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Validation Report

Indo Gulf Fertiliser (a unit of Aditya Birla Group)

**Validation of “Effective utilization of waste heat
by installing vacuum pre-concentrator in urea
section at Indo Gulf Fertilisers (A Unit of Aditya
Birla Group), Jagdishpur” project in India**

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Validation of the “Effective utilization of waste heat by installing vacuum pre-concentrator in urea section at Indo Gulf Fertilisers (A Unit of Aditya Birla Group), Jagdishpur” project in India



Industrie Service

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Executing Operational Unit:		TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199 - 80686 Munich Federal Republic of Germany		
Client:		Indo Gulf Fertiliser - a unit of Aditya Birla Group Jagdishpur, Uttar Pradesh - 227817, India		
Contract approved by:		Werner Betzenbichler		
Report Title:		Validation of the “Effective utilization of waste heat by installing vacuum pre-concentrator in urea section at Indo Gulf Fertilisers (A Unit of Aditya Birla Group), Jagdishpur” project in India		
Number of pages		22 (excluding cover page and annexes)		
Summary: The Certification Body "Climate and Energy" has been ordered by Indo Gulf Fertiliser -a unit of Aditya Birla Group- to perform a validation of the above mentioned project. The project is a unilateral CDM project. Project participant is Indo Gulf Fertiliser - a unit of Aditya Birla Group- India. Using a risk based approach, the validation of this project has been performed by document reviews and on-site inspection, audits at the locations of the project and interviews at the offices of the project developer and the project owner. As the result of this procedure, it can be confirmed that the submitted project documentation is in line with all requirements set by the Kyoto Protocol, the Marrakech Accords and relevant guidance by the CDM Executive Board. Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reduction of 328,000 tonnes CO2e over a crediting period of ten years, resulting in a calculated annual average of 32,800 tonnes CO2e, represents a reasonable estimation using the assumptions given by the project documents.				
Work carried out by:	• Dr. Ayse Frey (Project manager, GHG auditor) • Prabhat Kumar (GHG auditor, Auditor Environmental Management Systems (ISO 14001), Local expert) • Dr. Alexandra Babeck (GHG auditor)		Internal Quality Control by: Werner Betzenbichler	

Abbreviations

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reduction
COP	Conference of the Parties
CR	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission Reduction
FICC	Fertilizer Industry Coordination Committee
GHG	Greenhouse gas(es)
IGF	Indo Gulf Fertiliser – a unit of Aditya Birla Group
KP	Kyoto Protocol
LP	Low pressure
MP	Monitoring Plan
ODA	Official Development Assistance
PDD	Project Design Document
SSCR	Specific Steam Consumption Ratio
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	United Nations Framework Convention on Climate Change
UPPCB	Uttar Pradesh Pollution Control Board
VPC	Vacuum pre-concentrator
VVM	Validation and Verification Manual

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Annex 1: Validation Protocol

Annex 2: Information Reference List

1 INTRODUCTION

1.1 Objective

Indo Gulf Fertiliser (IGF) – a unit of Aditya Birla Group has commissioned TÜV SÜD Industrie Service GmbH (TÜV SÜD) to validate the “Effective utilization of waste heat by installing vacuum pre-concentrator in urea section at Indo Gulf Fertilisers (A Unit of Aditya Birla Group), Jagdishpur” project in India. The validation serves as a design verification and is a requirement of all CDM projects. The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakech Accords.

1.2 Scope

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. TÜV SÜD has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

The audit team has been provided with a draft PDD in September 2006. Based on this documentation, a document review and a fact finding mission in form of an on-site audit has taken place. The revised final PDD, in response to the CARs and CRs indicated in the audit process, was submitted in August 2007. This PDD and the results from the on-site audit serve as the basis for the assessment presented herewith. In response to the comments given by EB in October 2007 this PDD has been revised again on 01.11.2007.

Studying the existing documentation belonging to this project, it was obvious that the competence and capability of the validation team has to cover at least the following aspects:

- Knowledge of Kyoto Protocol and the Marrakech Accords
- Environmental and Social Impact Assessment
- Skills in environmental auditing (ISO 14000, EMAS)
- Quality assurance
- Technical aspects of ammonia and urea production

- Technical aspects of steam generation and heat recovery
- Monitoring concepts
- Political, economical and technical framework conditions in host country

According to these requirements, TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV certification body “climate and energy”:

Dr. Ayse Frey is an auditor and project manager for CDM/JI projects as well as an energy/waste expert at TÜV SÜD Industrie Service GmbH. In her position she is responsible for the implementation of validation, verification and certifications processes for greenhouse gas mitigation projects in the context of the Kyoto Protocol. After her studies in civil and environmental engineering, she completed a PhD in the field of water and waste policy. She has extensive experience with the CDM and JI flexible mechanisms as well as with management systems.

Prabhat Kumar is an auditor for quality and environmental management systems (according to ISO 9001 and ISO 14001) and an auditor for CDM projects at TÜV South Asia, TÜV SÜD Group. He is also based in New Delhi. He has received extensive training in the CDM validation process and participated already in CDM project (pre-) assessments.

Dr. Alexandra Babeck is an auditor for CDM projects and environmental management systems as well as a technical expert on energy systems and environmental technologies. Before joining the TÜV SÜD Industrie Service GmbH as co-operation partner she worked as an expert for energy efficiency, renewable energy, environmental technologies and emission trading. She participated already in several CDM project assessments.

The audit team covers the above mentioned requirements as follows:

- Knowledge of Kyoto Protocol and the Marrakech Accords (ALL)
- Environmental and Social Impact Assessment (ALL)
- Skills in environmental auditing (ALL)
- Quality assurance (ALL)
- Technical aspects of ammonia and urea production (BABECK/KUMAR)
- Technical aspects of steam generation and heat recovery (ALL)
- Monitoring concepts (ALL)
- Political, economical and technical framework conditions in host country (KUMAR)

In order to have an internal quality control of the project, a team of the following persons has been composed by the certification body “climate and energy”:

- Werner Betzenbichler (head of the certification body “climate and energy”)

1.3 GHG Project Description

The project activity takes place at an urea production plant and involves the reduction of steam consumption in urea production by the installation of a vacuum pre-concentrator (VPC) for urea

solution. The VPC is heated with off-gases from medium pressure decomposer. Due to the pre-concentration of urea solution from 71 % to 85 %, steam consumption in the vacuum concentrator is reduced.

The plant is located at Jagdishpur industrial area, Sultanpur district, Uttar Pradesh, India. The project is a unilateral CDM project. Project participant is Indo Gulf Fertiliser (IGF) – a unit of Aditya Birla Group, India.

The project starting date has been defined as March 17, 2000, when consultancy engineering contract became effective. The fixed crediting period of 10 years starts on October 15, 2007 or or date of registration, whichever occurs later.

2 METHODOLOGY

The project assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual (for further information see www.vvmanual.info), an initiative of all Applicant Entities, which aims to harmonize the approach and quality of all such assessments.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

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

Validation Protocol Table 1: Mandatory Requirements			
Requirement	Reference	Conclusion	Cross reference
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.	Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.

Validation Protocol Table 2: Requirement checklist				
Checklist Question	Reference	Means of verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	Gives reference to documents where the answer to the checklist question or item is found.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification is used when the validation team has identified a need for further clarification.

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

Figure 1 Validation Protocol Tables

2.1 Review of Documents

The project design document submitted by the client and additional background documents related to the project design and baseline were reviewed. A complete list of all documents reviewed is attached as Annex 2 to this report. The project design document underwent several revisions addressing corrective action and clarification requests issued by TÜV SÜD.

2.2 Follow-up Interviews

On 24th and 25th of November, 2006, TÜV SÜD performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Indo Gulf Fertiliser	➤ Project design ➤ Technical equipment ➤ Sustainable development issues ➤ Baseline determination ➤ Additionality ➤ Crediting period ➤ Monitoring plan ➤ Management system ➤ Environmental impacts ➤ Stakeholder process ➤ Approval by the Parties involved

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve the requests for corrective actions and clarification and any other outstanding issues which needed to be clarified for TÜV SÜD's positive conclusion on the project design. The Corrective Action Requests and Clarification Requests raised by TÜV SÜD were resolved during communications between the client and TÜV SÜD. To guarantee the transparency of the validation process, the concerns raised and responses given are summarised in chapter 3 below and documented in more detail in the validation protocol in Annex 1.

3 VALIDATION FINDINGS

In the following sections the findings of the validation are stated. The validation findings for each validation subject are presented as follows:

- 1) The findings from the desk review of the project design documents and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the Validation Protocol in annex 1.
- 2) Where TÜV SÜD had identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in Annex 1. The validation of the project resulted in 6 Corrective Action Request and 21 Clarification Requests.
- 3) Where Clarification or Corrective Action Requests have been issued, the exchanges between the client and TÜV SÜD to resolve these Clarification or Corrective Action Requests is summarised.
- 4) The conclusions for validation subject are presented.

The validation findings relate to the project design as documented and described in the final project design documentation.

3.1 Project Design

3.1.1 Discussion

The project participant is Indo Gulf Fertiliser -a unit of Aditya Birla Group, India. No project participant from an Annex I Party is involved in the project. The participating Party, India as the host Party meets all relevant participation requirements, but Letter of Approval was missing.

The objective of the project is to reduce steam consumption in urea production by the installation of a vacuum pre-concentrators(VPC) for urea solution. The VPC is heated with off-gases from medium pressure decomposer. Due to the pre-concentration of urea solution from 71 % to 85 %, low pressure steam consumption in the 1st vacuum concentrator is reduced. The reduced Specific Steam Consumption Ratio (SSCR) of urea section results in lower fuel consumption, thus subsequently reducing CO₂-emissions.

The activity is located at the premises of Indo Gulf Fertilisers urea complex at Jagdishpur industrial area, Sultanpur district, Uttar Pradesh. The project boundary includes the steam generator and the urea section of the plant with the processes involved in steam consumption reduction. The additional electricity load due to the new equipment needed to be included. All components and facilities used to mitigate GHGs or which may form a potential source of GHGs are covered by the project boundary in the revised PDD. Information regarding the capacity of the installations is clearly presented in the revised PDD and has been supported by corresponding documentation. During the visit on site the given information has been confirmed.

The project design engineering is reflecting current good practices. The project is professionally managed. The technology has been developed by M/S Snamprogetti S.P.A., an Italian Engineering company and technology supplier of Urea Section of IGF.

Recognizing its efforts in the implementation of several energy efficiency measures the company received the “National Award for Excellence in Energy Management 2004” from the Confederation of Indian Industry. The project equipment can be expected to run for the whole project period and it is not expected that it will be replaced by more efficient technologies. The company has a full-fledged maintenance department, which is responsible for the preventive and scheduled maintenance of the equipments.

Trained manpower is available to meet the operation and maintenance needs of the plant. The existing quality management system covers training needs.

The project is in line with sustainable development policies of the country. The Government of India is encouraging energy conservation in industry. In the Letter of Approval, to be issued in advance to the registration of the project under CDM, the Government of India moreover confirms that the project contributes to sustainable development in the country.

Indo Gulf Fertilizers is a established company since 1988. The project activity is an energy efficiency improvement project, implemented inside the premises of Indo Gulf fertilizers. As per law there is no need for the company to acquire any special or separate permission or licenses.

A consent to operate the fertiliser plant is existent and environmental statements are regularly submitted to the State Pollution Control Board (UPPCB). All relevant corresponding documents have been verified during the audit on site. Moreover the necessity for an environmental clearance of the project has been assessed.

Official Development Assistance (ODA) does not contribute to the financing of the project as according to the information obtained by the audit team. All expenditures were covered by internal accruals.

The starting date defined in the revised PDD is March 17, 2000, when work order for engineering services was given. Plant was commissioned in July 2001. Respective evidences have been provided. The company postponed the start of the CDM registration process in order to finalise the registration of their first CDM project “Energy efficiency through installation of modified CO₂ removal system in Ammonia Plant”, which was registered in January 2006. Only after this registration the company wanted to take initiatives on further CDM registrations. This argumentation is considered to be plausible as well as the expected life time of the activity of 20 years. The fixed crediting period of 10 years starts on October 15, 2007 or or date of registration, whichever occurs later.

3.1.2 Findings

Corrective Action Request No. 1:

Respective emissions due to the additional electrical load needs to be considered in the project boundary.

Response:

Necessary correction has been made in the revised PDD.

CER calculation, Efficiency of power generation system-NG Based and pump specification are provided.

Clarification Request No. 1:

A Letter of Approval confirming that the project contributes to sustainable development in the country needs to be submitted to the audit team.

Response:

Host country approval letter has been submitted.

Clarification Request No. 2:

As the measure is included in a complex process please include a brief schematic diagram of the pre- and post project scenario in the PDD. In addition please describe also clearly that pre-concentrators will be installed in two urea streams.

Response:

Necessary correction has been made in the revised PDD.

Clarification Request No. 3:

A detailed technical specification of the falling film vacuum pre-concentrator (VPC) should be included in the PDD.

Response:

Necessary correction has been made.

Clarification Request No. 18:

Capital Budget Approvals were submitted to DOE for three other IGF projects in order to substantiate starting date of the projects. Please clarify why this document has not been issued for VPC project.

Response:

Indo Gulf Fertilisers (IGF) follows standard procedure for Management approval of new or proposed projects. The projects or proposals which requires substantial amount of investment, gives low returns or highly risky in nature are discussed before the Chairman of the group during Planning & Budgeting meeting. This meeting is held in the month of March/April before commencement of the financial year. The investments / energy saving initiatives agreed by Chairman are published in the Directors Report.

Since VPC project involves huge investment and also carries certain risks, this project was discussed and agreed during the Planning & Budgeting Meeting held on 23rd April 2000 at Mumbai. (Please find enclosed the relevant page of CAPEX report).

The investment for other three IGF projects was low, so these projects did not go for chairman's approval through annual planning & budgeting meeting, but via capital budget proposal (see response to CR 19).

The project got top management approval on 23rd April 2000, which clearly indicates that the project activity has started after January 2000 only. The relevant pages of Directors Report for the year 2000-01 are attached, which clearly indicates that Indo Gulf is planning to implement and commission Vacuum Pre-concentrator project by mid 2001.

3.1.3 Conclusion

The project complies with the requirements. Project start has been defined on March 17, 2000, when work order for engineering services was given. PP has demonstrated that Capital Budget Approval is not available for the project due to its higher investment size. Final approval has been provided - following the standard procedures of the company - by the Chairman of the Aditya Birla group during the annual planning & budgeting meeting held on 23rd April 2000.

A Letter of Approval from the Ministry of Environment and Forests issued on February 07, 2007 has been submitted. The pre- and post project scenario as well as specifications of the key technology applied are transparently described in the revised PDD. All emission related to the project scenario have been clearly identified and described in a complete manner.

3.2 Baseline and Additionality

3.2.1 Discussion

The project is based on the approved baseline methodology AM0018, version 01.1 “Baseline methodology for steam optimization systems” of 06 December 2004 which is deemed to be the one most applicable for this project. The PDD responds convincingly to each of the applicability criteria which are outlined in the baseline methodology. The project comprises a steam optimization project in the urea production process. Outputs are relatively constant. The production rate is controlled by government allotment (fixed on annual basis). Steam output is monitored continuously.

The application of the methodology and the determination of the baseline are presented transparently in the updated PDD. Continuation of production using current processes and efficiency as well as implementation of the project activity without CDM consideration has been discussed.

The determination of the baseline specific steam consumption rate is following the steps of the methodology. However details of calculations were requested for reproduction.

The PDD describes that the project is not a likely baseline scenario by applying the “tool for the demonstration and assessment of additionality”. Taking into account the guidelines given by this tool, the PDD complies with each defined step. Evidence has been provided that CDM has been considered in the decision to proceed with the project activity.

Via barrier analysis the project demonstrates that it is not the baseline scenario. The PDD describes innovation and technological barriers faced by the project. The barrier due to prevailing practice describes that the measure undertaken to reduce steam consumption in the vacuum concentration of urea solution is the first of its kind in Indian fertilizer industry. Supporting documentation giving evidence for the same was requested. The CDM-incentive is expected to stimulate R & D efforts in IGF and provide training support.

References have been made to all data sources used.

3.2.2 Findings

Corrective Action Request No. 6:

A detailed project schedule should be included in the PDD chapter B 5 under step 0 discussion (as per the project schedule submitted on 05.04.07).

Please list the documents available to substantiate that starting date of the project activity does not fall before 1st of January 2000 and that CDM has been considered in the decision to proceed with the project rather than stating that “Documents are available that can be shown as evidence...”.

Response:

Detailed project schedule for installation of vacuum pre-concentrator in Urea section is included in revised PDD. The documents and Annual Report for year 2001-02 is submitted to substantiate that the starting date of project activity does not fall before the 1st January 2000 are listed below:

Clarification Request No. 4:

Please add version number and date in B.1 of the PDD.

Response:

Necessary correction has been made in section B.1 of revised PDD.

Clarification Request No. 5:

Please provide specific values for the representative production P_{rep} and S_{rep} as well as SSCR.

Response:

Necessary correction has been made in the revised PDD.

Clarification Request No. 6:

Please define the Alternatives in Sub step 1a and discuss in substep 1 b its conformance with applicable laws and regulations.

Response:

Necessary correction has been made.

Clarification Request No. 7:

Please provide substantiating documents evidencing that pre-vacuum concentrators are not common practice in Indian fertiliser industry.

Response:

Necessary document is attached as Annexure.

Clarification Request No. 8:

Please clearly justify why especially in the pre-vacuum concentration process technological problems emerge that do not also apply for the vacuum concentration process (e.g. urea

solution pumping, maintaining the precise vacuum, avoidance of polymer deposition, biuret content).

Response:

In pre-project scenario urea solution (71% concentration) gets transferred from LP decomposer to Vacuum concentrator due to pressure gradient ($\Delta P=4.62$ ata). In project activity case urea solution (85% concentration) has to be transferred from Vacuum pre-concentrator to Vacuum concentrator through a urea solution pump (P-54), since there is no or negligible pressure gradient between Vacuum pre-concentrator and Vacuum concentrator.

Pump (P-54) is installed between Vacuum pre-concentrator and Vacuum concentrator. Proper operation of P-54 becomes very vital for normal urea production. If P-54 pump trips on account of problems like cavitation, discharge valve malfunction etc., the urea production has to be reduced or stopped.

IGF has already many times faced problem of P-54 tripping and subsequent reduction in urea production or stop in urea production. (Please refer Annexure)

In project case, urea solution of high concentration (85%) is fed to Vacuum concentrator compared to pre-project scenario urea concentration of 71%.

The urea solution of higher concentration has lead to polymer formation in the suction and polymer deposition on the roof of the vacuum concentrator. The coagulated polymer lumps causes choking problem (Lute choking) also leads to diversion for Prilling and shutdown of the vacuum concentrator. Hence affecting urea production.

IGF has been continuously facing the problem of polymer deposition due to installation of vacuum pre-concentrator.

Polymer coagulation/deposition also leads to the choking of the small openings of buckets in prilling tower and leads to bucket replacement and unnecessary maintenance problem. Also please refer Annexure.

Clarification Request No. 19:

The document provided by PP in order to substantiate CDM consideration for project implementation dated 15th of January 2000 states that

“As you are aware that we have decided to install Vacuum Preconcentrator “.

Please clarify to which date of decision this letter is referring to. "Have decided" seems to refer to a decision that was made before the document was written. However the Feasibility Study to the Executive President has been submitted to the Executive President on 23rd of March 2000 (note submitted by PP). There seems to be a discrepancy that needs to be clarified.

Response:

Indo Gulf Fertilisers (IGF) follows standard procedure for management approval of new or proposed projects. This includes

- 1) **Preliminary and brief discussion during** in Monthly Progress Review meeting (MPR). The MPR meeting is convened by Head Unit Technical Cell, chaired by Unit Head and is attended by functional heads, GMs, departmental heads and area in-charges. During the MPR meeting held in January 2000, a preliminary and brief discussion on concept of Vacuum Pre-concentrator (proposed activity) was carried out for understanding the concept and principle of VPC project. The members present in the meeting principally agreed and decided to take forward the project to next step of IGF management

approval process. This step is considered very preliminary and not highly significant in the management approval process.

- 2) **Detailed Analysis & Comprehensive deliberation:** After first step of management approval process the new or proposed projects are reviewed/ analyzed in detail and comprehensive manner by conducting technical and commercial feasibility study, detail project report etc. After preparation of techno-commercial study or feasibility study the report is forwarded to executive president (Unit head) for approval depending upon the investment and risk associated with the project following sub step is followed:

- (i) For low investment and low risky projects, project is directly approved by the unit head
- (ii) For high investment and risk prone projects, the techno commercial feasibility study or feasibility report of the project is critically reviewed and submitted to Chairman of the group for approval during Planning & Budgeting meeting.

This step is considered very imperative and of high significance in project approval process.

Clarification Request No. 20:

For three previous IGF projects CDM consideration in project implementation was substantiated by a letter dated December 2000. This letter directed to the vice president (Mfg. Oprns.), informs briefly on CDM and suggests that **future projects** should consider possible carbon revenues. It seems as that management was informed for the first time about CDM benefits with this December 2000 note, although - as according to the documents on CDM consideration dated 15th of January 2000 and minutes of meeting of 05.05.2000 - management should have been already aware on possible CDM benefits. Please clarify this discrepancy.

Response:

IGF first came to know about Clean Development Mechanism during the “Roundtable on Environment Management: Issues in Compliance and Profitability, 24th of April, 1999” at New Delhi.

Since Vacuum pre-concentrator project is an energy saving project, the project results significant reduction in the steam demand of the plant and subsequently fossil fuel consumption reduction in the service boiler. Therefore the project activity leads GHG emission reduction and would help to protect the environment. IGF had considered this project as CDM project and therefore, an internal note was circulated specifically for this project.

Over a period of time, Indo Gulf Fertilizer’s team expanded its awareness on CDM and came to know other associated benefits, which can significantly contribute to the profitability of the organization and local & global environment. Keeping this in view, an internal note was circulated highlighting that future energy conservation initiatives of the company should consider as a CDM potential and carbon revenue, which may benefit the company and environment.

Clarification Request No. 21:

The Feasibility study clearly mentions that production faces bottlenecking, which could be resolved by the implementation of the project activity. Thus it might be assumed that the incentive for the project is not CDM but removing the bottlenecks. The benefits of removing bottlenecks seems to offer sufficient added value offsetting the barriers described in the PDD.

Please clearly justify why the project would have not been implemented without CDM although it was expected to overcome actual and/or future limitations in the production process.

Response:

Following documents were submitted to TuV-sud to clarify various issues raised during validation: Planning & Budgeting Meeting Report, Annual Report (year 2001-02), Project Progress Report, Minutes of Meeting, Letter of Intent, Completion Report, CDM consideration, Stake holder consultation process (Minutes of meeting), Covering letter of feasibility report.

All the above documents clearly mentions that the project activity is a energy saving project and would lead to steam savings and reduce energy consumption of plant. No where, in these documents it is mentioned that the project would lead to increase in urea production. In annual report which is highly authenticated document (verified and signed by independent auditor, director of the company and also distributed to all shareholders) it is mentioned VPC project is an energy saving project.

From the above, it is evident that the project is a steam savings project, not a production enhancement project. Hence the project is implemented after considering CDM to save steam and energy only.

3.2.3 Conclusion

The project complies with the requirements. The determination of the SSCR in the baseline is considered to be appropriate. Detailed calculations have been provided and verified.

CDM consideration in the decision to proceed with the project activity has been evidenced by an internal document dated 15th of January 2000. According to the project proponent this has been issued after the Monthly Progress Review meeting (MPR held on 14th of January) where a preliminary discussion on concept of Vacuum Pre-concentrator took place. The members present in the meeting principally agreed and decided to take forward the project to next step of IGF management approval process. A detailed project schedule has been included in the PDD.

It has been convincingly demonstrated and evidenced that that the project faced technological barriers due to polymer deposition and pumping of pre-concentrated urea solution as well as barriers due to innovation and prevailing practice. Moreover Projects & Development India Ltd., providing services for the design, engineering and construction of fertilizer plants, with proven track records in the Indian fertilizer sector, confirmed that IGF was the first of only few companies implementing the VPC technology. PP substantiated that main purpose of the project activity was energy saving. Thus it seems credible that CDM incentive has been a driver for project implementation mitigating the risk due to change of established processes.

It is concluded that the project activity itself is not a likely baseline scenario.

3.3 Monitoring Plan

3.3.1 Discussion

The selected monitoring methodology AM0018 is deemed to be the most applicable for this project. The application of the monitoring methodology is transparent.

Project emissions arise due to the additional electrical loads. However these emissions are estimated conservatively based on the nameplate load in accordance with the methodology. Therefore monitoring is not required. There is no leakage within the project activity.

All relevant datas for estimating of emission reductions have been included in the revised monitoring plan. The interlink between LP steam and HP steam needed to be clarified. Information on accuracy level of measurement instruments has also been included in the revised PDD. Recording frequency and archiving methods are based on well established procedures and are considered being reasonable and appropriate as well.

Since the fertilisers plant is certified for the management system as per ISO 9001:2000, ISO 14001:2004 and OHSAS, all the plans for recording data and retrieval of data are implemented as per management system standard. Thus the delivery of high quality data deemed to be ensured. However quality assurance and control procedures needed to be discussed for all monitoring parameters.

Operational and management structure of the project activity is outlined briefly and additional information was required. A CDM manual has been provided defining roles, responsibilities and internal procedures. A CDM team is beeing constituted under the Chairmanship of Shri C. K. Datta. The overall supervision is with Shri A. K. Gupta, the General Manager (Technical Cell). He will be responsible for reporting also, while Shri T. K. Ghosh will be the responsible coordinator.

3.3.2 Findings

Corrective Action Request No. 2:

Please include the parameter steam generation in boiler that is needed to calculate the boilers efficiency.

Response:

Necessary correction has been made.

Corrective Action Request No. 3:

The monitoring plan should consider monitoring of probable retrofitting measures (as requested by monitoring methodology ID number 2.23).

Response:

Necessary correction has been made.

Clarification Request No. 10:

Please revise monitoring plan and clarify the interrelation between LP steam consumption/generation and HP steam consumption/generation. The monitoring includes the parameters LP steam consumption but HP steam pressure/temperature.

Response:

Monitoring plan has been revised and additional information on the interlink between LP and HP steam has been included in the PDD. Formulae have been provided.

Clarification Request No. 11:

Monitoring plan does not include information on how temperatures (steam and feed water), pressure (steam), feed water flow and fuel consumption (gas and naphtha) etc. will be monitored. Please specify.

Response:

Necessary correction has been made.

Clarification Request No. 12:

Accuracy levels of measuring equipment and uncertainty of metering and procedures for calibration of monitoring equipment and maintenance of monitoring equipment in monitoring plan are missing.

Response:

Necessary correction has been made. Procedures are defined in CDM manual.

Clarification Request No 13

Please include in the PDD a brief justification about the application of daily recording frequencies rather than shift-wise recording frequencies as required by the methodology.

Response:

As per the monitoring methodology SSCR is the ratio between representative steam consumption for the day and representative production for the day. The representative steam consumption for the day is calculated as product of arithmetic average of shift-wise steam consumption values and number of shift per day.

IGF has online monitoring system (integrator) and steam consumption and urea production are continuously monitored. In the integrator, the instantaneous readings (for every second) are integrated continuously for the day and by this method steam consumption/urea production per day is measured. Hence the online monitoring system (with integrator) is more accurate and representative.

Clarification Request No. 14

Please clearly define if QA/QC procedures are planned for each parameter.

Response:

Necessary correction has been made. Please find attached CDM Manual.

Clarification Request No. 15:

More information on roles and responsibilities in the monitoring and reporting of emission reduction is necessary. The organization chart roles and responsibilities should be described in more detail.

Response:

Necessary correction has been made. Please find attached CDM Manual as Annexure.

Clarification Request No.16

Please provide a detailed consistent monitoring plan including relevant procedures for calibration maintenance, day-to-day records handling, troubleshooting, review of reported results/data etc.

Response:

A CDM manual is prepared detailing various procedures like calibration, data review, data storage etc., to be followed. Please find attached CDM manual.

3.3.3 Conclusion

The project does comply with the requirements. Low pressure steam savings in urea section, reduces high pressure steam consumption, the latter being generated in service boiler. The monitoring plan includes all relevant parameters to monitor SSCR (low pressure steam) and service boiler efficiency (high pressure steam). The approach is deemed to be appropriate and conservative.

The revised monitoring plan addresses all relevant parameters in detail. Recording frequencies once a day have been justified and are appropriate as measurement is undertaken continuously. Information on accuracy and uncertainty levels of measurement instruments has been given for all parameters.

A separate working document “CDM manual” has been elaborated. Monitoring procedures and responsibilities are clearly defined in the CDM manual. Monitoring information in Annex 4 is providing a consistent summary.

3.4 Calculation of GHG Emissions

3.4.1 Discussion

All direct and indirect GHG emissions in the baseline and project scenario have been considered in the revised PDD. GHG emission reductions depend on the reduction in specific steam consumption rate, the actual value of urea production, net enthalpy of steam reduced as well as the boilers efficiency. Project emissions due to additional electricity load needs to be deducted.

The formulae for calculating the project emissions and emission reductions are documented in a complete and transparent manner in the revised PDD.

Emission reduction projections are based on operational data. These approach is appropriate.

Leakage is not envisaged in accordance with the methodology.

3.4.2 Findings

Corrective Action Request No. 4:

Emissions due to additional electrical loads are not taken into consideration (see also D.2.1) and needs to be included.

Response:

Necessary correction has been made. Please find in CER calculation sheet.

Corrective Action Request No. 5:

The emission reduction calculations are not transparently presented. Please include all formulae applied with the respective values/parameters used.

Response:

Necessary correction has been made.

Clarification Request No. 17:

Please clearly state all assumptions and calculations (equations) used with respective values in E 1/E 4 (this should be reflecting the formulae given in chapter D).

Response:

Necessary correction has been made.

3.4.3 Conclusion

All calculation have been presented in a complete and transparent manner. Additional CO₂ emissions due to additional electrical loads have been taken into account and estimated in accordance with the methodology.

A separate excel sheet has been annexed allowing reproduction of the calculations. The project complies with the requirements.

3.5 Environmental Impacts

3.5.1 Discussion

The environmental impacts of the project activity have been addressed in the PDD. The legislation does not require an EIA for this type of project.

Negative environmental effects are not expected to be created by the project. Given the nature of the project design this seems to be reasonable. IGF regularly submits environmental statements to the Pollution Control Board. Transboundary effects are not expected.

3.5.2 Findings

None.

3.5.3 Conclusion

The project complies with the requirements.

3.6 Comments by Local Stakeholders

3.6.1 Discussion

Stakeholders have been informed and invited to comment on the project. No stakeholder process is required according to national legislation.

As the project activity comprises plant specific efficiency improvements employees of IGF have been defined as main stakeholders together with the Ministry of Environment and Forests and Uttar Pradesh Pollution Control Board as well as the equipment supplier. The approach is deemed to be appropriate regarding the nature of the project.

Comments have been positive.

3.6.2 Findings

None.

3.6.3 Conclusion

The project complies with the requirements.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TÜV SÜD published the project documents on its website and invited comments from Parties, stakeholders and non-governmental organizations during a period of 30 days, from September 2, to October 1, 2006.

Published on:

http://www.netinform.net/KE/Wegweiser/Guide2.aspx?ID=2028&Ebene1_ID=26&Ebene2_ID=586&mode=1

No comments have been received.

VALIDATION OPINION

TÜV SÜD has performed a validation of the project “Effective utilization of waste heat by installing vacuum pre-concentrator in urea section at Indo Gulf Fertilisers (A Unit of Aditya Birla Group), Jagdishpur” in India. The project is a unilateral CDM project. Project participant is Indo Gulf Fertiliser - a unit of Aditya Birla Group, India. The Party involved is India as the host country. The validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and subsequent decisions by the CDM Executive Board.

The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the project does meet all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The project will hence be recommended by TÜV SÜD for registration with the UNFCCC under the CDM.

By reducing the specific heat consumption rate in vacuum concentration process in urea section through utilising waste heat in pre-vacuum concentrators the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the barriers demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reduction of 328,000 tonnes CO₂e over a crediting period of ten years, resulting in a calculated annual average of 32,800 tonnes CO₂e, represents a reasonable estimation using the assumptions given by the project documents.

The validation is based on the information made available to us and the engagement conditions detailed in this report. The validation has been performed using a risk based approach as described above. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence, TÜV SÜD can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

Munich, 2007-11-02



Werner Betzenbichler
**Head of certification body “climate
and energy”**

Munich, 2007-11-02



Dr. Ayse Frey
Project Manager



Industrie Service

Annex 1: Validation Protocol



Industrie Service

Table 1 Project's Environment

REQUIREMENT	REFERENCE	Comment	CONCLUSION
1. The host country shall be a Party to the Kyoto Protocol	Marrakech Accords, CDM Modalities §30	India is a Party to the Kyoto Protocol and has accessed the Protocol at 26 Aug 2002.	☑
2. Parties participating in the CDM shall designate a national authority for the CDM	Marrakech Accords, CDM Modalities §29	India has established a designated national authority.	☑
3. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, Marrakech Accords, CDM Modalities §40a	<u>Clarification Request No. 1:</u> A Letter of Approval confirming that the project contributes to sustainable development in the country needs to be submitted to the audit team.	CR 1
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved.	Kyoto Protocol Art. 12.5a, Marrakech Accords, CDM Modalities §40a	The project is a unilateral project. See CR Table 1, No.3.	☑
5. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3. A letter of approval for participants originating from Annex-I-Countries should be available.	Kyoto Protocol Art.12.2	Not relevant as it is a unilateral project.	☑



Industrie Service

REQUIREMENT	REFERENCE	Comment	CONCLUSION
6. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available	Marrakech Accords, CDM Modalities, §40	The PDD has been made public in accordance with the provisions during period 2 nd September 2006 to 1 st October 2006 and no comments have been received. http://www.netinform.net/KE/Wegweiser/Guide2.aspx?ID=2028&Ebene1_ID=26&Ebene2_ID=586&mode=1	☒
7. The project design document shall be in conformance with the UNFCCC CDM-PDD format	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	The project design document does conform to the simplified CDM Project Design Document format (version 02, from 8 July 2005) valid by the time of PDD submission.	☒
8. The project participants shall submit a letter on the modalities of communication (MoC) before submitting a request for registration	EB-09 F_CDM_REG form	A letter on the modalities of communication has been provided.	☒



Table 2 PDD

CHECKLIST QUESTION	Ref.	MoV ^a	COMMENTS	Draft Concl	Final Concl
A. General Description of Project Activity					
A.1. Project Title					
A.1.1. Does the used project title clearly enable to identify the unique CDM activity?	1, 2	DR, I	The project name is specific and does allow a clear tracking of the project location.	☒	☒
A.1.2. Are there an indication of a revision number and the date of the revision?	1, 2	DR, I	Yes, revision and related changes are described in Page 2 of PDD.	☒	☒
A.1.3. Is this in consistency with the time line of the project's history?	1, 2,6,7 ,9,10 ,12,1 4,18, 19,2 0,21, 22,2 4,29, 33,3 7	DR, I	Yes, although project start was in 2000 the project proponent postponed the start of the CDM registration process in order to finalise the registration of their first CDM project "Energy efficiency through installation of modified CO ₂ removal system in Ammonia Plant", which was registered in January 2006. Only after this registration project proponent wanted to take initiatives on further CDM registrations.	☒	☒
A.2. Description of the project activity					
A.2.1. Is the description delivering a transparent overview of the project activities?	1, 2,39	DR, I	Yes, the project is mainly described in a transparent manner. <u>Clarification Request No. 2:</u> However as the measure is included in a	CR 2	☒

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



Industrie Service

CHECKLIST QUESTION	Ref.	MoV ^a	COMMENTS	Draft Concl	Final Concl
			complex process please include a brief schematic diagram of the pre- and post project scenario in the PDD. In addition please describe also clearly that pre-concentrators will be installed in two urea streams.		
A.2.2. Is all information provided in compliance with actual situation or planning?	1,2,6, 7,9,10 ,12,14 ,18,19 ,20,21 ,22,24 ,29,33 ,37,38	DR, I	All the information provided is confirmed with the actual situation.	☒	☒
A.2.3. Are proofs available evidencing all information with relevance for the validity, for the determination of baseline and project emissions and for emission projections?	1,2,6, 7,9,10 ,12,14 ,18,19 ,20,21 ,22,24 ,29,33 ,37,38	DR, I	Yes. Following documents evidencing the information provided has been verified: • Feasibility study for the project including steam balance details • Purchase orders • Technical specifications of process and equipments • Pre-concentration level of urea • Excerpts from log books (steam consumption rates/urea production rates) It can be stated that the given information is correct.	☒	☒

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

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CHECKLIST QUESTION	Ref.	MoV ^a	COMMENTS	Draft Concl	Final Concl
A.2.4. Is all information provided in consistency with details provided by further chapters of the PDD?	1,2,6, 7,9,10 ,12,14 ,18, 19,20, 21,22, 24,29, 33,37	DR, I	Yes, the description of the project activity is consistent within the PDD.	☒	☒
A.3. Project Participants					
A.3.1. Is the form required for the indication of project participants correctly applied?	1, 2	DR, I	The form is correctly used and applied. Indo Gulf Fertilizers (IGF) is named as the only project participant.	☒	☒
A.3.2. Is the voluntary participation of all listed entities or Parties confirmed by each of them?	1, 2	DR, I	The Letter of Approval needs to be provided. See above CR 1, Table 1, No.3.	CR 1	☒
A.3.3. Is all information provided in consistency with details provided by further chapters of the PDD (in particular annex 1)?	1, 2	DR, I	Yes, the consistency with Annex 1 can be confirmed.	☒	☒
A.4. Technical description of the project activity					
A.4.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)?	1, 2,11,	DR, I	The project location is clearly identified. It is located at the premises of Indo Gulf Fertilisers urea complex at Jagdishpur industrial area, Sultanpur district, Uttar Pradesh.	☒	☒
A.4.2. Do the project participants possess ownership or licenses which will allow the implementation of the project at that site / those sites?	1, 2,11, 38	DR, I	Indo Gulf Fertilizers is an established company since 1988. The project activity is an energy efficiency project, implemented in-	☒	☒

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



CHECKLIST QUESTION	Ref.	MoV ^a	COMMENTS	Draft Concl	Final Concl
			side the premises of Indo Gulf fertilizers. As per law there is no need for the company to acquire any special or separate permission or licenses.		
A.4.3. Is the category(ies) of the project activity correctly identified?	1, 2, 3,4,5	DR, I	The category is correctly identified. Project categorized in scope Number 3, Sectoral Scope –Energy Demand.	☒	☒
A.4.4. Does the project design engineering reflect current good practices?	1,2,6, 7,9,10, 12,14, 18,19, 20,21, 22,24, 27,29, 33,37, 38,39	DR, I	The project design reflects the current good practices. <u>Clarification Request No. 3</u> A detailed technical specification of the falling film vacuum pre-concentrator (VPC) should be included in the PDD.	CR 3	☒
A.4.5. Does the description of the technology to be applied provide sufficient and transparent input to evaluate its impact on the greenhouse gas balance?	1, 2	DR, I	The project activity reduces Low Pressure (LP) steam consumption in the 1 st vacuum concentrator in urea section. The reduced Specific Steam Consumption Ratio (SSCR) of urea section results in lower fuel consumption, thus subsequently reducing CO ₂ -emissions.	☒	☒
A.4.6. Is the brief explanation how the project will reduce greenhouse gas emission transparent and suitable?	1,2,8, 12,1, 3,15, 16,2, 0,21, 27	DR, I	Yes. Latent heat of condensation of medium pressure decomposer off-gases will be used to pre-concentrate urea solution from approx. 71% to 85% in VPC before feeding the solution to vacuum concentrator. Thus the heat load on 1 st vacuum concentrator in	☒	☒

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



CHECKLIST QUESTION	Ref.	MoV ^a	COMMENTS	Draft Concl	Final Concl
			urea section will be reduced, saving LP steam.		
A.4.7. Is all information provided in compliance with actual situation or planning as available by the project participants?	1, 2,	DR, I	Yes, all the information are available and in compliance with actual situation.	☒	☒
A.4.8. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	1,2,8 ,12,1 5,16	DR, I	The project has been developed by M/S Snamprogetti S.P.A., an Italian Engineering company and technology supplier of Urea Section of IGF. Recognizing its efforts in the implementation of several energy efficiency measures the company received the "National Award for Excellence in Energy Management 2004" from the Confederation of Indian Industry.	☒	☒
A.4.9. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1, 2	DR, I	The probability that the technology will be replaced is considered to be very low.	☒	☒
A.4.10. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	1, 2	DR, I	The company has a full-fledged maintenance department, which look after the preventive and scheduled maintenance of the equipments. The proponent refers to the existing quality management system, which also covers training needs.	☒	☒

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



CHECKLIST QUESTION	Ref.	MoV ^a	COMMENTS	Draft Concl	Final Concl
A.4.11. Does the project make provisions for meeting training and maintenance needs?	1, 2	DR, I	Trained manpower is expected to be available to meet the operation and maintenance needs of the plant.	☒	☒
A.4.12. Is a schedule available on the implementation of the project and are there any risks for delays?	1,2, 8,12, 13,1 6,27	DR, I	Yes the project schedule is available and the execution of the same was carried out in accordance to the planning. Completion letter for installation of Vacuum Pre-concentrator has been issued on 30.06.2001.	☒	☒
A.4.13. Is the form required for the indication of projected emission reductions correctly applied?	1,2	DR	The form is correctly used and applied.	☒	☒
A.5. Public Funding					
A.5.1. Is all information on public funding provided in compliance with actual situation or planning as available by the project participants?	1, 2,8	DR, I	According to the information obtained by the audit team ODA does not contribute to the financing of the project. All expenditures were covered by internal accruals, after approval of the same by the management team	☒	☒
A.5.2. Is all information provided in consistency with details provided by further chapters of the PDD (in particular annex 2)?	1, 2	DR, I	The statements are consistent within the PDD.	☒	☒

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



CHECKLIST QUESTION	Ref.	MoV ^a	COMMENTS	Draft Concl	Final Concl
B. Baseline Methodology					
B.1. Choice and Applicability					
B.1.1. Is the baseline methodology previously approved by the CDM Methodology Panel?	1, 2, 3,4, 5,39	DR, I	Yes, the baseline methodology applied has been approved by the CDM Executive Board and is published as under the name Approved baseline methodology AM0018 "Baseline methodology for steam optimization systems", version 01.1 of 6th December 2004. <u>Clarification Request No. 4:</u> Please add version number and date in B.1 of the PDD.	CR 4	☒
B.1.2. Is the choice of the methodology correctly justified by the PDD?	1, 2, 3,4,5	DR, I	The selected baseline methodology is in line with the baseline methodology provided for the relevant project category. The PDD responds convincingly to the applicability criteria of the project category.	☒	☒
B.1.3. Is the baseline methodology the one deemed most applicable for this project?	1, 2, 3,4,5	DR, I	The baseline methodology is deemed to be, the most applicable for this project.	☒	☒
B.1.4. Is the project in conformance with all applicability criteria of the applied methodology?	1, 2, 3,4,5	DR, I	Yes, the project comprises a steam optimization project in a production process. Outputs are relatively constant. The production rate is controlled by government allotment (fixed on annual basis). Steam output is monitored continuously.	☒	☒

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



CHECKLIST QUESTION	Ref.	MoV ^a	COMMENTS	Draft Concl	Final Concl
B.2. Application of the Baseline Methodology / Identification of the Baseline Scenario					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	1, 2, 3,4, 5,39	DR, I	The application of the methodology and the discussion and determination of the chosen baseline is clear. The representative production rate for the day is determined from yearly urea allocation and production days. This approach is deemed to be adequate as the production rate in the Indian Fertilizer Industry is controlled by the government. Clarification Request No. 5: Please provide specific values for the representative production P_{rep} and S_{rep} as well as SSCR.	CR 5	☒
B.2.2. Does the application consider all potential baseline scenarios in the discussion?	1, 2, 3,4,5	DR, I	Yes. Continuation of production using current processes and efficiency as well as implementation of the project activity without CDM consideration has been considered.	☒	☒
B.2.3. Is conservativeness addressed in the way of identifying the baseline?	1, 2, 3,4,5	DR, I	The approach is deemed plausible and conservative.	☒	☒
B.2.4. Has the baseline been established on a project-specific basis?	1, 2, 3,4,5	DR, I	Yes, it has been established in a project specific manner.	☒	☒
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	1, 2, 3,4,5	DR, I	Yes. The Indian government encourages energy conservation in industry but there is no legislation requiring energy saving measures specifically in fertilisers industry.	☒	☒

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



CHECKLIST QUESTION	Ref.	MoV ^a	COMMENTS	Draft Concl	Final Concl
			The Department of Fertilizers, Ministry of Chemicals & Fertilizers (Government of India) introduced energy norms, raw material mix and mechanism for providing escalation/de-escalation in prices of inputs for urea units not before 2004.		
B.2.6. Is the baseline determination compatible with the available data?	1, 2	DR, I	Yes, all necessary data are available.	☒	☒
B.2.7. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	1, 2	DR, I	Yes, the selected scenario represents the most likely scenario.	☒	☒
B.2.8. Does the PDD follow the approach for identifying the baseline scenario as given by the approved methodology?	1, 2, 3,4,5	DR, I	Yes.	☒	☒
B.2.9. Is all literature and sources clearly referenced?	1, 2	DR, I	Yes, literature and sources are referenced.	☒	☒
B.3. Additionality					
B.3.1. Is the discussion of how emission reductions are archived by the project scenario in comparison to the identified project scenario provided in a transparent manner?	1, 2,8,1 2,13, 16,2 7,29, 33	DR, I	Yes, additionality discussion has been provided according to the methodology by using the latest version of the "Tool for demonstration and assessment of additionality.	☒	☒
B.3.2. In case of using calculation models in order to demonstrate emission reductions: Are all formulae and input data based on provable records?	1,2, 3,4,5	DR, I	Not applicable	☒	☒

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



B.3.3. Does the PDD clearly demonstrate the additionality using the approach as given by the methodology?	1,2,14,18	DR, I	Yes. See above B.3.1.	☒	☒
B.3.4. In case of using the additionality tool: Are all steps followed in a transparent and provable manner?	1,2,18,37,39,41,42,43,44	DR, I	Yes. All steps are followed. Evidence has been provided that the company considered probable CDM benefits for the project activity. Barriers analysis has been chosen to demonstrate that the project is not a likely baseline scenario. Documentary evidence is needed. <u>Clarification Request No. 6:</u> Please define the Alternatives in Sub step 1a and discuss in substep 1 b its conformance with applicable laws and regulations. <u>Clarification Request No. 7:</u> Please provide substantiating documents evidencing that pre-vacuum concentrators are not common practice in Indian fertiliser industry. <u>Clarification Request No. 8:</u> Please clearly justify why especially in the pre-vacuum concentration process technological problems emerge that do not also apply for the vacuum concentration process	CR 6 CR 7 CR 8	☒



			(e.g. urea solution pumping, maintaining the precise vacuum, avoidance of polymer deposition, biuret content).		
B.3.5. Does the discussion sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	1,2,11	DR, I	Yes. See above B.2.5	☒	☒
B.3.6. Does the CDM registration have any impact on the implementation of the project?	1,2,8	DR, I	The CDM-incentive stimulates R & D efforts in IGF and provides training support.	☒	☒
B.3.7. Is the approach for demonstrating additionality provided by the most recent (or still applicable) methodology correctly applied?	1, 2	DR, I	Yes, please refer to B.3.3	☒	☒
B.3.8. Are other proofs than anecdotal evidence for all assumptions and statements used by the additionality discussion?	1, 2,39	DR, I	It has been evidenced that polymer deposition has been emerged. Further proofs are needed. See B.3.4. <u>Clarification Request No. 20:</u> For three previous IGF projects CDM consideration in project implementation was substantiated by a letter dated December 2000. This letter directed to the vice president (Mfg. Oprns.), informs briefly on CDM and suggests that future projects should consider possible carbon revenues. It seems as that management was informed for the first time about CDM benefits with this December 2000 note, although - as according to the documents on CDM consideration dated 15th of January 2000 and minutes of meeting of 05.05.2000 - management should have been already aware on possible CDM	Cr 20 CR 21	☒



			benefits. Please clarify this discrepancy. <u>Clarification Request No. 21:</u> The Feasibility study clearly mentions that production faces bottlenecking, which could be resolved by the implementation of the project activity. Thus it might be assumed that the incentive for the project is not CDM but removing the bottlenecks. The benefits of removing bottlenecks seems to offer sufficient added value offsetting the barriers described in the PDD. Please clearly justify why the project would have not been implemented without CDM although it was expected to overcome actual and/or future limitations in the production process.		
B.4. Project Boundary					
B.4.1. Are all emission related to the baseline scenario clearly identified and described in a complete manner?	1, 2, 27	DR, I	All baseline emissions are identified and described in PDD. The project boundary includes Steam generator in the boiler and process area of the urea section.	☒	☒
B.4.2. In case of grid connected electricity projects: Is the relevant grid correctly identified due to the EB guidance and the underlying methodology?	1,2	DR, I	The project is not a grid connected electricity project.	☒	☒
B.4.3. Are all emission related to the project scenario clearly identified and described in a complete	1, 2, 39	DR, I	No. The project activity comprises the installation of urea solution pumps besides the	CAR 1	☒



manner?			vacuum pre-concentrators.		
			<u>Corrective Action Request No.1:</u> Respective emissions due to the additional electrical load needs to be considered.		
B.4.4. Are all emission related to leakage clearly identified and described in a complete manner?	1,2	DR, I	As the project activity does not transfer equipment from another activity leakage is not to be considered according to the methodology.	☒	☒
B.5. Detailed Baseline Information					
B.5.1. Is there any indication of a date when determine the baseline?	1, 2	DR, I	Yes. According to the PDD, chapter B.5, the baseline study was completed on 30 th June 2006.	☒	☒
B.5.2. Is this in consistency with the time line of the PDD history?	1, 2	DR, I	Yes, its consistent taking into account that CDM registration process has been postponed awaiting the registration of the first CDM project and using the experience out of that process.	☒	☒
B.5.3. Is all data required provided in a complete manner by annex 3 of the PDD?	1, 2	DR, I	PDD refers to emission reduction calculation sheet that has been submitted separately.	☒	☒
B.5.4. Is all data given in compliance with the methodology?	1, 2	DR, I	Yes. Benchmark SSCR has been defined as baseline energy efficiency in line with the methodology.	☒	☒
B.5.5. Is all data evidence by official data sources or replicable records?	1, 2, 21,2 3,28, 31,3	DR, I	Yes. Documentary evidence has been verified by monitoring logbooks.	☒	☒



	5				
B.5.6. Is the vintage of the baseline data correct?	1,2	DR, I	Yes. Calculations are based on the historical data of July 00 to June 01. This is considered appropriate.	☒	☒
C. Duration of the Project / Crediting Period					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	1,2, 8,39, 40	DR, I	Yes, the project starting date and operational lifetime are clearly defined. The expected lifetime is 20 years, which is reasonable. <u>Clarification Request No. 9:</u> Please provide a clear date for project starting. <u>Corrective Action Request No. 6:</u> A detailed project schedule should be included in the PDD chapter B 5 under step 0 discussion (as per the project schedule submitted on 05.04.07). Please list the documents available to substantiate that starting date of the project activity does not fall before 1st of January 2000 and that CDM has been considered in the decision to proceed with the project rather than stating that "Documents are available that can be shown as evidence...". <u>Clarification Request No. 18:</u> Capital Budget Approvals were submitted to	CR 9 CAR 6 CR 18 CR 19	☒



			DOE for three other IGF projects in order to substantiate starting date of the projects. Please clarify why this document has not been issued for VPC project. Clarification Request No. 19: The document provided by PP in order to substantiate CDM consideration for project implementation dated 15th of January 2000 states that “As you are aware that <u>we have decided</u> to install Vacuum Preconcentrator “. Please clarify to which date of decision this letter is referring to. "Have decided" seems to refer to a decision that was made before the document was written. However the Feasibility Study to the Executive President has been submitted to the Executive President on 23rd of March 2000 (note submitted by PP). There seems to be a discrepancy that needs to be clarified.		
C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max. 10 years)?	1,2,	DR, I	The crediting period is clearly defined and reasonable. The fixed crediting period of 10 years has been indicated.	☒	☒
D. Monitoring Plan					
D.1. Monitoring Methodology					
D.1.1. Is the monitoring methodology previously approved by the CDM Authority?	1,	DR,	The monitoring methodology is largely in line with the approved monitoring methodology.	☒	☒



proved by the CDM Methodology Panel?	2,3,4 ,5	I	line with the approved monitoring methodology "Monitoring methodology for steam optimization systems" AM0018/version 01.1 of 6. December 04.		
D.1.2. Is the choice of the methodology correctly justified by the PDD?	1, 2,3,4 ,5	DR, I	Yes.	☒	☒
D.1.3. Is the project in conformance with all applicability criteria of the applied methodology?	1, 2,3,4 ,5	DR, I	Yes.	☒	☒
D.1.4. Does the monitoring methodology provide a consistent approach in the context of all parameter to be monitored and further information provided by the PDD?	1, 2,3,4 ,5	DR, I	The monitoring methodology is consistent with the activities defined in the project boundary.	☒	☒
D.1.5. Does the monitoring methodology apply consistently the choice of the option selected for monitoring both of project and baseline emissions?	1, 2,3,4 ,5	DR, I	Yes.	☒	☒
D.2. Monitoring of Project Emissions (if applied)					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	1,2, 39	DR, I	Project emissions arise due to the additional electrical loads. However these emissions are estimated based on the nameplate load in accordance with the methodology. Therefore monitoring is not required. All relevant data for estimating of emission reductions have been included.	☒	☒
D.2.2. Are the choices of project GHG indicators reasonable and in conformance with the requirements set by the approved methodology applied?	1, 2	DR, I	See D.2.2.	☒	☒



D.2.3. Will it be possible to determine the specified project GHG indicators?	1,2	DR, I	Yes, as relevant indicators are operational parameters.	☒	☒
D.2.4. Will the indicators enable comparison of project data and performance over time?	1,2	DR, I	Yes.	☒	☒
D.2.5. Is the information given for each monitoring variable by the presented table sufficient to ensure the verification of a proper implementation of the monitoring plan?	1,2	DR, I	Yes.	☒	☒
D.2.6. Is the information given for each monitoring variable by the presented table sufficient to ensure the delivery of high quality data free of potential for biases or intended or unintended changes in data records?	1,2	DR, I	Yes. All parameters are monitored regularly and recorded in log books. Information given is transparent.	☒	☒
D.2.7. Is the monitoring approach in line with current good practice, i.e. will it deliver data in a reliable and reasonably acceptable accuracy?	1,2	DR, I	Yes.	☒	☒
D.2.8. Are all formulae used to determine project emission clearly indicated and in compliance with the monitoring methodology.	1,2	DR, I	Yes. Formulae are indicated and calculations have been provided as separate Excel file.	☒	☒
D.3. Monitoring of Baseline Emissions (if applied)					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions of the baseline emissions during the crediting period?	1,2, 39	DR, I	The monitoring plan provide for the collection and archiving of relevant data. However there seems some inconsistencies between monitoring data and parameters used in subsequent formulae. While the monitoring includes <u>HP steam/pressure</u> the formulae requires the net enthalpy of <u>LP steam</u>.	CAR 2 CAR 3 CR 10 CR 11	☒



			<u>Clarification Request No. 10:</u> Please revise monitoring plan and clarify the interrelation between LP steam consumption/generation and HP steam consumption/generation. The monitoring includes the parameters LP steam consumption but HP steam pressure/temperature. <u>Corrective Action Request No. 2:</u> Please include the parameter steam generation in boiler that is needed to calculate the boilers efficiency. <u>Corrective Action Request No. 3:</u> The monitoring plan should consider monitoring of probable retrofitting measures (as requested by monitoring methodology ID number 2.23). <u>Clarification Request No. 11:</u> Monitoring plan does not include information on how temperatures (steam and feed water), pressure (steam), feed water flow and fuel consumption (gas and naphtha) etc. will be monitored. Please specify.		
D.3.2. Are the choices of project GHG indicators reasonable and in conformance with the require-	1,2,39	DR, I	See CAR D.3.1	CAR 2	☒



ments set by the approved methodology applied?					
D.3.3. Will it be possible to determine the specified project GHG indicators?	1,2, 39	DR, I	Yes, as relevant indicators are operational parameters.	☒	☒
D.3.4. Is the information given for each monitoring variable by the presented table sufficient to ensure the verification of a proper implementation of the monitoring plan?	1,2, 39	DR, I	Yes.	☒	☒
D.3.5. Is the information given for each monitoring variable by the presented table sufficient to ensure the delivery of high quality data free of potential for biases or intended or unintended changes in data records?	1,2, 39	DR, I	Daily logbooks are maintained for recording operation. Together with the available management systems this deemed to be sufficient to ensure delivery of high quality data.	☒	☒
D.3.6. Is the monitoring approach in line with current good practice, i.e. will it deliver data in a reliable and reasonably acceptable accuracy?	1, 2, 28,3 1,35, 36, 39, 45	DR, I	<u>Clarification Request No. 12:</u> Accuracy levels of measuring equipment and uncertainty of metering and procedures for calibration of monitoring equipment and maintenance of monitoring equipment in monitoring plan are missing. <u>Clarification Request No 13:</u> Please include in the PDD a brief justification about the application of daily recording frequencies rather than shift-wise recording frequencies as required by the methodology.	CR 12 CR 13	☒
D.3.7. Are all formulae used to determine baseline emission clearly indicated and in compliance with the monitoring methodology.	1, 2, 39	DR, I	Formulae are clearly presented and has been applied according to the methodology ho	☒	☒



D.4. Direct Monitoring of Emission Reductions (if applied)					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring directly the greenhouse gas emissions reductions during the crediting period?	1, 2	DR, I	Not applicable.	☒	☒
D.4.2. Are the choices of project GHG indicators reasonable and in conformance with the requirements set by the approved methodology applied?	1, 2	DR, I	See D.4.1.	☒	☒
D.4.3. Will it be possible to determine the specified project GHG indicators?	1, 2	DR, I	See D.4.1.	☒	☒
D.4.4. Is the information given for each monitoring variable by the presented table sufficient to ensure the verification of a proper implementation of the monitoring plan?	1, 2	DR, I	See D.4.1.	☒	☒
D.4.5. Is the information given for each monitoring variable by the presented table sufficient to ensure the delivery of high quality data free of potential for biases or intended or unintended changes in data records?	1, 2	DR, I	See D.4.1.	☒	☒
D.4.6. Is the monitoring approach in line with current good practice, i.e. will it deliver data in a reliable and reasonably acceptable accuracy?	1, 2	DR, I	See D.4.1.	☒	☒
D.4.7. Are all formulae used to determine project emission reductions clearly indicated and in compliance with the monitoring methodology.	1, 2	DR, I	See D.4.1.	☒	☒
D.5. Monitoring of Leakage (if applicable)					
D.5.1. Does the monitoring plan provide for the collec-	1, 2,	DR,	There is no leakage within the project activ-	☒	☒



tion and archiving of all relevant data necessary for estimation or measuring of leakage emissions during the crediting period?	39	I	ity.		
D.5.2. Are the choices of project GHG indicators reasonable and in conformance with the requirements set by the approved methodology applied?	1, 2, 39	DR, I	see D.5.1.	☒	☒
D.5.3. Will it be possible to determine the specified project GHG indicators?	1, 2, 39	DR, I	See D.5.1.	☒	☒
D.5.4. Is the information given for each monitoring variable by the presented table sufficient to ensure the verification of a proper implementation of the monitoring plan?	1, 2, 39	DR, I	See D.5.1.	☒	☒
D.5.5. Is the information given for each monitoring variable by the presented table sufficient to ensure the delivery of high quality data free of potential for biases or intended or unintended changes in data records?	1, 2, 39	DR, I	See D.5.1.	☒	☒
D.5.6. Is the monitoring approach in line with current good practice, i.e. will it deliver data in a reliable and reasonably acceptable accuracy?	1, 2, 39	DR, I	See D.5.1.	☒	☒
D.5.7. Are all formulae used to determine leakage emissions clearly indicated and in compliance with the monitoring methodology.	1, 2, 39	DR, I	See D.5.1.	☒	☒
D.6. Determination of Emission Reductions					
D.6.1. Are all formulae used to determine emission reductions clearly indicated and in compliance with the monitoring methodology.	1, 2, 39	DR, I	Yes. Formulae are in compliance with the methodology.	☒	☒
D.6.2. Is the information given for each calculated variable sufficient to ensure the delivery of high	1, 2, 39	DR, I	The data is basically sufficient to calculate the emission reduction in a proper manner.	☒	☒



quality data free of potential for biases or intended or unintended changes in data records?	39	I	the emission reduction in a proper manner.		
D.7. Quality Control (QC) and Quality Assurance (QA) Procedures					
D.7.1. Is the selection of data undergoing quality control and quality assurance procedures complete?	1, 2, 39	DR, I	Since the fertilizers plant is certified for the management system as per ISO 9001:2000, ISO 14001:2004 and OHSAS, so all the plans for recording data and retrieval of data are implemented as per management system standard.	☒	☒
D.7.2. Is the belonging determination of uncertainty levels done correctly for each ID in a correct and reliable manner?	1, 2, 39, 45	DR, I	Clarification Request No. 14 Please clearly define if QA/QC procedures are planned for each parameter.	CR 14	☒
D.7.3. Are quality control procedures and quality assurance procedures sufficiently described to ensure the delivery of high quality data?	1, 2, 39	DR, I	All monitoring plan are govern through ISO 9001:2000. However needed to be briefly described (see D.7.2)	☒	☒
D.7.4. Is it ensured that data will be bound to national or internal reference standards?	1, 2, 39	DR, I	Yes. It should be ensured.	☒	☒
D.7.5. Is it ensured that data provisions will be free of potential conflicts of interests resulting in a tendency of overestimating emission reductions?	1, 2, 39	DR, I	Yes main data are measured by online monitoring systems and as data are operation parameters it is expected that data provisions are free of potential conflict of interest.	☒	☒
D.8. Operational and management structure					
D.8.1. Is the authority and responsibility of project management clearly described?	1, 2	DR, I	The operational and management structure for the project is outlined only very briefly in the PDD.	CR 15	☒



			Clarification Request No. 15: More information on roles and responsibilities in the monitoring and reporting of emission reduction is necessary. The organization chart roles and responsibilities should be described in more detail.		
D.8.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	1, 2	DR, I	See D.8.1.	CR 15	☒
D.8.3. Are procedures identified for training of monitoring personnel?	1, 2	DR, I	See D.8.1.	CR 15	☒
D.8.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	1, 2	DR, I	There are no unintended emissions in this project.	☒	☒
D.9. Monitoring Plan (Annex 4)					
D.9.1. Is the monitoring plan developed in a project specific manner clearly addressing the unique features of the CDM activity?	1,2, 39,45	DR, I	Yes. The monitoring plan clearly addresses the relevant processes of the project activity.	☒	☒
D.9.2. Does the monitoring plan completely describes all measures to be implemented for monitoring all parameter required?	1,2, 39,45	DR, I	The monitoring plan is only defined partly. At on site audit it has been confirmed that relevant procedures are implemented however a clear and detailed description is required in the PDD. Clarification Request No.16 Please provide a detailed consistent monitoring plan including relevant procedures for calibration maintenance, day-to-day records handling, troubleshooting, review of reported results/data etc.	CR 16	☒



D.9.3. Does the monitoring plan completely describes all measures to be implemented for ensuring data quality of all parameter to be monitored?	1,2, 39,45	DR, I	See D.9.2.	CR 16	☒
D.9.4. Does the monitoring plan provide information on monitoring equipment and respective positioning in order to safeguard a proper installation?	1,2, 39,45	DR, I	See D.9.2.	CR 16	☒
D.9.5. Are procedures identified for calibration of monitoring equipment?	1,2, 39,45	DR, I	See D.9.2.	CR 16	☒
D.9.6. Are procedures identified for maintenance of monitoring equipment and installations?	1,2, 39,45	DR, I	See D.9.2.	CR 16	☒
D.9.7. Are procedures identified for monitoring, measurements and reporting?	1,2, 39,45	DR, I	See D.9.2.	CR 16	☒
D.9.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	1,2, 39,45	DR, I	See D.9.2.	CR 16	☒
D.9.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	1,2, 39,45	DR, I	See D.9.2.	CR 16	☒
D.9.10. Does the monitoring plan provide procedures identified for troubleshooting allowing redundant reconstruction of data in case of monitoring problems?	1,2, 39,45	DR, I	See D.9.2.	CR 16	☒
D.9.11. Are procedures identified for review of reported results/data?	1,2, 39,45	DR, I	See D.9.2.	CR 16	☒
D.9.12. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	1,2, 39,45	DR, I	See D.9.2.	CR 16	☒



D.9.13. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	1,2,39,45	DR, I	See D.9.2.	CR 16	☒
D.9.14. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	1,2,39,45	DR, I	See D.9.2.	CR 16	☒
E. Calculation of GHG Emissions by Source					
E.1. Predicted Project GHG Emissions					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	1,2,39	DR, I	<u>Corrective Action Request No. 4:</u> Emissions due to additional electrical loads are not taken into consideration (see also D.2.1) and needs to be included.	CAR 4	☒
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	1,2,39	DR, I	<u>Clarification Request No. 17:</u> Please clearly state all assumptions and calculations (equations) used with respective values.	CR 17	☒
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	1,2,39	DR, I	Yes. Project emissions due to additional electrical loads are based on nameplate capacity	CR 17	☒
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	1,2,39	DR, I	Yes.	☒	☒
E.1.5. Is the projection based on same procedures as used for later monitoring or acceptable alternative models?	1,2,39	DR, I	Yes.	☒	☒
E.1.6. Is the projection based on provable input parameter?	1,2,39	DR, I	Yes. On operational data.	☒	☒



E.2. Leakage					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	1, 2	DR, I	There is no leakage in the project.	☒	☒
E.2.2. Have these leakage effects been properly accounted for in calculations?	1, 2	DR, I	Not applicable, see E.2.1.	☒	☒
E.2.3. Have conservative assumptions been used to calculate leakage emissions?	1, 2	DR, I	Not applicable, see E.2.1.	☒	☒
E.2.4. Are uncertainties in the leakage estimates properly addressed in the documentation?	1, 2	DR, I	Not applicable, see E.2.1.	☒	☒
E.2.5. Is the projection based on same procedures as used for later monitoring or acceptable alternative models?	1, 2	DR, I	Not applicable, see E.2.1.	☒	☒
E.2.6. Is the projection based on provable input parameter?	1, 2	DR, I	Not applicable, see E.2.1.	☒	☒
E.3. Baseline Emissions					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	1, 2, 39	DR, I	Yes. Baseline efficiency is based on operational data in pre-project scenario.	☒	☒
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	1, 2, 39	DR, I	Yes. Baseline energy efficiency has been defined as benchmark in accordance to the methodology.	☒	☒
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	1, 2, 39	DR, I	Clarification Request No. 17: Please clearly state all assumptions and calculations (equations) used with respective values.	CR 17	☒
E.3.4. Have conservative assumptions been used	1, 2, 39	DR, I	Yes.	☒	☒



when calculating baseline emissions?	39	I			
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	1,2,39	DR, I	Yes.	☒	☒
E.3.6. Is the projection based on same procedures as used for later monitoring or acceptable alternative models?	1,2,39	DR, I	Yes.	☒	☒
E.3.7. Is the projection based on provable input parameter?	1,2,39	DR, I	Yes.	☒	☒
E.4. Emission Reductions					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	1, 2	DR, I	Yes, the project shall result in fewer emissions as compared to the baseline scenario.	☒	☒
E.4.2. Is the form/table required for the indication of projected emission reductions correctly applied?	1, 2	DR, I	<u>Corrective Action Request No. 5:</u> The emission reduction calculations are not transparently presented. Please include all formulae applied with the respective values/parameters used.	CAR 5	☒
E.4.3. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	1, 2	DR, I	Yes.	☒	☒
F. Environmental Impacts					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	1, 2,11	DR, I	Yes environmental impacts and benefits have been described in the PDD. The analysis is deemed sufficient in view of the nature of the project.	☒	☒
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and	1, 2	DR, I	The project requires no EIA study as the local law exempts modification as per SO.60	☒	☒



if yes, is an EIA approved?			(E) dated 27.01.1990 and the subsequent revisions.		
F.1.3. Will the project create any adverse environmental effects?	1, 2	DR, I	The project will create no adverse environmental impacts.	☒	☒
F.1.4. Are transboundary environmental impacts considered in the analysis?	1, 2	DR, I	Transboundary impacts are not expected.	☒	☒
F.1.5. Have identified environmental impacts been addressed in the project design?	1, 2	DR, I	No negative environmental impacts are expected to result from the project activity.	☒	☒
F.1.6. Does the project comply with environmental legislation in the host country?	1, 2	DR, I	Since the project activity is a process modification no special permission is required from the Statutory /regulatory authority.	☒	☒
G. Stakeholder Comments					
G.1.1. Have relevant stakeholders been consulted?	1, 2, 14,39	DR, I	The relevant stakeholders have been contacted.	☒	☒
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	1, 2, 14,39	DR, I	Comments have been gathered through formal written approvals, interviews and personal meetings.	☒	☒
G.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, 2, 14,39	DR, I	There is no legal requirement for carrying out the stakeholder process for this project activity.	☒	☒
G.1.4. Is the undertaken stakeholder process described in a complete and transparent manner?	1, 2, 14,39	DR, I	Yes.	☒	☒
G.1.5. Is a summary of the stakeholder comments received provided?	1, 2, 14,39	DR, I	Yes.	☒	☒



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G.1.6. Has due account been taken of any stakeholder comments received?	1, 2, 14,39	DR, I	Till date no due comments has been received.	☒	☒
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* MoV = Means of Verification, DR= Document Review, I= Interview

CDM Validation Protocol - Report: Validation of the Effective Utilization of waste heat by installing vacuum pre-concentrator in urea section at Indo Gulf Fertilisers, Jagdishpur

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Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in tables 1 and 2	Summary of project owner response	Validation team conclusion
<u>Corrective Action Request No.1:</u> Respective emissions due to the additional electrical load needs to be considered.	B.4.3.	Necessary correction has been made in the revised PDD. CER calculation, Efficiency of power generation system-NG Based and pump specification are provided.	☒ Emissions due to electrical loads will be accounted for. Estimations are based on the nameplate data of the pumps in accordance with the methodology. Supporting documentation has been provided.
<u>Corrective Action Request No. 2:</u> Please include the parameter steam generation in boiler that is needed to calculate the boilers efficiency.	D.3.1.	Necessary correction has been made.	☒ PDD has been revised. Steam quantity and steam parameters at boiler are monitored.



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<u>Corrective Action Request No. 3:</u> The monitoring plan should consider monitoring of probable retrofitting measures (as requested by monitoring methodology ID number 2.23).	D.3.1.	Necessary correction has been made.	☒
<u>Corrective Action Request No. 4:</u> Emissions due to additional electrical loads are not taken into consideration (see also D.2.1) and needs to be included.	E.1.1.	Necessary correction has been made. Please find in CER calculation sheet.	☒
<u>Corrective Action Request No. 5:</u> The emission reduction calculations are not transparently presented. Please include all formulae applied with the respective values/parameters used.	E.4.2.	Necessary correction has been made.	☒ PDD has been revised. In addition excel sheet with calculations has been annexed to allow reproduction.
<u>Clarification Request No. 1:</u> A Letter of Approval confirming that the project contributes to sustainable development in the country needs to be submitted to the audit team.	Table 1, No.3.	Host country approval letter has been submitted.	☒ A Letter of Approval from the Ministry of Environment and Forests issued on February 07, 2007 has been submitted.
<u>Clarification Request No. 2:</u> However as the measure is included in a complex process please include a brief schematic diagram of the pre- and post project scenario in the PDD. In addition please describe also clearly that pre-concentrators will be installed in two urea streams.	A.2.1.	Necessary correction has been made in the revised PDD.	☒



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<u>Clarification Request No. 3</u> A detailed technical specification of the falling film vacuum pre-concentrator (VPC) should be included in the PDD.	A.4.4	Necessary correction has been made.	☑
<u>Clarification Request No. 4:</u> Please add version number and date in B.1 of the PDD.	B.1.1.	Necessary correction has been made in section B.1 of revised PDD.	☑
<u>Clarification Request No. 5:</u> Please provide specific values for the representative production P_{rep} and S_{rep} as well as SSCR.	B.2.1.	Necessary correction has been made in the revised PDD.	☑ Excel sheets with monitored data has been provided and it can be confirmed that the approach taken is adequate and conservative.
<u>Clarification Request No. 6:</u> Please define the Alternatives in Sub step 1a and discuss in substep 1 b its conformance with applicable laws and regulations.	B.3.4.	Necessary correction has been made.	☑



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<u>Clarification Request No. 7:</u> Please provide substantiating documents evidencing that pre-vacuum concentrators are not common practice in Indian fertiliser industry.	B.3.4.	Necessary document is attached as Annexure.	☒ Projects & development India Ltd. providing services for the design, engineering and construction of fertilizer plants, with proven track records in the Indian fertilizer sector, confirmed that IGF was the first of only few companies implementing the VPC technology.
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<u>Clarification Request No. 8:</u> Please clearly justify why especially in the pre-vacuum concentration process technological problems emerge that do not also apply for the vacuum concentration process (e.g. urea solution pumping, maintaining the precise vacuum, avoidance of polymer deposition, biuret content).	B.3.4.	In pre-project scenario urea solution (71% concentration) gets transferred from LP decomposer to Vacuum concentrator due to pressure gradient ($\Delta P=4.62$ ata). In project activity case urea solution (85% concentration) has to be transferred from Vacuum pre-concentrator to Vacuum concentrator through a urea solution pump (P-54), since there is no or negligible pressure gradient between Vacuum pre-concentrator and Vacuum concentrator. Pump (P-54) is installed between Vacuum pre-concentrator and Vacuum concentrator. Proper operation of P-54 becomes very vital for normal urea production. If P-54 pump trips on account of problems like cavitation, discharge valve malfunction etc., the urea production has to be reduced or stopped. IGF has already many times faced problem of P-54 tripping and subsequent reduction in urea production or stop in urea production. (Please refer Annexure) In project case, urea solution of high concentration (85%) is fed to Vacuum concentrator compared to pre-project scenario urea concentration of 71%. The urea solution of higher concentration has lead to polymer formation in the suction and polymer deposition on the roof of the vacuum concentrator. The coagulated polymer lumps causes choking problem (Lute choking) also leads to diversion for Prilling and shutdown of the vacuum concentrator. Hence affecting urea production. IGF has been continuously facing the problem of polymer deposition due to installation of vacuum pre-concentrator. Polymer coagulation/deposition also leads to the choking of the small openings of buckets in prilling tower and leads to bucket replacement and unnecessary maintenance problem. Also please refer Annexure.	☒ At time of investment decision project proponent was well aware of possible risks due to the change of process. This considerations has been proven to come true by actual problems. Evidence on problems due to polymer deposition has been provided.
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<u>Clarification Request No. 9:</u> Please provide a clear date for project starting	C.1.1.	Necessary correction has been made in section C.1.1 of revised PDD. Supporting documents are attached.	☒ Starting date has clearly stated and evidenced.
<u>Clarification Request No. 10:</u> Please revise monitoring plan and clarify the interrelation between LP steam consumption/generation and HP steam consumption/generation. The monitoring includes the parameters LP steam consumption but HP steam pressure/temperature.	D.3.1.	Monitoring plan has been revised and additional information on the interlink between LP and HP steam has been included in the PDD. Formulae have been provided.	☒ It has been confirmed that reducing the consumption of low pressure steam in urea section reduces high pressure steam generation in service boiler. Monitoring plan and calculation include all relevant parameters to monitor SSCR and service boiler efficiency. The approach is deemed to be appropriate and conservative.
<u>Clarification Request No. 11:</u> Monitoring plan does not include information on how temperatures (steam and feed water), pressure (steam), feed water flow and fuel consumption (gas and naphtha) etc. will be monitored. Please specify.	D.3.1.	Necessary correction has been made.	☒



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<u>Clarification Request No. 12:</u> Accuracy levels of measuring equipment and uncertainty of metering and procedures for calibration of monitoring equipment and maintenance of monitoring equipment in monitoring plan are missing.	D.3.6	Necessary correction has been made. Procedures are defined in CDM manual.	☑
<u>Clarification Request No 13.</u> Please include in the PDD a brief justification about the application of daily recording frequencies rather than shift-wise recording frequencies as required by the methodology.	D.3.6	As per the monitoring methodology SSCR is the ratio between representative steam consumption for the day and representative production for the day. The representative steam consumption for the day is calculated as product of arithmetic average of shift-wise steam consumption values and number of shift per day. IGF has online monitoring system (integrator) and steam consumption and urea production are continuously monitored. In the integrator, the instantaneous readings (for every second) are integrated continuously for the day and by this method steam consumption/urea production per day is measured. Hence the online monitoring system (with integrator) is more accurate and representative.	☑ Recording frequencies once a day are appropriate as measurement is undertaken continuously.
<u>Clarification Request No. 14</u> Please clearly define if QA/QC procedures are planned for each parameter.	D.7.2.	Necessary correction has been made. Please find attached CDM Manual.	☑



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<u>Clarification Request No. 15:</u> More information on roles and responsibilities in the monitoring and reporting of emission reduction is necessary. The organization chart roles and responsibilities should be described in more detail.	D.8.1	Necessary correction has been made. Please find attached CDM Manual as Annexure.	☒ The CDM manual defines in detail roles and responsibilities.
<u>Clarification Request No.16</u> Please provide a detailed consistent monitoring plan including relevant procedures for calibration maintenance, day-to-day records handling, troubleshooting, review of reported results/data etc.	D.9.2.	A CDM manual is prepared detailing various procedures like calibration, data review, data storage etc., to be followed. Please find attached CDM manual.	☒ Monitoring procedures and responsibilities are clearly defined in the CDM manual. Monitoring plan in Annex 4 is providing a consistent summary.
<u>Clarification Request No. 17:</u> Please clearly state all assumptions and calculations (equations) used with respective values.	E.1.2. E.3.3.	Necessary correction has been made.	☒ Calculations have been provided as Annex.



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<u>Corrective Action Request No. 6:</u> A detailed project schedule should be included in the PDD chapter B 5 under step 0 discussion (as per the project schedule submitted on 05.04.07). Please list the documents available to substantiate that starting date of the project activity does not fall before 1st of January 2000 and that CDM has been considered in the decision to proceed with the project rather than stating that "Documents are available that can be shown as evidence..."	C.1.1.	Detailed project schedule for installation of vacuum pre-concentrator in Urea section is included in revised PDD. The documents and Annual Report for year 2001-02 is submitted to substantiate that the starting date of project activity does not fall before the 1st January 2000 are listed below:	☒ Official Project start has been defined as 17th of March 2000, when consultancy engineering contract with PDIL became effective according to PDIL documentation. As per the documents provided a brief techno economic study was presented on 23th of March 2000. The project was presented to the Chairman of the Aditya Birla group during Planning & Budgeting meeting on 23th of April 2000 and was approved. Excerpts of CAPEX report has been submitted as substantiating documents together with the directors report. Purchase orders were issued starting in June 2000. CDM consideration has been proofed by an internal document dated 15th of January 2000. According to the project proponent this has been issued after the Monthly Progress Review meeting (MPR held on 14th of January) where a preliminary discussion on concept of Vacuum Pre-concentrator took place. The members present in the meeting principally agreed and decided to take forward the project to next step of IGF management approval process.
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<u>Clarification Request No. 18:</u> Capital Budget Approvals were submitted to DOE for three other IGF projects in order to substantiate starting date of the projects. Please clarify why this document has not been issued for VPC project.	C.1.1.	Indo Gulf Fertilisers (IGF) follows standard procedure for Management approval of new or proposed projects. The projects or proposals which requires substantial amount of investment, gives low returns or highly risky in nature are discussed before the Chairman of the group during Planning & Budgeting meeting. This meeting is held in the month of March/April before commencement of the financial year. The investments / energy saving initiatives agreed by Chairman are published in the Directors Report. Since VPC project involves huge investment and also carries certain risks, this project was discussed and agreed during the Planning & Budgeting Meeting held on 23rd April 2000 at Mumbai. (Please find enclosed the relevant page of CAPEX report). The investment for other three IGF projects was low, so these projects did not go for chairman's approval through annual planning & budgeting meeting, but via capital budget proposal (see response to CR 19). The project got top management approval on 23rd April 2000, which clearly indicates that the project activity has started after January 2000 only. The relevant pages of Directors Report for the year 2000-01 are attached, which clearly indicates that Indo Gulf is planning to implement and commission Vacuum Pre-concentrator project by mid 2001.	☒ PP has demonstrated that Capital Budget Approval is not available for the project due to its higher investment size. Final approval has been provided - following the standard procedures of the company - by the Chairman of the Aditya Birla group during the annual planning & budgeting meeting held on 23rd April 2000.
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<u>Clarification Request No. 19:</u> The document provided by PP in order to substantiate CDM consideration for project implementation dated 15th of January 2000 states that “As you are aware that <u>we have decided</u> to install Vacuum Preconcentrator “. Please clarify to which date of decision this letter is referring to. "Have decided" seems to refer to a decision that was made before the document was written. However the Feasibility Study to the Executive President has been submitted to the Executive President on 23rd of March 2000 (note submitted by PP). There seems to be a discrepancy that needs to be clarified.	C.1.1.	Indo Gulf Fertilisers (IGF) follows standard procedure for management approval of new or proposed projects. This includes 1) <u>Preliminary and brief discussion during</u> in Monthly Progress Review meeting (MPR) .The MPR meeting is convened by Head Unit Technical Cell, chaired by Unit Head and is attended by functional heads, GMs, departmental heads and area in-charges. During the MPR meeting held in January 2000, a preliminary and brief discussion on concept of Vacuum Pre-concentrator (proposed activity) was carried out for understanding the concept and principle of VPC project. The members present in the meeting principally agreed and decided to take forward the project to next step of IGF management approval process. This step is considered very preliminary and not highly significant in the management approval process. 2) <u>Detailed Analysis & Comprehensive deliberation:</u> After first step of management approval process the new or proposed projects are reviewed/ analyzed in detail and comprehensive manner by conducting technical and commercial feasibility study, detail project report etc. After preparation of techno-commercial study or feasibility study the report is forwarded to executive president (Unit head) for approval depending upon the investment and risk associated with the project following sub step is followed: (i) For low investment and low risky projects, project is directly approved by the unit head (ii) For high investment and risk prone projects, the techno commercial feasibility study or feasibility report of the project is critically reviewed and submitted to Chairman of the group for approval during Planning & Budgeting meeting. This step is considered very imperative and of high significance in project approval process.	☒ CDM consideration letter seems to refer to results from MPR (14th of January 2000) while official management approval required a techno-commercial feasibility study to be submitted to the executive president (23rd of March 2000).
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<u>Clarification Request No. 20:</u> For three previous IGF projects CDM consideration in project implementation was substantiated by a letter dated December 2000. This letter directed to the vice president (Mfg. Oprns.), informs briefly on CDM and suggests that future projects should consider possible carbon revenues. It seems as that management was informed for the first time about CDM benefits with this December 2000 note, although - as according to the documents on CDM consideration dated 15th of January 2000 and minutes of meeting of 05.05.2000 - management should have been already aware on possible CDM benefits. Please clarify this discrepancy.	B.3.8.	IGF first came to know about Clean Development Mechanism during the "Roundtable on Environment Management: Issues in Compliance and Profitability, 24th of April, 1999" at New Delhi. Since Vacuum pre-concentrator project is an energy saving project, the project results significant reduction in the steam demand of the plant and subsequently fossil fuel consumption reduction in the service boiler. Therefore the project activity leads GHG emission reduction and would help to protect the environment. IGF had considered this project as CDM project and therefore, an internal note was circulated specifically for this project. Over a period of time, Indo Gulf Fertilizer's team expanded its awareness on CDM and came to know other associated benefits, which can significantly contribute to the profitability of the organization and local & global environment. Keeping this in view, an internal note was circulated highlighting that future energy conservation initiatives of the company should consider as a CDM potential and carbon revenue, which may benefit the company and environment.	☒
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<u>Clarification Request No. 21:</u> The Feasibility study clearly mentions that production faces bottlenecking, which could be resolved by the implementation of the project activity. Thus it might be assumed that the incentive for the project is not CDM but removing the bottlenecks. The benefits of removing bottlenecks seems to offer sufficient added value offsetting the barriers described in the PDD. Please clearly justify why the project would have not been implemented without CDM although it was expected to overcome actual and/or future limitations in the production process.	B.3.8.	Following documents were submitted to TuV-sud to clarify various issues raised during validation: Planning & Budgeting Meeting Report, Annual Report (year 2001-02), Project Progress Report, Minutes of Meeting, Letter of Intent, Completion Report, CDM consideration, Stake holder consultation process (Minutes of meeting), Covering letter of feasibility report. All the above documents clearly mentions that the project activity is a energy saving project and would lead to steam savings and reduce energy consumption of plant. No where, in these documents it is mentioned that the project would lead to increase in urea production. In annual report which is highly authenticated document (verified and signed by independent auditor, director of the company and also distributed to all shareholders) it is mentioned VPC project is an energy saving project. From the above, it is evident that the project is a steam savings project, not a production enhancement project. Hence the project is implemented after considering CDM to save steam and energy only.	☒ PP substantiated that main purpose of the project activity was energy saving. Thus it seems credible that CDM incentive has been a driver for project implementation mitigating the risk due to change of established processes.
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Annex 2: Information Reference List

	Validation of the “Effective Utilization of waste heat by installing vacuum pre-concentrator in urea section at Indo Gulf Fertilisers, (a unit of Aditya Birla Group), Jagdishpur” project in India Information Reference List	Page 2 of 2	 Industrie Service
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Reference No.	Document or Type of Information
9.	Evidence of payments made for projects by Indo Gulf Corporation Limited (Fertilisers Unit), dated 04.05.2001,1.5.2001 and 19.04.2001, submitted 25.11.2006.
10.	Offer for Erection of Pre-Concentrator and other equipments to M/s Satnam Engineers &Fabricators Pvt.Ltd., dated 07.09.2000, submitted 25.11.2006.
11.	Consents from Uttar Pradesh Pollution control Board dated 26.07.2006, submitted on 25.11.2006
12.	Process Engineering Evaluation sheet for Technical Barrier –polymer deposition due to high Concentration from 71-85%, problem started after Vacuum Pre-Concentrator installation by Indo Gulf Corporation Limited (Fertilisers Unit), dated 07.11.2001,submitted 25.11.2006.
13.	Preventive schedule for P-54 Pump by Indo Gulf Corporation Limited (Fertilisers Unit), dated November 2006, submitted 25.11.2006.
14.	Minutes of meeting of employees meeting on energy conservation projects by Indo Gulf Corporation Limited (Fertilisers Unit), dated 16.05.2001, submitted 25.11.2006.
15.	Work Order for the cleaning/removal of Polymer from 11/21, MV-6 to M/s Surendra Construction Company, dated 01.05.2006, submitted 25.11.2006.
16.	Ultimate analysys of natural gas reports by Gail India Limited, dated 9.9.2006, 18.10.2006, 03.11.2006, 15.11.2006, 23.11.2006, submitted 25.11.2006.
17.	Calibration Certificate for Online gas analyser by Gail (India) Limited, FTL, Jagdishpur, dated 16.02.2006, submitted 25.11.2006.
18.	Letter for consideration of Vacuum Pre-concentrator project as CDM project by Indo Gulf Corporation Limited (Fertilisers Unit), dated 15.01.2000, submitted 25.11.2006.
19.	Completion letter for installation of Vacuum Pre-concentrator by Indo Gulf Corporation Limited (Fertilisers Unit), dated 30.06.2001, ssubmitted 25.11.2006.
20.	Purchase Order for the supply of condensers, interconnected piping and instruments for Vacuum Pre-concentrator in Urea Plant to M/s Patel Airtemp (India) Ltd., dated 13.07.2000, submitted 25.11.2006.
21.	Progress report of Vacuum Pre Concentrator System Project (Urea plant) by M/s Project & Development India Limited, dated 25.04.2000, submitted 25.11.2006
22.	Urea production daily reports by Indo Gulf Corporation Limited (Fertilisers Unit), dated 29.07.2006, 19.09.2006; 05.10.2006, 30.10.2006; 23.11.2006, submitted 25.11.2006.
23.	Operating and Training Manual for Vacuum Pre-concentrator, Urea plant by Indo Gulf Corporation Limited (Fertilisers Unit), dated nil, submitted 25.11.2006.

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Reference No.	Document or Type of Information
24.	Work Order for Erection of Vacuum Pre-concentrator, Allied Equipments & Piping to M/s Lloyd insulations (India) Limited, dated 06.09.2000, submitted 25.11.2006.
25.	Integrated Manual for Urea Plant –Procedure manual by Indo Gulf Corporation Limited (Fertilisers Unit), dated 29.05.2006, submitted 25.11.2006.
26.	Annual report 2000-2001 by Indo Gulf Corporation Limited, submitted 25.11.2006.
27.	Urea plant Process block diagram of Vacuum Pre-concentrator section before and after project status by Indo Gulf Corporation Limited (Fertilisers Unit), dated 25.11.2006, submitted 25.11.2006.
28.	Sample of the Control room Log sheet steam network by Indo Gulf Corporation Limited (Fertilisers Unit), dated 21.10.2006, submitted 25.11.2006.
29.	Technical details of Pump and equipments of Vacuum Pre-concentrator projects by M/s Snamprogetti, dated 30.03.2000, submitted 25.11.2006.
30.	Urea Production days for the year 2005-2006 by Indo Gulf Corporation Limited (Fertilisers Unit), submitted 25.11.2006.
31.	Samples of Log Sheet of service boiler for KS Steam –Temperature, Pressure and Feed water by Indo Gulf Corporation Limited (Fertilisers Unit), submitted 25.11.2006.
32.	Shift report of 11.12.2001 (Production /Consumption Figures/ Operating conditions) by Indo Gulf Corporation Limited (Fertilisers Unit), submitted 25.11.2006.
33.	Tripping and Urea Production Interruption history (shift reports) Indo Gulf Corporation Limited (Fertilisers Unit), dated 31.05.2006, submitted 25.11.2006.
34.	Process Engineering evaluation sheet for problem due to Polymer formation by Indo Gulf Corporation Limited (Fertilisers Unit), dated 07.11.2001, submitted 25.11.2006.
35.	Samples of daily Process report of Service boiler by Indo Gulf Corporation Limited (Fertilisers Unit) dated 16.01.06 and 15.04.06, submitted 25.11.2006.
36.	Samples of Logbook of Urea plant LS steam consumption by Indo Gulf Corporation Limited (Fertilisers Unit), submitted 25.11.2006.
37.	Minutes of the meetings regarding Problem faces due to no bypass arrangement of Vacuum Pre-concentrator between M/s Indo Gulf Corporation Limited (Fertilisers Unit) & M/s PDIL, dated 15.05.2000, submitted 25.11.2006.
38.	Photographs of the site visit, validation team dated 24.11.2006 – 25.11.2006
39.	Revised Project Design Document, Version 08 dated 01.08.2007, submitted on August 2007 and revised PDD, version 09 dated

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Reference No.	Document or Type of Information
	01.11.2007.
40.	Excerpts from assignment of engineering services to Projects & Development India Limited dated April 2000, submitted on January 2007.
41.	Letter of Projects & Development India Ltd. (PDIL) confirming that IGF was the first of only few companies implementing the VPC technology, dated 24.11.2006, submitted on January 2007.
42.	Engineering work requisition for installing grating in the inlet of vacuum concentrator, dated 21.11.2001, submitted on January 2007.
43.	Excerpts from logbook evidencing P-54 tripping, dated 22.12.03, submitted on January 2007.
44.	Work order for cleaning/removal of polymer, dated 01.05.2006, submitted on January 2007.
45.	CDM manual for the project activity, undated, submitted on January 2007.