VALIDATION REPORT

BOILER FUEL CONVERSION FROM RFO TO BIOMASS BASED BRIQUETTES AT FRESENIUS KABI INDIA PRIVATE LIMITED, RANJANGAON (M.S.) IN INDIA

REPORT NO. 2007-1029

REVISION NO. 03

DET NORSKE VERITAS

VALIDATION REPORT

Date of first issue: 05-06-2007	Project No.: 46071029
Approved by: Michael Lehmann Technical Director	Organisational unit: DNV Certification, International Climate Change Services
Client: Fresenius Kabi India private Limtied (FKIPL)	Client ref.: Mr. Gajanan Sathe

DET NORSKE VERITAS
CERTIFICATION AS

Climate Change Services

Veritasveien 1
N-1322 Høvik
Norway
http://www.dnv.com

Summary:
Det Norske Veritas Certification AS (DNV) has performed a validation of the "Boiler Fuel Conversion from RFO to Biomass Based Briquettes at Fresenius Kabi India Private Limited, Ranjangaon (M.S.)" project in India on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the simplified modalities and procedures for small-scale CDM project activities and the subsequent decisions by the CDM Executive Board. This validation report summarizes the findings of the validation.

The validation consisted of the following three phases: i) a desk review of the project design documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is DNV's opinion that the "Boiler Fuel Conversion from RFO to Biomass Based Briquettes at Fresenius Kabi India Private Limited, Ranjangaon (M.S.)" project in India, as described in the PDD of 12 October 2007, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the simplified small-scale baseline and monitoring methodology AMS-I.C, version 9. DNV thus requests the registration of the project as a CDM project activity.

Report No.: 2007-1029	Subject Group: Environment
Report title: Boiler Fuel Conversion from RFO to Biomass Based Briquettes at Fresenius Kabi India Private Limited, Ranjangaon (M.S.) in India	
Work carried out by: Subhendu Biswas, Soumik Biswas, Michael Lehmann	
Work verified by: Kumaraswamy Chandrashekara	

Date of this revision:	Rev. No.:	Number of pages:
2008-01-02	03	9

Indexing terms

Key words	Service Area
Climate Change Kyoto Protocol Validation Clean Development Mechanism	Verification
	Market Sector Energy Industry

☒ No distribution without permission from the client or responsible organisational unit

☐ free distribution within DNV after 3 years

☐ Strictly confidential

☐ Unrestricted distribution

Table of Content *Page*

Abbreviations

BEE	Bureau of Energy Efficiency
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
DNA	Designated National Authority
FKIPL	Fresenius Kabi India Private Limited
FO	Furnace Oil
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
HSD	High speed diesel
IPCC	Intergovernmental Panel on Climate Change
LDO	Light Diesel Oil
MoEF	Ministry of Environment and Forests
MP	Monitoring Plan
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
RFO	Residual furnace oil
TPH	Tonnes per hour
UNFCCC	United Nations Framework Convention on Climate Change

1 EXECUTIVE SUMMARY – VALIDATION OPINION

Det Norske Veritas Certification AS (DNV) has performed a validation of the "Boiler Fuel Conversion from RFO to Biomass Based Briquettes at Fresenius Kabi India Private Limited, Ranjangaon (M.S.)" in India. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

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

The host Party is India. No Annex-I Party has been identified as yet. India meets the participation criteria for CDM and has approved the project and authorized the project participant. The Indian DNA also confirmed that the project assists the country in achieving sustainable development.

The project correctly applies AMS-I.C, version 9 "Thermal energy for the user with or without electricity".

By utilising biomass briquettes instead of furnace oil for steam generation, the project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 6 558 tCO_2e per year over the selected 10 year crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

Adequate training and monitoring procedures have been implemented.

In summary, it is DNV's opinion that the "Boiler Fuel Conversion from RFO to Biomass Based Briquettes at Fresenius Kabi India Private Limited, Ranjangaon (M.S.)" in India, as described in the PDD of 12 October 2007, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology AMS-I.C, version 9. DNV thus requests the registration of the project as a CDM project activity."

2 INTRODUCTION

FKIPL has commissioned Det Norske Veritas Certification AS (DNV) to validate the "Boiler Fuel Conversion from RFO to Biomass Based Briquettes at Fresenius Kabi India Private Limited, Ranjangaon (M.S.)" in India. This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for small-scale CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consisted of the following personnel:

Mr Subhendu Biswas	DNV Certification Kolkata	Project Manager, CDM validator
Mr Soumik Biswas	DNV Certification Kolkata	CDM validator
Mr C Kumaraswamy	DNV Certification Bangalore	Technical reviewer
Mr Michael Lehmann	DNV Certification Oslo	Energy sector expert

2.1 Validation Objective

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

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords, the simplified modalities and procedures for small-scale CDM project activities and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-I.C, version 9. The validation team has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

3 METHODOLOGY

The validation consisted of the following three phases:

I a desk review of the project design documents
II follow-up interviews with project stakeholders
III the resolution of outstanding issues and the issuance of the final validation report and opinion.

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

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

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

The completed validation protocol for the "*Boiler Fuel Conversion from RFO to Biomass Based Briquettes at Fresenius Kabi India Private Limited, Ranjangaon* (M.S.)" is enclosed in Appendix A to this report.

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

i) mistakes have been made with a direct influence on project results;
ii) validation protocol requirements have not been met; or
iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term clarification may be used where additional information is needed to fully clarify an issue.

Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements or a request for **Clarification (CL)** where further clarifications are needed.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.*

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

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

Figure 1 Validation protocol tables

3.1 Review of Documents

Documents provided by the project proponent that relate directly to the project:

/1/ FKIPL: *CDM PDD, initial version 3 dated 23 December 2006.*

/2/ FKIPL: *CDM PDD, final version 6 dated 12 October 2007.*

/3/ DNA of India: *Letter of Approval dated 12 March 2007.*

/4/ FKIPL: *Communication from Eco Energies, Saoner confirming the biomass requirement and energy consumption for briquette manufacturing*

/5/ FKIPL: *Board resolution of Fresenius Kabi (dated 7 March 2006)*

/6/ FKIPL: *Boiler efficiency evaluation report*

/7/ FKIPL: *Survey document from the biomass supplier Anant Products confirming availability of biomass*

/8/ FKIPL: *Survey report of Energetic Consulting Private limited to confirm common practice and cost of steam production using different fuels*

/9/ FKIPL: *Boiler KWh consumption excel spreadsheets*

/10/ FKIPL: *Briquette consumption and steam generation excel spreadsheets*

/11/ FKIPL: *CER and Boiler efficiency calculation excel spreadsheets*

/12/ FKIPL: *Presentation to the President-Region Asia in management meet at Hongkong in 2005*

/13/ FKIPL: *Stakeholder consultation questionnaire and other documents*

Background documents related to the design and/or methodologies employed in the design or other reference documents:

/14/ International Emission Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): *Validation and Verification Manual*. http://www.vvmanual.info

/15/ AMS-I.C: *Thermal energy for the user with or without electricity, version 9, sectoral scope 01 of EB 31.*

/16/ Attachment A (Information on Additionality) to Appendix B of the simplified modalities and procedures for small-scale CDM project activities: *Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories*. Version 10

/17/ Appendix B of the simplified modalities and procedures for small-scale CDM project activities: *Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories*. Version 10

/18/ CEA: *CO_2 Baseline Database for the Indian Power Sector dated 04 October 2006.*

3.2 Follow-up Interviews

On 24 May 2007, DNV performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of FKIPL and the project consultants See-tech Solutions were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
FKIPL *Mr. Gajanan Sathe* *Mr. Mandar Inamdar* ***See-tech Solutions*** *Mr. Milind Chittawar*	➢ Assessment of project additionality and the barriers discussed in the PDD ➢ Validation of emission reduction calculations and data used therein. ➢ Review of project design and technology used therein. ➢ Review of monitoring and verification procedure of the organisation and management structure of the organisation for the project activity. ➢ Review of the stakeholder consultation process. ➢ Estimation of leakage.

3.3 Resolution of Clarification and Corrective Action Requests

Issues identified in DNV's draft validation report of 5 June 2007 were resolved to DNV's satisfaction during communications between FKIPL and DNV. To guarantee the transparency of the validation process, the concerns raised and responses given are documented in the validation protocol in Appendix A.

Since modifications to the project design were necessary to resolve DNV's concerns, FKIPL decided to revise the PDD and resubmitted the same as version 6, dated 12 October 2007. After assessing the revised PDD, DNV issued this final validation report and opinion.

3.4 Internal Quality Control

The draft validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The validation findings relate to the project design as documented and described in the revised and resubmitted project design document dated 12 October 2007.

4.1 Participation Requirements

The project participant is the private entity "Fresenius Kabi India Private Limited" of India. The project is proposed as a unilateral project and no Annex-I Party has yet been identified. The host Party India meets all the requirements for participating in a CDM project. The Ministry of Environment and Forests, the DNA of India, has approved the project with a letter of approval dated 12 March 2007 which also confirms that the project assists in achieving sustainable development in India.

4.2 Project Design

The project involves retrofitting of a RFO fired boiler of 8 tonnes per hour capacity to facilitate firing of briquette instead of furnace oil. The project thus results in emission reductions due to displacement of furnace oil by renewable biomass briquettes. The maximum output capacity of renewable energy technology is ~6 MW which is within the stipulated limit of 180 $MW_{thermal}$. Hence, the project qualifies as a type I small scale project activity. The technology is safe and environmentally sustainable. The ash generated during the project activity because of briquette firing, is collected & drenched with water. Wetted ash is then carried away with the help of trolleys and used for land filling within the plant premises. Due to this conversion, the boiler efficiency goes down from 79.73% to 75.31% and increases electricity consumption by 1.12 KWh/MT of steam generated

In the absence of the project activity, one of the existing RFO fired boiler would have been used for steam generation. In this project activity, 8 TPH water tube boiler is retrofitted to facilitate briquette firing and is used for steam generation. Steam production of briquette-fired boiler is ~3.81 TPH.

The project activity is not a debundled component of a larger project activity as there are no other projects proposed by the same project proponents.

The starting date of the project activity has been selected as 7 March 2006 as the project was approved by the Board of Directors on this date. The real action of the project started from 10 April 2006 and the lifetime of the project is 20 years. The lifetime of the project activity is reasonable. The project selects a non-renewable crediting period of 10 years starting from 1 March 2008. The crediting period will start after the registration of the project as a CDM project.

The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA.

4.3 Baseline Determination

The project selects the approved small-scale methodology AMS-I.C, version 9 of EB 31. AMS-I.C is applicable to project activities that provide thermal energy for the user from renewable sources with an installed capacity less than 45 $MW_{thermal}$. Since the project involves steam generation from biomass briquettes and the installed capacity of the project is ~6 MW, the methodology is applicable to the project.

The discussion of the baseline selection has been done in a transparent manner. Emissions due to combustion of furnace oil in the pre-project scenario have been selected as the baseline. The cost of steam generation in the region is lowest with coal. However, steam generation by combusting furnace oil has been selected as the baseline since it is the status quo for the project activity, the prevailing practice in the region and also gives the lowest baseline emissions.

4.4 Additionality

The additionality of the project has been established by elaborating barriers due to investment, technology and common practice. The project proponent has also provided the board approval for the project (dated 7 March 2006) /5/ which demonstrates that CDM was considered during the initiation of the project activity.

Investment barrier: Due to increase in furnace oil price the project proponent planned to shift to other fuel sources than furnace oil. Both coal and biomass based steam generation was assessed in terms of cost of steam generation and availability. The comparative cost estimates were presented to the President-Region Asia in a management meet at Hongkong in 2005. The cost of steam generation with coal is demonstrated and verified to be INR 0.67/kg of steam compared to biomass based steam generation cost of INR 0.76 to 0.98 per kg of steam. Thus, compared to the furnace oil based steam generation cost of INR 0.96 to 1.48 per kg of steam, steam generation by using coal is the most economically attractive option for the project proponent. The comparative cost estimates have been validated on the basis of available data and a third party survey by Government of India certified energy auditors. Since the cost of steam generation in the region is lowest with coal as fuel, hence, as per Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities, the project proponent had a financially more viable alternative to the project activity which would have led to higher emissions.

Technology barrier: The project proponent used furnace oil for steam generation. Furnace oil is supplied by reputed companies and boiler operation with furnace oil is automatic. Use of furnace oil in the boilers does not require any additional manpower or ash handling system. However, usage of biomass in the boilers entail dedicated manpower for the unloading and charging of biomass. Also to ensure constant supply of biomass briquettes, long term contracts for the supply of biomass had to be established and dedicated ash handling systems had to be installed for disposal of the ash. Thus, usage of furnace oil did not require any modification in the furnace which was necessary for using biomass and additional manpower had to be employed to facilitate the biomass usage.

Common practice barrier: It has been observed from a survey conducted by an independent third party energy auditor, certified by the Bureau of Energy Efficiency, Government of India, that there are 9 industries in the Ranjangaon area with boilers for thermal service. Among these only Fresenius Kabi has installed a briquette fired boiler. All the others use a variety of fuels among which furnace oil is the prevalent fuel, the other fuels being coal and LDO. Among these RFO

leads to the lowest amount of baseline emissions. Thus RFO has been selected as the baseline for the project activity.

The above barriers demonstrate that the project activity is not a business-as-usual scenario and hence that the emission reductions due to the project activity are deemed to be additional.

4.5 Monitoring

The monitoring methodology selected complies with requirements of AMS-I.C, version 9.

4.5.1 Parameters determined ex-ante

The CO_2, CH_4 and N_2O emission factors for furnace oil and biomass briquettes, the NCV of furnace oil and HSD are fixed *ex-ante*. These parameters have been fixed on the basis of IPCC 2006 good practice guidelines. Along with these the efficiency of the furnace oil fired boilers, density of High Speed Diesel (HSD) used by the trucks transporting biomass, mileage of trucks, amount of biomass and briquettes transported per truck and electrical energy consumed in the furnace oil fired boiler in the baseline have been fixed based on monitored data.

4.5.2 Parameters monitored ex-post

To calculate the baseline emissions the following parameters will be monitored in the post-project scenario:

- Amount of biomass fired in the boilers
- NCV of biomass briquettes
- Efficiency of biomass fired boiler
- Distance of briquette supplier from FKIPL and biomass supplier from briquetting plant (fixed ex-ante on the basis of the maximum distance, monitoring will be done only if the distance increases)
- Electricity consumption of the briquetting plant
- Amount of steam generation along with pressure, temperature of steam
- Parameters required to establish surplus availability of biomass

4.5.3 Management system and quality assurance

Detailed project management and monitoring procedures, including procedures for QA/QC of monitoring reports are described and found to be adequate. Procedures for internal audits, project performance review and corrective actions have been identified and found to be satisfactory.

4.6 Estimate of GHG Emissions

The calculations have been documented in a transparent manner using conservative assumptions. The baseline emission boundaries have been identified clearly. It includes the amount furnace oil fired in the boilers in the baseline scenario. CO_2, CH_4 and N_2O emission due to consumption of equivalent amount of furnace oil in the baseline which has been displaced by the biomass briquettes in the project scenario has been calculated

Project emissions associated with CH_4 and N_2O emissions due to briquette combustion have been calculated as per default emission factors provided in IPCC 2006 good practice guidance.

The emission calculations have also taken into account the additional amount of electricity consumed in the boilers due to the project activity. Since the CH_4 and N_2O emissions in the project scenario is more than that in the baseline scenario, considering CH_4 and N_2O emissions have led to conservative estimates of the emission reductions.

Project emissions due to transportation of biomass to the plant as well as transportation of the biomass to the briquetting plant and electricity consumption of the briquetting plant have been accounted for. The project emissions are based on the maximum distance from which the biomass material is sourced to make the estimates conservative in nature. This distance has been fixed *ex-ante*. However if there is any increase in the distance travelled the same will be monitored and accounted for in the emission reduction calculations.

As per the methodology, since the energy generating equipment has not been transferred from any other facility, leakage calculations have not been accounted for this project. Also, as it has been documented by the briquette supplier that there is surplus supply of biomass residue in the region, leakage calculations on account of competing use of biomass is not applicable for this project.

In the *post-project* scenario the emission reduction will be calculated from the actual briquette consumption in the plant, NCV of the briquette, and electricity consumption in the boilers. This will also be cross-checked with the monitored steam generation and boiler efficiency data.

4.7 Environmental Impacts

It has been confirmed that the project does not require an environmental impact analysis. The project complies with environmental regulations in India and has obtained necessary licences and environmental clearances. The project is not likely to create any adverse environmental effects.

4.8 Comments by Local Stakeholders

The local community, employees of the organisation, regulatory and statutory authorities, neighbouring industries and equipment suppliers have been identified as relevant stakeholders to the project. The local stakeholders were contacted by the plant authorities through one to one interaction. Comments from the local stakeholders were invited in the form a questionnaire distributed to the individual stakeholders. The project did not receive any adverse comment and hence no mitigation actions were necessary.

Local stakeholder consultation is not required by the Indian DNA.

5 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

The PDD of 23 December 2006 was made publicly available on DNV's climate change website (www.dnv.com/certification/climatechange) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 22 March 2007 to 20 April 2007.

No comments were received.

- o0o -

APPENDIX A

VALIDATION PROTOCOL
FOR SMALL-SCALE CDM PROJECT ACTIVITIES

Table 1 Mandatory Requirement for Small Scale Clean Development Mechanism (CDM) Project Activities

Requirement	Reference	Conclusion	Cross Reference/ Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art. 12.2	OK	Table 2, Section E.4.1
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	OK	Table 2, Section A.3
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art. 12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	~~CL 03~~ OK	
5. The emission reductions should be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E.1 to E.4
6. Reduction in GHG emissions must be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5.c, Simplified Modalities and Procedures for Small Scale CDM Project Activities §26	~~CL 2~~ ~~CL 3~~ ~~CAR 3~~ OK	Table 2, Section B.2.1
7. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	NA	Public funding has not been employed for this project.

Requirement	Reference	Conclusion	Cross Reference/ Comment
is not counted towards the financial obligations of these Parties.			
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures § 29	OK	Designated National Authority of India is The Ministry of Environment and Forests.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities and Procedures § 30, 31b	OK	The host country India has ratified the Kyoto Protocol on 26 August 2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	Annex – I Party is yet to be identified.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	OK	Annex – I Party is yet to be identified.
12. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK.	Table 2, Section A.1
13. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	The project design document conforms to the version 3 format of CDM-SSC-PDD of UNFCCC.
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Table 2, Section A.1.3, B and D
15. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities	OK	Table 2, Section G

Requirement	Reference	Conclusion	Cross Reference/ Comment
	§22b		
16. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK	Table 2, Section F
17. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	OK	The PDD has been made available for stakeholders' comment on the validator's website for 30 days period. No comments were received.

Table 2 Requirements Checklist

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A. **Project Description** The project design is assessed.					
A.1. Small scale project activity It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/, /2/, /15/	DR/I	The project involves retrofitting of the RFO fired boiler of 8 tonnes per hour capacity to facilitate firing of briquette instead of fossil fuel. The maximum output capacity of renewable energy technology must be within 45 $MW_{thermal}$ to qualify as a small scale CDM project. The applicability of small scale methodology is to be demonstrated based on the installed capacity of the boilers and not on the steam generation level in the plant.	~~CAR 1~~	OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/1/, /2/, /15/	DR/I	The project is not a debundled component as there are no other projects registered by the same project proponent within 1 km of the proposed small scale activity using the same technology.		OK
A.1.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	/1/, /2/, /15/	DR/I	Same as A.1.1	~~CAR 1~~	OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
A.2. Project Design Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/, /2/, /15/	DR/I	The coordinates of the project plant are to be provided for unique identification of the location of project activity.	~~CAR 2~~	OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/1/, /2/, /15/	DR/I	The project boundaries include the boiler house where-in the retrofit measures are carried out, and the briquette handling and storage facility for the project.		OK
A.2.3. Does the project design engineering reflect current good practices?	/1/, /2/, /15/	DR/I	The project involves switching from fossil fuel, RFO, to biomass briquette for thermal energy generation. The technology penetration is low in the region due to technological uncertainties but involves incorporation of latest available technology for firing of briquette. Thus the project reflects good engineering practice.		OK
A.2.4. Will the project result in technology transfer to the host country?	/1/, /2/, /15/	DR/I	There is no technology transfer in the project activity.		OK
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?	/1/, /2/, /15/	DR/I	The existing personnel in the plant had been trained as a part of the technical up-gradation of the plant. The training needs of the operating and maintenance personnel are covered in the existing QMS of the organisation.		OK
A.3. Contribution to Sustainable Development The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	/1/, /2/,	DR/I	The project results in emission reduction along with development of the neighbouring areas from where the		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/3/		biomass is sourced. The project also contributes in preventing uncontrolled burning of the biomass residue and ill effects associated with decay of these materials which otherwise do not have any usage in the absence of the project. The project also generates additional employment for collecting biomass, briquette manufacturing and charging of briquettes in the boiler.		
A.3.2. Will the project create any adverse environmental or social effects?	/1/, /2/, /3/	DR/I	No adverse environmental or social effects are envisaged due to the project activity.		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/, /2/, /3/	DR/I	Clarification is requested on the status of host country approval for the project.	~~CL 1~~	OK
A.3.4. Is the project in line with relevant legislation and plans in the host country?	/1/, /2/, /3/	DR/I	Same as A.3.3	~~CL 1~~	OK
B. **Project Baseline** The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
B.1. Baseline Methodology It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	/1/, /2/, /15/	DR/I	The project applies the simplified baseline methodology AMS I C version-09.		OK
B.1.2. Is the baseline methodology applicable to the project being considered?	/1/, /2/, /15/	DR/I	The methodology is applicable to the project as it is demonstrated that		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			- The project involves replacement of RFO with biomass material for steam generation used in process and - The total installed capacity of the steam generator is lower than the ceiling of 180 MWth for category I small scale projects.		
B.2. Baseline Determination It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to prevailing practice or other barriers?	/1/, /2/, /5/, /8/ /16/	DR/I	It is argued that the project faces technological barrier with respect to risks associated with continuous supply of biomass to the unit and hindrance to operation due to unavailability of biomass material. Clarification is requested as to why the project faces these risks when there is a long term contract in place for supply of briquette from M/s Anand Limited. In the projects' additionality assessment, it is argued that the cost of procurement and transport of raw material may cause the price of briquette to rise. Clarification is requested as to why these price escalation and uncertainty of price affects the project only and does not affect the baseline, RFO, of the project. For determination of common practice in the region documentary evidence and relevant quantitative information on the industries in the region with similar technology needs to be provided. Claims of low technology penetration needs to be substantiated with quantitative information.	~~CL 2~~ ~~CL 3~~ ~~CAR 3~~	OK
B.2.2. Is the application of the baseline methodology	/1/,	DR/I	The project boundary involves 2 boilers of varying	~~CL 4~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
and the discussion and determination of the chosen baseline transparent and conservative?	/2/, /5/, /8/ /16/		capacity of 10 tons and 8 tonnes each. The project activity involves the 8 tonne capacity boiler which is being retrofitted as a part of the project. Clarification is requested as to whether the baseline boiler efficiency used in estimation is based on monitored performance of the 8 tonne capacity boiler and whether emission reductions estimates will be estimated on the amount of steam generated from the retrofitted boiler only.		
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/1/, /2/, /15/	DR/I	Yes.		OK
B.2.4. Is the baseline selection compatible with the available data?	/1/, /2/, /5/, /8/ /16/	DR/I	The baseline for the project is based on monitored values of fossil fuel and biomass briquettes and is thus compatible with the available data.		OK
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	/1/, /2/, /5/, /8/ /16/	DR/I	The project applies the approved baseline methodology AMS-I.C version 9 for small scale project activities. As per methodology for technologies that replace fossil fuel technology, the baseline for the project is the fuel technology that would have been used in the absence of the project. Clarification is requested as to why the continuation of RFO as the fossil fuel is the baseline for the project and not any other fossil fuel technologies like coal based thermal energy generation in view of the fact that coal based thermal energy generation is prevalent in the region.	~~CL 5~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
C. **Duration of the Project / Crediting Period** It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined?	/1/, /2/	DR/I	The start date of project activity is 7 March 2006 and the real action of the project started on 10 April 2006. The operational lifetime of the project is 20 years which is reasonable.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/, /2/	DR/I	The project opts for a fixed crediting period of 10 years duration starting from 15 December 2007 or from the date of registration of the project activity.		OK
D. **Monitoring Plan** The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
D.1. Monitoring Methodology It is assessed whether the project applies an appropriate monitoring methodology.					
D.1.1. Is the selected monitoring methodology in line with the monitoring methodologies provided for the relevant project category?	/1/, /2/, /15/, /7/	DR/I	The project applies the monitoring methodology AMS-I.C, version 9 which is applicable to the project.		OK
D.1.2. Is the monitoring methodology applicable to the project being considered?	/1/, /2/, /15/, /7/	DR/I	The monitoring methodology is applicable to the project as it is demonstrated that: - The project involves replacement of RFO with biomass material for steam generation used in process and - The installed capacity of the boilers is lower than		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			the ceiling of 180 MW_{th} for category I small scale projects.		
D.1.3. Is the application of the monitoring methodology transparent?	/1/, /2/, /15/, /7/	DR/I	Yes.		OK
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	/1/, /2/, /15/, /7/	DR/I	The parameters are measurable in nature.		OK
D.2. Monitoring of Project Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/, /2/, /15/, /7/	DR/I	The monitoring plan does not provide for monitoring of average quantity of briquette per vehicle, average quantity of biomass material for briquette manufacturing and average mileage of vehicle used in briquette and raw material transport for the project activity.	~~CAR 4~~	OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/, /2/, /15/, /7/	DR/I	CO_2, CH_4 and N_2O are the relevant baseline GHG indicators.		OK
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/, /2/, /15/, /7/	DR/I	All the parameters related to determination of project emissions are measurable in nature.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/, /2/,	DR/I	The fuel consumption and electricity consumption associated with project emissions is measured and thus		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/15/, /7/		results in real measurement of project emissions		
D.3. Monitoring of Leakage If applicable, it is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/, /2/, /15/, /7/	DR/I	The project involves installation of a steam generator unit based on briquette instead of fossil fuel which is used at present. The briquette to be used in the project plant is regarded to be made from renewable biomass material. As per the guideline for assessment of leakage associated with competing use of renewable biomass clarification is requested on how the same is taken care of in the project.	~~CL 6~~	OK
D.4. Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/, /2/, /15/, /7/	DR/I	The monitoring plan provides for collection and archiving of quantity of biomass material that will be utilised in the boilers for steam generation and the NCV of biomass. This monitored amount of biomass is used for estimation of baseline emissions. The biomass utilised will be cross-verified against the steam generation data and the boiler efficiency of the biomass fired boiler.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/, /2/, /15/,	DR/I	CO_2, CH_4 and N_2O are the relevant baseline GHG indicators and the same will be monitored through the equivalent amount of furnace oil displaced by the		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/7/		biomass combusted in the boilers.		
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/, /2/, /15/, /7/	DR/I	Yes.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/, /2/, /15/, /7/	DR/I	Yes.		OK
D.5. Project Management Planning It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.5.1. Is the authority and responsibility of project management clearly described?	/1/, /2/, /15/, /7/	DR/I	The overall project management is overseen by the Director – Technical and the President - Standard Solutions of FKIPL.		OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/1/, /2/, /15/, /7/	DR/I	The roles and responsibilities are clearly identified in the project activity.		OK
D.5.3. Are procedures identified for training of monitoring personnel?	/1/, /2/, /15/, /7/	DR/I	Yes.		OK
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/, /2/, /15/, /7/	DR/I	No such emergency scenarios are envisaged in the project activity		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
D.5.5. Are procedures identified for calibration of monitoring equipment?	/1/, /2/, /15/, /7/	DR/I	The calibration frequencies of the measuring instruments are clearly identified in the monitoring plan.		OK
D.5.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/, /2/, /15/, /7/	DR/I	Yes.		OK
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/1/, /2/, /15/, /7/	DR/I	Yes.		OK
D.5.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/, /2/, /15/, /7/	DR/I	The data will be collected by project operators in a prescribed format and will be reviewed by a team under the supervision of project manager.		OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/, /2/, /15/, /7/	DR/I	In case of discrepancies in measurement of biomass material the supplier invoice data will be used as a data source thus taking care of uncertainties.		OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/1/, /2/, /15/, /7/	DR/I	Yes.		OK
D.5.11. Are procedures identified for project performance reviews?	/1/, /2/, /15/, /7/	DR/I	The performance review of the project activity is clearly identified in the project.		OK
D.5.12. Are procedures identified for corrective actions?	/1/, /2/,	DR/I	Yes.		OK

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

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/15/, /7/				
E. **Calculation of GHG emission** It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.					
E.1. Project GHG Emissions The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	/1/, /2/, /7/, /9/, /10/, /11/, /15/, /6/	DR/I	Project emissions associated with combustion, manufacture and transportation of briquette to the project plant are clearly identified in the project design.		OK
E.1.2. Have all relevant greenhouse gases and sources been evaluated?	/1/, /2/, /7/, /9/, /10/, /11/, /15/, /6/	DR/I	CO_2, CH_4 and N_2O are the relevant GHGs and all of them have been accounted for.		OK
E.1.3. Do the methodologies for calculating project emissions comply with existing good practice?	/1/, /2/, /7/,	DR/I	Clarification is requested on the basis of parameters like moisture content of biomass received at briquetting plant, average truck load of biomass material and	~~CL 7~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/9/, /10/, /11/, /15/, /6/		briquette, % excess dry biomass requirement for briquette preparation as used in the estimation of emission reduction. Clarification is requested as to whether these factors will be monitored ex-post or fixed ex-ante in the project and how are the estimates conservative in nature.		
E.1.4. Are the calculations documented in a complete and transparent manner?	/1/, /2/, /10/, /11/	DR/I	Clarification is requested on the basis of determination of the western regional grid emission factor which is used in determination of project emission associated with briquette manufacturing.	~~CL 8~~	OK
E.1.5. Have conservative assumptions been used?	/1/, /2/, /10/, /11/	DR/I	The project emissions are based on the maximum distance from which the biomass material is sourced to make the estimates conservative in nature.		OK
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	/1/, /2/, /10/, /11/	DR/I	Same as E.1.3	~~CL 7~~	OK
E.2. Leakage It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed and estimated ex-ante.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	/1/, /2/, /10/, /11/	DR/I	The project proponent has demonstrated the surplus availability of biomass in the region. Hence leakage calculations due to competing use of biomass is not required for this project activity.		OK
E.2.2. Are potential leakage effects properly accounted for in the calculations (if	/1/, /2/,	DR/I	Same as D.3.1		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
applicable)?	/10/, /11/				
E.2.3. Do the methodologies for calculating leakage comply with existing good practice (if applicable)?	/1/, /2/, /10/, /11/	DR/I	Same as D.3.1		OK
E.2.4. Are the calculations documented in a complete and transparent manner and (if applicable)?	/1/, /2/, /10/, /11/	DR/I	Same as D.3.1		OK
E.3. Baseline GHG Emissions The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Are the baseline emission boundaries clearly defined and do they sufficiently cover sources for baseline emissions?	/1/, /2/, /10/, /11/	DR/I	The baseline emissions are calculated on the amount of briquette fired in the 8 tonne boiler used for steam generation.		OK
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/1/, /2/, /10/, /11/	DR/I	The direct baseline emissions related to the combustion of equivalent amount of furnace oil in the baseline have been evaluated. There are no indirect baseline emissions.		OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/1/, /2/, /10/, /11/	DR/I	CO_2, CH_4 and N_2O are the relevant GHGs and all of them have been accounted for.		OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/1/, /2/, /10/,	DR/I	Clarification is requested on the mechanism of determination of the boiler efficiency during the project period and baseline and QA/QC procedures for	~~CL 9~~	OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
	/11/		determination of boiler efficiency.		
E.3.5. Are the calculations documented in a complete and transparent manner?	/1/, /2/, /10/, /11/	DR/I	Same as E.3.4.	~~CL 9~~	OK
E.3.6. Have conservative assumptions been used?	/1/, /2/, /10/, /11/	DR/I	The baseline estimates are based on the actual average run hours of the unit during the baseline period making the estimates conservative in nature.		OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/1/, /2/, /10/, /11/	DR/I	Since the baseline emissions are calculated based on monitored data, there are no uncertainties in the baseline emissions.		OK
E.4. Emission Reductions Validation of ex-ante estimated emission reductions.					
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	/1/, /2/, /10/, /11/	DR/I	The switch from fossil fuel to biomass briquette will result in 6 558 t CO_2e emission reductions per annum over the 10 year crediting period.		OK
***F.* Environmental Impacts** It is assessed whether environmental impacts of the project are sufficiently addressed.					
F.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	/1/, /2/	DR/I	Being a renewable energy generation project, an EIA is not required in the project activity.		OK
F.1.2. Does the project comply with environmental legislation in the host country?	/1/, /2/	DR/I	Yes, the project complies with environmental regulations in India. All the licences and consents for the		OK

Checklist Question	Ref.	MoV*	Comments	Draft Concl.	Final Concl.
			project have been found to be in order.		
F.1.3. Will the project create any adverse environmental effects?	/1/, /2/	DR/I	There are no adverse effects on the environment due to the project activity.		OK
G. **Comments by Local Stakeholder** Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/1/, /2/, /13/	DR/I	The local community, employees of the organisation, regulatory and statutory authorities, neighbouring industries and equipment suppliers have been identified as relevant stakeholders to the project.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/, /2/, /13/	DR/I	The above mentioned personnel had been contacted by the plant authorities through a one to one interaction.		OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/, /2/, /13/	DR/I	No such regulation exists under the Indian DNA.		OK
G.1.4. Is a summary of the comments received provided?	/1/, /2/, /13/	DR/I	Yes.		OK
G.1.5. Has due account been taken of any comments received?	/1/, /2/, /13/	DR/I	No adverse comments have been received during the stakeholder consultation process.		OK

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
CAR 1 The applicability of small scale methodology shall be demonstrated based on the installed capacity of the boilers and not on the steam generation level in the plant.		Corrected in PDD in item B-2.	**OK**. The installed capacity of the project activity is ~ 6 $MW_{thermal}$. Hence AMS-I.C is applicable to the project. CAR is closed.
CAR 2 The coordinates of the project plant shall be provided for unique identification of the location of project activity.		Coordinates of the project plant are provided in PDD in item A.4.1.4.	**OK**. The co-ordinates of the project plant have been provided in the revised PDD. CAR is closed.
CAR 3 For determination of common practice in the region documentary evidence and relevant quantitative information on the industries in the region with similar technology needs to be provided. Claims of low technology penetration needs to be substantiated with quantitative information.		A survey has been conducted to arrive at the fuels, which are commonly used in the boilers, & similar thermal equipments by BEE (Ministry of Power, GOI) accredited Energy Auditor. Accordingly list of units having boiler in that area is given in item B-5 in the PDD, which clearly shows that the boilers are fossil fuel (FO/LDO/HSD/Coal) fired. Therefore briquette-fired boiler is not a common practice in the region. From the list, It is evident that 1 boiler in this project activity out of 9 operating boilers in the region is on briquette, which is 11.11% of the total population and this is first briquette-fired boiler in this area.	**OK**. Quantitative information on the common practice in the Ranjangaon region has been provided. This information has been substantiated by a survey report from Bureau of Energy Efficiency certified energy auditor. CAR is closed.
CAR 4 The monitoring plan does not provide for monitoring of average quantity of briquette per vehicle, average quantity of biomass material for		Change in distance of the briquette supplier from the FKIPL & change in distance of the biomass supplier from briquetting plant are being monitored in the monitoring plan.	**OK**. Since the average quantity of briquette per vehicle, average quantity of biomass material for briquette manufacturing and average mileage of vehicle used in briquette

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
briquette manufacturing and average mileage of vehicle used in briquette and raw material transport for the project activity.		However average quantity of biomass material for briquette manufacturing, average mileage of vehicle used & quantity of raw material transport per vehicle to the briquetting plant are practically constant values. Therefore these are not required to be monitored.	and raw material transport are practically constant quantities as observed from past plant records, it is not required to monitor these parameters during the project period. CAR is closed.
CL 1 Clarification is requested on the status of host country approval for the project.		Host country approval for the project has already been received. A copy of the approval is attached.	**OK**. The DNA of India has approved the project with a letter of approval dated 12 March 2007. CL is closed.
CL 2 It is argued that the project faces technological barrier with respect to risks associated with continuous supply of biomass to the unit and hindrance to operation due to unavailability of biomass material. Clarification is as to why the project faces these risks when there is a long term contract in place for supply of briquette from M/s Anand limited.		Another technological alternative to the project activity is to continue with RFO, which involves much lower performance risk. RFO is ex-stock available from well-established oil companies like IOCL, HPCL, BPCL, Reliance and several others. There is no risk of non-availability of FO. Further boiler operation with FO is automatic, there is no manpower required for fuel handling as in case of briquettes. Operating the boiler on briquettes is highly manpower intensive – right from briquette unloading, transferring to boiler shed, briquette charging into the boiler, ash removal and handling. Due to continuous availability of FO, there is no need of long term contract for FO procurement however as briquettes are manufactured from	**OK**. The technological barriers to the project relate to the operational requirement of the briquette fired boilers. Since FO is readily available from reputed oil companies, use of FO in the boilers do not require establishing long term contracts to ensure constant supply. Thus there are no risks of non-availability of FO. But to ensure constant supply of briquette long term contract was required to be established as well as large stockpiles required to be maintained in the plant. This required large storage areas to be put up. Also the briquette fired boilers required more stringent maintenance procedures which entailed one day shutdown of the boilers every month which was not required for the FO fired boilers. Also firing briquettes in the boiler is more manpower intensive than

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
		agricultural residue, which is highly seasonal and depends on crop cycle completion, necessitates large briquette storage facilities at the user site as well as long term contract for briquette supply. If proper care is not taken and inventory of raw material & briquettes is not planned then interruptions due to short supply of briquettes may occur any time throughout the year. This risk is particularly high during the rainy season. Further due to the nature of the furnace and hot duct, the briquette-fired boiler needs to be shut down for about one day in a month for preventive maintenance, which is not a requirement for FO fired boiler. Thus, FO carries much lower performance risk as compared to that with briquettes as a fuel for steam generation in boiler. Conversion of existing FO fired boiler to briquette-fired boiler, the technology that has been adopted for this project activity has a considerably low market share as also evident from the given data on various boilers in this area. It is evident that continuing use of FO for steam generation would have lead to higher GHG emissions.	FO firing since firing briquettes in the boiler require manual unloading and charging of the briquettes. CL is closed.
CL 3 In the project additionality assessment it is argued that the cost of procurement and transport of raw		Impact of briquette & FO price variation on steam cost has been shown in the attached excel sheet.	**OK**. The comparative costs of steam generation using RFO, coal and briquettes have been provided. Steam generation using coal is the cheapest option of the

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
material may cause the price of briquette to rise. Clarification is requested as to why these price escalation and uncertainty of price affects the project only and does not affect the baseline, RFO, of the project.		Another fuel option would have been coal, which provides minimum steam cost. Project proponents have not opted for this fuel option since RFO would lead to lower baseline emissions than coal.	three. As per Attachment A to Appendix B of the simplified M&P for small-scale CDM project activities a project faces investment barrier if *"A financially more viable alternative to the project activity would have led to higher emissions"*. In this case, the steam generation using coal is financially more attractive than the project activity but it would have led to higher emissions. However the project proponent has selected RFO as the baseline fuel since this corresponds to the pre-project scenario, is the common practice in the region and would have led to lower baseline emissions than coal. CL is closed.
CL 4 The project boundary involves 2 boilers of varying capacity of 10 tons and 8 tonnes each. The project activity involves the 8 tonne capacity boiler which is being retrofitted as a part of the project. Clarification is requested as to whether the baseline boiler efficiency used in estimation is based on monitored performance of the 8 tonne capacity boiler and whether emission reductions estimates will be estimated on the amount of steam generated from the retrofitted boiler only.		Both the boilers were in use on FO prior to this project activity. Therefore overall boiler efficiency is used in the estimation of Baseline which is based on actual monitored performance the boilers. Details are given in the excel sheet. The basis for emission reductions estimates is based on briquette consumption, which will occur in the retrofitted boiler only. Daily steam generation & the boiler from which this steam is generated; both records are maintained at the plant.	**OK**. The baseline has been established on the basis of monitored steam generation and FO consumption in the baseline. CL is closed.
CL 5 The project applies the approved baseline		If we refer to the region data, which is obtained by carrying out third party survey, it is clear that majority of boilers use FO as	**OK**. *Please refer to response under CL3 above*.

Draft report corrective action requests and requests for clarification	Ref. to Table 2	Summary of project participants' response	Final conclusion
methodology AMS-I.C, version 9 for small scale project activities. As per methodology for technologies that replace fossil fuel technology the baseline for the project is the fuel technology that would have been used in the absence of the project. Clarification is requested as to why the continuation of RFO as the fossil fuel is the baseline for the project and not any other fossil fuel technologies like coal based thermal energy generation in view of the fact that coal based thermal energy generation is prevalent in the region.		fuel; therefore FO is used as baseline. Using coal as the baseline would have led to lowest cost of steam generation, but higher baseline emissions. Hence use of RFO which was the status quo scenario in the absence of the project activity and results in lower amount of emissions have been selected as the baseline.	CL is closed.
CL 6 The project involves installation of a steam generator unit based on briquette instead of fossil fuel which is used at present. The briquette to be used in the project plant is regarded to be made from renewable biomass material. As per the guideline for assessment of leakage associated with competing use of renewable biomass clarification is requested on how the same is taken care of in the project.		The fact is there is no other use of this renewable biomass. Otherwise this biomass is burnt in the field. Further such renewable biomass is still available in plenty and only a part of it is going for briquette manufacturing. Therefore it can be said that as there is no other competing use of this biomass therefore there will not be any leakage due to this reason in briquette manufacturing. Annual evaluation for surplus biomass availability will be carried out as per the guideline for assessment of leakage (ver-2). This aspect has been incorporated in the monitoring plan also.	**OK**. It has been demonstrated by data from the briquette manufacturer that the available quantity of biomass for preparing the briquettes is almost 5 times of that required in Fresenius Kabi. Also since FKIPL has established a long-term contract with the briquette supplier, it has ensured its own supply of briquette. Thus the briquette used in the project activity is not diverted from other activities. In the post-project scenario the surplus availability of biomass will be monitored annually. CL is closed.
CL 7 Clarification is requested on the basis of parameters like moisture content of biomass		The briquette manufacturing industry is has picked up since past few years and these factors have been found to be constant on	**OK**. The moisture content of biomass received at briquetting plant, average truck load of biomass material and briquette, %

Draft report corrective action requests and requests for clarification	**Ref. to Table 2**	**Summary of project participants' response**	**Final conclusion**
received at briquetting plant, average truck load of biomass material and briquette, % excess dry biomass requirement for briquette preparation as used in the estimation of emission reduction. Clarification is requested as to whether these factors will be monitored ex-post or fixed ex-ante in the project and how are the estimates conservative in nature		average basis. Therefore these factors are fixed ex-ante in the project. Data from briquette manufacturer has also been attached, which indicates that these estimates conservative in nature. For example, moisture % that has been used here is 35% for calculating quantity of biomass to be transported, where as actually it is 5 to 7%. Similarly average truck load of biomass material and briquette, % excess dry biomass requirement for briquette preparation are also conservative. The biomass is never thrown out of briquette manufacturing unit, it finally gets dried and used; even then it has been considered as 98%.	excess dry biomass requirement for briquette preparation have been fixed ex-ante based on the data provided by the briquette manufacturer and in-plant data. The monitored highest values have been used in the calculations to ensure conservativeness. CL is closed.
CL 8 Clarification is requested on the basis of determination of the western regional grid emission factor which is used in determination of project emission associated with briquette manufacturing		Western regional grid emission factor has been calculated from Central Electricity Commission data.	**OK**. The emission factor for the western regional electricity grid has been selected from the *Baseline Carbon Dioxide Emission Database Version 1.1* – as published on the CEA Website (http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm) CL is closed.
CL 9		Efficiency estimation is be direct method,	**OK**. The boiler efficiency has been

Draft report corrective action requests and requests for clarification	**Ref. to Table 2**	**Summary of project participants' response**	**Final conclusion**
Clarification is requested on the mechanism of determination of the boiler efficiency during the project period and baseline and QA/QC procedures for determination of boiler efficiency		wherein steam as well as FO quantities are fully measured and using their heat values efficiency is calculated. The steam flow meter is duly calibrated and FO quantities are also fully measured. Further, in the monitoring plan efficiency determination by BEE certified Energy Auditor has also been included.	determined by direct method from the steam generation and furnace oil consumption. In the project period, the boiler efficiency calculation will be cross-verified by BEE certified energy auditors. CL is closed.

- o0o -

APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Michael Lehmann

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	Yes	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1, 2, 3		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	*AM0027*	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	*AM0030*	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	*AM0031*	Yes
ACM0004, ACM0012	Yes	*AM0032*	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	*AM0035*	Yes
ACM0007	Yes	*AM0038*	Yes
ACM0008	Yes	*AM0041*	Yes
ACM0009, AM0008, AMS-III.B	Yes	*AM0034*	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	*AM0043*	
AM0009, AM0037	Yes	*AM0046*	
AM0013, AM0022, AM0025, AM0039, AMS-III.H, AMS-III.I	Yes	*AM0047*	
AM0014	Yes	*AMS-II.A-F, AM0044*	Yes
AM0017	Yes	*AMS-III.A*	Yes
AM0018	Yes	*AMS-III.E, AMS-III.F*	Yes
AM0020	Yes	*AM0023*	Yes
AM0021, AM0028, AM0034, AM0051	Yes	*AM0024*	Yes

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Kumaraswamy Chandrashekara

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	Yes	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 4 & 5		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	*AM0027*	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	*AM0030*	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	*AM0031*	Yes
ACM0004, ACM0012	Yes	*AM0032*	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	*AM0035*	Yes
ACM0007	Yes	*AM0038*	Yes
ACM0008	Yes	*AM0041*	Yes
ACM0009, AM0008, AMS-III.B	Yes	*AM0034*	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	*AM0043*	
AM0009, AM0037	Yes	*AM0046*	
AM0013, AM0022, AM0025, AM0039, AMS-III.H, AMS-III.I	Yes	*AM0047*	
AM0014	Yes	*AMS-II.A-F, AM0044*	Yes
AM0017	Yes	*AMS-III.A*	Yes
AM0018	Yes	*AMS-III.E, AMS-III.F*	Yes
AM0020	Yes		
AM0021, AM0028, AM0034, AM0051	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Subhendu Biswas

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	--	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 10		

Høvik, 22 December 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

Soumik Biswas

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	Yes	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	--		

Høvik, 30 October 2007

Michael Lehmann
Techncal Director, International Climate Change Services