational and management structure clearly described and it is in compliance with the envisioned situation.			☑	☑
B.7.2.2. Are responsibilities and institutional arrangements for data collection and archiving clearly provided?	1,2	Yes, Shift Operator at Lucky Cement Karachi <u>Pezu</u> Plant are responsible.			☑	☑
B.7.2.3. Does the monitoring plan provide current good monitoring practice?	1,2	Yes.			☑	☑
B.7.2.4. Have QA/QC procedures of the methodology been covered?	1,2	Yes, QA/QC procedures of the methodology been covered			☑	☑
B.7.2.5. If applicable: Does annex 4 provide useful information enabling a better understanding of the envisioned monitoring provisions?	1,2	Not Applicable			☑	☑

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B.8. Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)				
B.8.1.1. Is there any indication of a date when the baseline was determined?	1,2	Yes, The baseline was determined on 23/06/2011.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.8.1.2. Is this consistent with the time line of the PDD history?	1,2 51, 57, 60	Yes. This consistent with the time line of the PDD history (IRL 1, 51, 57, 60).	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.8.1.3. Is the information on the person(s) / entity(ies) responsible for the application of the baseline and monitoring methodology provided consistent with the actual situation?	1,2	Yes.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
B.8.1.4. Is information provided whether this person / entity is also considered a project participant?	1,2	Yes, First Climate (Switzerland) AG and Carbon Services (Private) Limited are project participants.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C. Duration of the project activity / crediting period				
C.1. Duration of the project activity				
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	1	Yes, Starting date of the project activity is May 7, 2008 which is the date of signing contract between Lucky Cement Limited and Sinoma Energy Conservation Ltd.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C.2. Choice of the crediting period and related information				
C.2.1. Is the assumed crediting time clearly defined and reasonable (renewable crediting)	1	The project has the fixed crediting period of 10 years.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD
period of max 7 years with potential for 2 renewals or fixed crediting period of max. 10 years)?				
D. Environmental impacts				
D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts				
D.1.1. Has the analysis of the environmental impacts of the project activity been sufficiently described?	1,15, 18, 45,	According to host country regulations, the project activity required an Initial Environmental examination (IEE). The evidences of Initial Environmental examination (IEE) has been delivered to the DOE (IRL 15) which states that there are no project is in line with country environmental law.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, has an EIA been approved?	1,18, 45,	See section D.1.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.1.3. Will the project create any adverse environmental effects?	1,18, 45,	See section D.1.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.1.4. Were transboundary environmental impacts identified in the analysis?	1,18, 45,	See section D.1.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party				
D.2.1. Have the identified environmental impacts been addressed in the project design sufficiently?	1,18, 45,	See section D.1.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D.2.2. Does the project comply with environmental legislation in the host country?	1,18, 45,	See section D.1.1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD
E. Stakeholders' comments				
E.1. Brief description how comments by local stakeholders have been invited and compiled				
E.1.1. Have relevant stakeholders been consulted?	1,15, 16,17	Yes, Local stakeholder consultation meeting was held on January 22 nd , 2009 at Lucky Cement Limited Pezu plant.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	1,15, 16,17	It is mentioned in section E.1 of the PDD that stakeholders were informed through specific advertising published by the project owner in the local (Urdu) and international language (English). The evidences have been submitted to DOE and TÜV SÜD confirms that the stakeholders were invited by using the proper media.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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?	1,15, 16,17	Based on its local and sectoral expertise TÜV SÜD confirms stakeholder consultation meeting is not required by law in Pakistan but it is required by DNA Pakistan for issuance of Host Country Approval.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.1.4. Is the undertaken stakeholder process that was carried out described in a complete and transparent manner?	1,15, 16,17	Yes, the undertaken stakeholder process carried out has been described in a complete and transparent manner.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.2. Summary of the comments received				
E.2.1. Is a summary of the received stakeholder comments provided?	1,15, 16,17	Yes, Summary of the received stakeholder comment have been provided in section E.2 of PDD and has been delivered to DOE.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E.3. Report on how due account was taken of any comments received				
E.3.1. Has due account been taken of any	1,15,	Summary of the received stakeholder comments shows that no	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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stakeholder comments received?	16, 17	negative comments received.		
F. Annexes 1 - 4				
F.1. Annex 1: Contact Information				
F.1.1. Is the information provided consistent with the one given under section A.3?	1	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.1.2. Is the information on all private participants and directly involved Parties presented?	1	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.2. Annex 2: Information regarding public funding				
F.2.1. Is the information provided on the inclusion of public funding (if any) in consistency with the actual situation presented by the project participants?	1,6	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.2.2. If necessary: Is an affirmation available that any such funding from Annex-I-countries does not result in a diversion of ODA?	1,6	Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.3. Annex 3: Baseline information				
F.3.1. If additional background information on baseline data is provided: Is this information consistent with data presented by other sections of the PDD?	1,2	<u>Corrective Action Request No.3.</u> The choice of the emission coefficients for HFO needs to clarify as for IPCC 2006 default values has been taken into account a conservative approach. Why not local or country-specific values of emission factors of fuels have been considered.	CAR3	<input checked="" type="checkbox"/>
F.3.2. If additional background informa-	1,2	See CAR3	See	<input checked="" type="checkbox"/>

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CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD
tion on baseline data is provided: Is this information consistent with data presented by other sections of the PDD?			CAR3	
F.3.3. Is the data provided verifiable? Has sufficient evidence been provided to the validation team?	1,2	See CAR3	See CAR3	<input checked="" type="checkbox"/>
F.3.4. Does the additional information substantiate / support statements given in other sections of the PDD?	1,2	See CAR3	See CAR3	<input checked="" type="checkbox"/>
F.4. Annex 4: Monitoring information				
F.4.1. If additional background information on monitoring is provided: Is this information consistent with data presented in other sections of the PDD?	1,2	Monitoring information has been given in Section B.7.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.4.2. Is the information provided verifiable? Has sufficient evidence been provided to the validation team?	1,2	Monitoring information has been given in Section B.7.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
F.4.3. Do the additional information and / or documented procedures substantiate / support statements given in other sections of the PDD?	1,2	Monitoring information has been given in Section B.7.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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Table 2 Resolution of Corrective Action and Clarification Requests

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
<p><u>Corrective Action Request No.1.</u></p> <p>For all default figures provided in the ER excel file calculation sheet appropriate sources have to be indicated in order to trace these figures.</p>	A.4.4.2. IRL 37	For all default figures provided in the ER excel file calculation sheet appropriate sources have already been indicated in order to trace these figures. Emission reduction calculation sheet with comments has been provided to DOE.	<p>The evidenced of default figures provided in PDD has been delivered to DOE.</p> <p>The issue is settled.</p> <p>☑</p>
<p><u>Parameter Title:</u> Amount of waste gas or the amount of energy contained in the waste heat or waste pressure:</p> <p><u>Corrective Action Request No.2.</u></p> <p>Please clarify the quantity and energy content of the waste energy produced for the rated plant capacity/per unit of product produced.</p>	B.7.1.16. IRL 1 IRL 2 IRL 3	The method selected for calculation of f_{cap} (Case 1 of Method 3) is based on Final Output Energy (electrical MWh) of the project plant; therefore, the determination of intermediate energy (waste heat per unit of product) is not relevant to the selected approach for calculation of f_{cap} . No historical measurements or data is available for waste energy produced by the kilns.	<p>The applied approach to calculate the F_{cap} is (Case 1 of Method 3) which does not required to determination the intermediate energy (waste heat per unit of product).</p> <p>The issue is settled.</p> <p>☑</p>
<p><u>Corrective Action Request No.3.</u></p> <p><u>The choice of the emission coefficients for HFO needs to clarify as for IPCC 2006 default values has been taken into account a conservative approach. Why not local or country-specific values of emission factors of fuels have been considered</u></p>	F.3.1. IRL 2	<p>The type of HFO has been specified in Annex 3 of the PDD. According to table 1.1 of Volume 2, Chapter 1 of IPCC 2006, types of HFO being used is Residual Fuel Oil.</p> <p>Local or country-specific values of emission factors of fuels are not available. Therefore, IPCC default values are used for all the fuels including HFO. According to applied methodology AMS-III.Q. / Version 04 it is permissible to use IPCC default values of emission factors for fuels.</p>	<p>According to applied methodology AMS-III.Q. / Version 04 it is permissible to use IPCC default values of emission factors for fuels.</p> <p>The issue is settled.</p> <p>☑</p>

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<p><u>Clarification Request No. 1.</u></p> <ul style="list-style-type: none"> – The LoA of the parties involved have to be provided to the DOE. – Please provide the Modalities of Communication (MoC). 	<p>A.3.2. IRL 42 IRL 43</p>	<ul style="list-style-type: none"> – Host Country Approval of the project activity for the Project Participants (Lucky Cement Ltd. and Carbon Services Private Ltd.) from the DNA (Designated National Authority) for CDM in Pakistan; and Swiss LoA of First Climate (Switzerland) AG have been provided to DOE. – Modalities of Communication form is in process and shall be provided to DOE later. 	<ul style="list-style-type: none"> – Both LoA have been provided to DOE – Modalities of Communication (MoC) has been provided to DOE. <p>The issue is settled. <input checked="" type="checkbox"/></p>
<p><u>Clarification Request No. 2.</u></p> <p>Proofs of operation license of cement plant and construction license of the project activity have to be provided to the DOE.</p>	<p>A.4.1.2. IRL 18</p>	<p>No operation license of cement plant is required by Government of Pakistan. The only construction license for the project activity is Environmental Approval from the Environmental Protection Agency of Provincial Government. The Environmental Approval has already been provided to DOE.</p>	<p>TÜV SÜD confirms based on its local and sectoral expertise that the project participant needs environmental approvals from Environmental Protection Agency of Provincial Government (Punjab, Pakistan) which has been delivered to DOE (IRL 18). The issue is settled. <input checked="" type="checkbox"/></p>
<p><u>Clarification Request No. 3.</u></p> <p>Please clarify the following questions.</p> <ul style="list-style-type: none"> - Who decides the KIBOR and basis points? - Why 200 basis points are considered and at what time project participants considered 200 basis points? – The project IRR value presented in FSR is 7.73% while IRR in GSP PDD is 7.95% and same value is in the repeated GSP. Please clarify why the 	<p>B.5.17. IRL 47 IRL 48 IRL 52 IRL 53 IRL 54 IRL 55</p>	<p>PP Response:</p> <ul style="list-style-type: none"> – State Bank of Pakistan decides the daily KIBOR. The lending bank decides the spread to be added to the KIBOR. The average spread over the KIBOR or the risk component used in the calculation of benchmark is linked to specific risks or characteristics of the project activity (which a lending bank will always take into account while extending a loan offer to a borrower). 	<p>The KIBOR (Karachi Interbank Offered Rate) is determined by the third party (State Bank of Pakistan) which is the lending bank which ultimately decides about the average spread to be charged above KIBOR. The average spread (200 basis points) used in the benchmark calculation is based on the loan offer that the PP got from a local bank As bank offer for basis</p>

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<p>project IRR presented in PDD is different from IRR value presented in FSR.</p> <ul style="list-style-type: none"> - Please provide all the relevant evidence related to benchmark, Investment Cost, operational & Maintenance cost, 		<ul style="list-style-type: none"> - The difference in the IRR value in the GSP PDD was due to difference between the input values of investment analysis and FSR. The project IRR value in the repeated GSP PDD is consistent with the FSR. - The average spread (200 basis points) used in the benchmark calculation is based on the loan offer that the PP got from a local bank (a copy of the loan offer letter has already been provided to the DOE). 200 basis points were considered at the time of feasibility preparation for the project activity. The basis for consideration of 200 points is already explained above under the first point. - All the relevant evidences related to benchmark, investment cost, operational & maintenance cost have been provided to DOE. <p>TÜV SÜD response:</p> <p>Please explain in detail why the different input values was applied in IRR spreadsheet while according to EB 61 Annex 13 clearly say that "Input values used in all investment analysis should be valid and applicable at the time of the investment decision taken by the project participant"</p> <p>PP Response:</p> <p>The initial investment analysis as provided in the GSP PDD was based on the information provided in financial questionnaire which was sent to the PP by the CDM Project Developer. As FSR of the proposed CDM project activity was not shared with the PDD developer at the time of PDD development that is why a differ-</p>	<p>point is also from the third party so it is clear that the approached used for the calculation of benchmark (KIBOR + basis point) is appropriate.</p> <p>The unprotected IRR calculation IRR file has been provided.</p> <p>See IRL 47, 52, 53, 54 and 55 of annex 2.</p> <p>The issue is settled.</p> <p><input checked="" type="checkbox"/></p>
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		ence in values of input parameters occurred. This has now been rectified and input values used in all investment analyses are now consistent and are in compliance with the guidance provided in EB61 Annex13.	
<p><u>Clarification Request No. 4.</u></p> <ul style="list-style-type: none"> – Please clarify why FC_{NG, historical}: Natural gas consumption for electricity generation at captive power plant in historical year has not been considered. The application of natural gas fired existing CPP would be more conservative baseline by definition. 	B.6.2.19.	<ul style="list-style-type: none"> – Natural gas (NG) consumption for electricity generation at captive power plant in the historical year has not been considered because there was no natural gas consumption at the gensets in the historical years. During the historical years, it was not technically possible for gensets to consume natural gas. PP made a purchase order for dual fuel conversion (HFO & NG) on 13/04/2007. A copy of the purchase order has already been provided to DOE. In the project years, the gensets shall operate 65% on NG and 35% on HFO. Due to curtailment of natural gas during winter season, 100% operation on natural gas is not possible. 	<p>The project participant provided description in PDD has been cross checked against the purchase order for dual fuel conversion (HFO & NG) on 13/04/2007 (IRL 60).</p> <p>The issue is settled.</p> <p><input checked="" type="checkbox"/></p>
<p><u>Clarification Request No. 5.</u></p> <p>Please clarify in detail how the efficiency of the power plant ($\eta_{Plant, j}$) has been calculated.</p>	B.6.2.1.	<p>PP response:</p> <p>Calculation of efficiency of the power plant has been explained in Emission Reduction Calculation Excel Sheet and the relevant supporting documents have been provided to DOE.</p> <p>TÜV SÜD 1st response:</p> <p>It is not clear that how the plant efficiency has been calculated in the excel file there is a need to amend the PDD and give more information how the calculation has been done according to applied methodology AMS.III. Q version 4 page 6.</p> <p>PP response:</p>	<p>The PDD has been updated and calculation of efficiency of the power plant has been explained in detail in PDD which is in line with applied methodology.</p> <p>The issue is settled.</p> <p><input checked="" type="checkbox"/></p>

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		<p>The efficiency of the captive plant has been determined according to option (i) mentioned at page 6 of AMS-III.Q. / Version 04. As a conservative approach, the highest optimal operation (designed) efficiency among the four types of gensets is selected as constant efficiency of the existing captive plant. The determination of efficiency has been explained in §B.6.1 of PDD version 06.</p>	
<p><u>Clarification Request No. 6.</u></p> <ul style="list-style-type: none"> - Please clarify which method is used to calculate the Fcap of the plant - Please clarify why Fcap has not been calculated for each clinker production line. - Please clarify the use of the waste heat to meet the internal energy demand of the clinker production lines - Please clarify the total energy demand of the industrial facility - Please clarify the specific energy consumption of the clinker production. 	<p>B.6.2.6. IRL 1 IRL 2 IRL 3 IRL 45 IRL 46</p>	<ul style="list-style-type: none"> - Case 1 of Method 3 is used to calculate f_{cap} of the plant. It is mentioned in §B.6.1 of the PDD. - The clinker production lines have same capacity of 3300 TPD each. The method selected for calculation of f_{cap} (Case 1 of Method 3) doesn't require calculation of f_{cap} for each clinker production line. - Lucky Cement Limited doesn't have any internal demand of waste heat. The waste heat generated at the cement plant in the clinker production process is vented to the atmosphere with only a small portion recycled to heat the incoming raw materials. - Fuel consumption at kilns and electricity demand corresponding to clinker production are mentioned in Annex 3 of the PDD version 05. Relevant proofs of the data have been provided to DOE. - Historical specific fuel energy consumption for the clinker production at Unit II (Kilns C & D) is 3.437 GJ per ton of clinker. It has been mentioned in Annex 3 of the PDD version 05 and calculation is provided in the Emission Reduc- 	<ul style="list-style-type: none"> - For calculation of Fcap, the method 3 case 1 has been used. - As all clinker production lines have same capacity of 3300 TPD, it is not required by methodology to calculate the Fcap for each clinker production lines. - The information regarding the internal waste heat demand has been described in PDD. - The information regarding Fuel consumption at kilns and electricity demand corresponding to clinker production has been provided in PDD and found correct. - The provided figure of historical specific fuel

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		tion Calculation Excel Sheet.	energy consumption for the clinker production is 3.437698 GJ per ton of clinker which is in a reasonable range. The issue is settled. <input checked="" type="checkbox"/>
Clarifications and corrective action requests by validation team after TR	Ref. to table 1	Summary of project owner response	Validation team conclusion
<u>Correct Action request :1</u> <ul style="list-style-type: none"> The title of the project mentioned in PDD is not consistent letter of approval from Pakistan. The title of project participant "Lucky Cement Limited" is not consistent with Letter of approval from Pakistan. 		Updated Host Country Approval Letter (LoA) for the project activity, containing correct details for the project title and project participant, has been provided to DOE	The updated LoA from Pakistan has been provided to DOE. The issue is settled. <input checked="" type="checkbox"/>


Table 3 Unresolved Corrective Action and Clarification Requests (in case of denials)

Clarifications and / or corrective action requests by validation team	Id. of CAR/CR	Explanation of Conclusion for Denial
-	-	-


Validation of the CDM Project:
Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited
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Annex 2: Information Reference List

Annex 2 07-12-2011	Validation of the Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant Information Reference List	Page 7 of 7	
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Ref . No.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)																				
1	29/07/2009 23/06/2011	PDD “Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant”, Version 01 PDD “Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant”, Version 05	First Climate Group	PDD in GSP PDD in Re-GSP																				
2	15/04/2011	AMS-III.Q.: Waste energy recovery (gas/heat/pressure) projects --- Version 4.0	UNFCCC	-																				
3	29/09/2009	Participant list of on-site interviews	TÜV SÜD	-																				
3a		<p>The project discussion part was conducted on September 30, 2009 in Lucky cement Karachi Office while the onsite of project was done later on May 12 2010 due to security situation in project area by auditing team of TÜV SÜD Industrie Service.</p> <p>Validation team on-site:</p> <table><tr><td>Khalid Mahmood</td><td>TÜV SÜD, Assessment Team Leader & host country expert</td></tr><tr><td>Robert Mitterwallner</td><td>TÜV SÜD, GHG auditor</td></tr><tr><td>Auer Paula</td><td>TÜV SÜD, GHG auditor</td></tr><tr><td>Georgios Agrafiotis</td><td>TÜV SÜD, GHG auditor</td></tr></table> <p>Interviewed persons at Lucky Cement Limited, Pakistan:</p> <table><tr><td>Qazi Sabir</td><td>Sr. Project Manager (Carbon Services private limited Pakistan)</td></tr><tr><td>Feroz Baig</td><td>Project Engineer (Carbon Services private limited Pakistan)</td></tr><tr><td>Mohammad</td><td>Technical Director (Lucky Cement Limited)</td></tr><tr><td>Qutubuddin Baig</td><td></td></tr><tr><td>Intisar Haqqi</td><td>Director Power Generation (Lucky Cement Limited)</td></tr><tr><td>Hassan Mazhar</td><td>Deputy General Manager, Power generation (Lucky Cement</td></tr></table>	Khalid Mahmood	TÜV SÜD, Assessment Team Leader & host country expert	Robert Mitterwallner	TÜV SÜD, GHG auditor	Auer Paula	TÜV SÜD, GHG auditor	Georgios Agrafiotis	TÜV SÜD, GHG auditor	Qazi Sabir	Sr. Project Manager (Carbon Services private limited Pakistan)	Feroz Baig	Project Engineer (Carbon Services private limited Pakistan)	Mohammad	Technical Director (Lucky Cement Limited)	Qutubuddin Baig		Intisar Haqqi	Director Power Generation (Lucky Cement Limited)	Hassan Mazhar	Deputy General Manager, Power generation (Lucky Cement	-	-
Khalid Mahmood	TÜV SÜD, Assessment Team Leader & host country expert																							
Robert Mitterwallner	TÜV SÜD, GHG auditor																							
Auer Paula	TÜV SÜD, GHG auditor																							
Georgios Agrafiotis	TÜV SÜD, GHG auditor																							
Qazi Sabir	Sr. Project Manager (Carbon Services private limited Pakistan)																							
Feroz Baig	Project Engineer (Carbon Services private limited Pakistan)																							
Mohammad	Technical Director (Lucky Cement Limited)																							
Qutubuddin Baig																								
Intisar Haqqi	Director Power Generation (Lucky Cement Limited)																							
Hassan Mazhar	Deputy General Manager, Power generation (Lucky Cement																							

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Ref No.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
		<div> <div>Muhammad Shahid Patel</div> <div>Limited) Deputy Manager , costing and budgeting (Lucky Cement Limited)</div> </div> <div> <div>Muhammad Faisal Panawala</div> <div>Senior Account officer (Lucky Cement Limited)</div> </div>		
4	29/09/2009	Lucky Cement Limited homepage http://www.lucky-cement.com/		
5	13/05/2008	Letter of credit for purchasing the major equipment of the project activity from SINOMA ENERGY ONSERVATION LTD.	Lucky Cement Limited	Document confirming the starting date of the project
6	05/11/2008	Letter of No Public Funding Involvement issued by Lucky Cement Limited	Lucky Cement Limited	-
7	03/02/2007	E-mail introduction of Carbon Services (Private) Limited and Factor Consulting AG to Lucky Cement Limited about the CDM Project benefits	Lucky Cement Limited	CDM Awareness evidence
8	11/07/2007	Offer letter from Habib Bank Limited of Pakistan for up to PKR 1,000 Million Tern Finance Facility to Lucky cement limited for Pezu Plant.	Habib Bank Limited	Benchmark
9	2005	<i>The State bank of Pakistan (Financial Year 2004) - Quarterly Report</i> <i>Initially, introduced in September 2001, KIBOR was only used as a reference rate for interbank money market (for clean lending). However, to promote the culture of floating rate lending and make the mechanism transparent both for lender as well as borrower, KIBOR was also introduced as a reference rate for corporate lending in February 2004.</i>	State bank of Pakistan	Benchmark
10	04/11/2008	Financial information was requested by Omar Malik (Carbon Services Private Limited) and information provided by Citi Bank Pakistan about the benchmark, Karachi Inter Bank offer rates (KIBOR).	Citi Bank, Pakistan	Benchmark
11	2009	Data of Pezu Waste heat Recovery project (fuel consumption for years October 2004- Sep 2007)	Lucky Cement Limited	
12	2009	Technical specification of turbines from Sinoma (Technological supplier)	Lucky Cement Limited	

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Ref No.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
13	29/07/2009	Investment Analysis Sheet (IRR Calculation spreadsheet)	First climate and Carbon services	-
14	30/09/2009	Lucky Waste Heat Recovery project Training Sheet part I	Lucky Cement Limited	-
15	01/05/2009	Initial Environmental Examination Report	Environmental Consultancy & Services	-
16	20/01/2009	Local Stakeholder meeting Consultation invitation in Daily SUBH, Daily Newspaper, Daily SUBH, Peshawar,	Lucky Cement Limited	-
17	22/01/2009	List of Participants of Public stakeholder process, issued and submitted by Lucky Cement Ltd	Lucky Cement Limited	-
18	07/02/2009	Environmental Approval decision on Initial Environment Examination (IEE), issued by Environment Protection Department, Government of the Khyber Pakhtunkhwa, formerly NWFP, Peshawar, Pakistan	Environmental Protection Agency, Government of NWFP	-
19	29/09/2009	Power Generation Data (captive Power plant and fuel consumption baseline data) of Lucky Pezu (October 2004 to September 2007)	Lucky Cement Limited	
20	29/09/2009	Statement of Clinker Production from October 1 st , 2006 to September 30 th , 2008	Lucky Cement Limited	
21	02/05/2007	Waste heat recovery system information provided by PITCO (Consultancy firm) about the WHR system cost, Waste Heat Generation, O&M Costs and Overhaul costs etc.	PITCO	
22	29/09/2009	Quality coal analysis Report from Quality Control Department of Lucky Cement Limited	Lucky Cement Limited	
23	13/04/2008	Analytical report of the Natural Gas Test by PERAC Research & Development Foundation	Lucky Cement Limited	-
24	12/03/2008	Analytical report of Heavy Speed Diesel (HSD) Sample Test by PERAC Research & Development Foundation	Lucky Cement Limited	-
25	NA	Single line diagram of Lucky Cement Plant	Lucky Cement Limited	
26	NA	Technical specification of Boilers and Turbines		
27	07/05/2008	Equipment Purchase contract between Lucky Cement Limited and Sinoma Energy	Sinoma Energy	

Annex 2 07-12-2011	Validation of the Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant Information Reference List	Page 7 of 7	 Industrie Service
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Ref No.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
		Conservation Limited	conservation Ltd & Lucky Cement Limited	
28	10/10/2007	Feasibility Study on Lucky Cement WHR Project Pezu Project	Lucky Cement Limited	
29	29/09/2009	Cement based power consumption KWHR/TON data from October 2006- September- 2008 at Lucky cement Limited	Lucky Cement Limited	
30	29/09/2009	Daily Operation Log Book of Gas consumption, Captive power plant Voltage, Exhaust Gas Temp	Lucky Cement Limited	
31	29/09/2009	Pakistan electric power company (private) limited (PEPCO) supply & demand position: http://www.ppib.gov.pk/SupplyDemand.htm	Pakistan electric power company	-
32	01/05/2007	Extract from IGI Pakistan Cement Sector Review - May 2007 Page 41	IGI Securities	-
33	29/09/2009	International Currency converter , Exchange rate US \$ --> PKR http://www.iccfx.com/history.php	International Currency converter	
34	2007	Annual Energy Outlook 2007 (AEO 2007) prepared by the Energy Information Administration http://www.eia.doe.gov/	U.S Energy Information Administration	
35	01/07/2009	Pakistani Cement Industry (Operational Units Data) issued by All Pakistan Cement Manufactures Association (APCMA)	All Pakistan Cement Manufactures Association	
36	29/09/2009	UDI World Electric Power Plants Data Base (WEPP). Global inventory of electric power generating units. Platts, McGraw Hill Group. <ul style="list-style-type: none"> Design information for more than 145,000 units at more than 60,000 plant sites in 225+ countries; Coverage of installed and projected steam and gas turbines, combined-cycle plants, IC engines, hydro units, wind turbines, and renewable energy units; Details on plant operators, geographic location, capacity (MW), age, technology, fuels, and boiler, turbine, and generator manufacturers, emissions control equipment, and 	Platts (www.platts.com)	

Annex 2 07-12-2011	Validation of the Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant Information Reference List	Page 7 of 7	 Industrie Service
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Ref No.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
		more.		
37	20/01/2009	Emission Reduction (ER) Calculation sheet version 1 Emission Reduction (ER) Calculation sheet version 2	Lucky Cement Limited	-
38	02/08/2007	Draft Proposal of the CDM Service Agreement between Lucky Cement Limited and Factor Consulting + Management AG (now First Climate, FC)	First Climate	Continued action evidence
39		CDM Service Agreement Contract between Lucky Cement Limited & First Climate)	First Climate	Continued action evidence
40	22/10/2007	Extract of Minutes of the Board Directors meeting of Lucky Cement Limited The document includes the following statement: <i>"The board extensively discussed the feasibility studies which were based on the preliminary quotations provided by the technology supplier. The CEO further briefed the board that it is evident from the feasibility studies that without the inclusion of carbon credits, none of the aforementioned projects is a financially viable investment opportunity. The carbon credit income from both (Lucky Karachi & Lucky Pezu) would approximately be Rs.100-110 Million annually up till 2012, which is critical to their financial approval.</i> <i>The projects (Lucky Karachi & Lucky Pezu) were approved by the Board of directors and resolution was passed.</i>	Lucky Cement Limited	Evidence of investment decision
41	10/07/2009	Validation contract between Lucky Cement Limited and TÜV SÜD Carbon Management Service	Lucky Cement Limited / TÜV SÜD	Continued action evidence
42	14/10/2009 26/08/2011	LoA Pakistan Updated LoA Pakistan	DNA Pakistan National Energy Conservation Center , Government of Pakistan	Continued action evidence

Annex 2 07-12-2011	Validation of the Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant Information Reference List	Page 7 of 7	
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Ref No.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
43	25/11/2011	LoA Switzerland	DNA Switzerland	Continued action evidence
44	31/10/2008	Analytical report of Furnace Oil Sample Test by PERAC Research & Development Foundation	Lucky Cement Limited	-
45	29/09/2009	Clinker Production of Lucky Pezu Unit 1 [kiln A&B] from October 1 st , 2006 to September 30 th , 2007	Lucky Cement Limited	
46	29/09/2009	Clinker Production of Lucky Pezu Unit 2 [kiln C&D] from October 1 st , 2006 to September 30 th , 2007	Lucky Cement Limited	
47	24/05/2007	News articles about the KIBOR and Basis point in Pakistan	Dawn News	
48	2000	Pakistan Environmental Protection Agency (Review of IEE And EIA) Regulations	Ministry of Environment of Pakistan,	
49	13/08/2009	Start of Civil Works	Lucky Cement Limited	
50	22/03/2010	Natural Gas curtailment, gas shortage articles and press releases in Pakistan		
		a Energy Shortage forcing textile units to shift abroad		
		b Winter gas shortage hurts consumers, business		
		c Five work days/week for industrial units, CNG stations announced		
		d Curtailment of gas supply to the fertilizer plants, Chemical Plants in 2008		
51	20/07/2010	I PDD of CDM project "Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited, Karachi Plant" Version 3	Lucky Cement Limited	
52	2007	Tax rate document "Rates and Taxes for Companies"	Government of Pakistan	
53	2007	KIBOR rate of 2007 are available at the website of State Bank of Pakistan http://sbp.org.pk/ecodata/kibor/2007/	State bank of Pakistan	

Annex 2 07-12-2011	Validation of the Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited Pezu Plant Information Reference List	Page 7 of 7	
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Ref No.	Issuance and/or submission date (dd/mm/yyyy)	Title/Type of Document	Author/Editor/ Issuer	Additional Information (Relevance in CDM Context)
54	2004	Press release by State Bank of Pakistan: http://www.sbp.org.pk/press/2004/jan-21-04.pdf	State bank of Pakistan	
55	2004	Third Quarterly report of 2004 of State Bank of Pakistan	State Bank of Pakistan	
56	13/10/2009	Email confirmation from DNA Pakistan that Waste Heat Recovery Based Power Generation is not a Common Practice in cement Industry of Pakistan.	DNA Pakistan	Common practice analysis
57	27/09/2010	PDD of CDM project "Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited, Karachi Plant" Version 4	Lucky Cement Limited	
58	08/09/2008	"Final Acceptance Certificates",	Wartsila	
59		(Audit of Cost Accounts) Rules, 1998 by "KPMG Taseer Hadi & Company	KPMG Taseer Hadi & Company	
60	05/07/2011	PDD of CDM project "Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited, Karachi Plant" Version 6	Lucky Cement Limited	
61	18/12/2009	Invoices of Freight, Duties, Taxes & Others		
62	08/10/2011	Actual Operational & Maintenance costs of Lucky WHR Pezu plant	Lucky Cement Limited Pezu Plant	
63	08/10/2011	Total operational and maintenance costs of Cement Plants (Lucky Karachi & Lucky Pezu Plant)	Lucky Cement Limited	
64	2011	Lucky Cement Limited annual report 2011	KPMG Taseer Hadi & Company	
65	08/10/2011	Total investment costs (Invoices of Freight, Duties, Taxes & Others, invoices values-F.O.B, Civil works, Mechanical works & Material cost, Electrical & Instrumentation, Pre-Production overheads, Financing costs,	Lucky Cement Limited	
66	08/10/2011	PDD of CDM project "Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited, Karachi Plant" Version 7	Lucky Cement Limited	
67	30/11/2011	PDD of CDM project "Waste Heat Recovery and Utilization for Power Generation at Lucky Cement Limited, Karachi Plant" Version 8	Lucky Cement Limited	Request for Registration

Validation of the CDM Project:
Waste Heat Recovery and Utilization for Power Generation at Lucky Cement
Limited Pezu Plant



Industrie Service

Annex 3: Appointment Certificates



Industrie Service

CERTIFICATE OF APPOINTMENT

Mr Mahmood, Khalid, fulfills the requirements of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH to participate in audits.

Qualification applicable to						
Standard	CDM	JI	GS	VCS	VER	Other
Date	23.03.11					

Qualification as						
Status	Trainee	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date		23.03.11	28.09.11	23.03.11		

Other qualification					
Country Expertise					
Region	1	2	3	4	5
Date	23.03.11				
Financial Expertise					
Date					

Qualification in technical areas	
Technical Area	Date
1.2_Energy generation from renewable energy source	03.05.11
13.1_Waste handling and disposal	03.05.11

This appointment is valid for 1 year from its date of signature below and is bound by internal requirements of the Management System of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH.

In case of loss of validity of this certificate as per result of an assessment according internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference No. CMS-Z-0009/02.

Date	Signature
23.03.11	<i>Thomas Kleise</i>
03.05.11	<i>Thomas Kleise</i>
28.09.11	<i>Thomas Kleise</i>



Industrie Service

CERTIFICATE OF APPOINTMENT

Mr Mitterwallner, Robert, fulfills the requirements of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH to participate in audits.

Qualification applicable to						
Standard	CDM	JI	GS	VCS	VER	Other
Date	23.03.11					

Qualification as						
Status	Trainee	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date		23.03.11	23.03.11	23.03.11	23.03.11	

Other qualification					
Country Expertise					
Region	1	2	3	4	5
Date	23.03.11		23.03.11		
Financial Expertise					
Date					

Qualification in technical areas	
Technical Area	Date
1.2_Energy generation from renewable energy source	23.03.11
4.1_Cement sector	23.03.11
4.3_Iron and steel sector	23.03.11
13.1_Waste handling and disposal	23.03.11

This appointment is valid for 1 year from its date of signature below and is bound by internal requirements of the Management System of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH.

In case of loss of validity of this certificate as per result of an assessment according internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference No. CMS-Z-0011/00.

Date	Signature
23.03.11	<i>Thomas Klein</i>



Industrie Service

CERTIFICATE OF APPOINTMENT

Mr Agrafiotis, Georgios, fulfills the requirements of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH to participate in audits.

Qualification applicable to						
Standard	CDM	JI	GS	VCS	VER	Other
Date	22.03.11					

Qualification as						
Status	Trainee	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date		22.03.11	22.03.11			

Other qualification					
Country Expertise					
Region	1	2	3	4	5
Date	22.03.11		31.03.11		
Financial Expertise					
Date	22.03.11				

Qualification in technical areas	
Technical Area	Date
13.1_Waste handling and disposal	22.03.11
1.2_Energy generation from renewable energy source	22.07.11

This appointment is valid for 1 year from its date of signature below and is bound by internal requirements of the Management System of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH.

In case of loss of validity of this certificate as per result of an assessment according internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference No. CMS-Z-0002/03.

Date	Signature
22.03.11	<i>Thomas Kleise</i>
31.03.11	<i>Thomas Kleise</i>
22.03.11	<i>Thomas Kleise</i>



Industrie Service

CERTIFICATE OF APPOINTMENT

Mr Agarwal, Nikunj, fulfills the requirements of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH to participate in audits.

Qualification applicable to						
Standard	CDM	JI	GS	VCS	VER	Other
Date	22.03.11					

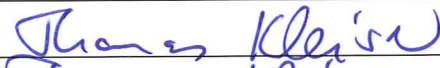

Qualification as						
Status	Trainee	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date		22.03.11	22.03.11	22.03.11	22.03.11	

Other qualification					
Country Expertise					
Region	1	2	3	4	5
Date	22.03.11				
Financial Expertise					
Date	29.03.11				

Qualification in technical areas	
Technical Area	Date
1.2_Energy generation from renewable energy source	22.03.11
13.1_Waste handling and disposal	12.04.11
3.1_Energy demand	27.04.11
13.2_15.2_Animal waste management	21.07.11

This appointment is valid for 1 year from its date of signature below and is bound by internal requirements of the Management System of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH. In case of loss of validity of this certificate as per result of an assessment according internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference No. CMS-Z-0001/05.

Date	Signature
27.04.11	
21.07.11	



Industrie Service

CERTIFICATE OF APPOINTMENT

Mr Kleiser, Thomas, fulfills the requirements of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH to participate in audits.

Qualification applicable to						
Standard	CDM	JI	GS	VCS	VER	Other
Date	25.03.11					

Qualification as						
Status	Trainee	Validator	Verifier	Team Leader	Technical Reviewer	Technical Expert
Date		25.03.11	25.03.11	25.03.11	25.03.11	

Other qualification					
Country Expertise					
Region	1	2	3	4	5
Date	25.03.11				
Financial Expertise					
Date	25.03.11				

Qualification in technical areas	
Technical Area	Date
1.1_4.10_Thermal energy generation...	25.03.11
1.2_Energy generation from renewable energy source	25.03.11
4.1_Cement sector	25.03.11

This appointment is valid for 1 year from its date of signature below and is bound by internal requirements of the Management System of the Certification Body "climate and energy" of TÜV SÜD Industrie Service GmbH.

In case of loss of validity of this certificate as per result of an assessment according internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference No. CMS-Z-0027/00.

Date	Signature
25.03.11	