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Validation Report

H & R Johnson (India) Limited

VALIDATION OF THE CDM-PROJECT:

ENHANCING ENERGY EFFICIENCY BY REPLACING BATCH SMELTER BY CONTINUOUS SMELTER AT KARAIKAL, PONDICHERRY

REPORT NO. 983242

~~**02 January, 2008**~~ **26 March 2008**

TÜV SÜD Industrie Service GmbH

Carbon Management Service
Westendstr. 199 - 80686 Munich – GERMANY

Industrie Service

Report No.	Date of first issue	Revision No.	Date of this revision	Certificate No.
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Subject: Validation of a CDM Project	
Accredited TÜV SÜD Unit: TÜV SÜD Industrie Service GmbH Certification Body "climate and energy" Westendstr. 199 - 80686 Munich Federal Republic of Germany	**TÜV SÜD Contract Partner:** TÜV SÜD South Asia C-153/1, Okhla Industrial Estate Phase- 1 New Delhi – 110020 India
Client: H & R Johnson (India) Limited Windsor, Kalina, Santacruz (East), Mumbai-400098, Maharashtra India	**Project Site(s):** Village: Thennangudy, District : Karaikal, Pondicherry, India
Project Title: Enhancing energy efficiency by replacing batch smelter by continuous smelter at Karaikal, Pondicherry	
Applied Methodology / Version: AMS II.D, version 8	**Scope(s):** 4
First PDD Version: Date of issuance: 2007-02-23 Version No.: 1 Starting Date of GSP 2007-04-05	**Final PDD version:** Date of issuance: 2007-10-04 Version No.: 03
Estimated Annual Emission Reduction:	34,556 tons CO_2e
Assessment Team Leader: Dr. Ayse Frey	**Further Assessment Team Members:** Bratin Roy Abhishek Goyal

Summary of the Validation Opinion:

☒ The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfillment of all stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM. Hence TÜV SÜD will recommend the project for registration by the CDM Executive Board in case letters of approval of all Parties involved will be available before the expiring date of the applied methodology(ies) or the applied methodology version respectively.

☐ The review of the project design documentation and the subsequent follow-up interviews have not provided TÜV SÜD with sufficient evidence to determine the fulfilment of all stated criteria. Hence TÜV SÜD will not recommend the project for registration by the CDM Executive Board and will inform the project participants and the CDM Executive Board on this decision.

Abbreviations

AM	Approved Methodology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority, India
CER	Certified Emission Reduction
CR	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission reduction
GAIL	Gas Authority of India Limited
GHG	Greenhouse gas(es)
HRJ	H & R Johnson (India) Limited
KP	Kyoto Protocol
MP	Monitoring Plan
NGO	Non Governmental Organisation
PDD	Project Design Document
PP	Project Proponent
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual

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1 INTRODUCTION

1.1 Objective

The validation objective is an independent assessment by a Third Party (Designated Operational Entity = DOE) of a proposed project activity against all defined criteria set for the registration under the Clean Development Mechanism (CDM). Validation is part of the CDM project cycle and will finally result in a conclusion by the executing DOE whether a project activity is valid and should be submitted for registration to the CDM-EB. The ultimate decision on the registration of a proposed project activity rests at the CDM Executive Board and the Parties involved.

The project activity discussed by this validation report has been submitted under the project title:

Enhancing energy efficiency by replacing batch smelter by continuous smelter at Karaikal, Pondicherry

1.2 Scope

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

- Ø The Kyoto Protocol, in particular § 12
- Ø Decision 2/CMP1 and Decision 3/CMP.1 (Marrakech Accords)
- Ø Further COP/MOP decisions with reference to the CDM (e.g. decisions 4 – 8/CMP.1)
- Ø Decisions by the EB published under http://cdm.unfccc.int
- Ø Specific guidance by the EB published under http://cdm.unfccc.int
- Ø Guidelines for Completing the Project Design Document (CDM-PDD), and the Proposed New Baseline and Monitoring Methodlogy (CDM-NM)
- Ø The applied approved methodology
- Ø The technical environment of the project (technical scope)
- Ø Internal and national standards on monitoring and QA/QC
- Ø Technical guideline and information on best practice

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.

Once TÜV SÜD receives a first PDD version, it is made publicly available on the internet at TÜV SÜD's webpage as well as on the UNFCCC CDM-webpages for starting a 30 day global stakeholder consultation process (GSP). In case of any request a PDD might be revised (under certain conditions the GSP will be repeated) and the final PDD will form the basis for the final evaluation as presented by this report. Information on the first and on the final PDD version is presented at page 1.

The only purpose of a validation 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.

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, an initiative of Designated and Applicant Entities, which aims to harmonize the approach and quality of all such assessments.

In order to ensure transparency, a validation protocol was customized for the project. TÜV SÜD developed a "cook-book" for methodology-specific checklists and protocol based on the templates presented by the Validation and Verification Manual. The protocol shows, in a transparent manner, criteria (requirements), the discussion of each criterion by the assessment team and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

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

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

Validation Protocol Table 1: Conformity of Project Activity and PDD				
Checklist Topic / Question	***Reference***	***Comments***	***PDD in GSP***	***Final PDD***
The checklist is organised in sections following the arrangement of the applied PDD version. Each section is then further subdivided. The lowest level constitutes a checklist question / criterion.	*Gives reference to documents where the answer to the checklist question or item is found in case the comment refers to documents other than the PDD.*	*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. In some cases sub-checklist are applied indicating yes/no decisions on the compliance with the stated criterion. Any **Request** has to be substantiated within this column*	*Conclusions are presented based on the assessment of the first PDD version. This is either acceptable based on evidence provided (þ), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **Clarification Request (CR)** is used when the validation team has identified a need for further clarification.*	*Conclusions are presented in the same manner based on the assessment of the final PDD version.*

Validation Protocol Table 2: Resolution of Corrective Action and Clarification Requests			
Clarifications and corrective action requests	***Ref. to table 1***	***Summary of project owner response***	***Validation team conclusion***
If the conclusions from table 1 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 1 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 1, under "Final PDD".*

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

Validation Protocol Table 3: Unresolved Corrective Action and Clarification Requests		
Clarifications and corrective action requests	***Id. of CAR/CR 1***	***Explanation of the Conclusion for Denial***
If the final conclusions from table 2 results in a denial the referenced request should be listed in this section.	*Identifier of the Request.*	*This section should present a detail explanation, why the project is finally considered not to be in compliance with a criterion.*

2.1 Appointment of the Assessment Team

According to the technical scopes and experiences in the sectoral or national business environment TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV SÜD certification body "climate and energy". The composition of an assessment team has to be approved by the Certification Body ensuring that the required skills are covered by the team. The Certification Body TÜV SÜD operates four qualification levels for team members that are assigned by formal appointment rules:

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

It is required that the sectoral scope linked to the methodology has to be covered by the assessment team.

The validation team was consisting of the following experts (the responsible Assessment Team Leader in written in bold letters):

Name	Qualification	Coverage of technical scope	Coverage of sectoral expertise	Host country experience
Dr. Ayse Frey	**ATL**	**þ**	**þ**	
Bratin Roy	GHG-A	þ	þ	þ
Abhishek Goyal	ATL		þ	þ

Dr. Ayse Frey is an Assessment Team Leader 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.

Bratin Roy is a lead auditor for quality, environment and occupational health and safety management system (according to ISO 9001, ISO 14001 and OHSAS 18001) and an auditor for CDM/JI projects at TÜV SÜD South Asia. He holds a master degree in environmental science. He is based in Pune, India. He has received extensive training in the CDM validation and verification processes and has already participated in several CDM project assessments.

Abhishek Goyal is an Assessment Team Leader for CDM/JI projects and environment/energy expert at TÜV SÜD Industrie Service GmbH. Before joining the TÜV SÜD Industrie Service GmbH he has worked on development of PDDs and methodologies for several energy efficiency, renewable energy, and waste to energy projects. He has extensive experience in CDM.

2.2 Review of Documents

The first PDD version submitted by the client and additional background documents related to the project design and baseline were reviewed as initial step of the validation process. A complete list of all documents and proofs reviewed is attached as Annex 2 to this report.

2.3 Follow-up Interviews

In the period of May 14-15, 2007, TÜV SÜD performed interviews on-site with project stakeholders to confirm selected information and to resolve issues identified in the first document review. Annex 2 lists all persons interviewed in the context of this on-site visit.

2.4 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is to resolve the requests for corrective actions and clarifications 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 communication between the client and TÜV SÜD. To guarantee the transparency of the validation process, the concerns raised and responses that have been given are summarised in chapter 3 below and documented in more detail in the validation protocol in Annex 1.

2.5 Internal Quality Control

As final step of a validation the validation report and the protocol have to undergo and internal quality control procedure by the Certification Body “climate and energy”, i.e. each report has to be approved either by the head of the certification body or his deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one.

It rests at the decision of TÜV SÜD’s Certification Body whether a project will be submitted for requesting registration by the EB or not.

3 SUMMARY OF FINDINGS

This section summarizes the main issues that were found and resolved during the validation process. A detailed listing of all findings is available in table 2 of the attached validation protocol (in Annex 1 of this report).

The main issues identified were:

1. Selection of baseline scenario and factors considered in calculation of baseline emissions
2. Compliance with monitoring methodology as per AMS II.D, version 8
3. Calculation of grid emission factor
4. Assessment of additionality using barrier analysis
5. Technical lifetime of existing equipments
6. Energy savings from the project activity

Resolution of 1. Selection of baseline scenario and factors considered in calculation of baseline emissions

Initial version of the PDD stated that one of the alternatives to the project activity was continuous smelter coupled with recuperative type heat exchanger with specific energy consumption of 3000-3500 kcal/kg. Clarification was requested by audit team as to why this technology is not considered for calculation of baseline emissions because it was conservative than identified baseline scenario i.e batch smelter (pre-project scenario). Project proponent clarified that cost of recuperative type smelter was very high compared to regenerative type continuous smelter installed in the project activity. Further specific energy consumption of continuous recuperative smelter is higher compared to continuous regenerative smelter. Therefore natural gas (NG) required to produce equivalent quantity of frit through recuperative continuous smelter would have been more compared to continuous regenerative smelter. Since natural gas availability was a constraint at site therefore implementing recuperative smelter was ruled out. Audit team compared the prices for both technologies and it was clear that recuperative technology is costlier than regenerative technology applied by the project activity. Also specific energy consumption for recuperative technology is higher than regenerative technology hence it can be concluded that recuperative technology would have been economically unattractive compared to regenerative technology and cannot be considered as a viable alternative scenario.

Project proponent has increased its production capacity from 12 ton to 42 ton per day of frit manufactured with installation of the project activity. Audit team was of the opinion that as per definition of the small scale methodology, this project activity "**replaces**" existing 12 ton and the remaining 30 ton must be treated as a **"new facility".** In this scenario the energy consumption of the pre-project plant cannot be taken as the baseline for the entire 42 ton capacity. The baseline energy consumption for the 30 ton capacity should be taken as that for a newly installed 30 ton batch smelter. Corrective action in this regard was requested. Project proponent clarified that according to the offer invited from the agency installing batch smelter, thermal energy consumption of the proposed new facility of 30 ton per day would have been in the range of 7000-7200 kcal/kg of frit manufactured. Audit team has verified the offer from supplier of batch smelter, which specified the thermal energy consumption in the range of 7000-7200 kcal/kg of frit manufactured. Based on data available from operation of 12 ton per day batch smelter in pre-project scenario, the thermal energy consumption is calculated as 7180.62 kcal/kg of frit manufactured. Hence the baseline thermal energy consumption for 12 ton per day capacity has been taken as 7180.62 kcal/kg of frit manufactured and that for 30 ton per day ca-

pacity it has been taken as 7000 kcal/kg of frit manufactured. There is insignificant electrical consumption in the baseline scenario and project scenario. The baseline electrical energy consumption has been established as 0.087 kWh/kg of frit manufactured. The baseline energy consumption (thermal and electrical) has been established based on data for operation of 12 ton per day batch smelter from November 2003 – March 2006. The batch smelter was commissioned in November 2003. Hence the condition stipulated in paragraph 6 (a) of the applied methodology AMS II.D is complied with where specification of equipment replaced is established as:

§ Thermal energy consumption for 12 ton per day capacity is 7180.62 kcal/kg of frit

§ Electrical energy consumption is 0.087 kWh/kg of frit

Baseline emission calculations have assumed that natural gas would have been used for 12 ton per day capacity and remaining 30 ton per day capacity would have been operated on coal gas because of shortage of natural gas in the region. This assumption was challenged by audit team because it was identified that the frit manufacturing plant based on batch process with 12 TPD production was consuming average 0.25 million standard cubic meters (SCM) of natural gas per month. The project plant with continuous smelter of 42 TPD production would consume approx. 0.32 million SCM of natural gas per month at current consumption levels. In this scenario if the gas supplier (GAIL) was not willing to supply 0.25 million SCM natural gas per month how will they supply 0.32 million SCM of natural gas per month. Project proponent clarified that average per kg consumption of natural gas for batch smelter was 7180.62 kcal/kg as per the actual consumption data. The design efficiency of continuous smelter is in the range of 1600-2000 kcal/kg (at full load), as per the offer submitted. Thus worst case design efficiency would be 2000 kcal/kg which is 3.6 times (7180/2000 = 3.6 times) less than batch smelter. Continuous smelter was designed, considering the least efficient case of 2000 kcal/kg; hence capacity comes out to be 42 tons per day (42/12= 3.5 times) as against 12 tons per day of existing batch smelter, at the same gas consumption levels. In present scenario, continuous smelters are running only at 50 - 60 percent load hence efficiency levels are to the tune of 2490 kcal/kg. But as the production levels will go higher the efficiency levels will improve and is expected to come down to the design efficiency levels. Hence the 42 ton per day project plant would consume natural gas at pre-project scenario level of 0.25 million SCM per month i.e consumed by 12 ton per day batch smelter plant. Audit team is convinced that natural gas is not abundantly available and hence usage of coal in the baseline scenario for 30 ton per day production was likely scenario. Any further requirement of natural gas above 0.25 million SCM per month would not have been met. Evidence in form of letters from natural gas supplier (GAIL) to project proponent have been submitted to audit team, which clearly indicate that GAIL was not in position to supply any gas in excess of contracted demand for 12 ton per day batch smelter.

Resolution of 2. Compliance with monitoring methodology as per AMS II.D, version 8

As specified above, paragraph 6 (a) of the applied methodology AMS II.D, version 8 is complied with where specification of equipment replaced is established. This is based on natural gas consumption, average calorific value of natural gas, frit production and electricity consumption during November 2003 to March 2006. These parameters were incorrectly mentioned in section B.7.1 of the PDD and following the corrective action request by audit team, were shifted to section B.6.2 of the PDD (data available at validation) because the baseline energy consumption is fixed at validation and cannot be monitored during project operation.

Paragraph 6 (b) (for replacement) and paragraph 7 (a) (for new facility) of the applied methodology AMS II.D, version 8 are also complied with because the monitoring plan in the final PDD makes provision for monitoring of thermal energy consumption of the project activity (continuous smelter) by monitoring the natural gas consumed in both the continuous smelters and calorific value of natural gas. The electrical energy consumption of the project activity will also be monitored. Project activity also monitors the amount of frit produced by the project activity. By multiplying the amount of frit

produced in project activity with specific thermal and electrical energy consumption of baseline the total energy consumption of the baseline is also established. The difference of baseline and project energy consumption gives the energy savings as required by paragraph 6 (c) and paragraph 7 (b) of the applied methodology AMS II.D, version 8.

The energy in the baseline cannot be directly used to calculate the baseline emission because both natural gas and coal are assumed to be used in baseline. Hence the project makes provision for calculating the ton of CO_2/kg of frit manufactured in baseline, which has been established based on energy consumption in the baseline (3.169 ton CO_2/ton of frit). The total baseline emissions will be calculated as product of specific CO_2 emission in baseline and total frit manufactured in the project activity. The project emissions will be calculated as product of energy consumed in form of natural gas and emission factor of natural gas. Project emissions from electricity consumption will be calculated as product of electrical energy consumed and emission factor of this electricity.

Resolution of 3. Calculation of grid emission factor

In the initial version of the PDD, the emission factor for regional grid was referred from data published by Central Electricity Authority (CEA), Govt. of India. Further, this factor was referred from an older version of the database and was used inconsistently in the PDD and emission reduction calculations. Corrective action was requested in this regard. The data on grid emission factor has now been made consistent in PDD and emission reduction calculations. The combined margin grid emission factor has been fixed ex-ante (0.86 ton CO_2/MWh) based on most recent data available (2005-2006) from CEA[1].

Resolution of 4. Assessment of additionality using barrier analysis

Technological barrier discussed in the initial version of the PDD did not seem prohibitive and hence corrective action request was raised by audit team to justify that there is a risk involved due to performance uncertainty of the project activity and authentic and verifiable evidence was requested. Operational uncertainty and risk of operation involved in the project activity were elaborated in the final version of the PDD and evidence in form of minutes of meeting between HRJ and equipment supplier was submitted. Minutes of meeting between technology supplier and project proponent submitted to the audit team (document enclosed), substantiates the technological barrier in terms of risks involved due to performance uncertainty of the project activity. Based on minutes of meeting (the document enclosed) between project proponent and equipment supplier it can be confirmed that natural gas flow is controlled by proportional control valve and in case this valve malfunctions then it needs to be changed with a spare one because there is no option for manual override control valve. This change requires temporary shutdown of the furnace and subsequent loss of production.

Initial version of the PDD also stated that project activity is first of its kind in the tile/frit manufacturing industry in the country. Documentary evidence to support the claim was requested by the audit team. Letter from an independent agency, Indian Council of Ceramic Tiles and Sanitaryware has been submitted to the audit team, which states that the project activity is ‘first of its kind’ in this sector in India. The letter is enclosed with validation report.

The above stated arguments are further strengthened by fact that the project technology is not available in the host country (India) and has been taken from China. The project runs huge risk due to delay in access to services, spare parts etc. from the Chinese counterparts in case of exigencies. Further, trained laborers to operate and maintain the technology were not available. Although the

[1] http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm

plant's operation staff has been provided extensive training by technology supplier, the project still runs the risk of malfunctioning, which could lead to substantial production losses in case of delay in troubleshooting.

Audit team is of the opinion that since the project activity faces barriers as discussed above, the project proponent was reluctant to invest in the 'first of its kind' project activity. The benefit of CDM has been considered during the approval of the project from the top management (document enclosed). CDM revenue, would help to alleviate the barriers discussed.

Following a request for review, audit team would like to clarify that decision to implement the project activity by project participant was made by taking CDM into consideration in May 2005. The real action to implement the project activity was started in October 2005 with ordering of equipments. The process to avail CDM benefits was started in March 2006 (Reference no. 35 in Annex 2 of this report), with request for proposal from consultants for preparation of PDD, which means the real action on starting the validation process**. Hence there was a delay of only 5 months from start of project activity in October 2005 to appointment of PDD consultants in March 2006**. Audit team feels that the PDD was ready by December 2006, which is normal time for preparation of PDD (March 2006 to December 2006). However, due to change in version of small scale PDD template from 2 to 3 and revision of methodology AMS II.D from version 7 to 8 led to further delay in submission of PDD to DOE. The validation process was started in April 2007.

We would like to confirm that the evidence of prior consideration of the CDM in the decision by the project participant to undertake the project activity has been validated by us. The evidence is extract of the discussion of The Executive Committee headed by Managing Director (Reference no. 18 in Annex 2 of this report), held on 19 May 2005. This document in third last paragraph clearly states that **"revenue generated through sale of carbon credits may make project quite viable".** In last paragraph it states that **"the committee has agreed to take necessary steps for getting this project registered for carbon credits".** Audit team would also like to emphasis here responsibility of the person who has signed this document. Mr. Vijay Aggarwal, who is the Managing Director has signed the document and is head of the company.

Based on the presumption that the Managing Director is acting responsibly in accordance with his position, it can be confirmed with reasonable level of assurance (terminology used by INTERNATIONAL STANDARD ON ASSURANCE ENGAGEMENTS 3000) that CDM was seriously considered in the development of this project activity. It is clearly evident from letter submitted by Indian Council of Ceramic Tiles and Sanitaryware that project activity is 'first of its kind' in this sector in India; it faced prevailing practice barrier and technological barrier. Hence it can be confirmed with reasonable level of assurance that CDM was necessary to go ahead with the project activity. Therefore TÜV SÜD submitted the project for registration.

Resolution of 5. Technical lifetime of existing equipments

Clarification was requested by audit team on technical lifetime of existing equipment i.e. 12 ton per day batch smelter. In response letter from Government approved charted engineer's firm was submitted to audit team (Reference no. 34 in Annex 2 of this report), which states that batch smelters (pre-project scenario) at project site are in good condition and service life of these smelters is expected to last another 20 years subject to regular maintenance. The batch smelter was recently commissioned in November 2003.

Resolution of 6. Energy savings from the project activity

The thermal energy savings from the project activity are estimated to be 92.38 GWh per annum, which is less than 180 GWh limit for applicability of small scale methodology.

The electrical energy has not been considered in the calculation for savings (but considered in emission reduction calculations) because the electrical energy consumption in the project is likely to be higher than that in the baseline. Hence it can be assumed that project activity is within limits of small scale because with consideration of electrical energy the savings are bound to be lower than 92.38 GWh.

COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TÜV SÜD published the project documents on UNFCCC website by installing a link to TÜV SÜD's own website and invited comments by Parties, stakeholders and non-governmental organisations during a period of 30 days.

The following table presents all key information on this process:

webpage: http://www.netinform.de/KE/Wegweiser/Guide2_1.aspx?ID=2818&Ebene1_ID=26&Ebene2_ID=854&mode=1	
Starting date of the global stakeholder consultation process: 2007-04-05	
Comment submitted by:	No comments have been received.

4 VALIDATION OPINION

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

Enhancing energy efficiency by replacing batch smelter by continuous smelter at Karaikal, Pondicherry

The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM. Hence TÜV SÜD will recommend the project for registration by the CDM Executive Board.

An analysis as provided by the applied methodology demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are 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 as specified within the final PDD version.

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, ~~2008-01-02~~ 2008-03-26

Certification Body “climate and energy”
TÜV SÜD Industrie Service GmbH

Munich, ~~2008-01-02~~ 2008-03-26

Assessment Team Leader

Annex 1: Validation Protocol

Validation Protocol

Project Title: Enhancing energy efficiency by replacing batch smelter by continuous smelted at Karaikal, Pondicherry

Date of Completion: ~~02.01.2008~~ 26.03.2008

Number of Pages: 45

Industrie Service

CHECKLIST TOPIC / QUESTION	Ref.	COMMENTS	PPD in GSP	Final PDD
A. General description of small-scale project activity				
A.1. Title of the small-scale project activity				
A.1.1. Does the used project title clearly enable to identify the unique CDM activity?	2	The project title clearly enables to identify the unique CDM activity.	x	x
A.1.2. Are there any indication concerning the revision number and the date of the revision?	2	Yes, there is an indication of a revision number and the date of the revision.	x	x
A.1.3. Is this consistent with the time line of the project's history?	2,13, 14	No, it is not consistent with the time line of the project history. **Clarification Request No. 1.** The decision to implement the project activity was taken in May 2005 and complete project was implemented in June 2006. However, the CDM process was started in February 2007. Please clarify why there was a delay in starting the CDM process.	CR	x
A.2. Description of the small-scale project activity				
A.2.1. Is the description delivering a transparent overview of the project activities?	1,2,5 ,6,9, 10	The description is delivering a transparent overview of the project activities in general. **Corrective Action Request No.1.** PDD does not include sufficient information on project equipments. More technical details and description is required to understand the system in pre project scenario and post project scenario. Additionally, PDD does not mention specifically about the installation of two continuous smelters.	CAR	x
A.2.2. What proofs are available demonstrating that the project description is in compliance with the actual situation or planning?	13,1 4,9,1 021, 22	Project schedule, operational log book, and technical specification for smelter along with purchase orders were submitted during the site visit.	x	x
A.2.3. Is the information provided by these	13,1	Yes, information provided in PDD is consistent with the implemen-	CAR	x

proofs consistent with the information provided by the PDD?	4,9,10 21, 22	tation of the project. However, please see CAR 1		
A.2.4. Is all information presented consistent with details provided by further chapters of the PDD?	13,14,9,10 21, 22	Yes, the description of the project activity is consistent in the PDD in general.	x	x
A.2.5. Does the description of the technology to be applied provide sufficient and transparent input to evaluate its impact on the greenhouse gas balance?	13,14,9,10 21, 22	Yes, the project activity is a continuous type of batch smelter operation where specific fuel consumption is much less in comparison to conventional batch smelter. Thus the technology implemented is an energy efficient one leading to reduction of green house gas emission.	x	x
A.2.6. Is the brief explanation how the project will reduce greenhouse gas emission transparent and suitable?	2,3,9 ,10,	Yes, the brief explanation is transparent and suitable. See above A.2.5.	x	x
A.3. Project participants				
A.3.1. Is the form required for the indication of project participants correctly applied?	2,30	The form for the indication of project participants is correctly applied. H & R Johnson (India) Ltd. has been identified as the only project participant.	x	x
A.3.2. Is the participation of the listed entities or Parties confirmed by each one of them?	2,30	**Clarification Request No. 2.** Modalities of communication and Host Country Approval needs to be submitted to DOE.	CR	x
A.3.3. Is all information on participants / Parties provided in consistency with details provided by further chapters of the PDD (in particular annex 1)?	2	Yes, all provided information is in consistency with details provided in other sections of the PDD.	x	x
A.4. Technical description of the small-scale project activity				
A.4.1. *Location of the small-scale project activity*				

A.4.1.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)?	1,2,25	Partially. **Clarification Request No. 3.** The plant is not at NH 45A as indicated in the PDD. Please revise the same and mention the exact street address in the PDD.	CR	x
A.4.1.2. How is it ensured and/or demonstrated, that the project proponents can implement the project at this site (ownership, licenses, contracts etc.)?	2,25	H & R Johnson (India) Ltd. has the complete rights to implement the project activity. This has been checked with help of consent of Pondicherry Pollution Control Board in the name of H & R Johnson (India) Ltd.	x	x
A.4.2. *Type and category(ies) and technology/measure of the small-scale project activity*				
A.4.2.1. To which type(s) does the project activity belong to? Is the type correctly identified and indicated?	2,29	The project activity belongs to Type II-Energy efficiency improvement projects. The type has been correctly identified and indicated in the PDD.	x	x
A.4.2.2. To which category (ies) does the project activity belong to? Is the category correctly identified and indicated?	2,29, 30	The project activity belongs to Project Category: Energy efficiency and fuel switching measures for industrial facilities (II.D Version 8: 23 December 2006). The category has been correctly identified and indicated in the PDD since project activity is an energy efficiency project with a maximum level of 102.37 GWh thermal energy saving per year.	x	x
A.4.2.3. Does the technical design of the project activity reflect current good practices?	2,9,10	Yes, the technical design does reflect current good practice. The project employs continuous smelters which are more energy efficient.	x	x
A.4.2.4. Does the implementation of the project activity require any technology transfer from Annex-I-countries to the host country (ies)?	1,2,9,10	No, it does not require any technology transfer from Annex-1 countries.	x	x
A.4.2.5. Is the technology implemented by the project activity environmentally safe?	1,2,9,10	Yes.	x	x
A.4.2.6. Is the information provided in compliance with actual situation or planning?	1,2,9,10	Yes, all information is provided in compliance with actual situation or planning as made available by the project participants.	x	x

A.4.2.7. Does the project use state of the art technology and / or does the technology result in a significantly better performance than any commonly used technologies in the host country?	1,2,9 ,10	Yes, the project uses energy efficient technology, which results in better performance as compared to the commonly used technologies in Indian Industry.	x	x
A.4.2.8. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1,2,9 ,10	It is not planned to substitute the project technology by other or more efficient technologies.	x	x
A.4.2.9. Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period?	1,2	The project does require extensive initial training and maintenance efforts.	x	x
A.4.2.10. Is information available on the demand and requirements for training and maintenance?	1,2	No. **Clarification Request No. 4.** Please submit a detailed procedure for the training of personal for regular operation and maintenance of the equipments under project activity.	CR	x
A.4.2.11. Is a schedule available for the implementation of the project and are there any risks for delays?	1,2,9 ,10	Project schedule is available at site. The project has already been commissioned and in operation since June 2006.	x	x
A.4.3. *Estimated amount of emission reductions over the chosen crediting period*				
A.4.3.1. Is the form required for the indication of projected emission reductions correctly applied?	2,30	The form required for the indication of projected emission reductions is correctly applied.	x	x
A.4.3.2. Are the figures provided consistent with other data presented in the PDD?	2	Yes, the figures are consistent with other data in the PDD.	x	x
A.4.3.3. Are the figures consistent with the small-scale criteria for the used Type?	2,29, 30	Small scale criteria for Type II projects are governed by energy saving from the project activity, which should be below 180 GWh per year in consideration of thermal energy. The project activity	x	x

		aims to maximum saving of 102.37 GWh thermal per year.		
A.4.4. *Public funding of the small-scale project activity*				
A.4.4.1. Is the information provided on public funding provided in compliance with the actual situation or planning as available by the project participants?	1,2	No public funding has been taken from any Annex I parties for the project.	x	x
A.4.4.2. Is all information provided consistent with the details given in remaining chapters of the PDD (in particular annex 2)?	2	Yes.	x	x
A.4.5. *Confirmation that the small-scale project activity is not a debundled component of a large scale project activity*				
A.4.5.1. Is there a registered small-scale CDM project activity or an application to register another small-scale CDM project activity: with the following characteristics:	1,2	<table><tr><th>Debundling checklist</th><th>Yes / No</th></tr><tr><td>the same project participants?</td><td>Yes</td></tr><tr><td>In the same project category and technology/measure?</td><td>No</td></tr><tr><td>Registered within previous two years? Or in registration process?</td><td>No</td></tr><tr><td>Whose boundary is within 1 km of the project boundary of the small scale project activity under consideration?</td><td>No</td></tr></table>	x	x
A.4.5.2. If the answer to all the above question is '**Yes**' then does the total size of the small scale project activity combined with previously registered small scale CDM project activity exceeds the limits of small scale CDM project activities?	1,2	Project participant has implemented two other small scale project activities which are also in the process of registration. Both of the projects are in type I C and belongs two different states Karnataka and Madhya Pradesh in India.	x	x
B. Application of a baseline and monitoring methodology				
B.1. Title and reference of the approved baseline and monitoring methodology applied to the small-scale project activity				
B.1.1.1.Are reference number, version number,	2	No, the reference number, version number and title of the base-	CAR	x

and title of the baseline and monitoring methodology clearly indicated?		line and monitoring methodology are not clearly indicated. **Corrective Action Request No.2.** Please mention the version number and the date of the baseline and monitoring methodology in the PDD.		
B.1.1.2. Is the applied version the most recent one and / or is this version still applicable?	2,29	Yes, the small-scale baseline methodology Type II.D: Energy efficiency and fuel switching measures for industrial facilities" (Version 8: 23 December 2006) is applicable for requesting registration until 17 Jan 2008.	x	x
B.2. Justification of the choice of the project category				
B.2.1. Is the applied methodology considered the most appropriate one?	2,29	Yes, AMS II.D version 8 is the most appropriate methodology. **Corrective Action Request No.3.** PDD incorrectly mentions in section B.2 that project is under sectoral scope 1. It should be 4.	CAR	x
Integrate the required amount of sub-checklists on the applicability criteria as given by the applied methodology and comment on at least every line answered with "No"				
B.2.1.1. Criterion 1: This category comprises any energy efficiency and fuel switching measure implemented at a single industrial facility. It covers project activities aimed primarily at energy efficiency.(A project activity that involves primarily fuel switching falls into category III.B)	1,2	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? Yes Compliance provable? Yes Compliance verified? Yes The project activity is an energy efficiency project implemented in single industrial facility.	x	x
B.2.1.2. Criterion 2: The measures may replace, modify or retrofit existing facilities or be installed in a new facility.	1,2,9,10	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? Yes Compliance provable? Yes Compliance verified? Yes	x	x

		The energy efficiency measures involve the installation of continuous smelter which replace the batch smelter to reduce the specific energy consumption.		
B.2.1.3. Criterion 3: The aggregate energy savings of a single project may not exceed the equivalent of 60 GWh_e per year, equivalent to a maximal saving of 180 GWh_{th} per year in fuel input.	1,2,3	Applicability checklist / Yes / No / NA Criterion discussed in the PDD? Yes Compliance provable? Yes Compliance verified? Yes The maximum thermal energy saving from the project activity is 102.37 GWh which is below the limit of180 GWh as specified in the methodology. **Clarification Request No. 5.** The excel calculation sheet for energy saving and emission reduction should include sources of the data as well assumptions taken. For example, 330 days of working, emission coefficient of fuel etc.	CR	x
B.3. Description of the project boundary				
B.3.1. Does the project boundary include physical, geographical site of the industrial facility, processes or equipment that are affected by the project activity??	1,2	Yes, the project boundary includes physical, geographical site where the project activity takes place. **Clarification Request No. 6.** The quenching and unloading unit should be included in the project boundary.	CR	x
B.3.2. Do the spatial and technological boundaries as verified on-site comply with the discussion provided by / indication included to the PDD?	1,2	Yes, the boundaries are defined and the same is verified with the PDD and project site. Please see B.3.1.	CR	x
B.4. Description of baseline and its development				
B.4.1. Have all technically feasible baseline scenario alternatives to the project activity been identified and discussed by the PDD? Why can this list be considered as	1,2,5,6,7,8,9,10,15,	Yes, all technically feasible baseline scenario alternatives to the project activity have been identified. The list can be considered as complete. Technically, project pro-	CAR	x

being complete?	17,18,30	ponent has only two options. One option could be continuation of existing batch smelter and installation of additional batch smelter for capacity enhancement and second option can be installation of new continuous smelter for capacity enhancement and also replacing the existing batch smelter with continuous smelter. **Corrective Action Request No.4.** Page 14 of the PDD states that one of the alternative to the project activity was continuous smelter coupled with recuperative type heat exchanger with specific fuel consumption of 3000-3500 kcal/kg. Why this technology is not considered for baseline emissions?		
B.4.2. Does the project identify correctly and excludes those options not in line with regulatory or legal requirements?	1,2,30	Yes, all the scenarios are in line with the regulatory and legal requirement. Please see above B.4.1.	CAR	x
B.4.3. Have applicable regulatory or legal requirements been identified?	1,2	Yes, all the applicable regulatory or legal requirements have been identified and fulfilled.	x	x
B.4.4. Does the PDD identify the most likely baseline scenario in absence of the project activity?	1,2,5,6,7,8,9,10,17,18,30	Please see above B.4.1.	CAR	x
B.4.5. Is this identification supported by official and/or verifiable documents (e.g. studies, web pages, certificates, etc?	1,2	Yes, the identification is deemed correct.	x	x
B.4.6. Is the identified baseline scenario in line with regulatory or legal requirements?	1,2	Please see above B.4.2.	x	x
B.4.7. In the case of replacement, modification or retrofit measures, does the baseline consists of the energy baseline of the existing	1,2	**Corrective Action Request No.5.** H R Johnson Karaikal has increased its production capacity from 12 ton to 42 ton per day. So as per definition of the small scale	CAR	x

facility or sub-system that is replaced, modified or retrofitted?		methodology, this project "replaces" existing 12 ton and the remaining 30 ton must be treated as a "new facility". In this scenario the energy consumption of the pre-project plant cannot be taken as the baseline for the entire 42 ton capacity. The baseline energy consumption for the 30 ton capacity should be taken as that for a newly installed 30 ton batch smelter. Please justify in the PDD why the baseline energy consumption for the increased capacity has been taken same as that for the 12 ton plant that was operating in pre-project scenario. **Clarification Request No. 7.** The project proponent has justified the baseline with usage of coal giving the argument that natural gas (NG) availability is a problem in the region. Audit team has identified that the frit manufacturing plant based on batch process with 12 TPD production was consuming average 0.25 million SCM of NG per month. The project plant with continuous smelter of 42 TPD production will consume approx. 0.32 million SCM of NG per month. In this scenario if the gas supplier (GAIL) was not willing to supply 0.25 million SCM NG per month how will they supply 0.32 million SCM SCM of NG per month. In this scenario, the baseline emissions must be estimated based on NG consumption. **Clarification Request No. 8.** Please clarify how energy has been calculated in terms of coal accounting for losses due to conversion of coal to coal gas.		
B.4.8. In the case of a new facility does the energy baseline consists of the facility that would otherwise be built?	1,2	Please see above B.4.7.	CAR	x
B.4.9. Is each energy form in the emission `baseline is multiplied by an emission coeffi-	1,2,3	Yes the emission co-efficient for grid electricity and natural gas	CAR	x

	cient (kg CO_2 e/kWh)? For the electricity displaced, is the emission coefficient is calculated in accordance with provisions under category I.D?		has been used. **Corrective Action Request No.6.** The grid emission factor cannot be directly referred from any official source. It should be calculated and complete data used for calculations should be presented in the PDD.		
B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:					
B.5.1.	In case of applying step 2 / investment analysis of the additionality tool: Is the analysis method identified appropriately (step 2a)?	2,30	Not applicable. The additonality tool has not been used.	x	x
B.5.2.	In case of Option I (simple cost analysis): Is it demonstrated that the activity produces no economic benefits other than CDM income?	2,30	Please see above B.5.1.	x	x
B.5.3.	In case of Option II (investment comparison analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)?	2,30	Please see above B.5.1.	x	x
B.5.4.	In case of Option III (benchmark analysis): Is the most suitable financial indicator clearly identified (IRR, NPV, cost benefit ratio, or (levelized) unit cost)?	2,30	Please see above B.5.1.	x	x
B.5.5.	In case of Option II or Option III: Is the calculation of financial figures for this indicator correctly done for all alternatives and the project activity?	2,30	Please see above B.5.1.	x	x
B.5.6.	In case of Option II or Option III: Is the analysis presented in a transparent manner including publicly available proofs for	2,30	Please see above B.5.1.	x	x

	the utilized data?				
B.5.7.	In case of applying step 3 (barrier analysis) of the additionality tool: Is a complete list of barriers developed that prevent the different alternatives to occur?	2,30	The additionality tool has not been used. In general there is a list of barriers developed that prevent different alternatives to occur. Please see below B.5.15. for specific comments.	x	x
B.5.8.	In case of applying step 3 (barrier analysis): Is transparent and documented evidence provided on the existence and significance of these barriers?	2,30	Please see above B.5.7.	x	x
B.5.9.	In case of applying step 3 (barrier analysis): Is it transparently shown that the execution of at least one of the alternatives is not prevented by the identified barriers?	2,30	Please see above B.5.7.	x	x
B.5.10.	Have other activities in the host country / region similar to the project activity been identified and are these activities appropriately analyzed by the PDD (step 4a)?	2,30	The additionality tool has not been used.	x	x
B.5.11.	If similar activities are occurring: Is it demonstrated that in spite of these similarities the project activity would not be implemented without the CDM component (step 4b)?	2,30	The additionality tool has not been used.	x	x
B.5.12.	Is it appropriately explained how the approval of the project activity will help to overcome the economic and financial hurdles or other identified barriers (step 5)?	2,30	Please see below B.5.18. for detailed comments.	x	x
If the additionality tool has not been used please answer B.5.13 to B.5.18					
B.5.13.	If the starting date of the project activity is before the date of validation, is evidence available to prove that incentive from the	1,2,18	Minutes of Board of Directors' meeting dated 19th May, 2005 has been submitted. This demonstrates that the CDM was considered	x	x

CDM was seriously considered in the decision to proceed with the project activity?		in the management decision for implementing the project activity.		
B.5.14. Is a complete list of barriers developed that prevents the project activity to occur?	2	Yes, a complete list of barriers has been developed that prevents the project activity to occur.	x	x
B.5.15. Does this list include at least one of the following barriers?	1,2,3,4,5,6,7,8,9,10,15,17,18	<table><tr><th>Barrier</th><th>Discussed?</th><th>Verifiable?</th></tr><tr><td>Investment</td><td>Yes</td><td>Partly</td></tr><tr><td>Technological</td><td>Yes</td><td>Partly</td></tr><tr><td>Due to prevailing practice</td><td>Yes</td><td>No</td></tr><tr><td>Other</td><td>Yes</td><td>Partly</td></tr></table> **Corrective Action Request No.7.** It is not very clear if project activity uses 'investment comparison analysis' or 'benchmark analysis'. If benchmark analysis is used then PDD should calculate equity IRR and not project IRR. See footnote number 7 of additionality tool, version 3. **Corrective Action Request No.8.** It is not very clear if project activity uses 'investment comparison analysis' or 'benchmark analysis'. If benchmark analysis is used then PDD should state the benchmark for IRR analysis. **Clarification Request No. 9.** Please submit the supporting documents for all the data considered in the IRR calculation. For example, 3600 unit of auxiliary consumption; coal and NG batch smelter costing. **Corrective Action Request No.9.** Technical barriers need to be discussed further especially to sup-	CAR CR	x

		port the evidence that there is a risk involved due to performance uncertainty of the project and also provide the authentic and verifiable evidence, possibly published literature as supporting documents. Is the handling of higher capacity addition a barrier? Please explain. Additionally, also explain how the batch size restriction is a technological barrier. **Corrective Action Request No.10.** It must be demonstrated with the authentic and verifiable supporting documents that the project is first of kind in the tile/frit manufacturing industry. **Clarification Request No. 10.** Please provide information on design life of existing batch smelters.		
B.5.16. Does the discussion sufficiently take into account relevant national and/or sectoral policies?	1,2	Yes.	x	x
B.5.17. Is transparent and documented evidence provided on the existence and significance of these barriers?	1,2	Partially. Please see above B.5.15.	x	x
B.5.18. Is it appropriately explained how the approval of the project activity will help to overcome the identified barriers?	1,2,17,18	It is not very clear how the approval of the project would help to overcome the identified barrier. **Corrective Action Request No.11.** Please define clearly in the PDD how the approval of the project activity will help to overcome the identified barriers.	x	x
B.6. Emissions reductions				

B.6.1. *Explanation of methodological choices*				
B.6.1.1. Is it explained how the procedures provided in the methodology are applied by the proposed project activity?	1,2,29	Yes.	x	x
B.6.1.2. Is every selection of options offered by the methodology correctly justified and is this justification in line with the situation verified on-site?	12	Partially. See also B.4.7.	CAR	x
B.6.1.3. Determination of project emissions (Comment on any line answered "No")				
B.6.1.3.1. Component 1: emissions from use of fossil fuel.	2,3	<table><tr><th>Project emission checklist</th><th>Yes / No</th></tr><tr><td>Component discussed in the PDD?</td><td>Yes</td></tr><tr><td>Formulae correctly applied?</td><td>Yes</td></tr></table> **Corrective Action Request No.12.** Project emission is the auxiliary power consumption which is grid electricity and in emergency DG set power. But the project emission has been calculated on only grid electricity consumption. What about the emission form DG set in case of use of DG set power?	CAR	x
B.6.1.4. Are the formulae required for the determination of baseline emissions correctly presented, enabling a complete identification of parameters to be used and / or monitored?	2,3	No. Please see B.4.7. and B.4.9.	CAR	x
B.6.1.5. Are the formulae required for the determination of leakage emissions correctly presented, enabling a complete identification of parameter to be used and / or monitored?	2,3	Yes. No leakage is investigated in the project activity because project equipment is new and equipment used in pre-project scenario (batch smelter plant) has been shutdown since the commissioning of continuous smelter plant and will be subsequently dismantled and sold as scrap.	x	x

<table>
<tr><td>B.6.1.6. Are the formulae required for the determination of emission reductions correctly presented?</td><td>2,3</td><td>Yes, emission reductions are defined as difference of baseline emission and summation of leakage and project emission.</td><td>x</td><td>x</td></tr>
<tr><td colspan="5">B.6.2. Data and parameters that are available at validation</td></tr>
<tr><td>B.6.2.1. Is the list of parameters presented in chapter B.6.2 considered to be complete with regard to the requirements of the applied methodology?</td><td>2</td><td><u>Corrective Action Request No.13.</u>
Parameters like natural gas consumption, average calorific value of NG, frit production and electricity consumption during April 2005 to March 2006 have been incorrectly mentioned in section B.7.1. They should be included in section B.6.2 because they are fixed during validation.</td><td>CAR</td><td>x</td></tr>
<tr><td colspan="5">B.6.2.2. Comment on any line answered with “No”</td></tr>
<tr><td>B.6.2.2.1. Parameter title: energy consumption of the identified baseline</td><td>2,29</td><td><table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>No</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>No</td></tr><tr><td>Choice of data correctly justified?</td><td>No</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr></table>Please see B.6.2.1.</td><td>CAR</td><td>x</td></tr>
<tr><td>B.6.2.2.2. Parameter title: emission coefficient of fossil fuel used by industrial facility/process/equipment</td><td>2,29</td><td><table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>Yes</td></tr><tr><td>Appropriate description of parameter?</td><td>Yes</td></tr></table></td><td>CAR</td><td>x</td></tr>
</table>

		<table><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided?</td><td>Yes</td></tr><tr><td>Has this value been verified?</td><td>Yes</td></tr><tr><td>Choice of data correctly justified?</td><td>Yes</td></tr><tr><td>Measurement method correctly described?</td><td>Yes</td></tr></table> **Corrective Action Request No.14.** The value applied for emission factor refers to 1996 IPCC guidelines. Please use the most recent available and applicable international or country specific source (if available) and indicate clearly the webpage or pages from the source in PDD.		
B.6.2.2.3. Parameter Title: Emission factor of the grid (CM)	2,29	<table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>No</td></tr><tr><td>Choice of data correctly justified?</td><td>No</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr></table> Please see B.4.9.	CAR	x
B.6.2.2.4. Parameter Title: Operating margin (OM) emission factor of the grid	2,3	<table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>No</td></tr><tr><td>Choice of data correctly justified?</td><td>No</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr></table>	CAR	x

<table>
<tr><td></td><td></td><td>Please see B.4.9.</td><td></td><td></td></tr>
<tr><td>B.6.2.2.5. Parameter Title: Build margin (BM) emission factor of the grid</td><td>2,3</td><td><table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>No</td></tr><tr><td>Choice of data correctly justified?</td><td>No</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr></table>Please see B.4.9.</td><td>CAR</td><td>x</td></tr>
<tr><td>B.6.2.2.6. Parameter Title: Fuel consumption of each power source</td><td>2,3</td><td><table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>No</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>No</td></tr><tr><td>Choice of data correctly justified?</td><td>No</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr></table>Please see B.6.2.1.</td><td>CAR</td><td>x</td></tr>
<tr><td>B.6.2.2.7. Parameter Title: Emission coefficient of each fuel</td><td>2,3</td><td><table><tr><th>Data Checklist</th><th>Yes / No / NA</th></tr><tr><td>Title in line with methodology?</td><td>No</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>No</td></tr><tr><td>Choice of data correctly justified?</td><td>No</td></tr></table></td><td>CAR</td><td>x</td></tr>
</table>

		Measurement method correctly described? | No Please see B.6.2.1.		
B.6.2.2.8. Parameter Title: Fraction of time with low costs /must run plant at the margin (for simple adjusted OM only)	2	Data Checklist | Yes / No / NA Title in line with methodology? | NA Data unit correctly expressed? | NA Appropriate description of parameter? | NA Source clearly referenced? | NA Correct value provided? | NA Has this value been verified? | NA Choice of data correctly justified? | NA Measurement method correctly described? | NA	x	x
B.6.2.2.9. Parameter Title: Electricity imports	2	Data Checklist | Yes / No / NA Title in line with methodology? | NA Data unit correctly expressed? | NA Appropriate description of parameter? | NA Source clearly referenced? | NA Correct value provided? | NA Has this value been verified? | NA Choice of data correctly justified? | NA Measurement method correctly described? | NA	x	x
B.6.2.2.10. Parameter Title: CO_2 emission coefficient of fuels used in connected grids.	2	Data Checklist | Yes / No / NA Title in line with methodology? | NA Data unit correctly expressed? | NA Appropriate description of parameter? | NA Source clearly referenced? | NA Correct value provided? | NA Has this value been verified? | NA Choice of data correctly justified? | NA Measurement method correctly described? | NA	x	x

B.6.3. *Ex-ante calculation of emission reductions*				
B.6.3.1. Is the projection based on the same procedures as used for future monitoring?	2,3	Yes. Emission reductions are defined as difference of baseline emission and summation of leakage and project emission.	x	x
B.6.3.2. Are the GHG calculations documented in a complete and transparent manner?	2,3,11,12,21,22	GHG calculations documented in a complete manner in general. Please also see B.2.1.3., B.4.7. and B.4.9. **Corrective Action Request No.15.** Section B.6.3 incorrectly mentions WREB in place of SREB. **Corrective Action Request No.16.** Section B.6.3 should mention the value along with formulae so that a reviewer can reproduce the calculations.	CAR CR	x
B.6.3.3. If there is more than one component of the project activity, then, are emission reduction calculations provided separately for each component?	1,2	There is only one component of the project activity.	x	x
B.6.3.4. Is the data provided in this section consistent with data as presented in other chapters of the PDD?	1,2	Yes, the data is consistent within the PDD.	x	x
B.6.4. *Summary of the ex-ante estimation of emission reductions*				
B.6.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	1,2	Yes, the project will result in fewer GHG emissions. The specific fuel consumption per kg of frit production will reduce.	x	x
B.6.4.2. Is the form/table required for the indication of projected emission reductions correctly applied?	1,2,30	Yes, table is correctly applied.	x	x
B.6.4.3. If the project activity involves more than one component, is separate table included for each of the component.	1,2,30	Please see B.6.3.3.	x	x

B.6.4.4. Do these values comply with small-scale criteria for every year?	2	Not applicable.	x	x
B.6.4.5. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	2	Yes, the project is already commissioned.	x	x
B.6.4.6. Is the data provided in this section in consistency with data as presented in other chapters of the PDD?	2	Yes, it is consistent within the PDD.	x	x
B.7. Application of the monitoring methodology and description of the monitoring plan				
B.7.1. *Data and parameters monitored*				
B.7.1.1. Is the list of parameters presented in chapter B.7.1 considered to be complete with regard to the requirements of the applied methodology?	2,29, 30	Partly. Please see B.6.2.1. and B.6.1.3.1.	CAR	x
B.7.1.2. In case of replacement, modification and retrofit measures. Comment on any line answered with "No"				
B.7.1.2.1. Parameter Title: Meter the energy use of the industrial facility, processes or the equipment affected by the project activity.	1,2,11,12, 21,22,23, 24	<table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided for estimation?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>No</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr><tr><td>Correct reference to standards?</td><td>No</td></tr><tr><td>Indication of accuracy provided?</td><td>No</td></tr><tr><td>QA/QC procedures described?</td><td>No</td></tr><tr><td>QA/QC procedures appropriate?</td><td>No</td></tr></table>	CR	x

		Clarification Request No. 11. Natural gas consumption is metered by individual meter available in both of the continuous smelter. The daily meter readings are entered in the log book and then transferred to the MIS record. The total natural gas consumption in continuous smelter will be the summation of the natural gas consumption in both of the smelters. Additonality, the direct meter's reading is multiplied by a factor and then the same is recorded in the log book. Please explain the same in details in the description of measurement methods and procedures for the parameter "Total gas consumption in continuous smelter". **Clarification Request No. 12.** Quantity of the frit produced in continuous smelter (Qcont) is monitored by weighing machine at individual smelter. Please explain the same in the B.7.1. of the PDD. Additionally, the frequency of the recoding is hourly not daily as mentioned in the PDD B.7.1. Please revise the same in the PDD. **Clarification Request No. 13.** Value of parameter Q_{batch} in section B.7.1 of the PDD has not been defined. Please include the same in the PDD. **Clarification Request No. 14.** Frequency of the recording for the parameter "Total electricity consumption in continuous smelter" is incorrect. The same is actually been recorded daily. Please clarify. **Corrective Action Request No.17.** Accuracy levels of measuring equipments and monitoring frequency are not listed in PDD. Please mention the same. The procedure covering retention period for records, calibration of monitoring equipments traceable with national and international standard, procedures to handle data uncertainty, frequency of		

<table>
<tr><td></td><td></td><td>internal audit and responsibility should be defined in detail.</td><td></td><td></td></tr>
<tr><td colspan="5">B.7.1.2.2. In the case of a new facility. Comment on any line answered with “No”.</td></tr>
<tr><td>B.7.1.2.3. Meter the energy use of the equipment installed.</td><td></td><td><table><tr><th>Monitoring Checklist</th><th>Yes / No</th></tr><tr><td>Title in line with methodology?</td><td>Yes</td></tr><tr><td>Data unit correctly expressed?</td><td>No</td></tr><tr><td>Appropriate description of parameter?</td><td>No</td></tr><tr><td>Source clearly referenced?</td><td>No</td></tr><tr><td>Correct value provided for estimation?</td><td>No</td></tr><tr><td>Has this value been verified?</td><td>No</td></tr><tr><td>Measurement method correctly described?</td><td>No</td></tr><tr><td>Correct reference to standards?</td><td>No</td></tr><tr><td>Indication of accuracy provided?</td><td>No</td></tr><tr><td>QA/QC procedures described?</td><td>No</td></tr><tr><td>QA/QC procedures appropriate?</td><td>No</td></tr></table>Please see above B.7.1.2.1.</td><td>CR</td><td>x</td></tr>
<tr><td colspan="5">B.7.2. Description of the monitoring plan</td></tr>
<tr><td>B.7.2.1.Is the operational and management structure clearly described and in compliance with the envisioned situation?</td><td>1,2,11,12, 21,22,23, 24</td><td><u>Corrective Action Request No.18.</u>
The operational and management structure is not clearly described in section B.7.2 and Annex 4. Please provide information about person responsible for data monitoring, data verification, report preparation, data archiving etc.</td><td>CAR</td><td>x</td></tr>
<tr><td>B.7.2.2.Are responsibilities and institutional arrangements for data collection and archiving clearly provided?</td><td>2</td><td>Please see above B.7.2.1.</td><td>CAR</td><td>x</td></tr>
<tr><td>B.7.2.3.Does the monitoring plan provide current good monitoring practice?</td><td>2</td><td>Yes.</td><td>x</td><td>x</td></tr>
<tr><td>B.7.2.4.If applicable: Does annex 4 provide</td><td>2</td><td>Please see above B.7.2.1.</td><td>CAR</td><td>x</td></tr>
</table>

useful information enabling a better understanding of the envisioned monitoring provisions?				
B.8. Date of completion of the application of the baseline study and monitoring methodology an the name of the responsible person(s)/entity(ies)				
B.8.1.1. Is there any indication of a date when the baseline was determined?	2	Yes, date has been mentioned in the PDD.	x	x
B.8.1.2. Has dd/mm/yyyy format been used to indicate the date.	2	Yes, the date of completion of baseline has been indicated.	x	x
B.8.1.3. Is this consistent with the time line of the PDD history?	2	Yes, the consistency is evident with PDD history.	x	x
B.8.1.4. Is the information on the person(s) / entity (ies) responsible for the application of the baseline and monitoring methodology provided consistent with the actual situation?	2	Yes, H & R Johnson (India) Limited is responsible for application of baseline and monitoring methodology.	x	x
B.8.1.5. Is information provided whether this person / entity is also considered a project participant?	2	H & R Johnson (India) Limited is the only project participant.	x	x
C. Duration of the project activity / crediting period				
C.1. Duration of the project activity				
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	2,13, 14	Yes, it is clearly defined in the PDD. **Clarification Request No. 15.** 02/04/2006 has been mentioned as a project starting date based on the commissioning of the first smelter. But as per the commissioning report, the same was on 04/05/2006. Please clarify. **Corrective Action Request No.19.** The commissioning date cannot be considered as start date of project activity. Out of real action, implementation or construction,	CAR, CR	x

		whichever occurred first should be considered as start date. Please revise. **Clarification Request No. 16.** Please submit the supporting documents for the 20 years of expected operational life time of the project activity.		
C.2. Choice of the crediting period and related information				
C.2.1. 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)?	2	Yes, fixed crediting period of 10 years has been selected.	x	x
C.2.2. Has dd/mm/yyyy format been used to indicate the start date of the crediting period.	2	**Clarification Request No. 17.** Start date of crediting period needs to be given in dd/mm/yyyy format. Section C.2.2.1 of the PDD should state "dd/mm/yyyy or date of registration whichever occurs later".	CR	x
D. Environmental impacts				
D.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:				
D.1.1. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, has an EIA been approved? If yes answer also D.1.2 to D.1.4	2	No, EIA is not a requirement for this kind of project in India.	x	x
D.1.2. Has the analysis of the environmental impacts of the project activity been sufficiently described?	2	NA	x	x
D.1.3. Will the project create any adverse environmental effects?	2	NA	x	x
D.1.4. Were transboundary environmental impacts identified in the analysis?	2	NA	x	x

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party				
D.2.1. Have the identified environmental impacts been addressed in the project design sufficiently?	1,2,28	**Clarification Request No. 18.** H & R Johnson (India) Limited has conducted a detailed aspect impact analysis for the project. But the same has not been addressed in the PDD. Please include the same in the PDD.	CR	x
D.2.2. Does the project comply with environmental legislation in the host country?	25	Yes, the project has received the permission for operation from the State Pollution Control Board.	x	x
E. Stakeholders' comments				
E.1. Brief description how comments by local stakeholders have been invited and compiled				
E.1.1. Have relevant stakeholders been consulted?	26,27	Yes, all relevant stakeholders have been consulted. Meetings with stake holder's representatives have taken place where project proponent described various aspects of CDM project activity.	x	x
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	26,27	Yes, a formal invitation in form of individual letter has been sent to the identified stakeholders by the project owner.	x	x
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	1,2	Stakeholder consultation process is not required by regulations/laws in India for this particular type of project.	x	x
E.1.4. Is the undertaken stakeholder process that was carried out described in a complete and transparent manner?	1,2	Yes.	x	x
E.2. Summary of the comments received				

E.2.1. Is a summary of the received stakeholder comments provided?	2	Yes, a summary of the comments received have been given in the PDD.	x	x
E.3. Report on how due account was taken of any comments received				
E.3.1. Has due account been taken of any stakeholder comments received?	2	No negative comments have been received and hence, there was no need to take any action.	x	x
F. Annexes 1 - 4				
F.1. Annex 1: Contact Information				
F.1.1. Is the information provided consistent with the one given under section A.3?	2	Yes.	x	x
F.1.2. Is the information on all private participants and directly involved Parties presented?	2	Yes, all information has been presented.	x	x
F.2. Annex 2: Information regarding public funding				
F.2.1. Is the information provided on the inclusion of public funding (if any) in consistency with the actual situation presented by the project participants?	2	Yes.	x	x
F.2.2. If necessary: Is an affirmation available that any such funding from Annex-I-countries does not result in a diversion of ODA?	2	There is no ODA funding involved.	x	x
F.3. Annex 3: Baseline information				
F.3.1. If additional background information on baseline data is provided: Is this information consistent with data presented by other sections of the PDD?	2	Yes, additional information has been provided and is consistent with data presented by other sections of PDD.	x	x
F.3.2. Is the data provided verifiable? Has sufficient evidence been provided to the	2	Please see above F.3.1.	x	x

validation team?				
F.3.3. Does the additional information substantiate / support statements given in other sections of the PDD?	2	Please see above F.3.1.	x	x
F.4. Annex 4: Monitoring information				
F.4.1. If additional background information on monitoring is provided: Is this information consistent with data presented in other sections of the PDD?	2	No additional information has been provided.	x	x
F.4.2. Is the information provided verifiable? Has sufficient evidence been provided to the validation team?	2	Please see above F.4.1.	x	x
F.4.3. Do the additional information and / or documented procedures substantiate / support statements given in other sections of the PDD?	2	Please see above F.4.1	x	x

Industrie Service

Table 2 Resolution of Corrective Action and Clarification Requests

Clarifications and corrective action re-quests by validation team	Ref. to table 1	Summary of project owner re-sponse	Validation team conclusion
Corrective Action Request No.1. PDD does not include sufficient infor-mation on project equipments. More technical details and description is re-quired to understand the system in pre project scenario and post project sce-nario. Additionally, PDD does not men-tion specifically about the installation of two continuous smelters.	A.2.1.	Corrections and additions made in the PDD in sections A.2 and A.4.	þ
Corrective Action Request No.2. Please mention the version number and the date of the baseline and moni-toring methodology in the PDD.	B.1.1.1.	Changes made in the PDD. Version 8 of methodology AMSII-D has been used for this project	þ
Corrective Action Request No.3. PDD incorrectly mentions in section B.2 that project is under sectoral scope 1. It should be 4.	B.2.1.	Changes made in the respective section in the PDD.	þ
Corrective Action Request No.4. Page 14 of the PDD states that one of the alternative to the project activity was continuous smelter coupled with recuperative type heat exchanger with specific fuel consumption of 3000-3500 kcal/kg. Why this technology is not	B.4.1.	Following considerations were there for not selecting this option as base line scenario ---- a) The cost of recuperative type continuous smelter is prohibitively high & similar type of technology is not available in India. Therefore	Response by audit team Please note that per day NG consumption in the project scenario is also higher than pre-project scenario and still the project activity anticipates to use NG. In this scenario it can be assumed that recuperative technology could have also used NG. Please provide further justification.

considered for baseline emissions?		in the project option analysis we have eliminated this option. b) Further this type of smelter could offer firing system based on natural gas or liquid fuel only and not capable of firing coal gas. Natural gas is short in supply (as explained below). Firing the same with liquid fuel or LPG is ruled out due to very high cost of these fuels, which will make frit very costly for our application. This is another consideration why the same option is not considered as baseline option. c) In continuation to the above, if we would have opted for this technology, despite the high investment involved, then the total gas requirement for the smelter would have been more than15000 scmd as compared to the present consumption in continuous smelter of about 8600 scmd at full capacity. This additional quantity of gas is not available in the region as evidenced by our communications with GAIL India Ltd (the gas supplier) and hence this option has not been considered as the baseline scenario.	<u>Response by project proponent</u> Average per kg consumption of natural gas for batch smelter was 7180 Kcal/kg as per the actual consumption data. The design efficiency of continuous smelter is in the range of 1600-2000 Kcal/kg (at full load), as per the offer letter attached. Thus worst case design efficient would be 2000Kcal/kg which is 3.6 times less than batch smelter. Continuous smelter was designed, considering the least efficient case of 2000 Kcal/kg, hence capacity comes out to be 42 tons per day (3.5 times) as against 12 tons per day of existing batch smelter, at the same gas consumption levels. In present scenario, continuous smelters are running only at 50 - 60 percent load hence efficiency levels are to the tune of 2490 Kcal/kg. But as the production levels will go higher the efficiency levels will improve and is expected to come down to the design efficiency levels. As on now HRJ frit plant is only consuming 0.155 million SCM per month, which is much less than 0.25 million SCM NG per month in case of batch smelter. Even if specific gas consumption does not come down at higher load, we will have to restrict our production to the amount of gas available in pre project scenario, as extra gas in not available in the region. So, the NG consumption in the project scenario will not be higher than baseline scenario and hence the above justification holds good. Barriers for implementation of recuperative type conti-

			nuous smelter ---- a) Cost of recuperative type smelter was very high compared to regenerative type continuous smelter installed at Karaikal. b) Specific energy consumption of continuous recuperative smelter is higher compared to continuous regenerative smelter. Therefore natural gas required to produce equivalent quantity of frit through recuperative continuous smelter would have more compared to continuous regenerative smelter. Since natural gas availability was a constraint at site therefore implementing recuperative smelter was ruled out. As a supporting document of the above we are attaching the offer we have received from IMAS S.p.a Industria Meccanica Via Briada, 62 (Please refer OFF376JOHNSON) Final response by audit team þ After comparing the prices for both technologies it is clear that recuperative technology is costlier than regenerative technology applied by the project activity. Also specific energy consumption for recuperative technology is higher than regenerative technology hence it can be concluded that recuperative technology would have been economically unattractive compared to regenerative technology and cannot be considered as a viable alternative scenario.
Corrective Action Request No.5. H R Johnson Karaikal has increased its production capacity from 12 ton to 42	B.4.7.	According to the offer invited from the agency installing batch smelter, energy consumption of the proposed new facility will be in	Response by audit team This explanation is accepted. However, the baseline should be based on at least three year historic data.

ton per day. So as per definition of the small scale methodology, this project "**replaces**" existing 12 ton and the remaining 30 ton must be treated as a **"new facility".** In this scenario the energy consumption of the pre-project plant cannot be taken as the baseline for the entire 42 ton capacity. The baseline energy consumption for the 30 ton capacity should be taken as that for a newly installed 30 ton batch smelter. Please justify in the PDD why the baseline energy consumption for the increased capacity has been taken same as that for the 12 ton plant that was operating in pre-project scenario.		the range of 7000-7200 kcal/kg of frit manufactured. This is primarily because of added modifications for operational flexibility in newer batch smelters. For our calculations we have taken a conservative estimate and used our actual baseline data of existing facility which is 7180.62 Kcal/kg. Thus specific energy consumption of pre-project batch smelter is taken as baseline for entire 42 ton capacity. The baseline data is now calculated from the start date of installation of batch smelter which was Nov, 2003. Please see the attached calculation sheet and batch smelter offer letter for reference.	The baseline calculations should be revised. Please clearly establish the energy consumption per tonne of frit (kcal/kg) for baseline. In the monitoring plan make provision for monitoring the total energy consumed by project activity and total frit produced. Then the emission reductions should be calculated as difference of 1. energy consumed in project activity 2. product of baseline specific energy consumption and frit production in project activity. <u>Response by project proponent</u> Batch smelter was commissioned in November 2003 and was in operation from Nov. 2003 – March 2006. We have now included the complete Nov03-Mar06 data for calculations. Monitoring plan has also been modified accordingly and monitoring will be done for smelter wise respective NG consumption and Frit production. Ex-ante fixed value of baseline specific energy consumption will be used for entire crediting period, and the data for the same is presented in Annex-3 of revised PDD. Reply on emission reduction calculations – Emissions calculation in the baseline scenario is done considering three different energy sources in to account. They are • Natural Gas • Coal gas for additional capacity • Electricity We can calculate the specific energy consumption for all the three and add them up, but after arriving at a single energy figure, we won't be able to convert it in terms of

			CO2 emissions as three emission factors are different. So our proposed approach is to add emissions from all the three sources and calculate the specific CO2 emissions (tons of CO2/per ton of frit) in the baseline case. Then we calculate the total energy consumption and total emissions in the project scenario (two different energy sources: electricity; natural gas), divided by total production, to arrive at the specific emissions (tons of CO2/per ton of frit). Hence we will get per ton emission reductions by subtracting the above two figures, and after multiplying by total production in the project activity, it will give us the total emission reductions. <u>Response by audit team</u> 1. Please provide evidence for entire NG consumption, electricity consumption and frit production data in the pre-project and post-project scenario in form of monthly MIS etc. 2. Please clarify why the meter reading for natural gas consumption in project scenario is multiplied with factor of 1.08. 3. How has the factor 2.33 been arrived that is used in cell C49 in 'baseline emissions final'. If it represents 2 years and 5 months of baseline data the it should be 2.41666 <u>Project Proponent's Response</u> 1. MIS generated report is enclosed detailing NG and electricity consumption and frit production. 2. This conversion factor is to convert the meter reading to standard cubic meter consumption. Globally used for all HRJ plants through SAP.

			3. Two years and five months comes out to be 2.41666, which has now been corrected in the calculation sheet. Final response by audit team þ The MIS data has been submitted as supporting for data taken for baseline emission calculations.
Corrective Action Request No.6. The grid emission factor cannot be directly referred from any official source. It should be calculated and complete data used for calculations should be presented in the PDD.	B.4.9.	Complete grid data is now used for calculation and same is presented in attached calculation sheet.	Response by audit team CEA has published grid emission factor based on 2005-2006 but the PDD still uses latest data uptil 2004-2005. Also based on other projects we can accept CEA published data for calculations. Hence kindly use latest published data. However please note that OM mentioned in CEA data is for one year and is not average of three years. You may fix OM ex-ante based on last three year data. Response by project proponent Latest data referred from CEA website. Last three year average taken for calculations. Response by audit team It seems that project proponent has used average of last three year values of CM. This approach is not in line with methodology. Please revise. Project Proponent's Response Value of CM has been revised for the calculation of project emissions, where 05-06 data is being used now. For baseline emissions, the baseline data for electricity consumption corresponds to the 03-06 period, and hence three year average has been used. Response by audit team

			The grid emission factor used for baseline emission calculations is different from that used for project emission calculations. These both factors are different from that mentioned in section B.6.2 of the PDD. Please ensure consistency and describe in section B.6.2 how the value has been calculated. Project Proponent's Response This has been corrected now. Final response by audit team þ The data on grid emission factor has now been made consistent in PDD and emission reduction calculations. The combined margin grid emission factor has been fixed ex-ante based on most recent data available from Central Electricity Authority (CEA), Govt. of India. Several registered projects from India now directly refer to the grid emission factor as available from CEA website.
Corrective Action Request No.7. It is not very clear if project activity uses 'investment comparison analysis' or 'benchmark analysis'. If benchmark analysis is used then PDD should calculate equity IRR and not project IRR. See footnote number 7 of additionality tool, version 3.	B.5.15.	We have decided to prove additionality of the project activity using technical and prevailing practice barrier analysis route. Hence we are removing the financial barrier analysis from the PDD.	þ
Corrective Action Request No.8. It is not very clear if project activity uses 'investment comparison analysis' or 'benchmark analysis'. If benchmark analysis is used then PDD should state the benchmark for IRR analysis.	B.5.15.	As per the requirement of small scale projects, it is not mandatory. Also, the decision of project proponents were based on technology and emission reductions. Additionality of the project activity is	þ

		demonstrated using technical and prevailing practice barrier analysis route.	
Corrective Action Request No.9. Technical barrier need to be discussed further specially to support the evidence that there is a risk involved due to performance uncertainty of the project and also provide authentic and verifiable evidence, possibly published literature. Is the handling of higher capacity addition a barrier? Please explain. Additionally, also explain how the batch size restriction is a technological barrier.	B.5.15.	Technical barrier has been elaborated in the section B.5 of PDD. Frit manufactured in HRJ Karaikal is used for captive consumption in entire Johnson family. Different plants produce different types of product and require different kind of frits. Sometimes requirements come for small quantity of frits like 5 – 6 tons, which can be produced through continuous smelter, but minimum production quantity through continuous smelter is 15 tons. Therefore the additional quantity of frit is stocked as inventory with a cost to us for indefinite time or till the time requirement for the same comes. This is major inventory issue HRJ is facing in running continuous smelter, which was not there is batch smelter, since it involves production frit in small batches, i.e. 1 ton per hour.	Response by audit team This discussion is not in line with definition of technological barrier defined in small scale guidelines or additionality tool. Please revise. Response by project proponent We have included the batch size restriction barrier in the other barrier category as defined in the tool for demonstration and assessment of additionality. Under the technical barrier section we have included the operational uncertainty barrier and risk of operation. A minutes of meeting (MOM) between HRJ & technician from Equipment Supplier is attached as a proof of technical barrier i.e. criticality of furnace operation. Final response by audit team þ Minutes of meeting between technology supplier and project proponent have been submitted, which substantiates the technological barrier in terms of risks involved due to performance uncertainty of the project.
Corrective Action Request No.10. It must be demonstrated with the authentic and verifiable supporting documents that the project is first of kind in	B.5.15.	Letter from tile manufacturing association is attached, certifying that HRJ's continuous smelter is the first instance of continuous	þ Letter from an independent agency, Indian Council of Ceramic Tiles and Sanitaryware has been submitted, which states that the project activity is 'first of its kind' in

the tile/frit manufacturing industry.		smelter being installed in any tile manufacturing industry in India.	this sector in India. The letter is enclosed with validation report.
Corrective Action Request No.11. Please define clearly in the PDD how the approval of the project activity will help to overcome the identified barriers.	B.5.18	Impact of project registration as CDM project have now been included in the PDD. Please refer section B.5 of the revised PDD.	þ
Corrective Action Request No.12. Project emission is the auxiliary power consumption which is grid electricity and in emergency DG set power. But the project emission has been calculated on only grid electricity consumption. What about the emission form DG set in case of use of DG set power?	B.6.1.3.1.	Consumption from DG is very minimal and is only in case of power failures. Still, we have calculated average emissions per unit of electricity generated from DG, and emissions from DG are coming out to be less then the Grid. So conservatively, we have taken grid emissions as project emissions due to auxiliary power consumption. See the attached calculation sheet for reference.	þ
Corrective Action Request No.13. Parameters like natural gas consumption, average calorific value of NG, frit production and electricity consumption during April 2005 to March 2006 have been incorrectly mentioned in section B.7.1. They should be included in section B.6.2 because they are fixed during validation.	B.6.2.1.	Corrections made in the relevant sections in the PDD.	The data for total NG consumption from Nov 2003 to Mach 2006 mentioned in the PDD is not matching with data in excel sheet. Response by project proponent Typing error is now corrected and number in the PDD is revised. Final response by audit team þ
Corrective Action Request No.14.	B.6.2.2.2.	We have used values from latest revised 2006 IPCC guidelines.	þ

The value applied for emission factor refers to 1996 IPCC guidelines. Please use the most recent available and applicable international or country specific source (if available) and indicate clearly the webpage or pages from the source in PDD.		Same has now been referenced in the PDD along with the link to the documents.	
Corrective Action Request No.15. Section B.6.3 incorrectly mentions WREB in place of SREB.	B.6.3.2	Corrections made in the PDD.	þ
Corrective Action Request No.16. Section B.6.3 should mention the value along with formulae so that a reviewer can reproduce the calculations.	B.6.3.2	Values for all the parameters now added in the PDD	þ
Corrective Action Request No.17. Accuracy levels of measuring equipments and monitoring frequency are not listed in PDD. Please mention the same. The procedure covering retention period for records, calibration of monitoring equipments traceable with national and international standard, procedures to handle data uncertainty, frequency of internal audit and responsibility should be defined in detail.	B.7.1.2.1.	Details of internal audit and standby gas flow meter are now added in the PDD. Monitoring frequency and calibration frequency of the flow meters is listed in the PDD. Accuracy levels have been mentioned in the PDD. Test certificates for gas flow meter are attached.	Please mention the accuracy levels of weigh bridge for frit measurement and energy meters. Response by project proponent Accuracy levels of the meters are now mentioned in the respective data tables in the PDD in section B.7.1 Accuracy level of weighing bridge: 20 grams Accuracy level of NG flow meters: 1.5 class Accuracy level of energy meters: 1.0 class Final response by audit team þ
Corrective Action Request No.18. The operational and management structure is not clearly described in section B.7.2 and Annex 4. Please	B.7.2.1.	The operation and management structure is now clearly elaborated in the PDD in detail. We have mentioned in detail in a	þ

provide information about person responsible for data monitoring, data verification, report preparation, data archiving etc.		table specifying the responsibility of each of these, monitoring, verification, report preparation etc.	
Corrective Action Request No.19. Further the commissioning date cannot be considered as start date of project activity. Out of real action, implementation or construction, whichever occurred first should be considered as start date. Please revise.	C.1.1	Purchase order date is now taken as the project start date. Please refer the revised PDD.	Please mention only one date as start date i.e date of PO of first smelter. Project Proponent's Response Start date revised and mentioned in the PDD as date of PO of first smelter. Final response by audit team þ
Clarification Request No. 1. The decision to implement the project activity was taken in May 2005 and complete project was implemented in June 2006. However, the CDM process was started in February 2007. Please clarify why there was a delay in starting the CDM process.	A.1.3	HRJ had decided to adopt the CDM route and started the search for a competent consultant at a very early stage. HRJ were into talks with consultant even before starting of project activity, so there is no question of any delay in starting the CDM process. We are attaching a copy of e-mail as the proof of communication. The delay in submission to validation agency was on account of change in the version of small scale PDD and change in the version of methodology which required rework several times.	þ
Clarification Request No. 2. Modalities of communication and Host	A.3.2.	Host country approval has been granted on 25th May, 2007. A copy of same has already been emailed	Response by audit team MoC not attached. LoA has been attached.

Country Approval needs to be submitted to DOE.		to you.	Response by project proponent Modalities of communication are now attached with this document. Response by audit team þ
Clarification Request No. 3. The plant is not at NH 45A as indicated in the PDD. Please revise the same and mention the exact street address in the PDD.	A.4.1.1.	Correct address has now been mentioned in the PDD.	þ
Clarification Request No. 4. Please submit a detailed procedure for the training of personal for regular operation and maintenance of the equipments under project activity.	A.4.2.10	Training procedure, frequency and responsibilities have been now included in the PDD.	þ
Clarification Request No. 5. The excel calculation sheet for energy saving and emission reduction should include sources of the data as well assumptions taken. For example, 330 days of working, emission coefficient of fuel etc.	B.2.1.3	All assumptions have now been included in the excel sheet. The values of data also have been included.	The energy savings from the project do not include electrical energy and data in cell C67 of 'baseline emission final' sheet has been incorrectly divided with 2. Please correct. Project Proponent's Response Electrical energy consumption in project scenario is slightly more than in the baseline scenario and hence savings in electrical energy are not included. C67 is now divided by 2.41666 which is the baseline data consideration period. Final response by audit team þ The thermal energy savings from the project activity are estimated to be 92.38 GWh per annum, which is less than 180 GWh limit for applicability of small scale meth-

			odology. The electrical energy has not been considered in the calculation for savings (but considered in emission reduction calculations) because the electrical energy consumption in the project is higher than that in the baseline. Hence it can be assumed that project activity is within limits of small scale because with consideration of electrical energy the savings are bound to be lower than 92.38 GWh.
Clarification Request No. 6. The quenching and unloading unit should be included in the project boundary.	B.3.1	Quenching and unloading unit now included in the project boundary. Please refer the revised PDD.	þ
Clarification Request No. 7. The project proponent has justified the baseline with usage of coal giving the argument that natural gas (NG) availability is a problem in the region. Audit team has identified that the frit manufacturing plant based on batch process with 12 TPD production was consuming average 0.25 million SCM of NG per month. The project plant with continuous smelter of 42 TPD production will consume approx. 0.32 million SCM of NG per month. In this scenario if the gas supplier (GAIL) was not willing to supply 0.25 million SCM NG per month how will they supply 0.32 million SCM SCM of NG per month. In this scenario, the baseline emissions must be estimated based on NG con-	B.4.7	Average per kg consumption of natural gas for batch smelter was 7180 kcal/kg as per the actual consumption data. The design efficiency of continuous smelter is in the range of 1600-2000 Kcal/kg (at full load), as per the offer letter attached. Thus worst case design efficient would be 2000Kcal/kg which is 3.5 times less than batch smelter. Continuous smelter was designed, considering the least efficient case of 2000 Kcal/kg, hence capacity comes out to be 42 tons per day (3.5 times) as against 12 tons per day of existing batch smelter, at the same gas consumption levels.	þ Evidence in form of letters from NG supplier (GAIL) to project proponent have been submitted, which demonstrate that NG is not abundantly available and hence usage of coal in the baseline scenario with 42 ton production per day was likely.

sumption only because it is difficult to justify that coal would have been used in the baseline scenario.		In present scenario, continuous smelters are running only at 50 - 60 percent load hence efficiency levels are to the tune of 2490 Kcal/kg. But as the production levels will go higher the efficiency levels will improve and is expected to come down to the design efficiency levels. As on now HRJ frit plant is only consuming 0.155 million SCM per month, which is much less than 0.25 million SCM NG per month in case of batch smelter. Even if specific gas consumption does not come down at higher load, we will have to restrict our production to the amount of gas available in pre project scenario, as extra gas in not available in the region. Hence our baseline assumption should be acceptable.	
Clarification Request No. 8. Please clarify how energy has been calculated in terms of coal accounting for losses due to conversion of coal to coal gas.	B.4.7	One kg of coal will generate 3.25 m3 of coal gas with calorific value of 1450 kcal/m3. These figures are as per the offer for gassifier which was invited from a competent supplier before installation of the project. Also in other plants of HRJ, similar	Please submit evidence of calorific value of coal gas, calorific value of coal and conversion factor from published independent sources. Project Proponent's Response Coal gas calorific value : http://www.kayelaby.npl.co.uk/chemistry/3_11/3_11_4.html Conversion factor

		type of coal gassifiers are in use for furnace and drier applications, where conversion of coal to coal gas comes in the range of 2.75 to 3 m3 of gas per kg of coal. Thus 3.25 is a very conservative figure considered for this project. We are attaching data for HRJ Kunigal plant as a reference.	http://www.frost.com/prod/servlet/market-insight-top.pag?docid=28897380 In the above web site it is clearly mentioned that around 80% of coal energy can be recovered through coal gas and 15% recovered as steam. In our calculation we have considered CV of coal as 6000 kcal/ kg, CV of coal gas 1450 kcal/m3 and conversion factor as 3.25, therefore net energy recovered through coal gas is 4712.5 kcal and that is 78.5% of total energy input which is almost same as figure mentioned in the web site. Since steam is used as a gasification agent, therefore steam produced though the gasification process used back in the gassifier system for captive consumption. Final response by audit team Þ
Clarification Request No. 9. Please submit the supporting documents for all the data considered in the IRR calculation. For example, 3600 unit of auxiliary consumption; coal and NG batch smelter costing.	B.5.15.	Additionality of the project activity is demonstrated using technical and prevailing practice barrier analysis route. Hence this information no longer stand valid.	Þ
Clarification Request No. 10. Please provide information on design life of existing batch smelters.	B.5.15	Please find attached equipment health audit report for the existing batch smelters.	Þ Letter from Government approved charted engineer's firm has been provided, which states that batch smelters (pre-project scenario) at project site are in good condition and service life of these smelters is expected to last another 20 years subject to regular maintenance.
Clarification Request No. 11. Natural gas consumption is metered by individual meter available in both of the	B.7.1.2.1.	We have included two separate data variable, one for each meter in the two smelters. And one data	Þ

continuous smelter. The daily meter readings are entered in the log book and then transferred to the MIS record. The total natural gas consumption in continuous smelter will be the summation of the natural gas consumption in both of the smelters. Additonality, the direct meter's reading is multiplied by a factor and then the same is recorded in the log book. Please explain the same in details in the description of measurement methods and procedures for the parameter "Total gas consumption in continuous smelter".		variable for the total NG consumption. Direct meter reading is multiplied by a factor of 1.08 due to difference in standard temperature and pressure. Same has now been included in the PDD. Procedure for the parameter "Total gas consumption in continuous smelter" is also mentioned in detail.	
Clarification Request No. 12. Quantity of the frit produced in continuous smelter (Qcont) is monitored by weighing machine at individual smelter. Please explain the same in the B.7.1. of the PDD. Additonality, the frequency of the recoding is hourly not daily as mentioned in the PDD B.7.1. Please revise the same in the PDD.	B.7.1.2.1.	Corrections made in the respective sections in the PDD. Two weighs are now being addressed as Q_{CSM01} & Q_{CSM02} Recording frequency has been changed to hourly.	þ
Clarification Request No. 13. Value of parameter Q_{batch} in section B.7.1 of the PDD has not been defined. Please include the same in the PDD.	B.7.1.2.1.	Corrections made in the PDD. Q_{batch} – Total quantity of frit produced in batch smelter for two years in baseline scenario.	þ
Clarification Request No. 14. Frequency of the recording for the parameter "Total electricity consumption	B.7.1.2.1.	Corrections made in the PDD. Frequency has now been changed to daily.	þ

in continuous smelter" is incorrect. The same is actually been recorded daily. Please clarify.			
Clarification Request No. 15. 02.04/2006 has been mentioned as a project starting date based on the commissioning of the first smelter. But as per the commissioning report, the same was on 04/05/2006. Please clarify.	C.1.1.	Corrections made in the PDD.	þ
Clarification Request No. 16. Please submit the supporting documents for the 20 years of expected operational life time of the project activity.	C.1.1.	Please find attached the letter from supplier supporting the lifetime of continuous smelters.	þ
Clarification Request No. 17. Start date of crediting period needs to be given in dd/mm/yyyy format. Section C.2.2.1 of the PDD should state "dd/mm/yyyy or date of registration whichever occurs later".	C.1.1.	Corrections made in the PDD.	þ
Clarification Request No. 18. H & R Johnson (India) Limited has conducted a detailed aspect impact analysis for the project. But the same has not been addressed in the PDD. Please include the same in the PDD.	C.1.1.	Details of aspect impacts mentioned in PDD.	þ

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

Clarifications and / or corrective action requests by validation team	Id. of CAR/CR	Explanation of Conclusion for Denial
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Annex 2: Information Reference List

Reference No.	Document or Type of Information
1.	On-site interviews at the project site in Karaikal, conducted on May 14-15, 2007 by the auditing team of TÜV SÜD: Validation team: Bratin Roy — TÜV SÜD South Asia, India Interviewed persons: Mr. S P Rajendran — Senior Vice President, H & R Johnson (India) Ltd. Mr. R Parasuraman — Dy. General Manager(Operation), H & R Johnson (India) Ltd. Mr. Sukhbinder Singh — Senior Manager, Purchase, H & R Johnson (India) Ltd. Mr. Arghya Mukherjee — Senior Manager, Project, H & R Johnson (India) Ltd.
2.	Project Design Document for CDM project "Enhancing energy efficiency by replacing batch smelter by continuous smelter at Karaikal, Pondicherry" Version 1, dated 23 February, 2007
3.	Emission reduction calculation (excel sheet), no date, submitted May 2007
4.	IRR (excel calculation sheet), no date, submitted May 2007
5.	Copy of techno commercial offer for 15T continuous smelter by Kexinda Enterprise dated 30.6.2005, submitted May 2007.
6.	Copy of techno commercial offer for 27T continuous smelter by Kexinda Enterprise dated 2.11.2005, submitted May 2007
7.	Copy of techno commercial offer for batch smelter by J R Engineers work dated 30.5.2004, submitted May 2007
8.	Copy of techno commercial offer for coal gasifier by Yida Corporation, no date, submitted May 2007
9.	Purchase order for 15T continuous smelter to Guangdong Foshan Packaging dated 20.10.2005, submitted May 2007
10.	Purchase order for 27T continuous smelter to Guangdong Foshan Packaging dated 04.01.2006, submitted May 2007
11.	Copy of invoices with the calorific value for Natural Gas(NG) from GAIL (India) Ltd. dated 15.7.05,31.7.05,15.12.06 and 31.12.06, submitted May 2007
12.	Copy of excel sheet for the calorific value of NG as received from the supplier for the year 2005 and 2006, no date, submitted May 2007
13.	Copy of detailed project schedule for 15T continuous smelter, submitted May 2007
14.	Copy of detailed project schedule for 27T continuous smelter, submitted May 2007
15.	Copies of letters from GAIL(India) Limited regarding the limitation of gas availability, submitted May 2007

Reference No.	Document or Type of Information
16.	Copy of 5 years gas supply contract with GAIL (India) Limited, dated 17.12.2005, submitted May 2007
17.	Copy of approval of capital investment proposal dated 22.10.05, submitted May 2007
18.	Copy of minutes of Board of Directors meeting dated 19.5.2005, submitted May 2007
19.	Copy of instruction manual for continuous smelter from Foshan Kexinda Aosibo Ceramic Technology Co. Ltd., submitted May 2007
20.	Excel sheet including the total frit production, NG consumption and electricity consumption from November 2003 to March 2006, submitted May, 2007
21.	Copies of continuous smelter log book, submitted May 2007
22.	Copies of batch smelter log book, submitted May 2007
23.	Copies of energy meter specification along with test certificate, submitted May 2007
24.	Copies of gas flow meter specification along with test certificate, submitted May 2007
25.	Copies of consent from Pondicherry Pollution Control Board and Licenses from Inspector of Factories, Karaikal, dated submitted May 2007
26.	Copies of stake holder invitation letter dated 1.9.06, submitted May 2007
27.	Minutes of stake holder comments and consultation, submitted May 2007
28.	Copies of aspect and impact evaluation for frit plant, submitted May 2007
29.	Revision to approved baseline and monitoring methodology II.D, Version 8, 23 December 2006
30.	UNFCCC homepage http://www.unfccc.int
31.	Minutes of meeting between HRJ and equipment supplier dated 19 May 2006, submitted September 2007
32.	Final Project Design Document submitted December 2007
33.	Letter from Indian Council of Ceramic Tiles and Sanitaryware dated 19 May 2007, submitted October 2007
34.	Letter from Government approved charted enginner firm, Ranade & Associates, dated 30 June 2006, submitted October 2007
35.	Copies of e-mail exchage for selection of PDD consultant, dated March 2006, submitted March 2008
36.	Natural gas supply contract between GAIL and HRJ dated 30 December 2005, submitted March 2008