

# Verification and Certification Report

## First periodic verification

Report for:

Thermax Sustainable Energy Solutions Ltd

Verification of Programme of Activities for

Promotion of Biomass Based Heat Generation  
Systems in India (UNFCCC Ref. No.4041)

Monitoring Period:

12/01/2011 to 31/08/2012 (both days included)

LRQA Reference : CDM-MUM-0061938, Version 03

Date : 19/12/2012

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## List of included CPAs covered in this monitoring period

Sr. No.	CPA Title	UNFCCC REF No.
1	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 001)	4041-0001
2	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 002)	4041-0002
3	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 011)	4041-0003
4	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 003)	4041-0004
5	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 004)	4041-0005
6	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 006)	4041-0006
7	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 007)	4041-0007
8	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 008)	4041-0008
9	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 005)	4041-0009
10	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 009)	4041-0010
11	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 010)	4041-0011
12	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 012)	4041-0012
13	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 013)	4041-0013
14	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 014)	4041-0014
15	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 015)	4041-0015
16	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 016)	4041-0016
17	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 017)	4041-0017



## Contents

<b>1</b>	<b><i>Executive Summary</i></b> .....	<b>5</b>
<b>2</b>	<b><i>Introduction</i></b> .....	<b>8</b>
2.1	Objective .....	8
2.2	Scope .....	9
2.3	PoA Description .....	9
2.4	CPA Description .....	9
<b>3</b>	<b><i>Methodology</i></b> .....	<b>14</b>
3.1	Verification approach.....	14
3.2	Desk review .....	15
3.3	On-site assessment.....	15
3.4	Quality of evidence.....	21
3.5	Resolution of clarification and corrective action requests.....	22
3.6	Internal quality control .....	22
<b>4</b>	<b><i>Verification protocol and conclusions</i></b> .....	<b>22</b>
4.1	Compliance of the project implementation with the registered project design document .....	23
4.2	Compliance of the monitoring plan with the monitoring methodology, including applicable tool(s).....	23
4.3	Compliance of monitoring activities with the registered monitoring plan .....	24
4.4	Compliance with the calibration frequency requirements for measuring instruments.....	24
4.5	Compliance of the implemented sampling procedure with the sampling plan (if any) of the CPA-DD and PoA-DD .....	24
4.6	Assessment of data and calculation of emission reductions.....	25
<b>5</b>	<b><i>Making the monitoring report publicly available</i></b> .....	<b>25</b>
<b>6</b>	<b><i>Certification report</i></b> .....	<b>27</b>
<b>7</b>	<b><i>Appendices</i></b> .....	<b>29</b>
7.1	Appendix A: List of documents reviewed .....	29
7.2	Appendix B: Certificate of Appointment.....	32
7.3	Appendix C1: Verification Protocol for CPA 4041-0001.....	33
7.4	Appendix C2: Verification Protocol for CPA 4041-0002.....	86
7.5	Appendix C3: Verification Protocol for CPA 4041-0003.....	136
7.6	Appendix C4: Verification Protocol for CPA 4041-0005.....	187
7.7	Appendix C5: Verification Protocol for CPA 4041-0006.....	242
7.8	Appendix C6: Verification Protocol for CPA 4041-0007.....	289
7.9	Appendix C7: Verification Protocol for CPA 4041-0009.....	339



7.10	<b>Appendix C8: Verification Protocol for CPA 4041-0011.....</b>	<b>407</b>
7.11	<b>Appendix C9: Verification Protocol for CPA 4041-0012.....</b>	<b>472</b>
7.12	<b>Appendix C10: Verification Protocol for CPA 4041-0013 .....</b>	<b>523</b>
7.13	<b>Appendix C11: Verification Protocol for CPA 4041-0015 .....</b>	<b>570</b>
7.14	<b>Appendix D: Consolidated Verification Findings .....</b>	<b>623</b>

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## 1 Executive Summary

Lloyd's Register Quality Assurance Limited has been contracted by Thermax Sustainable Energy Solutions Ltd. (TSESL), representing the project participants (PP), to undertake the first periodic verification of the registered programme of activities "Promotion of Biomass Based Heat Generation Systems in India" PoA reference number 4041, covering the monitoring period from 12/01/2011 to 31/08/2012 (both days included). The verification has been performed by document review based on the Monitoring Report for the PoA "Promotion of Biomass Based Heat Generation Systems in India" Version 1.0, dated 24/11/2012<sup>1</sup>, on-site assessment and interviews with the stakeholders, resolution of outstanding issues and issuance of the verification report.

The PoA intends to reduce greenhouse gas (GHG) emissions by displacing fossil fuel utilisation for thermal energy generation by the promotion of biomass based heat generation systems in India. The PoA involves installation of new biomass fired heat generating systems and/or replacement of existing fossil fuel fired heat generating systems and/or switching of fossil fuel fired heat generating systems to biomass based heat generation systems and/or additional of renewable energy unit to existing facility types of project activities for below equipment which pick up the heat from the combustion of the fuel & transfer it to the process.

1. Heat generation from biomass fired Boilers
2. Heat generation by biomass fired Heaters.

The fulfilment of the requirements as set forth in the Article 12 of the Kyoto Protocol of the United Nations Framework Convention on Climate Change (UNFCCC), the modalities and procedures for a CDM and relevant decisions of the Conference of the Parties serving as meeting of the Parties to the Kyoto Protocol (COP/MOP) and the Executive Board of the CDM (CDM-EB) has been evaluated and the conformance to the verification requirements were confirmed based on the given information. A risk based approach was taken to conduct the verification, and corrective action requests (CARs), clarifications (CLs) and forward action requests (FARs) were issued for relevant actions by the PP.

The verification team identified, through the verification process, 8 CARs and 9 CLs. The PP has taken actions and submitted to LRQA the revised Monitoring Report and supporting evidence. The verification team, through the verification process, confirmed that the emission reductions achieved by the project activity during the monitoring period are correctly calculated in the Monitoring Report Version 4.0 dated (12/12/2012) based on the approved monitoring methodology and the monitoring plan of the included CPA-DD. Therefore, LRQA certifies the emission reductions amounting to 9,591 tCO<sub>2</sub>e which includes:

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<sup>1</sup> Initially the CME had submitted separate MRs for the 11 CPAs (CPA No.1, 2, 3, 5, 6, 7, 9, 11, 13 and 15 Version numbers 1.0, dated 18/10/2012 and CPA No.12 Version number 1.0, dated 09/10/2012) on 19/10/2012 and these MRs were published by UNFCCC. But subsequently, as requested by UNFCCC secretariat, CME submitted a consolidated MR (Version 1.0, dated 24/11/2012), which was published on UNFCCC web site.



- 912 tCO<sub>2</sub>e from the CPA "Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 001) for the period 12/01/2011 to 31/08/2012
- 2,624 tCO<sub>2</sub>e from the CPA "Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 002) for the period 31/03/2012 to 31/08/2012
- 675 tCO<sub>2</sub>e from the CPA "Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 011) for the period 31/03/2012 to 31/08/2012
- 467 tCO<sub>2</sub>e from the CPA "Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 004) for the period 01/05/2012 to 31/08/2012
- 398 tCO<sub>2</sub>e from the CPA "Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 006) for the period 01/05/2012 to 31/08/2012
- 773 tCO<sub>2</sub>e from the CPA "Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 007) for the period 01/05/2012 to 31/08/2012
- 1,202 tCO<sub>2</sub>e from the CPA "Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 005) for the period 01/06/2012 to 31/08/2012
- 1,969 tCO<sub>2</sub>e from the CPA "Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 010) for the period 01/06/2012 to 31/08/2012
- 491 tCO<sub>2</sub>e from the CPA "Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 012) for the period 01/07/2012 to 31/08/2012
- 77 tCO<sub>2</sub>e from the CPA "Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 013) for the period 01/07/2012 to 31/08/2012
- 3 tCO<sub>2</sub>e from the CPA "Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 015) for the period 01/08/2012 to 31/08/2012

and requests the CDM-EB to issue the CERs.

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## Abbreviations

API	Active Pharmaceutical Ingredient
CAR	Corrective action request
CDM	Clean Development Mechanism
CDM-EB	Executive Board of Clean Development Mechanism
CDM M&P	Modalities and procedures for a clean development mechanism
CDM-VVS	Clean Development Mechanism-Validation and Verification Standard
CER	Certified Emission Reduction
CL	Clarification
CME	Coordinating/Managing Entity
cm	Centimetre
COP/MOP	Conference of the Parties serving as meeting of the Parties to the Kyoto Protocol
CPA	Component Programme Activities
CPA-DD	CDM Programme Activity Design Document
DG	Diesel Generator
DOC	De Oiled Cake
ERs	Emission reductions
FAR	Forward action request
FO	Furnace Oil
g	gauge
GCV	Gross Calorific Value
GHG	Greenhouse gas
IBR	Indian Boiler Regulations
IPCC	Intergovernmental panel on climate change
kCal	Kilo Calories
kg/mg/Gg	Kilogram/Milligram/Gigagram
km	Kilometre
KP	Kyoto Protocol of the United Nations Framework Convention on Climate Change
LR	Lloyd's Register
LRQA	Lloyd's Register Quality Assurance Limited
MP	Monitoring Plan
MR	Monitoring Report
MSSV	Main Steam Stop Valve
MW/MWh	Mega watt/Mega watt hour
NABL	National Accreditation Board for Testing and Calibration Laboratories
NCV	Net Calorific Value
PoA	Programme of Activities
PoA-DD	Programme of Activities Design Document
PP	Project participant
QA/QC	Quality Assurance/Quality Control
RO	Reverse Osmosis
RTD	Resistance Temperature Detectors
SCADA	Supervisory control and data acquisition
TJ	Tera Joules
TPH	Tonnes per hour
TSESL	Thermax Sustainable Energy Solutions Ltd.
tCO <sub>2</sub> e	Tonne of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change



## 2 Introduction

The project participants (PP) represented by Thermax Sustainable Energy Solutions Ltd. (TSESL) has contracted with Lloyd's Register Quality Assurance Limited (LRQA) to undertake the first periodic verification of the registered programme of activities "Promotion of Biomass Based Heat Generation Systems in India" PoA reference number 4041 covering the monitoring period from 12/01/2011 to 31/08/2012 (both days included). This report summarises the findings through the verification process that has been conducted on the verification requirements of the CDM.

The verification has been undertaken by the team formed of the qualified personnel of LRQA as follows:

Sanjay Kumar Agarwalla	LRQA Ltd, India	Team Leader, CDM Lead Verifier, Sector Expert
Archak Pattanaik	LRQA Ltd, India	Team Member, CDM Lead Verifier
Syju Alias	LRQA Ltd, India	Team Member, CDM Verifier
S Saravanan	External Expert	Sector Expert to verification team
Rudra Charan Padhy	External Expert	Sector Expert to verification team
Prabodha C Acharya	LRQA Ltd, India	Technical Reviewer
Ramchandra Vyankatesh Nesari	External Expert	Sector Expert to Technical reviewer
Andrew Ritchie	LRQA Ltd.	Decision Maker

Personnel being engaged in a PoA verification are qualified based on the established procedures of LRQA to assure the resource requirements that satisfy all the requirements of competence criteria of the CDM accreditation standard for operational entities. LRQA is designated as an operational entity and holds the full responsibility on decision-making regarding the verification in accordance with the accreditation requirements of the CDM-EB. The certificate of appointment of the team personnel is attached to this report.

### 2.1 Objective

Through the verification activities, the verification team was to confirm that:

- 1) the CDM project activities (CPAs) have been implemented and operated as described in the registered PoA-DD and included CPA-DD(s) and that all physical features of the project activity are in place
- 2) the Monitoring Report (MR) and other supporting documents provided are complete and verifiable, and in accordance with applicable CDM requirements
- 3) actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan(s) (MP(s)) of the respective Included CPA-DDs, monitoring plan of the registered PoA-DD and the approved methodology(ies); and





4) the data is recorded and stored as per the monitoring methodology(ies).

The verification followed the requirements of the current version of the CDM Validation and Verification Standard (CDM VVS) to ensure the quality and consistency of the verification work and the report.

## 2.2 Scope

The scope of verification was an independent and objective review of the monitored emission reductions (ERs) against the verification requirements of the CDM M&P. LRQA followed a risk-based approach in the verification, focusing on the identification of significant risks for implementation of the registered monitoring plan and the resultant emission reductions. The verification statement shall become final after final review by the decision maker of LRQA Ltd.

## 2.3 PoA Description

PoA title	Promotion of Biomass Based Heat Generation Systems in India
PoA reference no.	4041
Date of registration	12/01/2011
Applied methodology(ies)	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of PoA	12/01/2011
Length of PoA	28 years (01 Dec 10 - 30 Nov 38)
Boundary of PoA	All the states and union territories of India
Co-ordinating/Managing Entity (CME)	Thermax Sustainable Energy Solutions Ltd.
Project Participants	1. Thermax Sustainable Energy Solutions Ltd. 2. RWE Power Aktiengesellschaft
Monitoring period	12/01/2011 to 31/08/2012 (both the days included)

## 2.4 CPA Description

CPA title	Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 001)
CPA reference no.	4041-0001
Date of inclusion	12/01/2011
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	29/12/2007
Crediting period of CPA	12/01/2011 - 11/01/2021 (Fixed)
CPA Implementer/ CPA Operator	Foods and Inns Limited



CPA title	Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 002)
CPA reference no.	4041-0002
Date of inclusion	23/03/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	05/05/2009
Crediting period of CPA	31/03/2012 – 30/03/2022 (Fixed)
CPA Implementer/ CPA Operator	Ramdevbaba Solvent Private Limited

CPA title	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 011).
CPA reference no.	4041-0003
Date of inclusion	23/03/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	23/06/2008
Crediting period of CPA	31/03/2012 – 30/03/2022 (Fixed)
CPA Implementer/ CPA Operator	Mega Solvent Extractions Limited

CPA title	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 003)
CPA reference no.	4041-0004
Date of inclusion	30/04/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	27/03/2008
Crediting period of CPA	01/05/2012 – 30/04/2022 (Fixed)
CPA Implementer/ CPA Operator	Srinivasa Soya Private Limited

CPA title	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 004).
CPA reference no.	4041-0005
Date of inclusion	30/04/2012



Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	19/07/2008
Crediting period of CPA	01/05/2012 – 30/04/2022 (Fixed)
CPA Implementer/ CPA Operator	LACTOSE (INDIA) LIMITED

CPA title	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 006)
CPA reference no.	4041-0006
Date of inclusion	30/04/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	13/01/2010
Crediting period of CPA	01/05/2012 - 30/04/2022 (Fixed)
CPA Implementer/ CPA Operator	Sneha Farms Private Limited

CPA title	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 007)
CPA reference no.	4041-0007
Date of inclusion	30/04/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	29/03/2008
Crediting period of CPA	01/05/2012 - 30/04/2022 (Fixed)
CPA Implementer/ CPA Operator	Swadisht Oils (P) Limited

CPA title	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 008)
CPA reference no.	4041-0008
Date of inclusion	30/04/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	29/03/2008
Crediting period of CPA	01/05/2012 - 30/04/2022 (Fixed)
CPA Implementer/ CPA Operator	Mantora Oil Products Limited

CPA title	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 005)
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CPA reference no.	4041-0009
Date of inclusion	31/05/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity"(Version16)
Start date of CPA	23/12/2008
Crediting period of CPA	01/06/2012 - 31/05/2022(Fixed)
CPA Implementer/ CPA Operator	Growel Feeds Private Limited

CPA title	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 009)
CPA reference no.	4041-0010
Date of inclusion	31/05/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	05/10/2008
Crediting period of CPA	01/06/2012 - 31/05/2022 (Fixed)
CPA Implementer/ CPA Operator	Vallabh Textiles Company Limited

CPA title	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 010)
CPA reference no.	4041-0011
Date of inclusion	31/05/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	28/11/2008
Crediting period of CPA	01/06/2012 - 31/05/2022 (Fixed)
CPA Implementer/ CPA Operator	Shree GRG Oil Mill

CPA title	Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 012)
CPA reference no.	4041-0012
Date of inclusion	29/06/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	27/05/2010
Crediting period of CPA	01/07/2012 – 30/06/2022(Fixed)
CPA Implementer/ CPA Operator	KOPRAN LIMITED



CPA title	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 013)
CPA reference no.	4041-0013
Date of inclusion	29/06/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	22/02/2011
Crediting period of CPA	01/07/2012 – 30/06/2022 (Fixed)
CPA Implementer/ CPA Operator	SHREE SITA EDIBLES PRIVATE LIMITED

CPA title	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 014)
CPA reference no.	4041-0014
Date of inclusion	29/06/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	26/03/2008
Crediting period of CPA	01/07/2012 – 30/06/2022 (Fixed)
CPA Implementer/ CPA Operator	Kapil Solvex Pvt. Ltd.

CPA title	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 015)
CPA reference no.	4041-0015
Date of inclusion	29/06/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	18/07/2011
Crediting period of CPA	01/08/2012 – 30/07/2022 (Fixed)
CPA Implementer/ CPA Operator	SKOL BREWERIES LIMITED

CPA title	"Promotion of Biomass Based Heat Generation Systems in India" (CPA Number 016)
CPA reference no.	4041-0016
Date of inclusion	31/07/2012
Applied methodology	AMS-I.C. "Thermal energy production with or without electricity" (Version 16)
Start date of CPA	31/03/2010



Crediting period of CPA	01/08/2012 – 30/07/2022(Fixed)
CPA Implementer/ CPA Operator	Navadurga Enterprises Private Limited

CPA title	“Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 017)
CPA reference no.	4041-0017
Date of inclusion	30/08/2012
Applied methodology	AMS-I.C. “Thermal energy production with or without electricity” (Version 16)
Start date of CPA	27/03/2008
Crediting period of CPA	01/09/2012 – 31/08/2022 (Fixed)
CPA Implementer/ CPA Operator	Shrinivasa Agro Foods Pvt. Ltd.

### 3 Methodology

#### 3.1 Verification approach

LRQA's verification of the project documentation provided by the project participant was based on both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the Monitoring Report submitted to LRQA. Qualitative information is made up of the information on internal management controls, calculation procedures, procedures for transfer of data, frequency of emission reports, and review and internal audit of calculations.

As well as the monitoring documentation provided by the project participants, LRQA also reviewed:

- a) the registered PoA-DD, included CPA-DD(s) and the respective monitoring plan(s), including any approved revised monitoring plan and/or changes from the registered PoA-DD/CPA-DD, and the corresponding validation reports.
- b) previous verification reports, if any
- c) the applied monitoring methodology(ies)
- d) relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board
- e) any other information and references relevant to the project's resulting emissions reductions.

LRQA also confirmed that the Monitoring Report is as per the standardised format.<sup>2</sup>

LRQA also confirmed that no FARs were identified during validation.

<sup>2</sup> Standardized Monitoring Report format (F-CDM-MR) version 2 is used by the CME as per EB 66, for individual CPAs (Appendix-1 to Appendix 11 of the consolidated Monitoring Report). Since there is no standardized MR format available for the consolidated MR, the CME has developed a format, which is acceptable to the DOE.



Since this is the first periodic verification, outstanding FAR(s) from the previous verification which needs to be addressed during this periodic verification is not applicable during the monitoring period.

### 3.2 Desk review

The verification was performed primarily based on the review of the Monitoring Report and the supporting documentation. This process included:

- 1) a review of data and information presented to verify their completeness
- 2) a review of the MP(s) and monitoring methodology(ies), paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the QA/QC procedures, and
- 3) an evaluation of data management and the QA/QC system in the context of their influence on the generation and reporting of ERs.

The consolidated Monitoring Report for the PoA “Promotion of Biomass Based Heat Generation Systems in India” Version 1.0 dated 24/11/2012, was initially reviewed and LRQA requested the CME/PP/CPA implementers to present the supporting information and documents and such additional information and documents were also reviewed by LRQA. The documents reviewed by LRQA are listed in Appendix A.

Through the process of the verification, the revised Monitoring Report and the supporting documents were evaluated to confirm the actions taken by the PP to the CARs and CLs issued by LRQA. The documents reviewed by LRQA are listed in Appendix A. LRQA reviewed the final version of the Monitoring Report for the PoA “Promotion of Biomass Based Heat Generation Systems in India” Version 4.0 dated 12/12/2012, to confirm that all changes agreed had been incorporated.

### 3.3 On-site assessment<sup>3</sup>

An on-site assessment was conducted as a part of verification activity and involved:

- 1) an assessment of the implementation and operation of the CPA(s) as per the registered PoA-DD & included CPA-DD(s)
- 2) a review of information flows for generating, aggregating and reporting of the monitoring parameters
- 3) interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the MP(s)
- 4) a cross-check between information provided in the MR(s) and data from other sources
- 5) a check of the monitoring equipment including calibration performance, and observations of monitoring practices against the requirements of the PDD and the applied methodology
- 6) A review of calculations and assumptions made in determining the GHG data and ERs, and

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<sup>3</sup> In case a sampling approach is chosen to identify the CPAs for verification, the site visit will be carried out for those sample CPAs only in line with requirements of “Standard for sampling and surveys for CDM project activities and programme of activities”



- 7) An identification of QA/QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters.

The detail of the on-site assessment is as follows:

Date	CPA Location	Team Members on-site	Subjects covered	Persons interviewed
05/11/2012	KOPRAN LIMITED, Raigad, Maharashtra	Sanjay Agarwalla & Syju Alias	<ol style="list-style-type: none"> <li>1. Re – confirming the applicability conditions of methodology</li> <li>2. Confirming project boundary &amp; Site layout</li> <li>3. Project implementation (review of changes if any as compared to the included CPA-DD), operation, boundary issues</li> <li>4. Confirming the technical specifications</li> <li>5. Confirming the performance of project activity – thermal energy generation</li> <li>6. Discussing on data management, reporting, and QA/QC systems including calibration of the monitoring equipment</li> <li>7. Discussing on the monitoring plan in the included CPA-DD/Monitoring / measuring systems</li> <li>8. Reviewing the Monitoring Report</li> <li>9. Reviewing documents and records</li> </ol>	<p>Satish D Shegde, Manager-Maintenance, Kopran Limited</p> <p>Deepak H Utekar Manager-Stores Kopran Limited</p> <p>Nilesh Lachake, Service Engineer, Kopran Limited</p> <p>Santosh S Pawar, Boiler Operator, Kopran Limited</p> <p>Pravin N Sakharkar Utility Incharge, Kopran Limited</p> <p>Rajesh MS, Villager, Mahad</p> <p>Dipak K Patil, Villager, Mahad</p> <p>Kiran Thakar HOD, CDM services, TSESL</p> <p>Bhushan Pachpande, Manager-CDM, TSESL</p> <p>Sreeraj PN, Assistant Manager,-CDM, TSESL</p> <p>Dipak Shirsath, Executive-CDM, TSESL</p> <p>Rohit Khindri, Senior Executive, TSESL</p>
07/11/2012	Shree GRG Oil Mills, Sri Ganganagar, Rajasthan	Sanjay Agarwalla	<ol style="list-style-type: none"> <li>8. Reviewing the Monitoring Report</li> <li>9. Reviewing documents and records</li> </ol>	<p>Praveen Singh, General Manager-Operations, Shree GRG Oil Mills</p> <p>Rajiv Gupta, Finance and Accounts executive, Shree GRG Oil Mills</p> <p>Rajesh Kumar, Boiler/Heater Supervisor, Shree GRG Oil Mills</p> <p>Hanuman Singh,</p>





Date	CPA Location	Team Members on-site	Subjects covered	Persons interviewed
				<p>Villager-Lalgarh Shree GRG Oil Mills</p> <p>Suvra Sengupta, Manager – CDM, TSESL</p> <p>Dipak Shirsath, Executive-CDM, TSESL</p>
07/11/2012	Sneha Farms Pvt Ltd, Karimnagar, Andhra Pradesh	Syju Alias & S Saravanan		<p>J Bhaskar Reddy, Plant In charge, Sneha Farms Pvt. Ltd.</p> <p>P Jagadeeswar Reddy, EDP Executive, Sneha Farms Pvt Ltd</p> <p>M Venukumar, Supervisor, Sneha Farms Pvt Ltd</p> <p>V Surendar, Supervisor, Sneha Farms Pvt Ltd</p> <p>Rama Krishna Reddy, Supervisor, Sneha Farms Pvt. Ltd</p> <p>S Rajendra, Boiler Operator, Sneha Farms Pvt. Ltd</p> <p>Sreeraj PN, Assistant Manager-CDM, TSESL</p> <p>Prasad Akkeni, Executive-CDM, TSESL</p>
07/11/2012	Mega Solvent Extractions Limited, Wardhannapet Warrangal, Andhra Pradesh	Syju Alias & S Saravanan		<p>K Keshav Reddy, Mega Solvent Extractions Limited,</p> <p>A Anjaneyalu, Mega Solvent Extractions Limited,</p> <p>Raju Mishra, Mega Solvent Extractions Limited,</p> <p>B Raju, Mega Solvent Extractions Limited</p> <p>P Santosh Reddy, Mega Solvent Extractions Limited,</p> <p>Sreeraj PN, Assistant Manager-CDM, TSESL</p> <p>Prasad Akkeni,</p>



Date	CPA Location	Team Members on-site	Subjects covered	Persons interviewed
				Executive-CDM, TSESL
08/11/2012	Growel Feeds Private Limited, Kanpur, Uttar Pradesh	Syju Alias & S Saravanan		<p>S Shivkumar, General Manager-Production, Growel Feeds Private Limited</p> <p>P Lakshmana Rao, Assistant Manager-Production, Growel Feeds Private Limited</p> <p>KS Ganesh Basu, Boiler Incharge, Growel Feeds Private Limited</p> <p>M Jaya Raja, Boiler Incharge Growel Feeds Private Limited,</p> <p>P Joji, Personal Assistant to Plant Manager, Growel Feeds Private Limited,</p> <p>Sreeraj PN, Assistant Manager-CDM, TSESL</p> <p>Prasad Akkeni, Executive-CDM, TSESL</p>
09/11/2012	Swadisht Oils (P) Limited, Kanpur, Uttar Pradesh	Sanjay Agarwalla		<p>S.K.Tiwari, Vice President-Technical, Swadisht Oils (P) Limited</p> <p>P.N.Sharma, Electrical in charge Swadisht Oils (P) Limited</p> <p>Vijay Singh, Boiler Operator, Swadisht Oils (P) Limited</p> <p>Kameshwar Singh, Boiler Operator, Swadisht Oils (P) Limited</p> <p>Munna Singh, Villager, Kavra, Swadisht Oils (P) Limited</p> <p>Dipak Shirsath, Executive-CDM, TSESL</p>
09/11/2012	SHREE SITA EDIBLES PRIVATE LIMITED, Durg, Chhattisgarh	Syju Alias & Rudra Charan Padhy		<p>Amit Agrawal, Director, SHREE SITA EDIBLES PRIVATE LIMITED</p> <p>Sumit Sahu, General</p>



Date	CPA Location	Team Members on-site	Subjects covered	Persons interviewed
				<p>Manager-Technical, SHREE SITA EDIBLES PRIVATE LIMITED</p> <p>Ashok Goswami</p> <p>Stores Incharge</p> <p>SHREE SITA EDIBLES PRIVATE LIMITED,</p> <p>Dharmendra Goswami, Accounts Assistant, SHREE SITA EDIBLES PRIVATE LIMITED</p> <p>Narendra Dongre, Commercial Manager, SHREE SITA EDIBLES PRIVATE LIMITED</p> <p>Dinesh Rugia, Accountant,</p> <p>SHREE SITA EDIBLES PRIVATE LIMITED</p> <p>Manoj Borkar, Sales Executive, SHREE SITA EDIBLES PRIVATE LIMITED,</p> <p>RK Jain, Cashier SHREE SITA EDIBLES PRIVATE LIMITED</p> <p>Aditya Nandanpawar, Executive-CDM, TSESL</p> <p>Sreeraj PN Assistant Manager, CDM, TSESL</p>
10/11/2012	Ramdevbaba Solvent Pvt Ltd, Chandrapur, Maharashtra	Syju Alias & Rudra Charan Padhy		<p>Nilesh Mohata, Director, Ramdevbaba Solvent Pvt Ltd</p> <p>AN Kuttan, Plant Manager, Ramdevbaba Solvent Pvt. Ltd</p> <p>Ravi Mahakaykar, consultant, Ramdevbaba Solvent Pvt Ltd</p> <p>Parag S Nagond, Assistant Engineer, Ramdevbaba Solvent Pvt Ltd</p> <p>Vijay Dubey, Boiler Incharge, Ramdevbaba</p>



Date	CPA Location	Team Members on-site	Subjects covered	Persons interviewed
				<p>Solvent Pvt Ltd</p> <p>Anand Ghatarkar Assistant Accountant, Ramdevbaba Solvent Pvt Ltd</p> <p>Prashant Meshram, Stores In charge, Ramdevbaba Solvent Pvt. Ltd.</p> <p>Aditya Nandanpawar, Executive-CDM, TSESL</p> <p>Sreeraj PN, Assistant Manager, CDM, TSESL</p>
16/11/2012	Foods and Inns Limited, Sinnar, Maharashtra	Sanjay Agarwalla		<p>YK Rao, General Manager, Operations Foods and Inns Limited</p> <p>Mahindra Dhore, Production Manager, Foods and Inns Limited</p> <p>Sudhakar Raut, Boiler Operator Foods and Inns Limited</p> <p>Kailash Jaibhave, Boiler Operator, Foods and Inns Limited</p> <p>Rahul H Haridas, Executive-Materials Foods and Inns Limited</p> <p>Yogesh Palve Villager, Gonde</p> <p>Dattu Tambe Villager, Gonde</p> <p>Bhushan Pachpande Manager, CDM TSESL</p> <p>Sreeraj PN Assistant Manager, CDM, TSESL</p>
17/11/2012	LACTOSE (INDIA) LIMITED, Vadodara	Sanjay Agarwalla		<p>JJ Mehta, Manager-Projects and Engineering Lactose (India) Limited</p> <p>KM Patel, Engineer-Maintenance, Lactose (India) Limited</p> <p>MK Darji, Engineer-Maintenance Lactose (India) Limited</p>



Date	CPA Location	Team Members on-site	Subjects covered	Persons interviewed
				Prakash Patel, Boiler Operator Lactose (India) Limited NM Solanki, Stores In charge Lactose (India) Limited Dilip M Rathod, Villager, Poicha Indre Vadan, Villager, Poicha Dipak Shirsath, Executive-CDM, TSESL
21/11/2012	SKOL BREWERIES LIMITED, Aurangabad, Maharashtra	Sanjay Agarwalla		SV Patil, Boiler Operator, Skol Breweries Limited Ratnaparkhi, Boiler Operator, Skol Breweries Limited, Satish Shere, Villager, Waluj Sanjay Wakchaure, Assistant Manager-CDM, Skol Breweries Limited Bhushan Pachpande Manager-CDM, TSESL Aditya Nandanpawar, Executive-CDM, TSESL

For details of all the findings of the desk review and site visit<sup>4</sup>, please refer to the Verification Protocol and Findings in Appendix C1 to C11 & Appendix D.

### 3.4 Quality of evidence

When verifying the report emission reduction, LRQA ensured that there was a clear audit trail that contained the evidence and records that validate the stated figures. All source documents that form the basis for assumptions and other information underlying the GHG data is shown in Appendix A.

When assessing the audit trails, LRQA also examined:

1. whether sufficient evidence was available, both in terms of frequency and in covering the full monitoring period
2. the source and nature of the evidence

<sup>4</sup> Since CME is claiming CERs from CPAs (CPA No.1, 2, 3, 5, 6, 7, 9, 11, 12, 13 and 15) for this monitoring period, site visits were made only to these CPAs during the verification.



3. if comparable information was available from sources other than that used in the Monitoring Report, LRQA cross-checked the Monitoring Report against the other sources to confirm that the stated figures were correct. The sources and the data referenced are shown in Appendix A.

LRQA also assessed that the data collection system met the requirements of the monitoring plan as per the applied methodology.

### 3.5 Resolution of clarification and corrective action requests

LRQA, during this verification, identified issues related to the monitoring, implementation or operation of the CPA(s) included within the framework of the registered PoA that could impair the capacity of the CPA(s) to achieve emission reductions or influence the reporting of emission reductions. LRQA has identified, discussed and concluded these issues within the Verification Protocol and Findings – Appendix C1 to C11 & Appendix D.

LRQA has raised a Corrective Action Request (CAR) if one of the following occurred:

1. A non-compliance with the monitoring plan or methodology is found in the monitoring and reporting that has not been sufficiently documented by the project participants, or the evidence provided to prove conformity is insufficient
2. Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants
3. Mistakes have been made in applying assumptions, data or calculations in relation to emission reductions that will impact upon the quantity of emission reductions
4. Issues identified in a FAR during validation or previous verification(s) to be verified during verification have not been resolved by the project participants.

LRQA has raised a Clarification Request (CL) if information was insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

All CARs and CLs raised by LRQA during this verification have been resolved. If this was not completed, the ERs cannot be certified and recommended for issuance to the CDM Executive Board.

### 3.6 Internal quality control

The technical review by a qualified person independent from the verification team, and a review by an authorised decision maker are conducted before the submission of the verification report to the PP and before requesting the issuance of the verified ERs.

## 4 Verification protocol and conclusions

LRQA has undertaken this verification in accordance with the verification protocol(s) (which is based on the Clean Development Mechanism Validation and Verification Standard Version 02.0). This section provides an overview of the verification activities and general conclusions. Further details in relation to each element of the protocol and to each finding are shown in Verification Protocol and Findings – Appendix C1 to C11 & Appendix D.

The protocol is structured based on the main verification requirements as follows:

- compliance of the project implementation with the Included CPA-DD and registered PoA-DD.



- compliance of the monitoring plan with the monitoring methodology, including applicable tool(s)
- compliance of monitoring activities with the monitoring plan of the CPA-DD and PoA-DD
- compliance with the calibration frequency requirements for measuring instruments
- compliance of the implemented sampling procedure with the sampling plan (if any) of the CPA-DD and PoA-DD
- assessment data and calculation of emission reductions.

#### 4.1 Compliance of the project implementation with the registered project design document

LRQA has determined during the verification process that:

- The CPA(s) are implemented within the boundary of the PoA as described in the registered PoA-DD
- The CME is the same as that mentioned in the registered PoA-DD
- the implementation and operation of the project activity has been conducted in accordance with the description contained in the registered PoA-DD and included CPA-DD.

LRQA has, by means of a desk review and an on-site visit, assessed that:

- all physical features of the CPA(s) proposed in the included CPA-DD(s) are in place
- the project participants/CPA implementers have operated the CPA(s) as per the included CPA
- For details of the implementation status of the CPA(s), the actual operation of the proposed CPA, any information provided in the Monitoring Report that is different from that stated in the included CPA-DD<sup>5</sup>, and any approvals of the necessary request of notification or request for approval of changes, please refer to the Verification Protocol in Appendix C1 to C11 & Appendix D.

#### 4.2 Compliance of the monitoring plan with the monitoring methodology, including applicable tool(s)

LRQA has determined that the project implementation is in accordance with the provisions of the included CPA-DD(s) and registered PoA and has also verified that the validated monitoring plan is in accordance with the approved methodology applied by the proposed CDM project activity.

For details relating to this section, please refer to the Verification Protocol in Appendix C1 to C11 & Appendix D.

LRQA confirms that the monitoring plan(s) is in accordance with the approved methodology applied by the included CPA(s) and registered PoA.

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<sup>5</sup> And has caused an increase in estimates of the emission reductions in the current monitoring period or is highly likely to increase the estimates of emission reductions in future monitoring periods



#### 4.3 Compliance of monitoring activities with the registered monitoring plan

LRQA has confirmed that:

1. the monitoring plan(s) and the applied methodology(ies) have been properly implemented and followed by the project participants/CPA implementers.
2. all parameters stated in the monitoring plan, the applied methodology and relevant CDM Executive Board decisions, have been sufficiently monitored and updated as applicable, including:
  - a. project emission parameters
  - b. baseline emission parameters
  - c. leakage parameters
  - d. management and operational system
3. the accuracy of equipment used for monitoring is in accordance with the relevant guidance provided by the CDM Executive Board and is controlled and calibrated in accordance with the monitoring plan
4. monitoring results are consistently recorded as per approved frequency
5. quality assurance and quality control procedures have been applied in accordance with the monitoring plan.

For details relating to this section, please refer to the Verification Protocol in Appendix C1 to C11 & Appendix D.

LRQA confirms that monitoring has been carried out in accordance with the monitoring plan(s) contained in the included CPA-DD(s).

The list in the Verification Protocol – Appendix C1 to C11 shows each parameter required by the monitoring plan, and clearly states how LRQA has verified the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters, including the values in the Monitoring Report.

#### 4.4 Compliance with the calibration frequency requirements for measuring instruments

LRQA has determined that the calibration of measuring equipment has been conducted at the frequency specified in the applied monitoring methodology and in the registered monitoring plan(s).

For details relating to the frequency of calibration and any cases identified of delayed calibration, please refer to the Verification Protocol in Appendix C.

#### 4.5 Compliance of the implemented sampling procedure with the sampling plan (if any) of the CPA-DD and PoA-DD<sup>6</sup>

Not applicable as no sampling plan is specified in the registered PoA-DD and included CPA-DD(s).

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<sup>6</sup> Section 4.5 to be filled only in case a sampling plan is specified in the registered PoA-DD and included CPA-DD(s)





## 4.6 Assessment of data and calculation of emission reductions

LRQA has determined whether:

1. a complete set of data for the specified monitoring period is available
2. information provided in the Monitoring Report has been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis
3. calculations of baseline emissions, project emissions from the CPA(s) and leakage, as appropriate, have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document
4. any assumptions used in emission calculations have been justified
5. appropriate emission factors, IPCC default values and other reference values have been correctly applied.

For details of whether data was not available because activity levels or non-activity parameters were not monitored in accordance with the registered monitoring plan, a description of LRQA cross-checked reported data, please refer to the Verification Protocol in Appendix C1 to C11 & Appendix D.

LRQA confirms that appropriate methods and formulae for calculating baseline emissions, projects emissions and leakage have been followed.

LRQA is of the opinion that all assumptions, emissions factors and default values that were applied in calculations have been justified.

## 5 Making the monitoring report publicly available

In accordance with the "Procedures for making the Monitoring Report available to the public in accordance with paragraph 62 of the modalities and procedures for the CDM", the consolidated Monitoring Report for the PoA "Promotion of Biomass Based Heat Generation Systems in India" Version 01 dated 24/11/2012 was considered to be made publicly available on the CDM website on 19/10/2012<sup>7</sup> at:

<https://cdm.unfccc.int/Issuance/index.html>

There have been changes to the emission reductions as verified in the final version of the Monitoring Report as against the emissions reductions reported in the version 1.0 of the MR that was made publicly available as per the details below.

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<sup>7</sup> Although 17 CPAs are included under the PoA 4041, as on last date of this monitoring period i.e. till 31/08/2012, the CME has opted to claim CERs only from 11 CPAs (CPA Nos. 1, 2, 3, 5, 6, 7, 9, 11, 12, 13 and 15) for this monitoring period. During the verification, the CME has confirmed that the CME will not be claiming any CERs from the CPAs (4, 8, 10, 14, 16 and 17) for this monitoring period, in subsequent periodic verifications. Monitoring Reports for all 11 CPAs covered under this verification were submitted to the UNFCCC on 19/10/2012 by email, as interface for publishing the Monitoring Reports for CPAs under registered PoAs is still under development. The Monitoring Reports were published on 09/11/2012 on UNFCCC website. As per the email communication from UNFCCC CDM Secretariat dated 14/11/2012, the CME was requested to submit a consolidated Monitoring Report, for all CPAs covered under the first periodic verification. Subsequently a consolidated MR was submitted to the UNFCCC, which was duly acknowledged by CDM Secretariat and published on the UNFCCC website. It was confirmed by the CDM Secretariat that the Monitoring Report is considered to be "published" as of 19/10/2012.



CPA Ref. Number	ER as per MR Version 1 tCO <sub>2</sub> e	ER as per MR Version 4.0 tCO <sub>2</sub> e	Remarks
4041-0001	954	912	ER has changed due to consideration of weighted average of pressure and temperature for the calculation of enthalpy and also for consideration of leakage due processing of biomass. CAR 03 and CAR 04 may be referred to in this respect.
4041-0002	2,615	2,624	ER has changed due to consideration of weighted average of pressure and temperature for the calculation of enthalpy. CAR 03 may be referred to in this respect.
4041-0003	675	675	No change in ER
4041-0005	490	467	ER has changed due to consideration of weighted average of pressure and temperature for the calculation of enthalpy and also for consideration of leakage due processing of biomass. CAR 03 and CAR 05 may be referred to in this respect.
4041-0006	413	398	ER has changed due to consideration of weighted average of pressure and temperature for the calculation of enthalpy. CAR 03 may be referred to in this respect.
4041-0007	760	773	ER has changed due to consideration of weighted average of pressure and temperature for the calculation of enthalpy. CAR 03 may be referred to in this respect.
4041-0009	1,891	1,202	ER has changed due to consideration of weighted average of pressure and temperature for the calculation of enthalpy, incorrect usage of formulae for the incremental energy and non consideration of project emissions due to electricity consumption for the RO plant. CAR 03 and CAR 05 may be referred to in this respect.
4041-0011	2,024	1,969	ER has changed due to consideration of weighted average of pressure and temperature for the calculation of enthalpy and also for the heater of this project, data was not available for some periods during the monitoring period. CAR 03 may be referred to in this respect.
4041-0012	546	491	ER has changed due to consideration of weighted average of pressure and temperature for the calculation of enthalpy and also for consideration of leakage due processing of biomass. CAR 03 and CAR 05 may be referred to in this respect.
4041-0013	74	77	ER has changed due to consideration of weighted average of pressure and temperature for the calculation of enthalpy CAR 03 may be referred to in this respect.
4041-0015	33	3	ER has changed due to consideration of weighted average of pressure and temperature for the calculation of enthalpy and also for consideration of leakage due processing of biomass. CAR 03 and CAR 05 may be referred to in this respect.
Total	10,475	9,591	



## 6 Certification report

LRQA has undertaken the first periodic verification of the registered Programme of Activities “Promotion of Biomass Based Heat Generation Systems in India” PoA reference number 4041 covering the monitoring period from 12/01/2011 to 31/08/2012, based on the requirements of CDM as set out in Article 12 of the Kyoto Protocol, the CDM M&P, the present annex, subsequent decisions made by the COP/MOP and CDM-EB, and the other rules applicable to the CDM programme of activity(ies) including the host country’s legislation and its specific requirements for sustainable development.

Through the verification process, the verification team identified 8 CARs and 9 CLs. The PP has taken actions to address the CARs and CLs and submitted to LRQA the revised consolidated Monitoring Report for the PoA “Promotion of Biomass Based Heat Generation Systems in India” Version 4.0 dated 12/12/2012 and any other supporting evidence. All CARs and CLs have been appropriately closed before the issuance of the verification report.

The verification team is of the opinion that the CPA(s) have been implemented in accordance with the included CPA-DD(s) and registered PoA-DD, the MPs comply with the approved monitoring methodology, the monitoring complies with the MP(s) and the monitored data and calculation of ERs are assessed and confirmed as correct. Therefore LRQA certifies the emission reductions amounting to 9,591 tCO<sub>2</sub>e which includes:

- 912 tCO<sub>2</sub>e from the CPA “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 001) for the period 12/01/2011 to 31/08/2012
- 2,624 tCO<sub>2</sub>e from the CPA “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 002) for the period 31/03/2012 to 31/08/2012
- 675 tCO<sub>2</sub>e from the CPA “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 011) for the period 31/03/2012 to 31/08/2012
- 467 tCO<sub>2</sub>e from the CPA “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 004) for the period 01/05/2012 to 31/08/2012
- 398 tCO<sub>2</sub>e from the CPA “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 006) for the period 01/05/2012 to 31/08/2012
- 773 tCO<sub>2</sub>e from the CPA “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 007) for the period 01/05/2012 to 31/08/2012
- 1,202 tCO<sub>2</sub>e from the CPA “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 005) for the period 01/06/2012 to 31/08/2012
- 1,969 tCO<sub>2</sub>e from the CPA “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 010) for the period 01/06/2012 to 31/08/2012
- 491 tCO<sub>2</sub>e from the CPA “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 012) for the period 01/07/2012 to 31/08/2012
- 77 tCO<sub>2</sub>e from the CPA “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 013) for the period 01/07/2012 to 31/08/2012
- 3 tCO<sub>2</sub>e from the CPA “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 015) for the period 01/08/2012 to 31/08/2012



to the CDM Executive Board.

**Decision Maker**

Andrew Ritchie  
Climate Change Services Manager  
21<sup>st</sup> December 2012



## 7 Appendices

### 7.1 Appendix A: List of documents reviewed

#### **Category A documents (documents from the CME/PP/CPA Implementer)**

1	Consolidated Monitoring Report Version 1.0 dated 24/11/2012 <sup>8</sup> , Version 2.0 dated 02/12/2012, Version 3.0 dated 11/12/2012 and Version 4.0 dated 12/12/2012
2	Emission reduction spreadsheets for all CPAs Version 1.0 dated 18/10/2012, Version 2.0 dated 02/12/2012, Version 3.0 dated 11/12/2012 and Version 4.0 dated 12/12/2012
3	Proof of the commissioning for all boilers/heater under the CPAs considered for the first monitoring period from 12/01/2011 to 31/08/2012.
4	Records of the quantity of steam generated during the monitoring period for all CPAs
5	Records of the temperature of the steam generated during the monitoring period for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
6	Records of the temperature of the boiler feed water during the monitoring period for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
7	Records of the pressure of the steam generated during the monitoring period for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
8	Evidence of the types of biomass used in the project activity for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
9	Inventory records (opening balance, purchase quantity and the closing balance) of the biomass during the monitoring period for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
10	Records of the NCV/GCV of the biomass used for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
11	Records of the average round trip distance of the trucks used for transporting biomass briquette from the briquette manufacturing sites to the project site and records for the average round trip distance from the biomass collection points to briquette manufacturing sites for CPAs 0001, 0005, 0012 and 0015 and average round trip distance of the trucks used for transportation of biomass for CPAs 0002, 0003, 0006, 0007, 0009, 0011 and 0013 covered in this monitoring period from 12/01/2011 to 31/08/2012.
12	Records for the number of trips of the trucks made for transporting the biomass briquette to the project sites and biomass to briquette manufacturing sites for for CPAs 0001, 0005, 0012 and 0015 all number of trips of the trucks for transporation of biomass to the project sites for CPAs 0002, 0003, 0006, 0007, 0009, 0011 and 0013 covered in this monitoring period from 12/01/2011 to 31/08/2012.
13	Records of the emission factor of the fuel used in the trucks for the transportation of the biomass to the project site for all CPAs covered in this monitoring period from

<sup>8</sup> Initially CME had submitted separate MRs for the 11 CPAs proposed for verification (CPA Nos.1, 2, 3, 5, 6, 7, 9, 11, 13 and 15 version numbers 1.0, dated 18/10/2012 and CPA No. 12 version number 1.0, dated 09/10/2012) for this monitoring period. Monitoring Reports for all 11 CPAs covered under this verification were submitted to UNFCCC on 19/10/2012 by email, as interface for publishing the Monitoring Reports for CPAs under registered PoAs is still under development. The Monitoring Reports, were published on 09/11/2012 on UNFCCC website. As per the email communication from UNFCCC CDM Secretariat dated 14/11/2012, CME was requested to submit a consolidated Monitoring Report, for all CPAs covered under the first periodic verification. Subsequently a consolidated MR version 1.0, dated 24/11/2012 was submitted to the UNFCCC, which is duly acknowledged by CDM Secretariat and published on the UNFCCC website.



	12/01/2011 to 31/08/2012.
14	Records of the auxiliary grid electricity consumed in the project activity for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
15	Records of the auxiliary captive electricity consumed in the project activity for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
16	Calibration certificates for the following monitoring equipment for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012. <ul style="list-style-type: none"> <li>- steam flow meter</li> <li>- steam temperature measuring instrument</li> <li>- steam pressure measuring instrument</li> <li>- boiler feed water temperature measuring instrument</li> <li>- weighbridge</li> <li>- auxiliary electricity energy meter</li> </ul>
17	Technical specifications of the boiler/heater along with nameplate proof of rated capacity for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
18	Evidence for rated thermal capacity of the project boiler / heater
19	Data capturing and QA/QC procedures, roles and responsibilities of the company personnel for the project activity for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
20	Proof of statutory clearances for the project activity such as PCB clearance (consent to operate), Boiler certificate for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
21	Project lay out diagram for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
22	Purchase Order copies for the project equipment placed on Thermax Limited for all the CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
23	Proof of training and competency of the project operators for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
24	Proof of technical specifications of the monitoring equipment like steam flow meter, steam and boiler feed water temperature measuring instrument, steam pressure measuring instrument, weighbridge, electricity meter (covering make, accuracy class, meter standard, model number, multiplication factor, etc.) for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
25	Copy of Log of outages of the project plant for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
26	Single line diagram showing the flow of steam from the steam generation point till the steam consumption points along with the monitoring system for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012..
27	Declaration by PP stating non usage of any ODA fund for all CPAs covered in this monitoring period from 12/01/2011 to 31/08/2012.
28	Declaration by all the CPA (covered in this monitoring period from 12/01/2011 to 31/08/2012) Operators confirming that the steam produced by the project activity is not delivered to another consumer facility within or outside the project boundary.
29	Copy of management system manual of CME (in line with the requirement of § 16 and § 17 of Annex 03 , EB 65) for the PoA, version 01, 01/01/2012
30	Letter from Directorate of steam boilers, Govt. of Maharashtra, dated 17/07/2012 to Koprani for scrapping the existing FO fired 3 TPH boiler number MR/12579 for CPA no 4041-0012
31	Declaration from CME confirming that CME will not be claiming any CERs from the CPAs (4, 8, 10, 14, 16 and 17) for this monitoring period in subsequent periodic verifications.





32	Declaration from CME confirming the eligibility criteria numbers 1, 3.3, 3.4, 3.5, 16, 17 and 18 as stated in section B.2 of the CPAs are applicable for all the CPAs during the first monitoring period
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**Category B documents (other documents referenced)**

1	PoA-DD of Promotion of Biomass Based Heat Generation Systems in India. Version – 05, dated 31/08/2010			
2	CPA-DD generic “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number XXX). Version - 05 dated 31/08/2010			
3	Included real case CPA-DDs for following CPAs;			
	<b>CPA Number</b>	<b>Version No.</b>	<b>Dated</b>	<b>UNFCCC Reference No.</b>
	CPA 001	5	23/09/2010	4041-0001
	CPA 002	3	22/03/2012	4041-0002
	CPA 003	3	16/04/2012	4041-0004
	CPA 004	4	16/04/2012	4041-0005
	CPA 005	4	24/05/2012	4041-0009
	CPA 006	3	27/04/2012	4041-0006
	CPA 007	4	27/04/2012	4041-0007
	CPA 008	4	27/04/2012	4041-0008
	CPA 009	4	27/04/2012	4041-0010
	CPA 010	4	30/04/2012	4041-0011
	CPA 011	3	24/02/2012	4041-0003
	CPA 012	2	13/06/2012	4041-0012
	CPA 013	2	14/06/2012	4041-0013
	CPA 014	2	13/06/2012	4041-0014
	CPA 015	2	13/06/2012	4041-0015
	CPA 016	2	2/6/2012	4041-0016
	CPA 017	3	17/08/2012	4041-0017
4	AMS-I.C. “Thermal energy production with or without electricity” (Version 16)			
5	Validation report Report No: 8000374262 - 09/302 for the PoA, Dated 2010-10-25			
6	Validation reports for individual CPAs considered for verification.			
7	Guidelines for completing the monitoring report form Version 2.0 (EB 66 Annex 20)			
8	Tool to calculate baseline, Project and/or leakage emissions from electricity consumption” (version 01 EB 39 Annex 7)			
9	Tool to calculate the emission factor for an electricity system” (Version 02), EB 50 Annex 14			
8	General Guidance on leakage in Biomass Project activities” (Version 03); EB 47; Annex 28			
10	Tool to calculate Project or leakage CO2 emissions from fossil fuel combustion” (version 02) EB 4, Annex 11			
11	Validation and Verification Standard, Version 02.0			



## 7.2 Appendix B: Certificate of Appointment

### First periodic verification of “Promotion of Biomass Based Heat Generation Systems in India”

We hereby certify that the following personnel have engaged in the verification process that has fully satisfied the competence requirements of the verification of the programme of activities.

**Name of Person**

Sanjay Kumar Agarwalla

Archak Pattanaik

Syju Alias

S Saravanan

Rudra Charan Padhy

Prabodha C Acharya

Ramchandra Vyankatesh Nesari

Andrew Ritchie

**Assigned Roles**

Team Leader, CDM Verifier, Sector Expert

Team Member, CDM Verifier

Team Member, CDM Verifier

Sector Expert to verification team

Sector Expert to verification team

Technical Reviewer

Sector Expert to Technical reviewer

Decision Maker

Signed by

**Decision Maker**

Andrew Ritchie

Climate Change Services Manager

21<sup>st</sup> December 2012



### 7.3 Appendix C1: Verification Protocol for CPA 4041-0001

	Verified situation	Conclusion
<b>SECTION 1. Project implementation in accordance with the registered PoA-DD &amp; CPA-DD</b>		
<b>General description of the project</b>		
1.1. Does the MR provide general information of the CPA and is it as per the CPA-DD included by CDM-EB or by a DOE <sup>9</sup> ?	<p>Yes, the Monitoring Report<sup>10</sup> provides the general information of the CPA. Details such as Title of the CPA, UNFCCC registration reference number, version number of the Monitoring Report, monitoring period, project participants, sectoral scope and estimated amount of GHG emission reductions. All the above details can be confirmed from the included CPA-DD through link in UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/N1UVKCLWBFR1429JYHGP76XQEZD03A/view">http://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/N1UVKCLWBFR1429JYHGP76XQEZD03A/view</a></p> <p>Title of the CPA is “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 001)” and it was included along with the registration of the PoA on 12/01/2011 applying the baseline and monitoring methodology AMS-I.C, version 16 “Thermal energy production with or without electricity” as verified from the project page of the CPA. The project activity applies AMS-I.C, version 16. The project activity is installation and operation of a 4 TPH biomass briquette fired boiler to meet the captive requirement of steam in Thermal Processing of Seasonal Fruits like Mango, Guava, Papaya, Tomato etc. The project is located in Village- Gonde, Taluka- Sinnar, District- Nasik, Maharashtra. The project is implemented by Foods and Inns Limited.</p>	OK
1.2. Is the general information provided in the MR in line with the PoA-DD registered by CDM-EB?	<p>Yes, the Monitoring Report is as per the PoA-DD registered by CDM-EB confirmed from the registered PoA-DD through link on UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/N1UVKCLWBFR1429JYHGP76XQEZD03A/view">http://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/N1UVKCLWBFR1429JYHGP76XQEZD03A/view</a></p>	OK
1.3. Is the Monitoring Report as per the standardised format (F-CDM-MR)? (EB 66 )	Yes, the Monitoring Report is as per the latest standardised format (F-CDM-MR) version 02.0 (EB66, Annex 20).	OK

<sup>9</sup> The first CPA is included by the CDM-EB along with registered PoA-DD and subsequent CPAs are included by DOEs

<sup>10</sup> Monitoring Report for this CPA (CPA 4041-0001) refer to the Appendix-1 of the consolidated MR Version 4.0

	Verified situation	Conclusion
1.4. Is the Monitoring Report filled as per the "Guidelines for completing the Monitoring Report form" (EB 66, Annex 20).	Yes, the MR is filled up as per the latest "Guidelines for completing the Monitoring Report form" EB 66, Annex 20. CAR 08 was raised as project page of the PoA on UNFCCC web site, the "Other Parties involved" is stated as "United Kingdom of Great Britain and Northern Ireland" and "Germany". But in the MR "Germany" was missing. CAR was closed as the MR is suitably revised.	CAR08 OK
1.5. Is there any open issue in the validation / previous verification including FARs? (CDM VVS para. 213)	No No FAR was raised in the Validation report during the CPA inclusion by TUV Nord, the DOE for validation of the CPA. Further this being the first periodic verification, no open issues exists from earlier verification.	OK
<b>Implementation status of the CPA</b>		
1.6. Is the CPA location indicated same as that in the included CPA-DD? Confirm geographical coordinates	Yes, the project location is same as stated in the CPA-DD and this was verified during the on-site visit. The geographical coordinates of the project site are 19.78889° (19° 47' 20") North, 74.06667° (74° 04' 00") East. This was cross-checked from the Google Earth web site.	OK
1.7. Is the project boundary described in the same way as the included CPA-DD and registered PoA-DD? Please confirm each component based on the applied methodology.	Yes, the project boundary is described in the same way as in the included CPA-DD and registered PoA-DD. During the on-site assessment it was also confirmed the project boundary is in line with the applied methodology. The project boundary for this CPA includes the biomass storage area and feeding system, boiler house and the facility which is consuming the heat generated by the project.	OK
1.8. Has on-site fossil fuel consumption, if any, been monitored? Is any emission source missed? Check the site lay-out and confirm through site tour.	Fossil fuel consumption is required to be monitored in this project. It has been confirmed during the on-site visit and document review that no fossil fuel has been consumed at the CPA site by the project during the monitoring period. The verification team did not find any emission source attributable to the project activity which has been missed out and the same was confirmed during the on-site visit and review of the site lay-out diagram.	OK
1.9. Confirm contractors for equipment and installation works	It is confirmed that the project equipment i.e., 4 TPH boiler for the project is supplied by Thermax Limited and this was confirmed during the on-site visit interview with the project implementer and from the purchase order copy of the boiler issued by the project implementer dated 29/12/2007.	OK
1.10. Confirm conformance with baseline and monitoring methodology - Applicability	Conformance to the applicable methodology conditions for the CPA are as follows:	OK

	Verified situation		Conclusion
conditions. Please refer to the complete description of the applicability conditions and confirm that the CPA meets all the requirements.	<b>Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C., version 16)</b>	<b>Means of Verification and Results</b>	
	<i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>	The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.	
	<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>	The total installed / rated capacity of the project equipment is 2.51 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .	
	<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>	The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.	
	<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>	The project does not use any charcoal.	
	The verification team confirms that the CPA conforms to all applicable condition of the applied methodology.		
Apart from the baseline and monitoring methodology applicability criteria as stated above, the verification team also verified the eligibility criteria stated in section B.2 of the included CPA-DD under “Monitoring Criteria” for the point numbers 1, 3.3, 3.4, 3.5, 16, 17 and 18 and found these to be valid			

	Verified situation	Conclusion
	for the project activity during the monitoring period. A declaration letter dated 11/12/2012 in this respect has also been submitted by the CME.	
1.11. Confirm use or no use of public funding and determine if there is no diversion of ODA to the CPA.	There is no use of public funding for the CPA. The same was confirmed during the interview with the CME and also a declaration in this respect has been provided by the CPA implementer.	OK
1.12. Check data in the MR and in the CPA-DD. Describe data and variables that are different from that stated in the registered CPA-DD and cause an increase in emission reductions estimations.	<p>Data in the MR and CPA-DD fixed at validation stage are found to be consistent.</p> <p>The ex-ante estimated emission reductions during this monitoring period of 598 days are 8,524 tCO<sub>2</sub> (5203/365*598) and the actual emission reductions during this monitoring period are 912 tCO<sub>2</sub>. Hence the actual emission reductions during this monitoring are less than the estimated values as per the CPA-DD.</p> <p>However, the following findings were raised and successfully closed during the verification;</p> <ol style="list-style-type: none"> <li>1) CL 02 was raised as for the parameters like "CAP<sub>boiler</sub>" and "SEC<sub>PJ,y,measured</sub>" it was stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation.</li> <li>2) CL 05 was raised, as the NCV is taken directly taken from the laboratory report, values of parameters like hydrogen, oxygen and moisture content in the biomass are still reported in the MR, which is not required as per the registered CPA-DD.</li> </ol> <p>MR was suitably revised and the revised MR was found to be in line with the registered CPA-DD and above findings are closed.</p>	<p>CL02 CL05 OK</p>
1.13. By means of an on-site visit: Is the general information of the project provided in the Monitoring report and is it as per the CPA-DD registered by CDM-EB or by a DOE? List each technical component and equipment and check design parameters and actual	<p>Yes.</p> <p>The on-site visit for the CPA was conducted on 16/11/2012.</p> <p>The project activity comprises of the installation and operation of a 4 TPH biomass briquette fired boiler to meet the captive requirement of steam at the project site.</p> <p>During the verification, by the observation of equipment, interviews with relevant staff and the checking of technical specifications of main components, it was confirmed that the project activity has been implemented as described in the registered CPA-DD.</p>	<p>CAR 01 CAR 03 OK</p>

<sup>11</sup> The sampling shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified situation	Conclusion
<p>status of installation and / or operation.</p> <p>Please check to ensure that all physical features of the proposed CPA in the registered/included CPA-DD are in place and the PP has operated the proposed CPA as per the registered CPA-DD.</p> <p>It may include but not limited to:</p> <ul style="list-style-type: none"> <li>the actual capacity and output</li> <li>plant load factor</li> <li>type of feedstock</li> <li>operation of other components / units within the project boundary which could affect functioning of the project plant.</li> </ul> <p>In cases where there are a large number of components and equipment items and the check of all of them is not an available option, then a random sampling check shall be performed. Justify here the sample chosen and describe the results.<sup>11</sup></p>	<p>The project is operational. The project was commissioned on 05/05/2008 and the same was verified from the commissioning certificate issued by Thermax Limited.</p> <p>No change from the registered CPA-DD of physical features which may impact the emission reduction of the project activity has been identified.</p> <ul style="list-style-type: none"> <li>Steam generation unit : 4 TPH boiler</li> <li>Net enthalpy supply by project activity : The ex-ante estimated annual enthalpy output from the project boiler is 72.254 TJ as per the registered CPA-DD (which corresponds to 118.378 TJ for 598 days of this monitoring period) whereas actual enthalpy supplied by the boiler during this monitoring period was 13.097 TJ which is less than the ex-ante estimated value.</li> <li>Type of biomass fired in the boiler: As per the registered CPA-DD, biomass briquette is to be fired in the boiler and it was noted that there was no deviation in the biomass firing during the monitoring period.</li> <li>As per the registered CPA-DD, the project may fire fossil fuel (Coal) in the boiler. During this monitoring period, no fossil fuel has been fired in the project boiler as confirmed by the project implementer during the site visit.</li> </ul> <p>100% data is monitored for the CPA and hence no sampling plan is applicable.</p> <p>However, CAR 01 was raised as in section B.1 of the MR, the downtime of the project boiler was not provided. The MR was suitably revised to provide the breakdown details and the CAR was closed.</p> <p>Further, CAR 03 was raised as the PP has considered a simple average of steam pressure, temperature and boiler feed water enthalpy, which are used for the calculation of net enthalpy supplied by the project boiler. The calculation approach was revised and a weighted average was considered for emission reduction. The CAR 03 was successfully closed.</p>	
<p>1.14. Have responsibilities for monitoring been described and specified?</p>	<p>The responsibilities of monitoring have been provided and described in the Monitoring Report. The Monitoring Report and CDM documents clearly describe the responsibilities for monitoring.</p> <p>The project owner has identified the CDM team, the structure of which is given in the Monitoring Report. During the verification, responsibilities for operational personnel, technical and support team have been verified and confirmed.</p>	OK

	Verified situation	Conclusion
	The CDM team has been assigned the responsibility for measuring, recording and storage of the measured data. Data is kept in electronic format and paper format.	
1.15. Are the responsibilities and authorities for monitoring and reporting in line with those stated in the monitoring plan of the registered CPA-DD?	Yes, responsibilities and authorities for monitoring and reporting are in accordance with the registered CPA-DD.	OK
1.16. Check QA/QC, management systems. Are procedures described and specified in the MR? Are they consistently applied as described in the MP? a. documented instructions, management manual b. documentation c. data archiving d. monitoring report e. cross-checking f. energy balance analysis (as relevant) g. internal audits / verification and management review	<p>QA/QC procedures include staff training, instrument calibration, cross-checking and data/documents archiving. They are consistent with the monitoring plan.</p> <p>The Monitoring Report describes the monitoring system, monitoring procedures, data collection and reporting, responsibilities of relevant staff/departments, calibrations that were implemented and QA/QC procedures including data cross-checking.</p> <p>By means of document review, on-site assessment and interviews, the verification team has confirmed that all the QA/QC measures, data archiving, monitoring report and internal audits are as per the registered monitoring plan of the registered PoA-DD and the registered CPA-DD.</p> <p>However, CL 03 was raised as the "QA/QC procedure" &amp; "Purpose of data" for the quantity of biomass in the MR is mentioned as "NA" and the same is not consistent with the monitoring plan of the registered CPA-DD. The monitoring and recording frequency of these parameters was not mentioned in the MR. Also the values for these parameters as stated in the MR is incorrect as verified during the on-site visit and also with the documents provided.</p> <p>The MR was suitably revised to close the finding.</p>	CL-03 OK
1.17. Have the procedures for emergency and abnormal situations been established?	<p>As stated in section C of the MR, the procedure for non-conformance and corrective actions is in place for the project activity to mitigate any emergency and abnormal situations in monitoring as per the registered CPA-DD.</p> <p>During the monitoring period, no emergency situation in monitoring has occurred.</p> <p>However, CAR 07 was raised as the CME needed to clarify why the details of the backup monitoring instruments (for steam pressure and temperature and feed water temperature) were not provided in the MR. Adequate justification was provided by the CME and the CAR was closed.</p>	CAR-07 OK

	Verified situation	Conclusion
1.18. Has the system for qualification and training been established as relevant for the monitoring and management activities?	<p>The training and qualification of the project personnel has also been confirmed during interview of the operational personnel during the on-site visit. It is confirmed that they have sufficient knowledge, experience and competency to implement and maintain the plant operation including data monitoring and recording in line with the boiler operation and maintenance manual provided by the boiler supplier, and with CDM requirements.</p> <p>This is further verified by the evidence for training of the project personnel and the boiler attendants' certificates issued by Directorate of Steam Boilers (Government agency) for the boiler operators.</p>	OK
1.19. Check the environmental report, license, permit and compliance to the local environmental legislation (if relevant).	The verification team has confirmed that the project meets the relevant local environmental legislation. This was confirmed from the copy of the consent to operate issued by Maharashtra Pollution Control Board valid from 29/10/2010 to 30/09/2014. Also, a copy of certificate for the use of the boiler for the period from 02/03/2010 to 01/03/2011, 21/02/2011 to 20/02/2012 and 22/02/2012 to 21/10/2013 issued by Directorate of Steam Boilers Department has been submitted.	OK
1.20. Check contribution to sustainable development, comparing those expected in the included CPA-DD and the actual status.	<p>With the provision of employment opportunities by the project activity, there has been a contribution for the social and economic well-being of some local people.. The project utilises renewable biomass to produce steam (thereby avoiding the fossil fuel usage) and this leads to environment well being by reduced environmental impact from fossil fuel use. Also the project uses renewable biomass technology which is deemed as a clean (as it displaces fossil fuel usage) and safe technology.</p> <p>Even though the sustainable development measures were not registered in the CPA-DD as a monitoring parameter, it was confirmed during the site visit that the CPA contributes to the sustainable development of the host country.</p>	OK
1.21. Check issues with local stakeholders, claims, complaints, etc.	It was confirmed by on-site interviews that there had been no claims and complaints from local stakeholders prior to the verification visit.	OK
<p>1.22. If from the above assessment the conclusion is that the implementation or operation of the CPA does not conform with the description contained in the included CPA-DD and/or corrections have been made to project information or parameters fixed at validation/inclusion, determine if these changes and/or corrections do not require prior approval by the board:</p> <ul style="list-style-type: none"> <li>- A request of approval is required if the boundary of a registered CDM PoA is changed to include an additional host party, in accordance with the project cycle procedure.</li> <li>- A request for approval is required if the CME of a registered CDM PoA changes after the registration of the PoA.</li> <li>- Any corrections to project information of an included CPA that do not affect the design of the project activity do not require prior approval by the Board.</li> <li>- A request for approval is required if any of the three issues below is adversely impacted by the identified changes to the project design.</li> </ul>		

	Verified situation	Conclusion	
1.23. The applicability and application of the applied methodology under which the CPA has been included:  Check if the project boundary has changed and if any of the parameters to assess the applicability conditions have changed.	No change in applicability and application of the applied methodology AMS-I.C. version 16, including the project boundary, is observed.	YES	NO
			X
1.24. Compliance of the included CPA to eligibility criteria as defined in the registered PoA-DD.  Check if any of the parameters to assess the PoA eligibility criteria have changed.	No change in the eligibility criteria of the registered CPA, as defined in the registered PoA-DD, is observed.	YES	NO
			X
1.25. The additionality of the project activity:  Check if any of the input parameters to the investment analysis have changed. For barrier analysis, check if any information or data used in the barrier analysis has changed.	There is no change in the project design parameters as the project is implemented as per the registered CPA-DD. Hence this is not applicable.	YES	NO
			X
1.26. The scale of the project activity.  Check if the project is still small scale or large scale after the implementation of the changes.	Small scale, as per the eligibility criteria for CPA inclusion and is in accordance with the methodology AMS-I.C, version 16.	YES	NO
			X
If the answer to any of the above items is YES, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			



	Verified situation	Conclusion
1.27. If, from the above assessment, the conclusion is that the changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA

	Verified Situation	Conclusion
<b>SECTION 2. Compliance of the Monitoring Plan with the Monitoring Methodology including applicable Tool(s)</b>		
2.1. Is the monitoring plan of the included CPA-DD in accordance with the applied methodology?	Yes, it is confirmed that monitoring plan of the registered CPA-DD is in accordance with the applied methodology, AMS-I.C, version 16.	OK
2.2. If the methodology provides different options (for example, use of default values or on-site measurements), has the Monitoring Report specified which option is used?	<p>Yes,</p> <p>The ex-ante parameters which are fixed for the crediting period at the time of CPA inclusion in the PoA as per the methodological tools are:</p> <ul style="list-style-type: none"> <li>• <math>CAP_{\text{boiler}}</math> (Rated capacity (thermal output) of the boiler of the Project activity)</li> <li>• <math>\eta_{\text{BL,thermal}}</math> (The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity)</li> <li>• <math>EF_{\text{FF,CO}_2}</math> (<math>\text{CO}_2</math> Emission Factor of the fossil fuel (Furnace Oil) that would have been used in the baseline plant)</li> <li>• <math>SA_k</math> (Surplus availability of Biomass within 50 km radial distance)</li> <li>• <math>EF_{\text{grid,CM,y}}</math> (ex-ante Grid Emission Factor in a year y)</li> <li>• <math>EF_{\text{EL,j,y}} = EF_{\text{EL,l,y}}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)</li> <li>• <math>EC_{\text{LE,l,y}}</math> (Auxiliary Electricity Consumption for biomass processing, outside Project boundary)</li> <li>• <math>EF_{\text{km,CO}_2}</math> (Average <math>\text{CO}_2</math> emission factor for the trucks measured during the year y)</li> <li>• <math>TDL_{i,y} = TDL_{j,y}</math> (Average technical transmission and distribution losses for providing electricity to source l and/or j in year y)</li> <li>• <math>SEC_{\text{PJ,j,y,measured}}</math> (Specific energy consumption of fuel type j of the Project activity in year y)</li> </ul> <p>Further, the verification team confirms that there is no deviation in the values of the ex-ante fixed parameters between the registered CPA-DD and the MR.</p> <p>The parameters being monitored ex-post as per the monitoring methodology and the CPA-DD are:</p> <ul style="list-style-type: none"> <li>• Quantity of steam supplied in year y (<math>Q_{\text{steam}}</math>)</li> <li>• Steam Temperature at MSSV (Main steam stop valve) outlet during year (<math>T_{\text{steam}}</math>)</li> <li>• Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year</li> </ul>	<p>CL-05</p> <p>OK</p>

	Verified Situation	Conclusion
	<p>(<math>P_{\text{steam}}</math>)</p> <ul style="list-style-type: none"> <li>• Feed Water Temperature at inlet of boiler (<math>T_{\text{FWB}}</math>)</li> <li>• Boiler operating hours of the project activity in year y (<math>h_y</math>)</li> <li>• Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob},k}</math>)</li> <li>• Quantity of subsequent delivery of fuel type k biomass at the Project site (<math>Q_{\text{np},k}</math>)</li> <li>• Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in},k}</math>)</li> <li>• Quantity of biomass fuel type k consumed during the monitoring period (<math>Q_{\text{c},k} = \text{FC}_{\text{biomass},k,y}</math>)</li> <li>• Quantity of stored fuel type fossil (Coal) i on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob},i}</math>) *</li> <li>• Quantity of subsequent delivery of fuel type fossil fuel (Coal) i (<math>Q_{\text{np},i}</math>) *</li> <li>• Quantity of remaining fossil fuel type (coal) i available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in},i}</math>) *</li> <li>• Quantity of fossil fuel type i (Coal) consumed during the monitoring period (<math>Q_{\text{c},i} = \text{FC}_{\text{fossil},i,y}</math>) *</li> <li>• Net calorific value of biomass fuel k used in the Project activity.( <math>\text{NCV}_k</math>)</li> <li>• Percentage of hydrogen in biomass fuel (Hydrogen) **</li> <li>• Percentage oxygen in Biomass fuel (Oxygen) **</li> <li>• Moisture content of the biomass residues (Moisture) **</li> <li>• Weighted average net calorific value of the fuel (coal) type i in year y (<math>\text{NCV}_{i,y}</math>) *</li> <li>• Quantity of fossil fuel (Furnace oil) type i consumed in a process j during the year y (<math>\text{FC}_{i,j,y}</math>) *</li> <li>• Auxiliary Electricity Consumption of the Project activity from the Grid in year y (<math>\text{EC}_{\text{PJ},j,y}</math>)</li> <li>• Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) in a year y (<math>\text{EC}_{\text{EL},j,y}</math>)</li> <li>• Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y (<math>\text{AVD}_{y,y}</math>)</li> <li>• Number of truck trips during the year y (<math>N_y</math>)</li> </ul>	

	Verified Situation	Conclusion
	<ul style="list-style-type: none"> <li>• Average round trip distance (from and to) between the biomass fuel supply sites and the site of biomass processing in year y (<math>AVD_{c,y}</math>)</li> <li>• Number of truck trips during the transportation of biomass to the biomass processing site in year y (<math>N_{c,y}</math>)</li> <li>• Weighted average mass fraction of carbón in fuel type i in year y (<math>w_{C,i,y}</math>) *</li> <li>• Weighted average CO<sub>2</sub> emission factor of fuel type i in year y (<math>EF_{CO2,i,y}</math>)</li> </ul> <p>These parameters are based on on-site measurement and have been verified during this verification.</p> <p>* No fossil fuel has been fired in the project boiler during this monitoring period</p> <p>** The laboratory report has directly provided the value of NCV. Hence Hydrogen, Oxygen and moisture are not required (which would be required in case NCV is not reported directly by the laboratory and needs to be calculated from GCV and the above three parameters)</p> <p>However, CL 05 was raised, since the NCV was taken directly from the laboratory report, yet the values of parameters like hydrogen, oxygen and moisture content in the biomass were reported in the MR, which is not required as per the registered CPA-DD. MR was suitably revised and the finding was closed.</p>	
2.3. Is all data collected and archived according to the tables in the applied Monitoring Methodology and is this included in the Monitoring Plan?	Yes, all the data is collected and archived in accordance to methodology and included in the monitoring plan. All the data will be archived until 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.	OK
2.4. Check the calculation of emission reductions following the applied methodology: <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and applied for the project activity are as follows:</p> <p><b>Baseline emissions:</b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where,</p>	CL04 OK

	Verified Situation	Conclusion
	<p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity during the year y (tCO<sub>2</sub>)</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity during the year y (TJ)</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant; tCO<sub>2</sub> / TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity</p> <p><math>EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}</math></p> <p>where,</p> <p><math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{steam}</math> = Quantity of steam supplied in Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet (kCal/kg)</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg)</p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p><math>PE_{EC,y} = EC_{PJ,j,y} * EF_{grid,CM,y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})</math></p> <p>where</p> <p><math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid in year y</p> <p><math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set)</p> <p><math>EF_{grid,CM,y}</math> (Ex-ante Grid Emission Factor in a year y)</p> <p><math>EF_{EL,j,y} = EF_{EL,I,y}</math> (Emission Factor for fossil fuel based electricity generation for</p>	

	Verified Situation	Conclusion
	<p>source j and/or l in year y)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j in year y</p> <p><u>Project emissions from fossil fuel combustion</u></p> <p><math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math></p> <p>where</p> <p><math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p><math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)</p> <p><math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)</p> <p><math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math></p> <p>where</p> <p><math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)</p> <p><math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)</p> <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math></p> <p><b><u>Leakage:</u></b></p> <p><math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math></p> <p><math>= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVDC_{y,y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km, CO2}</math></p> <p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption in year y (tCO<sub>2</sub>/yr)</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p>	

	Verified Situation	Conclusion
	<p><math>LE_{\text{transportation}, y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p><math>EC_{LE, l, y}</math> = Net increase in electricity consumption of source <math>l</math> in year <math>y</math> as a result of leakage (MWh/yr)</p> <p><math>EF_{EL, l, y}</math> = Emission factor for electricity generation for source <math>l</math> in year <math>y</math> (tCO<sub>2</sub>/MWh)</p> <p><math>TDL_{l, y}</math> = Average technical transmission and distribution losses for providing electricity to source <math>l</math> in year <math>y</math></p> <p><math>N_{c, y}</math> = Number of truck trips for collecting loose biomass during the year <math>y</math></p> <p><math>AVD_{c, y}</math> = Average round trip distance between the biomass fuel supply sites and biomass collection site during the year <math>y</math></p> <p><math>EF_{km, CO_2}</math> = Average CO<sub>2</sub> emission factor for the trucks measured during year <math>y</math></p> <p><math>N_{, y}</math> = Number of truck trips during the year <math>y</math></p> <p><math>AVD_{, y}</math> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant during year <math>y</math> (km)</p> <p>Emission reductions are calculated as follows:  <math>ER_y = BE_y - PE_y - LE_y</math></p> <p>CL 01 was raised as, in section E.5 of the MR, the calculation of the ex-ante emission reductions was not transparently presented. The revised MR clearly and transparently describes the ER calculation approach providing relevant equations in line with the included CPA-DD.</p>	
<p>2.5. List any monitoring aspect that is not specified in the methodology and check its compliance with the Monitoring Plan, for example:</p> <ul style="list-style-type: none"> <li>• additional monitoring parameters</li> <li>• monitoring frequency</li> <li>• calibration frequency.</li> </ul>	<p>No additional monitoring parameter is identified that is not specified in the approved methodology and the registered CPA-DD available in the project page on UNFCCC website.</p> <p>The monitoring frequency and the calibration frequency specified are not less than the requirements of the approved methodology and the Monitoring plan in the included CPA-DD.</p>	OK

	Verified Situation	Conclusion
<b>SECTION 3. Compliance of Monitoring activities with the Monitoring Plan of the included CPA-DD</b>		
<p>3-1. Is the Monitored Data included in the Monitoring Report as per the Monitoring Plan or any accepted revised MP?</p> <p>3-2. Has the data been generated at the frequency required by the Monitoring Plan or any accepted revised MP?</p>	<p>Yes</p> <p>The monitored data included in section D.2 of the MR is as per the monitoring plan of the registered CPA-DD.</p> <p>The values are indicated in the section D.2 of the Monitoring Report. At the site visit it was verified that data was generated at the required frequency as per the monitoring plan in the included CPA-DD.</p>	OK
<p>3-3. Has the monitoring been implemented in accordance with the monitoring plan contained in the included CPA-DD or any accepted revised MP?</p> <p>Confirm that the monitoring and reporting procedures have been implemented as documented and follow by PPs.</p>	<p>Yes, by means of document review, on-site assessment and interviews with the plant personnel, it was confirmed that the monitoring has been implemented in accordance with the monitoring plan contained in the registered CPA-DD.</p> <p>It was also established that monitoring and reporting procedures have been implemented as documented by the CME and the CPA operator.</p>	OK
<p>3-4. Have types of measurement instrumentation used been described and specified?</p>	<p>Yes, the MR specifies and describes the use of different measurement instruments (Steam flow meter, RTD / Temperature gauge, Pressure transmitter / Pressure gauge, energy meter and weighbridge). The details of the measuring equipment are provided in the "Annex-1_4041-0001: Instrument Details" of the MR. The provided details have been verified during the on-site visit.</p>	OK
<p>3-5. Is the accuracy of equipment used for monitoring sufficient and regularly controlled and calibrated in line with the registered monitoring plan or any accepted revised MP?</p> <p>Check relevance of maintenance and calibration included in the monitoring plan.</p> <p>Check relevance of laboratory analysis if included in the monitoring plan.</p>	<p>Yes, the verification team confirmed through the on-site assessment and the review of evidence that the installation of the measuring devices has been completed and the equipment has been operated and maintained in normal operating conditions.</p> <p>The accuracy classes of all the monitoring equipment are found as per the monitoring plan of the registered CPA-DD, or of higher accuracy as detailed in "Annex-1_4041-0001: Instrument Details" of the MR.</p> <p>It was confirmed that the information of the meters was consistent with that described in the Monitoring Report.</p> <p>The CME has provided the calibration certificates of all the monitoring equipment and the verification team confirms the certificates to be appropriate and relevant.</p> <p>For further details of the calibration of the monitoring equipment please refer to section 3.19 of this report below.</p>	<p>CL-07</p> <p>OK</p>



	Verified Situation	Conclusion
	CL 07 was raised as the CME has not provided the credentials of the calibrating agencies and the laboratories which have carried out the NCV analysis. Adequate information was provided by the CME and the CL was closed. For details please refer to Appendix D of this report.	
3-6. If the monitoring plan of the CPA-DD refers to a sampling plan and monitoring is carried out for the chosen samples, ensure that the sampling is carried out as per the sampling plan <sup>12</sup> .	The monitoring plan of the CPA-DD does not refer to a sampling plan and the monitoring is carried out for 100% data for all the monitoring parameters.	NA
3-7. Check that responsibilities and authorities for monitoring and reporting are in line with the monitoring plan.  Are the monitoring results consistently recorded, reviewed and approved as stated in the CPA-DD or any accepted revised MP?	Yes During the site visit, monitoring and reporting procedures were confirmed by the verification team through interview with the relevant plant personnel, CME and by document review. However, the following CAR/CLs were raised and successfully closed; <ul style="list-style-type: none"> <li>CAR 02 was raised as the opening readings of the parameter "Q<sub>steam</sub>" and closing readings of the parameters "EC<sub>PJ,j,y</sub>" and "EC<sub>EL,j,y</sub>" have not been presented to the verification team.</li> <li>CL 02 was raised as for the parameters like "CAP<sub>boiler</sub>" and "SEC<sub>PJ,y,measured</sub>" CME had stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation.</li> <li>CL 05 was raised, since the NCV is taken directly taken from the laboratory report, however the values of parameters like hydrogen, oxygen and moisture content in the biomass were reported in the MR, which is not required as per the registered CPA-DD.</li> </ul> MR was suitably revised and the revised MR was found to be in line with registered CPA-DD. For details please refer to Appendix D of this report.	<del>CAR-02</del> <del>CL-02</del> <del>CL-05</del> OK
3-8. Reporting period: Defined?  If a monitoring period of a parameter more / less than	The monitoring period for the PoA and this CPA is from 12/01/2011 to 31/08/2012. Hence the monitoring period for the CPA is for 598 days which is more than a year. However, monitoring of all the parameters is complete, as there is no specific	<del>CL-09</del> OK

<sup>12</sup> The sampling plan shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified Situation	Conclusion
<p>a year is applied, check if the monitoring is in a complete and consistent manner?</p> <p>Is the monitoring period within the crediting period of the CPA and length of the registered PoA?</p>	<p>requirement in the methodology for annual reporting of any data. The verification team therefore confirms the monitoring to be complete and consistent and clearly defined in the MR.</p> <p>The monitoring period is within the crediting period of the CPA and also the length of the registered PoA.</p> <p>CL 09 was raised as the monitoring period of the CPA is not consistent with that of the PoA in the webhosted MR. The issue has been addressed and the finding was successfully closed.</p>	
<p>3-9. If the monitoring plan includes the determination of environmental and / or social indicators, have the sustainable development indicators been monitored in accordance with the monitoring plan of the included CPA-DD?</p>	Not applicable	NA
<p>3-10. Check monitoring of Environmental and Social indicators (if relevant)</p> <ul style="list-style-type: none"> <li>• implementation of measures</li> <li>• monitoring equipment</li> <li>• quality assurance procedures</li> <li>• external data.</li> </ul>	Not applicable	NA

	Verified Situation	Conclusion	
<b>SECTION 2 and 3: Post Registration Changes</b>			
<p>3-11. If, from the above assessment in SECTIONS 2 and 3, the conclusion is that there are temporary deviations or permanent changes from the registered Monitoring Plan or Monitoring Methodology, determine if these deviations or changes require prior approval by the EB by answering the questions below. All the answers to the applicable questions below shall be explained and the reasons for each conclusion given in the "Verified situation" column.</p>			
<p><b>Temporary deviations from the registered monitoring plan or applied methodology:</b>  Prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES.</p>			
3-12. Have the PPs reported as zero any parameter related to baseline GHG emissions that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?	No temporary deviation is sought during this monitoring period	YES -	NO -
3-13. Have the PPs estimated (assuming that the source of the project GHG emissions operated at maximum capacity for the full period of the missing data) any parameter that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?  For project GHG emissions related to the consumption of electricity, the estimate shall include an addition of 10% to account for transmission and distribution losses.	No temporary deviation is sought during this monitoring period	YES -	NO -
<b>Permanent changes from the registered monitoring plan or applied methodology</b>			
<p>If the monitoring equipment actually installed has a lower accuracy level than the accuracy stipulated in the applied methodology and/or in the registered monitoring plan, and the monitoring equipment is under the control of the project participants, prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES:</p>			
3-14. Have the PPs deducted from the measured value, for any parameter used for calculating baseline GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES -	NO -
3-15. Have the PPs added to the measured value, for	No permanent change in the monitoring plan is observed during this monitoring	YES	NO

	Verified Situation	Conclusion	
any parameter used for calculating project GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	period	-	-
Changes to the monitoring of the included CPA of a type listed below do not require approval by the EB. Confirm in the conclusion column that the change is of the type in the table below and explain the reasons.			
3-16. Change of calibration frequency or practice for monitoring equipment not within the control of project participants	Not Applicable	NA	
3-17. Change of accuracy / type / model of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
3-18. Change of location of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
If the answer to any of the above items has been that approval from the EB is required, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
3-19. If, from the above assessment, the conclusion is that the temporary deviations or permanent changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	

### 3.19 Monitoring Parameters and Calibration Checklist:

Complete the following table for each parameter:

Data / Parameter (as in the MP)		Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Value	Ex-ante	28,621 per annum	179.88
	Ex-post	5,235.04	177.54 <sup>13</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		As per the monitoring plan of the registered CPA-DD, the quantity of steam delivered by the project is measured by duly calibrated steam flow meter and the calibration certificate has been verified.  Further, the verification team cross-checked the quantity of steam delivered by the project activity during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the registered CPA-DD, the steam temperature is measured by duly calibrated RTD and the calibration certificate has been verified.  Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Steam flow meter Sr. No.: N1-W728-9026162	RTD Sr. No.: 082783
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		± 2% Maximum (which is better than that stated in the CPA-DD of ±3%)	Class B_(which is same as stated in the CPA-DD)

<sup>13</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised and successfully closed by the CME.

Data / Parameter (as in the MP)	Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Period of operating time	12/01/2011 to 31/08/2012	12/01/2011 to 31/08/2012
Instrument type	Steam flow meter	RTD
Manufacturer, model and serial number	Make: Siemens; Sr. No.: N1-W728-9026162	Make: Eureka; Sr. No.: 082783
Specific location	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler
Calibration dates	20/09/2010 (valid till 19/09/2011) ; 20/04/2011 (valid till 19/04/2012) & 20/04/2012 (valid till 19/04/2013)	02/07/2010 (valid till 01/07/2011); 20/04/2011 (valid till 19/04/2012) & 20/04/2012 (valid till 19/04/2013)
Company performing the calibration	On 20/09/2010 by Samartha Services (National Accreditation Board for Testing and Calibration Laboratories (NABL) accredited agency) On 20/04/2011 and 20/04/2012 by Prajyo Instrument and Maintenance Services (NABL accredited agency)	On 02/07/2010 by Samartha Services (NABL accredited agency) On 20/04/2011 and 20/04/2012 by Prajyo Instrument and Maintenance Services (NABL accredited agency)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the registered CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturer's specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the registered CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The Steam flow meter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P <sub>steam</sub> ” (kg/cm <sup>2</sup> g)	Feed Water Temperature at inlet of boiler “T <sub>FWB</sub> ” (°C)
Value	Ex-ante	9.0	60
	Ex-post	9.22 <sup>14</sup>	65.55 <sup>15</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		As per the monitoring plan of the registered CPA-DD, the steam pressure is measured by duly calibrated pressure transmitter and the calibration certificate has been verified. Further, the verification team cross-checked the steam pressure during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the registered CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the feed water temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Pressure transmitter Sr. No. A2B/W6135512	RTD Sr. No. 13141
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		± 2% (which is same as stated in the CPA-DD)	Class B (which is same as stated in the CPA-DD)
Period of operating time		12/01/2011 to 31/08/2012	12/01/2011 to 31/08/2012

<sup>14</sup> The value is the weighted average of the daily recorded pressure readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised and successfully closed by the CME.

<sup>15</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised and successfully closed by the CME.

<b>Data / Parameter (as in the MP)</b>	<b>Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P<sub>steam</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Feed Water Temperature at inlet of boiler “T<sub>FWB</sub>” (°C)</b>
Instrument type	Pressure transmitter	RTD
Manufacturer, model and serial number	Siemens; Sr. No. A2B/W6135512	Eureka; Sr. No. 13141
Specific location	Project site, at the Main Steam Stop Valve (MSSV)	Project site, after the boiler feed water tank at the inlet of the boiler
Calibration dates	20/09/2010 (valid till 19/09/2011); 20/04/2011 (valid till 19/04/2012) & 20/04/2012 (valid till 19/04/2013)	02/07/2010 (valid till 01/07/2011); 20/04/2011 (valid till 19/04/2012) & 20/04/2012 (valid till 19/04/2013)
Company performing the calibration	On 20/09/2010 by Samartha Services (NABL accredited agency) On 20/04/2011 and 20/04/2012 by Prajyo Instrument and Maintenance Services (NABL accredited agency)	On 02/07/2010 by Samartha Services (NABL accredited agency) On 20/04/2011 and 20/04/2012 by Prajyo Instrument and Maintenance Services (NABL accredited agency)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the registered CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the registered CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification, local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The pressure transmitter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk



Data / Parameter (as in the MP)		Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q <sub>ob,k</sub> ” (Tonnes)	Quantity of subsequent delivery of fuel type k biomass at the Project site “Q <sub>np,k</sub> ” (Tonnes)
Value	Ex-ante	NA	NA
	Ex-post	8.96	1111.32
Measuring / Monitoring frequency		At the start of the monitoring period	Data is monitored and recorded for each truck delivery
Reporting frequency		Once during the monitoring period	Each truck trip
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		The opening balance of the biomass is measured by a calibrated weighbridge	Biomass procured is measured for each truck entering the plant premises by a calibrated weighbridge
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Weighbridge; Sr. No. 161200	Weighbridge; Sr. No. 161200
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		Class III <sup>16</sup>	Class III <sup>17</sup>
Period of operating time		12/01/2011 to 31/08/2012	12/01/2011 to 31/08/2012
Instrument type		Weighbridge	Weighbridge
Manufacturer, model and serial number		Endeavour; Sr. No. 161200	Endeavour; Sr. No. 161200
Specific location		At project site	At project site

<sup>16</sup> In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable.

<sup>17</sup> In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable.

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Calibration dates	17/06/2010 (valid till 16/06/2011); 30/06/2011 (valid till 29/06/2012) and 21/06/2012 (valid till 20/06/2013)	17/06/2010 (valid till 16/06/2011); 30/06/2011 (valid till 29/06/2012) and 21/06/2012 (valid till 20/06/2013)
Company performing the calibration	Weights and Measure Department, Govt. of India	Weights and Measure Department, Govt. of India
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.
Is calibration valid for the whole reporting period?	No. The weighbridge was in use during this monitoring period beyond the due date of calibration from 17/06/2011 to 29/06/2011. But for this parameter, error will not impact the measurement, as this was done for the opening balance of biomass on the start date of monitoring period and at the time when the weighbridge was within the due date of calibration.	No. The weighbridge was in use during this monitoring period beyond the due date of calibration from 17/06/2011 to 29/06/2011. Hence as per para 238 of VVS, version 02.0 error has been applied (maximum permissible error as per the accuracy class of the weighbridge as the calibration report of 30/06/2011 did not have error more than the accuracy class of the weighbridge) in a conservative manner to calculate the amount of biomass procured during that period. For details of the calculation, please refer to the ER spreadsheet. The error has not affected the overall emission reductions since it was already rounded down for conservative estimation.
Maintenance	The weighbridge was functional throughout the monitoring period	The weighbridge was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q <sub>in,k</sub> ” (Tonnes)	Quantity of biomass fuel type k consumed during the monitoring period “Q <sub>c,k</sub> ” = “FC <sub>biomass,k,y</sub> ” (Tonnes)
Value	Ex-ante	NA	6,171 per annum
	Ex-post	8.65	1,111.63
Measuring / Monitoring frequency		Measured at the end of the monitoring period	Calculated from the opening, received and closing balance of the biomass during the monitoring period
Reporting frequency		Once during the monitoring period	At the end of the monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		The closing balance of the biomass is measured by a calibrated weighbridge	The quantity of biomass consumed is cross- checked with the invoices obtained from the fuel supplier and found to match
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Weighbridge; Sr. No. 161200	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		Class III <sup>18</sup>	NA
Period of operating time		12/01/2011 to 31/08/2012	NA
Instrument type		Weighbridge	NA

<sup>18</sup>In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable.

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “<math>Q_{in,k}</math>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “<math>Q_{c,k}</math>” = “<math>FC_{biomass,k,y}</math>” (Tonnes)</b>
Manufacturer, model and serial number	Endeavour; Sr. No. 161200	NA
Specific location	At project site	NA
Calibration dates	17/06/2010 (valid till 16/06/2011); 30/06/2011 (valid till 29/06/2012) and 21/06/2012 (valid till 20/06/2013)	NA
Company performing the calibration	Weights and Measure Department, Govt. of India	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices).	NA
Is calibration valid for the whole reporting period?	No. The weighbridge was in use during this monitoring period beyond the due date of calibration from 17/06/2011 to 29/06/2011. But for this parameter, error will not impact the measurement, as this was done for the opening balance of biomass on the start date of monitoring period and at the time when the weighbridge was within the due date of calibration.	NA
Maintenance	The weighbridge was functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low Risk as this data is not used for emission reduction calculation.

Data / Parameter (as in the MP)		Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q <sub>ob,i</sub> ” (Tonnes)	Quantity of subsequent delivery of fuel type fossil fuel i “Q <sub>np,i</sub> ” (Tonnes)
Value	Ex-ante	-	-
	Ex-post	0	0
Measuring / Monitoring frequency		Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double- checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA
Company performing the calibration		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site "<math>Q_{ob,i}</math>" (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i "<math>Q_{np,i}</math>" (Tonnes)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site "<math>Q_{in,i}</math>" (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period "<math>Q_{c,i}</math>" = "<math>FC_{i,PJ,y}</math>" (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	0
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site "<math>Q_{in,i}</math>"  (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period "<math>Q_{c,i}</math>" = "<math>FC_{i,P,J,y}</math>"  (Tonnes)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Net calorific value of biomass fuel k used in the Project activity “NCV <sub>k</sub> ”  (TJ/Gg)	Percentage of hydrogen in biomass fuel “Hydrogen”  (%)
Value	Ex-ante	-	-
	Ex-post	15.39	- <sup>19</sup>
Measuring / Monitoring frequency		Annually once	Annually once
Reporting frequency		Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		The NCV analysis is carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA

<sup>19</sup> This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report



<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “NCV<sub>k</sub>”  (TJ/Gg)</b>	<b>Percentage of hydrogen in biomass fuel “Hydrogen”  (%)</b>
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	NA
Key reporting risks	Low risk	NA

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen”  (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Value	Ex-ante	-
	Ex-post	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency	Annually once	Annually once
Reporting frequency	Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel "Oxygen"  (%)</b>	<b>Moisture content of the biomass residues "Moisture"</b>
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The NCV analysis is carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL	The NCV analysis is carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Weighted average net calorific value of the fuel type i in year y “NCV <sub>i,y</sub> ” (TJ/GI)	Quantity of fossil fuel type i consumed in a process j during the year y “FC <sub>i,j,y</sub> ”
Value	Ex-ante	-	-
	Ex-post	-	-
Measuring / Monitoring frequency		Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA
Company performing the calibration		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/GI)</b>	<b>Quantity of fossil fuel type i consumed in a process j during the year y “FC<sub>i,j,y</sub>”</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>		<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>”  (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>”  (MWh)</b>
Value	Ex-ante	262.6 per annum	0
	Ex-post	38.51	1.24
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Monthly	Monthly
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>”  (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>”  (MWh)</b>
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically CAR 02 was raised as the recording frequency of the monitoring parameter “EC <sub>EL,j,y</sub> ” was not stated in the MR.
QA/QC How are values verified? (Cross-checked, double- checked,...)	The auxiliary electricity is measured by a calibrated energy meter	The auxiliary electricity is measured by a calibrated energy meter
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Energy Meter; Sr. No.DS-10-10-0029	Energy Meter; Sr. No. DS-10-10-0029
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class I (which is better than Class 2 stated in the CPA-DD)	Class I (which is better than Class 2 stated in the CPA-DD)
Period of operating time	12/01/2011 to 31/08/2012	12/01/2011 to 31/08/2012
Instrument type	Energy Meter	Energy Meter
Manufacturer, model and serial number	Cologicx; Sr. No. DS-10-10-0029	Cologicx; Sr. No. DS-10-10-0029
Specific location	Project site	Project site
Calibration dates	01/01/2011 (valid till 31/12/2011) and 01/01/2012 (valid till 31/12/2012)	01/01/2011 (valid till 31/12/2011) and 01/01/2012 (valid till 31/12/2012)
Company performing the calibration	Prajyo Instrument and Maintenance Services (NABL accredited agency)	Prajyo Instrument and Maintenance Services (NABL accredited agency)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.
Is calibration valid for the whole reporting period?	Yes	Yes

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>”  (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>”  (MWh)</b>
Maintenance	The energy meter was functional throughout the monitoring period	The energy meter was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>”  (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Value	Ex-ante	-
	Ex-post	112
Measuring / Monitoring frequency	Continuous at each trip	Continuous at each trip
Reporting frequency	Calculated at the end of the monitoring period	Calculated at the end of monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>”  (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the invoices and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average round trip distance (from and to) between the biomass fuel supply sites and the site of biomass processing in year y “AVD <sub>c,y</sub> ”  (km)	Number of truck trips during the transportation of biomass to the biomass processing site in year y “N <sub>c,y</sub> ”
Value	Ex-ante	-	-
	Ex-post	65.28	193
Measuring / Monitoring frequency		Continuous at each trip	Continuous at each trip
Reporting frequency		Calculated at the end of monitoring period	Calculated at the end of monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the quantity of biomass combusted and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA



<b>Data / Parameter (as in the MP)</b>	<b>Average round trip distance (from and to) between the biomass fuel supply sites and the site of biomass processing in year y “AVD<sub>C,y</sub>”  (km)</b>	<b>Number of truck trips during the transportation of biomass to the biomass processing site in year y “N<sub>C,y</sub>”</b>
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average mass fraction of carbon in fuel type i in year y “w<sub>C,i,y</sub>”</b>	<b>Weighted average CO2 emission factor of fuel type i in year y “EF<sub>CO2,i,y</sub>” (tCO<sub>2</sub>/GJ)</b>
Value	Ex-ante	-
	Ex-post	NA (No fossil fuel has been used during the monitoring period)
Measuring / Monitoring frequency	NA	NA
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average mass fraction of carbon in fuel type i in year y “w<sub>C,i,y</sub>”</b>	<b>Weighted average CO2 emission factor of fuel type i in year y “EF<sub>CO2,i,y</sub>” (tCO<sub>2</sub>/GJ)</b>
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Boiler operating hours of the Project activity in year y “h <sub>y</sub> ”
Value	Ex-ante	8,000 per annum
	Ex-post	1,458
Measuring / Monitoring frequency		Daily (Boiler operating hours is monitored by SCADA system based on the operating hours of the draft fan of the boiler)
Reporting frequency		Monthly
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes
Does monitoring of the parameter involve sampling? (yes / no)		No
Population Size		NA
Sample Size		NA
Confidence level		NA
Margin of error		NA
Recording (Manually / electronically / ...)		Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA
Period of operating time		12/01/2011 to 31/08/2012
Instrument type		NA
Manufacturer, model and serial number		NA
Specific location		NA
Calibration dates		NA

<b>Data / Parameter (as in the MP)</b>	<b>Boiler operating hours of the Project activity in year y “h<sub>y</sub>”</b>
Company performing the calibration	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA
Is calibration valid for the whole reporting period?	NA
Maintenance	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA
Key reporting risks	Low risk

Verified situation	Conclusion
<b>SECTION 4. Compliance with the calibration frequency requirements for measuring instruments</b>	
The "Monitoring Parameters and Calibration Checklist" in section 3 above shall be checked to determine if the calibration frequency specified in the applied monitoring methodology and/or monitoring plan is followed in the monitoring report and in the monitoring activities. Where a failure to comply with the required frequency is detected, or no frequency is mentioned in the monitoring report, please follow the checklist below:	
<p>4-1. If the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (that is, the results of delayed calibration are available), confirm that the following conservative approach has been adopted in the calculation of emission reductions:</p> <ul style="list-style-type: none"> <li>- If the delayed calibration did not show any errors in the measuring equipment, or the error was smaller than the maximum permissible error, have the PPs applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> <li>- If the delayed calibration identified an error greater than the maximum permissible error, have the PPs applied the error identified in the delayed calibration test to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> </ul> <p>Confirm that the error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer emission reductions being claimed;</p>	<p>No delayed calibration was noted during this monitoring period, except for the weighbridge used for measuring biomass quantity. The weighbridge was in use during this monitoring period beyond the due date of calibration from 17/06/2011 to 29/06/2011. Hence as per para 238 of VVS, version 02.0, for the quantity of biomass procured during this period, an error has been applied (maximum permissible error as per the accuracy class of the weighbridge as the calibration report of 30/06/2011 did not have error more than the accuracy class of the weighbridge) in a conservative manner to calculate the amount of biomass procured during that period. For details of the calculation, please refer to the ER spreadsheet.</p> <p><del>CAR-07</del> OK</p>

	Verified situation	Conclusion
<p>4-2. If the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification:</p> <ul style="list-style-type: none"> <li>a. Request the PPs to conduct the required calibration;</li> <li>b. On receipt of the calibration results, determine whether the PPs have calculated the emission reductions conservatively using the approach mentioned in section 4.1 above.</li> </ul>	Not Applicable.	NA
<p>4-3. If it is not possible for the PPs to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of the PPs, check if the PPs have prepared a temporary deviation or a 'Permanent changes from the monitoring plan and/or monitoring methodology application'.</p> <p>Follow the requirements for post registration changes in sections 3.10 to 3.19 above.</p>	Not Applicable.	NA
<p>4-4. If neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipment, determine whether the equipment is calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification. If neither local/national standards nor the manufacturer's specification are available, international standards may be used.</p>	Not Applicable.	NA

	Verified situation	Conclusion
<b>SECTION 5. Assessment of data and calculation of emission reductions</b>		
<p>5-1. Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in line with the formulae and methods described in the monitoring plan and the applied methodology document?</p> <p>Check consistency in the ERs spreadsheet.</p>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and the applicable methodological tools for the project activity are as follows:</p> <p><b>Baseline emissions:</b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity = 988.82 tCO<sub>2</sub> – Calculation shown below</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity = 13.097 TJ – Calculation shown below</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant as per the registered CPA-DD = 75.5 tCO<sub>2</sub>/TJ</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity as per the registered CPA-DD = 100%</p> $EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}$ <p>where</p> <p><math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{steam}</math> = Quantity of steam supplied in Tonnes = 5235.04 Tonnes</p>	<p>CAR-04 CL-08 CL-02 OK</p>

<sup>20</sup> As per the registered CPA-DD, for calculation of the parameter “EC<sub>LE,I,y</sub>”, during the first periodic verification, declaration has been taken from the briquette supplier, Akshata Industries vide letter dated 20/10/2012 stating the electricity consumption for biomass processing is @0.035 MWh/tonne. Hence for this monitoring period, the electricity due to processing of biomass has been calculated by multiplying this value with the quantity of briquette consumed during this monitoring period (1111.63 tonnes) i.e. 0.035 \* 1111.63 = 38.91MWh

	Verified situation	Conclusion
	<p> <math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet = 663.21 kCal/kg  <math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg) = 65.55 kCal/kg  <math>EG_{thermal} = 5235.04 * (663.21 - 65.55) * 4.186 * 10^{-6}</math>  <math>= 13.097 \text{ TJ}</math> </p> <p>Note: Steam enthalpy is calculated at the weighted average steam pressure during the monitoring period from standard steam table for saturated steam. Similarly, the enthalpy of the boiler feed water is determined at the weighted average feed water temperature during the monitoring period. The verification team independently calculated the steam enthalpy at the average steam pressure of 7.41 kg/cm<sup>2</sup> g using the web site - <a href="http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp">http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp</a> ; and found the steam enthalpy as 663.62 kCal/kg. Hence the enthalpy used by the CME is conservative.</p> <p>Therefore,  <math>BE_{thermal,CO2,y} = 13.097 / 100\% * 75.5</math>  <math>= 988.82 \text{ tCO}_2</math> </p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> $PE_{EC,y} = EC_{PJ,j,y} * EF_{grid,CM,y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})$ <p>where  <math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid = 38.51 MWh  <math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) = 1.24 MWh </p>	



	Verified situation	Conclusion
	<p> <math>EF_{grid,CM,y}</math> = Ex-ante Grid Emission Factor = 0.80 tCO<sub>2</sub>/MWh  <math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l) = 1.3 tCO<sub>2</sub>/MWh  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j as per the registered CPA-DD = 20% </p> <p> <math>PE_{EC,y} = 38.51 * 0.80 * (1 + 20\%) + 1.24 * 1.3 * (1 + 20\%)</math>  <math>= 38.90 \text{ tCO}_2</math> </p> <p><u>Project emissions from fossil fuel combustion</u></p> <p> <math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math> </p> <p>where</p> <p> <math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr) </p> <p> <math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr) = 0 Tonnes  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit) </p> <p> <math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math> </p> <p>where</p> <p> <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ) </p> <p>As there is fossil fuel consumption during the monitoring period,</p> <p> <math>PE_{FC,j,y} = 0</math> </p> <p>Hence PE<sub>y</sub> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math>  <math>= 38.90 + 0 = 38.90 \text{ tCO}_2</math> </p>	

	Verified situation	Conclusion
	<p><b><u>Leakage:</u></b></p> $LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}$ $= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVD_{c,y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km,CO2}$ <p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p><math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p><math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source as a result of leakage = 38.91 MWh<sup>20</sup></p> <p><math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source as per registered CPA-DD = 0.80 (tCO<sub>2</sub>/MWh)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity as per registered CPA-DD = 20%</p> <p>The average collection / transportation distance for biomass is less than 200 km. Hence leakage due to collection and transportation is not considered.</p> $LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}$ $= 38.91 * 0.8 (1 + 20\%)$ $= 37.35 \text{ tCO}_2\text{e}$ <p>Emission reductions are calculated as follows:</p> $ER_y = BE_y - PE_y - LE_y$ $= 988.82 - 38.90 - 37.35 = 912 \text{ tCO}_2 \text{ (rounded down value)}$ <p>CAR 04#1 was raised as non consideration of leakage due to processing and</p>	

	Verified situation	Conclusion
	<p>transportation (where availability of surplus biomass is more than 25%) for the CPA was not justified in the MR. In the revised MR / ER spreadsheet, the CME had considered Leakage emissions due to processing of biomass but leakage emissions due to transporation / collection of biomass has not been considered as the transportation distance is less than 200 km. Hence the finding was successfully closed.</p> <p>CAR 04#2 was raised as the value of the parameter "<math>EC_{LE,i,y}</math>" was not consistent with the CPA-DD and it was closed after appropriate revision in the MR.</p> <p>CL 08 was raised as the ER calculation spreadsheet provided for the CPA had not included daily monitored data for steam quantity, temperature, pressure and feed water temperature to calculate the average of these parameters. ER calculation spreadsheet was adequately revised and the CL was closed.</p> <p>CL 02#2 was raised as, for the parameter "<math>TD_{Li,y} = TD_{Li,y}</math>", it was stated in the MR that it is used for Leakage emission calculation. But this parameter is also used for the calculation of project emission. CL was closed after appropriate revision in the MR.</p>	
<p>5-2. Has the calculation tool been correctly documented? Check its consistency and formulae.</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	The Monitoring Report is supported by Microsoft excel based spreadsheet for the calculation of emission reductions. The consistency and formula were verified and found to be accurate.	OK
<p>5-3. Is a complete set of data available during the specified monitoring period? If only partial data is available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan proceed as follows:</p> <p>a. Check if sections 3.11 and/or 3.12 above are applicable and raise a CAR for the PPs to comply with these requirements.</p>	Yes, the complete data set was available during the specified monitoring period.	OK

	Verified situation	Conclusion
<p>b. If sections 3.11 and 3.12 are not applicable or the answer to this question remains NO, a request for deviation is necessary.</p> <p>Conduct an assessment of the potential impacts of these changes in accordance to the procedures for Post Registration Changes.</p>		
<p>5-4. Has information provided in the Monitoring Report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?</p> <p>Please describe how LRQA has cross-checked reported data.</p>	<p>All the information provided in the Monitoring Report was cross-checked with the Plant log book records, purchase records (for biomass and fossil fuel), site visit and interview of the CPA implementer/CME.</p>	OK
<p>5-5. Have any assumptions used in emission calculations been justified?</p>	<p>All assumptions in the emission reduction calculation are consistent with assumptions taken in the included monitoring plan and have reference to the applied methodology.</p>	OK
<p>5-6. Have appropriate emission factors, IPCC default values, and other reference values been correctly applied?</p>	<p>The CME has applied the appropriate ex-ante fixed factors as stated in the registered CPA-DD like:</p> <ul style="list-style-type: none"> <li>• The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity(<math>\eta_{BL,thermal}</math>)</li> <li>• CO<sub>2</sub> Emission Factor of the fossil fuel that would have been used in the baseline plant (<math>EF_{FF,CO_2}</math>)</li> <li>• Surplus availability of Biomass within identified region (<math>SA_k</math>)</li> <li>• Ex-ante Grid Emission Factor in a year y.</li> <li>• Emission Factor for fossil fuel based electricity generation for source j and/or l in year y (<math>EF_{EL,j,y} = EF_{EL,l,y}</math>)</li> <li>• Auxiliary Electricity Consumption for biomass processing, outside Project boundary. (<math>EC_{LE,l,y}</math>)</li> <li>• Average CO<sub>2</sub> emission factor for the trucks measured during the year y(<math>EF_{km,CO_2}</math>)</li> <li>• Average technical transmission and distribution losses for providing electricity to source l and/or j in year y(<math>TDL_{l,y} = TDL_{j,y}</math>)</li> <li>• Specific energy consumption of fuel type j of the Project activity in year y(<math>SEC_{PJ,j,y,measured}</math>)</li> </ul>	<p>CAR-04 GL-02 OK</p>

	Verified situation	Conclusion
	<p>Nevertheless, the following CAR/CL were raised and successfully closed</p> <p>CAR 04 #2 was raised as the value of the parameter “EC<sub>LEI,y</sub>” reported in the published MR was not consistent with the CPA-DD and it was closed after appropriate revision in the MR.</p> <p>CL 02#3 was raised for the CME to clarify the appropriateness of the “Source of data” and “Additional comment” as stated in the MR for the parameters in section D.1, which are fixed ex-ante at the time of validation of the CPA.</p> <p>The MR was suitably revised against the raised findings and hence the CAR/CL were closed. For details please refer to the Annex D of this report.</p>	

## 7.4 Appendix C2: Verification Protocol for CPA 4041-0002

	Verified situation	Conclusion
<b>SECTION 1. Project implementation in accordance with the registered PoA-DD &amp; CPA-DD</b>		
<b>General description of the project</b>		
1.1. Does the MR provide general information of the CPA and is it as per the CPA-DD included by CDM-EB or by a DOE <sup>21</sup> ?	<p>Yes, the Monitoring Report<sup>22</sup> provides the general information of the CPA. Details such as Title of the CPA, UNFCCC registration reference number, version number of the Monitoring Report, monitoring period, project participants, sectoral scope and estimated amount of GHG emission reductions. All the above details can be confirmed from the included CPA-DD through link in UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=N1UVKCLWBFR1429JYHGP76XQEZD03A">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=N1UVKCLWBFR1429JYHGP76XQEZD03A</a></p> <p>Title of the CPA is “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 002)” and it was included in the PoA on 23/03/2012 applying the baseline and monitoring methodology AMS-I.C, version 16 “Thermal energy production with or without electricity” as verified from the project page of the CPA. The project activity applies AMS-I.C, version 16. The project activity is installation and operation of a 12 TPH biomass (rice husk) fired boiler to meet the captive requirement of steam in the production of oil &amp; De Oiled Cake (DOC) through solvent extraction process from soyabean, groundnut, cotton seed, linseed, castor seed etc. The project is located in Armori road, Bramhapuri, District- Chandrapur, Maharashtra. The project is implemented by Ramdevbaba Solvent Private Limited.</p>	OK
1.2. Is the general information provided in the MR in line with the PoA-DD registered by CDM-EB?	<p>Yes, the Monitoring Report is as per the PoA-DD registered by CDM-EB confirmed from the registered PoA-DD through link on UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=N1UVKCLWBFR1429JYHGP76XQEZD03A">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=N1UVKCLWBFR1429JYHGP76XQEZD03A</a></p>	OK

<sup>21</sup> The first CPA is included by the CDM-EB along with registered PoA-DD and subsequent CPAs are included by DOEs.

<sup>22</sup> Monitoring Report for this CPA (CPA 4041-0002) refer to the Appendix-2 of the consolidated MR Version 4.0

	Verified situation	Conclusion
1.3. Is the Monitoring report as per the standardised format (F-CDM-MR)? (EB 66 )	Yes, the Monitoring Report is as per the latest standardised format (F-CDM-MR) version 02.0 (EB66, Anne 20).	OK
1.4. Is the monitoring report filled as per the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).	Yes, the MR is completed as per the latest "Guidelines for completing the monitoring report form" EB 66, Annex 20. CAR 08 was raised as, on the project page of the PoA on the UNFCCC web site, the "Other Parties involved" is stated as "United Kingdom of Great Britain and Northern Ireland" and "Germany". But in the MR "Germany" is missing. CAR was closed as the MR was suitably revised.	<del>CAR 08</del> OK
1.5. Is there any open issue in the validation / previous verification including FARs? (CDM VVS para. 213)	No No FAR was raised in the Validation report during the CPA inclusion by TUV Nord, the DOE for validation of the CPA. Further, this being the first periodic verification, no open issues exist from earlier verification.	OK
<b>Implementation status of the CPA</b>		
1.6. Is the CPA location indicated same as that in the included CPA-DD? Confirm geographical coordinates	Yes, the project location is same as stated in the CPA-DD and this was verified during the on-site visit. The geographical coordinates of the project site are 20.6020° (20° 36' 7.41") North, 79.8758° (79° 52' 32.87") East. This was cross-checked from the wikimapia web site.	OK
1.7. Is the project boundary described in the same way as the included CPA-DD and registered PoA-DD? Please confirm each component based on the applied methodology.	Yes, the project boundary is described in the same way as in the included CPA-DD and registered PoA-DD. During the on-site assessment it was also confirmed that the project boundary is in line with the applied methodology. The project boundary for this CPA includes the biomass storage area and feeding system, boiler house and the facility which is consuming the heat generated by the project.	OK
1.8. Has on-site fossil fuel consumption, if any, been monitored? Is any emission source missed? Check the site lay-out and confirm through site tour.	Fossil fuel consumption is required to be monitored in this project. It has been confirmed during the on-site visit and document review that no fossil fuel has been consumed at the CPA site by the project during the monitoring period. The verification team did not find any emission source attributable to the project activity which has been missed out and the same was confirmed during the on-site visit and review of the site lay-out diagram.	OK
1.9. Confirm contractors for	It is confirmed that the project equipment i.e., 12 TPH boiler for the project is supplied by Thermax Limited and this was confirmed during the on-site visit interview with the project implementer and from	OK

	Verified situation	Conclusion										
equipment and installation works	the purchase order copy of the boiler issued by the project implementer dated 05/05/2009.											
1.10. Confirm—conformance with baseline and monitoring methodology - Applicability conditions. Please refer to the complete description of the applicability conditions and confirm that the CPA meets all the requirements.	<div>Conformance to the applicable methodology conditions for the CPA are as follows:</div> <table><tr><th>Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)</th><th>Means of Verification and Results</th></tr><tr><td><i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i></td><td>The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.</td></tr><tr><td><i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i></td><td>The total installed / rated capacity of the project equipment is 7.53 MW<sub>thermal</sub> which is less than 45 MW<sub>thermal</sub>.</td></tr><tr><td><i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i></td><td>The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.</td></tr><tr><td><i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i></td><td>The project does not use any charcoal.</td></tr></table>	Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)	Means of Verification and Results	<i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>	The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.	<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>	The total installed / rated capacity of the project equipment is 7.53 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .	<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>	The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.	<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>	The project does not use any charcoal.	OK
Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)	Means of Verification and Results											
<i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>	The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.											
<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>	The total installed / rated capacity of the project equipment is 7.53 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .											
<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>	The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.											
<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>	The project does not use any charcoal.											



	Verified situation	Conclusion
	<p>The verification team confirms that the CPA conforms to all applicable condition of the applied methodology.</p> <p>Apart from the baseline and monitoring methodology applicability criteria as stated above, the verification team also verified the eligibility criteria stated in section B.2 of the included CPA-DD under “Monitoring Criteria” for the point numbers 1, 3.3, 3.4, 3.5, 16, 17 and 18 and found these to be valid for the project activity during the monitoring period. A declaration letter dated 11/12/2012 in this respect has also been submitted by the CME.</p>	
1.11. Confirm use or no use of public funding and determine if there is no diversion of ODA to the CPA.	There is no use of public funding for the CPA. The same was confirmed during the interview with the CME and also a declaration in this respect has been provided by the CPA implementer.	OK
1.12. Check data in the MR and in the CPA-DD. Describe data and variables that are different from that stated in the included CPA-DD and cause an increase in emission reductions estimations.	<p>Data in the MR and CPA-DD those fixed at validation stage are found consistent.</p> <p>The ex-ante estimated emission reductions during this monitoring period of 154 days are 5,289 tCO<sub>2</sub> (12536/365*154) and the actual emission reductions during this monitoring period are 2,624 tCO<sub>2</sub>. Hence the actual emission reductions during this monitoring are less than the estimated values as per the CPA-DD.</p> <p>However, the following findings were raised and successfully closed during the verification:</p> <ol style="list-style-type: none"> <li>1) CL 02 was raised as for the parameters like “CAP<sub>boiler</sub>” and “SEC<sub>P,J,y,measured</sub>”, was stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation.</li> <li>2) CL 05 was raised, as the NCV is taken directly taken from the laboratory report, values of parameters like hydrogen, oxygen and moisture content in the biomass are still reported in the MR, which is not required as per the registered CPA-DD.</li> </ol> <p>The MR was suitably revised and the revised MR was found to be in line with registered CPA-DD and hence above findings are closed.</p>	<p>CL-02</p> <p>CL05</p> <p>OK</p>
1.13. By means of an on-site visit: Is the general information of the	<p>Yes.</p> <p>The on-site visit for the CPA was conducted on 10/11/2012.</p>	<p>CAR-01</p> <p>CAR-03</p>

	Verified situation	Conclusion
<p>project provided in the Monitoring report and is it as per the CPA-DD included by CDM-EB or by a DOE?</p> <p>List each technical component and equipment and check design parameters and actual status of installation and / or operation.</p> <p>Please check to ensure that all physical features of the proposed CPA in the registered/included CPA-DD are in place and the PP has operated the proposed CPA as per the included CPA-DD.</p> <p>It may include but not limited to:</p> <ul style="list-style-type: none"> <li>the actual capacity and output</li> <li>plant load factor</li> <li>type of feedstock</li> <li>operation of other components / units within the project boundary which could affect functioning of the project plant.</li> </ul> <p>In cases where there are a large number of components and equipment items and the check of all of them is not an available option, then a random sampling check shall be performed.</p>	<p>The project activity comprises of the installation and operation of a 12 TPH biomass (rice husk) fired boiler to meet the captive requirement of steam at the project site.</p> <p>During the verification, by the observation of equipment, interviews with relevant staff and the checking of technical specifications of main components, it was confirmed that the project activity has been implemented as described in the included CPA-DD.</p> <p>The project is operational. The project was commissioned on 17/04/2010 and the same was verified from the commissioning certificate issued by Thermax Limited.</p> <p>No change from the included CPA-DD of physical features which may impact the emission reduction of the project activity has been identified.</p> <ul style="list-style-type: none"> <li>Steam generation unit : 12 TPH boiler</li> <li>Net enthalpy supply by project : The ex-ante estimated annual enthalpy output from the project boiler is 149.565 TJ as per the included CPA-DD (which corresponds to 63.10 TJ for 154 days of this monitoring period) whereas actual enthalpy supplied by the boiler during this monitoring period was 30.47 TJ which is less than the ex-ante estimated value.</li> <li>Type of biomass fired in the boiler: As per the included CPA-DD, renewable biomass residue (rice husk) is to be fired in the boiler and it was noted that there was no deviation in the biomass firing during the monitoring period.</li> <li>As per the included CPA-DD, the project may fire fossil fuel (Coal) in the boiler. During this monitoring period, no fossil fuel has been fired in the project boiler as confirmed by the project implementer during the site visit.</li> </ul> <p>100% data is monitored for the CPA and hence no sampling plan is applicable.</p> <p>However, CAR 01 was raised as in section B.1 of the MR, the downtime time of the project boilers is not provided. Details are provided in the revised MR and the CAR was closed.</p> <p>Further, CAR 03 was raised as PP has considered a simple average of steam pressure, temperature and boiler feed water enthalpy, which are used for the calculation of net enthalpy supplied by the project boiler, which is not correct. The calculation approach was revised and a weighted average was considered for emission reduction. The CAR 03 was successfully closed.</p>	OK

	Verified situation	Conclusion
Justify here the sample chosen and describe the results. <sup>23</sup>		
1.14. Have responsibilities for monitoring been described and specified?	<p>The responsibilities of monitoring have been provided and described in the Monitoring Report. The Monitoring Report and CDM documents clearly describe the responsibilities for monitoring.</p> <p>The project owner has identified the CDM team, the structure of which is given in Monitoring Report. During the verification, responsibilities for operational personnel, technical and support team have been verified and confirmed.</p> <p>The CDM team has been assigned the responsibility for measuring, recording and storage of the measured data. Data is kept in electronic format and paper format.</p>	OK
1.15. Are the responsibilities and authorities for monitoring and reporting in line with those stated in the monitoring plan of the included CPA-DD?	Yes, responsibilities and authorities for monitoring and reporting are in accordance with the included CPA-DD.	OK
<p>1.16. Check QA/QC, management systems. Are procedures described and specified in the MR? Are they consistently applied as described in the MP?</p> <p>a. documented instructions, management manual</p> <p>b. documentation</p> <p>c. data archiving</p> <p>d. monitoring report</p> <p>e. cross-checking</p> <p>f. energy balance analysis (as relevant)</p> <p>g. internal audits / verification and management review</p>	<p>QA/QC procedures include staff training, instrument calibration, cross-checking and data/documents archiving. They are consistent with the monitoring plan.</p> <p>The Monitoring Report describes the monitoring system, monitoring procedures, data collection and reporting, responsibilities of relevant staff/departments, calibrations that were implemented and QA/QC procedures including data cross-checking.</p> <p>By means of document review, onsite assessment and interviews, the verification team has confirmed that all the QA/QC measures, data archiving, monitoring report and internal audits are as per the registered monitoring plan of the registered PoA-DD and the included CPA-DD.</p> <p>However, CL 03 was raised as the "QA/QC procedure" &amp; "Purpose of data" for the quantity of biomass in MR was mentioned as "NA" and the same was not consistent with the monitoring plan of the included CPA-DD. Monitoring and recording frequency of these parameters were not mentioned in the MR. Also the values for these parameters as stated in the MR was incorrect as verified during the on-site visit and also with the documents provided.</p> <p>The MR was suitably revised to close the finding.</p>	<p>CL-03</p> <p>OK</p>

<sup>23</sup> The sampling shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified situation	Conclusion
1.17. Have the procedures for emergency and abnormal situations been established?	<p>As stated in section C of the MR, the procedure for non-conformance and corrective actions is in place for the project activity to mitigate any emergency and abnormal situations in monitoring as per the included CPA-DD.</p> <p>During the monitoring period, no emergency situation in monitoring has occurred.</p> <p>However, CAR 07 was raised as the CME needed to clarify why the details of the backup monitoring instruments (for steam pressure and temperature and feed water temperature) were not provided in the MR. Adequate justification was provided by the CME and the CAR was closed.</p>	CAR 07 OK
1.18. Has the system for qualification and training been established as relevant for the monitoring and management activities?	<p>The training and qualification of the project personnel has also been confirmed during interview of the operational personnel during the on-site visit. It is confirmed that they have sufficient knowledge, experience and competency to implement and maintain the plant operation including data monitoring and recording in line with the boiler operation and maintenance manual provided by the boiler supplier, and with CDM requirements.</p> <p>This is further verified by the evidence for training of the project personnel and the boiler attendants' certificates issued by Directorate of Steam Boilers (Government agency) for the boiler operators.</p>	OK
1.19. Check the environmental report, license, permit and compliance to the local environmental legislation (if relevant).	The verification team has confirmed that the project meets the relevant local environmental legislation. The same was confirmed from the copies of the consent to operate issued by Maharashtra Pollution Control Board valid from 31/05/2011 to 28/02/2012 and 27/02/2012 to 28/02/2013. Also copies of boiler certificates valid from 09/02/2011 to 08/02/2012 and from 10/04/2012 to 09/04/2013 (the CPA operator had applied for renewal of certificate on 03/02/2012 i.e., before the due date of 08/02/2012 and hence deemed acceptable) issued by Directorate of Steam Boilers Department has been submitted for the operation of the boiler.	OK
1.20. Check contribution to sustainable development, comparing those expected in the included CPA-DD and the actual status.	<p>With the provision of employment opportunities by the project activity, there has been a contribution for the social and economic well-being of some local people.. The project utilises renewable biomass to produce steam (thereby avoiding the fossil fuel usage) and this leads to environment well being by reduced environmental impact from fossil fuel use. Also the project uses renewable biomass technology which is deemed as a clean (as it displaces fossil fuel usage) and safe technology.</p> <p>Even though the sustainable development measures were not registered in the CPA-DD as a monitoring parameter, it was confirmed during the site visit that the CPA contributes to the sustainable development of the host country.</p>	OK
1.21. Check issues with local stakeholders, claims,	It was confirmed by on-site interviews that there had been no claims and complaints from local stakeholders prior to the verification visit.	OK

	Verified situation	Conclusion	
complaints, etc.			
<p>1.22. If from the above assessment the conclusion is that the implementation or operation of the CPA does not conform with the description contained in the included CPA-DD and/or corrections have been made to project information or parameters fixed at validation/inclusion, determine if these changes and/or corrections do not require prior approval by the board:</p> <ul style="list-style-type: none"> <li>- A request of approval is required if the boundary of a registered CDM PoA is changed to include an additional host party, in accordance with the project cycle procedure.</li> <li>- A request for approval is required if the CME of a registered CDM PoA changes after the registration of the PoA.</li> <li>- Any corrections to project information of an included CPA that do not affect the design of the project activity do not require prior approval by the Board.</li> <li>- A request for approval is required if any of the three issues below is adversely impacted by the identified changes to the project design.</li> </ul>			
<p>1.23. The applicability and application of the applied methodology under which the CPA has been included:</p> <p>Check if the project boundary has changed and if any of the parameters to assess the applicability conditions have changed.</p>	No change in applicability and application of the applied methodology AMS-I.C. version 16, including the project boundary, is observed.	YES	NO
			X
<p>1.24. Compliance of the included CPA to eligibility criteria as defined in the registered PoA-DD.</p> <p>Check if any of the parameters to assess the PoA eligibility criteria have changed.</p>	No change in the eligibility criteria of the registered CPA, as defined in the registered PoA-DD, is observed.	YES	NO
			X
<p>1.25. The additionality of the project activity:</p> <p>Check if any of the input parameters to the investment analysis have changed. For barrier analysis, check</p>	There is no change in the project design parameters as the project is implemented as per the included CPA-DD. Hence this is not applicable.	YES	NO
			X

	Verified situation	Conclusion	
if any information or data used in the barrier analysis has changed.			
1.26. The scale of the project activity. Check if the project is still small scale or large scale after the implementation of the changes.	Small scale, as per the eligibility criteria for CPA inclusion and is in accordance with the methodology AMS-I C, version 16.	YES	NO
			X
If the answer to any of the above items is YES, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
1.27. If, from the above assessment, the conclusion is that the changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	

Verified Situation		Conclusion
<b>SECTION 2. Compliance of the Monitoring Plan with the Monitoring Methodology including applicable Tool(s)</b>		
2.1. Is the monitoring plan of the included CPA-DD in accordance with the applied methodology?	Yes, it is confirmed that monitoring plan of the included CPA-DD is in accordance with the applied methodology, AMS-I.C, version 16.	OK
2.2. If the methodology provides different options (for example, use of default values or on-site measurements), has the Monitoring Report specified which option is used?	<p>Yes,</p> <p>The ex-ante parameters which are fixed for the crediting period at the time of CPA inclusion in the PoA as per the methodological tools are:</p> <ul style="list-style-type: none"> <li>• <math>CAP_{\text{boiler}}</math> (Rated capacity (thermal output) of the boiler of the Project activity)</li> <li>• <math>\eta_{\text{BL,thermal}}</math> (The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity)</li> <li>• <math>EF_{\text{FF,CO}_2}</math> (<math>\text{CO}_2</math> Emission Factor of the fossil fuel (Indian Coal) that would have been used in the baseline plant)</li> <li>• <math>SA_k</math> (Surplus availability of Biomass)</li> <li>• <math>EF_{\text{grid,CM,y}}</math> (Ex-ante Grid Emission Factor in a year y)</li> <li>• <math>EF_{\text{EL,j,y}}</math> (Emission Factor for fossil fuel based electricity generation for source j in year y)</li> <li>• <math>EF_{\text{km,CO}_2}</math> (Average <math>\text{CO}_2</math> emission factor for the trucks measured during the year y)</li> <li>• <math>TDL_{\text{i,y}}</math> (Average technical transmission and distribution losses for providing electricity to source j in year y)</li> <li>• <math>SEC_{\text{PJ,j,y,measured}}</math> (Specific energy consumption of fuel type j of the Project activity in year y)</li> </ul> <p>Further, the verification team confirms that there is no deviation in the values of the ex-ante fixed parameters between the included CPA-DD and the MR.</p> <p>The parameters being monitored ex-post as per the monitoring methodology and the CPA-DD are:</p> <ul style="list-style-type: none"> <li>• Quantity of steam supplied in year y (<math>Q_{\text{steam}}</math>)</li> <li>• Average Steam Temperature at MSSV (Main steam stop valve) outlet during year (<math>T_{\text{steam}}</math>)</li> <li>• Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year (<math>P_{\text{steam}}</math>)</li> <li>• Average Feed Water Temperature at inlet of boiler (<math>T_{\text{FWB}}</math>)</li> <li>• Boiler operating hours of the project activity in year y (<math>h_y</math>)</li> <li>• Quantity of stored fuel type biomass k on the starting date of each monitoring period</li> </ul>	<p>CL05</p> <p>OK</p>

Verified Situation	Conclusion
<p>measured at the Project site (<math>Q_{ob,k}</math>)</p> <ul style="list-style-type: none"> <li>Quantity of subsequent delivery of fuel type k biomass at the Project site (<math>Q_{np,k}</math>)</li> <li>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site (<math>Q_{in,k}</math>)</li> <li>Quantity of biomass fuel type k consumed during the monitoring period (<math>Q_{c,k} = FC_{biomass,k,y}</math>)</li> <li>Quantity of stored fuel type fossil (Coal) i on the starting date of each monitoring period measured at the Project site (<math>Q_{ob,i}</math>) *</li> <li>Quantity of subsequent delivery of fuel type fossil fuel (Coal) i (<math>Q_{np,i}</math>) *</li> <li>Quantity of remaining fossil fuel type (Coal) i available at the end date of each monitored period measured at the Project site (<math>Q_{in,i}</math>) *</li> <li>Quantity of fossil fuel type i (Coal) consumed during the monitoring period (<math>Q_{c,i} = FC_{j,PJ,y}</math>) *</li> <li>Net calorific value of biomass fuel k used in the Project activity. (<math>NCV_k</math>)</li> <li>Percentage of hydrogen in biomass fuel (Hydrogen)</li> <li>Percentage oxygen in Biomass fuel (Oxygen)</li> <li>Moisture content of the biomass residues (Moisture)</li> <li>Weighted average net calorific value of the fuel (coal) type i in year y (<math>NCV_{i,y}</math>) *</li> <li>Quantity of fossil fuel (Furnace oil) type i consumed in a process j during the year y (<math>FC_{i,j,y}</math>) *</li> <li>Auxiliary Electricity Consumption of the Project activity from the Grid in year y (<math>EC_{PJ,j,y}</math>)</li> <li>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) in a year y (<math>EC_{EL,j,y}</math>)</li> <li>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y (<math>AVD_{y,y}</math>)</li> <li>Number of truck trips during the year y (<math>N_{y,y}</math>)</li> <li>Weighted average CO<sub>2</sub> emission factor of fuel type i in year y (<math>EF_{CO2,i,y}</math>)</li> </ul> <p>These parameters are based on on-site measurement and have been verified during this verification.</p> <p>* No fossil fuel has been fired in the project boiler during this monitoring period</p> <p>However, CL05 was raised, since the NCV is taken directly from the laboratory report, yet the values of parameters like hydrogen, oxygen and moisture content in the biomass were still reported in the</p>	



	Verified Situation	Conclusion
	MR, which is not required as per the registered CPA-DD. MR was suitably revised and the finding was closed.	
2.3. Is all data collected and archived according to the tables in the applied Monitoring Methodology and is this included in the Monitoring Plan?	Yes, all the data is collected and archived in accordance to methodology and included in the monitoring plan. All the data will be archived until 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.	OK
2.4. Check the calculation of emission reductions following the applied methodology: <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and applied for the project activity are as follows:</p> <p><b><u>Baseline emissions:</u></b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity during the year y (tCO<sub>2</sub>)</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity during the year y (TJ)</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant; tCO<sub>2</sub> / TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity</p> <p><math>EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}</math></p>	GL-04 OK

Verified Situation	Conclusion
<p>where</p> <p><math>EG_{\text{thermal}}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{\text{steam}}</math> = Quantity of steam supplied in Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet (kCal/kg)</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg)</p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p><math>PE_{EC,y} = EC_{PJ,j,y} * EF_{\text{grid,CM},y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})</math>  <math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid in year y  <math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set)  <math>EF_{\text{grid,CM},y}</math> (Ex-ante Grid Emission Factor in a year y)  <math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j in year y</p> <p><u>Project emissions from fossil fuel combustion</u></p> <p><math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math></p> <p>where</p> <p><math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)  <math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)  <math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math></p> <p>where</p> <p><math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)</p>	

Verified Situation	Conclusion
<p>Hence, <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math></p> <p><b><u>Leakage:</u></b></p> $LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}$ $= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVDC_{y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km,CO2}$ <p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption in year <math>y</math> (tCO<sub>2</sub>/yr)</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p><math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p><math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source <math>l</math> in year <math>y</math> as a result of leakage (MWh/yr)</p> <p><math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source <math>l</math> in year <math>y</math> (tCO<sub>2</sub>/MWh)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source <math>l</math> in year <math>y</math></p> <p><math>N_{c,y}</math> = Number of truck trips for collecting loose biomass during the year <math>y</math></p> <p><math>AVDC_{y}</math> = Average round trip distance between the biomass fuel supply sites and biomass collection site during the year <math>y</math></p> <p><math>EF_{km,CO2}</math> = Average CO<sub>2</sub> emission factor for the trucks measured during year <math>y</math></p> <p><math>N_{y,y}</math> = Number of truck trips during the year <math>y</math></p> <p><math>AVD_{y,y}</math> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant during year <math>y</math> (km)</p> <p>Emission reductions are calculated as follows:</p> $ER_y = BE_y - PE_y - LE_y$ <p>However, CL 01 was raised as in section E.5 of the MR, the calculation of the ex-ante emission reductions was not transparently presented. The revised MR clearly and transparently describes the</p>	

Verified Situation		Conclusion
	ER calculation approach providing relevant equations in line with the included CPA-DD and hence the CL was closed.	
<p>2.5. List any monitoring aspect that is not specified in the methodology and check its compliance with the Monitoring Plan, for example:</p> <ul style="list-style-type: none"> <li>• additional monitoring parameters</li> <li>• monitoring frequency</li> <li>• calibration frequency.</li> </ul>	<p>No additional monitoring parameter is identified that is not specified in the approved methodology and the included CPA-DD available in the project page on UNFCCC website.</p> <p>The monitoring frequency and the calibration frequency specified are not less than the requirements of the approved methodology and the Monitoring plan in the included CPA-DD.</p>	OK

	Verified Situation	Conclusion
<b>SECTION 3. Compliance of Monitoring activities with the Monitoring Plan of the included CPA-DD</b>		
<p>3-1. Is the Monitored Data included in the Monitoring Report as per the Monitoring Plan or any accepted revised MP?</p> <p>3-2. Has the data been generated at the frequency required by the Monitoring Plan or any accepted revised MP?</p>	<p>Yes</p> <p>The monitored data included in section D.2 of the MR is as per the monitoring plan of the included CPA-DD.</p> <p>The values are indicated in the section D.2 of the Monitoring Report. At the site visit it was verified that data was generated at the required frequency as per the monitoring plan in the included CPA-DD.</p>	OK
<p>3-3. Has the monitoring been implemented in accordance with the monitoring plan contained in the included CPA-DD or any accepted revised MP?</p> <p>Confirm that the monitoring and reporting procedures have been implemented as documented and follow by PPs.</p>	<p>Yes, by means of document review, on-site assessment and interviews with the plant personnel, it was confirmed that the monitoring has been implemented in accordance with the monitoring plan contained in the included CPA-DD.</p> <p>It was also established that monitoring and reporting procedures have been implemented as documented by the CME and the CPA operator.</p>	OK
<p>3-4. Have types of measurement instrumentation used been described and specified?</p>	<p>Yes the MR specifies and describes the use of different measurement instruments (Steam flow meter, RTD / Temperature gauge, Pressure transmitter / Pressure gauge, energy meter and weighbridge). The details of the measuring equipment are provided in the "Annex-1_4041-0002: Instrument Details" of the MR. The provided details have been verified during the on-site visit.</p>	OK
<p>3-5. Is the accuracy of equipment used for monitoring sufficient and regularly controlled and calibrated in line with the registered monitoring plan or any accepted revised MP?</p> <p>Check relevance of maintenance and calibration</p>	<p>Yes, the verification team confirmed through the on-site assessment and the review of evidence that the installation of the measuring devices has been completed and the equipment has been operated and maintained in normal operating conditions.</p> <p>The accuracy classes of all the monitoring equipment are found as per the monitoring plan of the included CPA-DD, or of higher accuracy as detailed in "Annex-1_4041-0002: Instrument Details" of the MR.</p> <p>It was confirmed that the information of the meters was consistent with that described in the</p>	<p>CL-07</p> <p>OK</p>

	Verified Situation	Conclusion
included in the monitoring plan. Check relevance of laboratory analysis if included in the monitoring plan.	<p>Monitoring Report.</p> <p>The CME has provided the calibration certificates of all the monitoring equipment and the verification team confirms the certificates to be appropriate and relevant.</p> <p>For further details of the calibration of the monitoring equipment please refer to section 3.19 of this report below.</p> <p>Nevertheless, CL 07 was raised as the CME had not provided the credentials of the calibrating agencies and the laboratories, which have carried out the NCV analysis. Adequate information was provided by the CME and the CL was closed.</p> <p>For details please refer to Appendix D of this report.</p>	
3-6. If the monitoring plan of the CPA-DD refers to a sampling plan and monitoring is carried out for the chosen samples, ensure that the sampling is carried out as per the sampling plan <sup>24</sup> .	The monitoring plan of the CPA-DD does not refer to a sampling plan and the monitoring is carried out for 100% data for all the monitoring parameters.	NA
3-7. Check that responsibilities and authorities for monitoring and reporting are in line with the monitoring plan.  Are the monitoring results consistently recorded, reviewed and approved as stated in the CPA-DD or any accepted revised MP?	<p>Yes</p> <p>During the site visit, monitoring and reporting procedures were confirmed by the verification team through interview with the relevant plant personnel, CME and by document review.</p> <p>However following CAR/CL were raised and successfully closed;</p> <ol style="list-style-type: none"> <li>1) CAR 02 was raised as the opening readings of the parameter "Q<sub>steam</sub>" and closing readings of the parameters "EC<sub>PJ,j,y</sub>" and "EC<sub>EL,j,y</sub>" have not been presented to the verification team.</li> <li>2) CL 02 was raised as for the parameters like "CAP<sub>boiler</sub>" and "SEC<sub>PJ,y,measured</sub>", the CME had stated in the MR that they are used for baseline emission calculation, whereas, as per the</li> </ol>	<p>CAR 02</p> <p>CL 02</p> <p>CL05</p> <p>OK</p>

<sup>24</sup> The sampling plan shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified Situation	Conclusion
	<p>CPA-DD, these parameters are not used for baseline emission calculation.</p> <p>3) CL 05 was raised, since the NCV is taken directly taken from the laboratory report, however the values of parameters like hydrogen, oxygen and moisture content in the biomass were still reported in the MR, which is not required as per the registered CPA-DD.</p> <p>The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p> <p>For details please refer to Appendix D of this report.</p>	
<p>3-8. Reporting period: Defined?</p> <p>If a monitoring period of a parameter more / less than a year is applied, check if the monitoring is in a complete and consistent manner?</p> <p>Is the monitoring period within the crediting period of the CPA and length of the registered PoA?</p>	<p>The monitoring period for the PoA is from 12/01/2011 to 31/08/2012. But for the CPA, the emission reduction starts from 31/03/2012 (i.e., the date of start of crediting period of the CPA) till 31/08/2012. Hence the monitoring period for the CPA is for 154 days which is less than a year. However, monitoring of all the parameters is complete, as there is no specific requirement in the methodology for annual reporting of any data. The verification team therefore, confirms the monitoring to be complete and consistent and clearly defined in the MR.</p> <p>The monitoring period is within the crediting period of the CPA and also the length of the registered PoA.</p> <p>CL 09 was raised as the monitoring period of the CPA is not consistent with that of the PoA in the webhosted MR. The issue has been addressed and the finding was successfully closed.</p>	<p><del>CL-09</del> OK</p>
<p>3-9. If the monitoring plan includes the determination of environmental and / or social indicators, have the sustainable development indicators been monitored in accordance with the monitoring plan of the included CPA-DD?</p>	Not applicable	NA
<p>3-10. Check monitoring of Environmental and Social indicators (if relevant)</p> <ul style="list-style-type: none"> <li>• implementation of measures</li> <li>• monitoring equipment</li> <li>• quality assurance procedures</li> <li>• external data.</li> </ul>	Not applicable	NA

		Verified Situation		Conclusion	
<b>SECTION 2 and 3: Post Registration Changes</b>					
<p>3-11. If, from the above assessment in SECTIONS 2 and 3, the conclusion is that there are temporary deviations or permanent changes from the registered Monitoring Plan or Monitoring Methodology, determine if these deviations or changes require prior approval by the EB by answering the questions below.</p> <p>All the answers to the applicable questions below shall be explained and the reasons for each conclusion given in the “Verified situation” column.</p> <p><b>Temporary deviations from the registered monitoring plan or applied methodology:</b>  Prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES.</p>					
3-12. Have the PPs reported as zero any parameter related to baseline GHG emissions that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?	No temporary deviation is sought during this monitoring period	YES	NO		
		-	-		
3-13. Have the PPs estimated (assuming that the source of the project GHG emissions operated at maximum capacity for the full period of the missing data) any parameter that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?  For project GHG emissions related to the consumption of electricity, the estimate shall include an addition of 10% to account for transmission and distribution losses.	No temporary deviation is sought during this monitoring period	YES	NO		
		-	-		



		Verified Situation	Conclusion	
Permanent changes from the registered monitoring plan or applied methodology				
If the monitoring equipment actually installed has a lower accuracy level than the accuracy stipulated in the applied methodology and/or in the registered monitoring plan, and the monitoring equipment is under the control of the project participants, prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES:				
3-14. Have the PPs deducted from the measured value, for any parameter used for calculating baseline GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES	NO	
		-	-	
3-15. Have the PPs added to the measured value, for any parameter used for calculating project GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES	NO	
		-	-	
Changes to the monitoring of the included CPA of a type listed below do not require approval by the EB. Confirm in the conclusion column that the change is of the type in the table below and explain the reasons.				
3-16. Change of calibration frequency or practice for monitoring equipment not within the control of project participants	Not Applicable		NA	

	Verified Situation	Conclusion
3-17. Change of accuracy / type / model of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA
3-18. Change of location of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA
If the answer to any of the above items has been that approval from the EB is required, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.		
3-19. If, from the above assessment, the conclusion is that the temporary deviations or permanent changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA

### 3.19 Monitoring Parameters and Calibration Checklist:

Complete the following table for each parameter:

Data / Parameter (as in the MP)		Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Value	Ex-ante	24,792 <sup>25</sup>	207.47
	Ex-post	12,046.63	195.91 <sup>26</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		As per the monitoring plan of the included CPA-DD, the quantity of steam delivered by the project is measured by duly calibrated steam flow meter and the calibration certificate has been verified. Further, the verification team cross-checked the quantity of steam delivered by the project activity during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the steam temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.

<sup>25</sup> Calculated for the monitoring period of 154 days from the ex-ante estimated value of 58,760 tonnes for one year as per the included CPA-DD

<sup>26</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of steam supplied in year y “Q<sub>steam</sub>” (Tonnes)</b>	<b>Average Steam Temperature at MSSV (Main steam stop valve) outlet “T<sub>steam</sub>” (°C)</b>
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Steam flow meter Sr. No.: E400D320000	RTD Sr. No.: E400D320000
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+/- 2.3% Maximum (which is better than that stated in the CPA-DD of +/-3%)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	31/03/2012 to 31/08/2012	31/03/2012 to 31/08/2012
Instrument type	Steam flow meter cum RTD	Steam flow meter cum RTD
Manufacturer, model and serial number	Make: Endress + Hauser; Sr. No.: E400D320000	Make: Endress + Hauser; Sr. No.: E400D320000
Specific location	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler
Calibration dates	25/04/2011 (valid till 24/04/2014)	25/04/2011 (valid till 24/04/2014)
Company performing the calibration	Manufacturer Endress + Hauser (NABL accredited agency)	Manufacturer Endress + Hauser (NABL accredited agency)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The Steam flow meter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period

Data / Parameter (as in the MP)	Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P <sub>steam</sub> ” (kg/cm <sup>2</sup> g)	Feed Water Temperature at inlet of boiler “T <sub>FWB</sub> ” (°C)
Value	Ex-ante	17.5	60
	Ex-post	13.20 <sup>27</sup>	61.86 <sup>28</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically

<sup>27</sup> The value is the weighted average of the daily recorded pressure readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily pressure readings was reported in the published MR which is incorrect. The CAR was closed after the pressure was revised as the weighted average of the daily readings during the monitoring period

<sup>28</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P<sub>steam</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Feed Water Temperature at inlet of boiler “T<sub>FWB</sub>” (°C)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the steam pressure is measured by duly calibrated pressure transmitter and the calibration certificate has been verified. Further, the verification team cross-checked the steam pressure during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the feed water temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Pressure transmitter Sr. No. C 907D501052	RTD Sr. No. 11050626
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+/- 2% (which is same as stated in the CPA-DD)	Class B (which is same as stated in the CPA-DD)
Period of operating time	31/03/2012 to 31/08/2012	31/03/2012 to 31/08/2012
Instrument type	Pressure transmitter	RTD
Manufacturer, model and serial number	Endress + Hauser; Sr. No. EC172101052	Endress + Hauser; Sr. No. 11050626
Specific location	Project site, at the Main Steam Stop Valve (MSSV)	Project site, after the boiler feed water tank at the inlet of the boiler
Calibration dates	13/03/2012 (valid till 12/03/2013)	13/03/2012 (valid till 12/03/2013)
Company performing the calibration	Microvision Calibration Services (A Government approved laboratory and calibration traceable to national standard and hence deemed acceptable).	Microvision Calibration Services (A Government approved laboratory and calibration traceable to national standard and hence deemed acceptable).

<b>Data / Parameter (as in the MP)</b>	<b>Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P<sub>steam</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Feed Water Temperature at inlet of boiler “T<sub>FWB</sub>” (°C)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The pressure transmitter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Value	Ex-ante	NA
	Ex-post	29.995
Measuring / Monitoring frequency	At the start of the monitoring period	3031.84
Reporting frequency	Once during the monitoring period	Data is monitored and recorded for each truck delivery
		Each truck trip

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The opening balance of the biomass is measured by a calibrated weighbridge	Biomass procured is measured for each truck entering the plant premises by a calibrated weighbridge
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge; Sr. No. 2730260001	Weighbridge; Sr. No. 2730260001
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III <sup>30</sup>	Class III <sup>29</sup>
Period of operating time	31/03/2012 to 31/08/2012	31/03/2012 to 31/08/2012
Instrument type	Weighbridge	Weighbridge
Manufacturer, model and serial number	Metler Toledo.; Sr. No. 2730260001	Metler Toledo.; Sr. No. 2730260001
Specific location	At project site	At project site
Calibration dates	23/02/2012 (valid till 22/02/2013)	23/02/2012 (valid till 22/02/2013)
Company performing the calibration	Weights and Measure Department, Govt. of India	Weights and Measure Department, Govt. of India

<sup>29</sup> In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable



<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The weighbridge was functional throughout the monitoring period	The weighbridge was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	40.48
Measuring / Monitoring frequency	Measured at the end of the monitoring period	1087.44 <sup>30</sup>
Reporting frequency	Once during the monitoring period	3021.36
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Calculated from the opening, received and closing balance of the biomass during the monitoring period
Does monitoring of the parameter involve sampling? (yes / no)	No	At the end of the monitoring period
Population Size	NA	Yes
Sample Size	NA	No

<sup>30</sup> Calculated for the monitoring period of 62 days from the ex-ante estimated value of 6401.89 tonnes for one year as per the included CPA-DD

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The closing balance of the biomass is measured by a calibrated weighbridge	The quantity of biomass consumed is cross-checked with the invoices obtained from the fuel supplier and found to match
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge; Sr. No. 2730260001	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable)	NA
Period of operating time	31/03/2012 to 31/08/2012	NA
Instrument type	Weighbridge	NA
Manufacturer, model and serial number	Metler Toledo.; Sr. No. 2730260001	NA
Specific location	At project site	NA
Calibration dates	23/02/2012 (valid till 22/02/2013)	NA
Company performing the calibration	Weights and Measure Department, Govt. of India	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The weighbridge was functional throughout the monitoring period	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “<math>Q_{in,k}</math>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “<math>Q_{c,k}</math>” = “<math>FC_{biomass,k,y}</math>” (Tonnes)</b>
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Yes. But this data is not used for emission reduction calculation.

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “<math>Q_{ob,i}</math>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i “<math>Q_{np,i}</math>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	0
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “<math>Q_{ob,i}</math>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i “<math>Q_{np,i}</math>” (Tonnes)</b>
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site “<math>Q_{in,i}</math>” (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period “<math>Q_{c,i}</math>” = “<math>FC_{i,PJ,y}</math>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	0
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	No	No

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site "<math>Q_{in,i}</math>" (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period "<math>Q_{c,i}</math>" = "<math>FC_{i,PJ,y}</math>" (Tonnes)</b>
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Net calorific value of biomass fuel k used in the Project activity “NCV <sub>k</sub> ” (TJ/Gg)	Percentage of hydrogen in biomass fuel “Hydrogen” (%)
Value	Ex-ante	11.69	4.9
	Ex-post	13.63	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency		Annually once	Annually once
Reporting frequency		Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		The NCV analysis is carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “NCV<sub>k</sub>” (TJ/Gg)</b>	<b>Percentage of hydrogen in biomass fuel “Hydrogen” (%)</b>
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen” (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Value	Ex-ante	35.5
	Ex-post	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency	Annually once	Annually once
Reporting frequency	Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically

Data / Parameter (as in the MP)		Percentage of Oxygen in biomass fuel "Oxygen" (%)	Moisture content of the biomass residues "Moisture"
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA
Company performing the calibration		NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?		NA	NA
Is calibration valid for the whole reporting period?		NA	NA
Maintenance		NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?		NA	NA
Key reporting risks		Low risk	Low risk

  

Data / Parameter (as in the MP)		Weighted average net calorific value of the fuel type i in year y "NCV <sub>i,y</sub> " (TJ/Gg)	Quantity of fossil fuel type i consumed in a process j during the year y "FC <sub>i,j,y</sub> "
Value	Ex-ante	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
	Ex-post	NA	



<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/Gg)</b>	<b>Quantity of fossil fuel type i consumed in a process j during the year y “FC<sub>i,j,y</sub>”</b>
Measuring / Monitoring frequency	NA	NA
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double- checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “<math>NCV_{i,y}</math>” (TJ/Gg)</b>	<b>Quantity of fossil fuel type i consumed in a process j during the year y “<math>FC_{i,j,y}</math>”</b>
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC <sub>PJ,j,y</sub> ” (MWh)	Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC <sub>EL,j,y</sub> ” (MWh)
Value	Ex-ante	885.7 per annum	0
	Ex-post	102.24	2.88
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Monthly	Monthly However, CAR 02 was raised as the recording frequency of the monitoring parameter “EC <sub>EL,j,y</sub> ” has not been stated in the MR. CAR was closed after revision in the MR.
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		The auxiliary electricity is measured by a calibrated energy meter	The auxiliary electricity is measured by a calibrated energy meter
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Energy Meter; Sr. No. 1K 162128	Energy Meter; Sr. No. 1K 162128
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		Class 1 (which is better than Class 2 stated in the CA-DD)	Class 1 (which is better than Class 2 stated in the CA-DD)
Period of operating time		31/03/2012 to 31/08/2012	31/03/2012 to 31/08/2012
Instrument type		Energy Meter	Energy Meter
Manufacturer, model and serial number		HPL- SOCOMEC Pvt. Ltd.; 1K 162128	HPL- SOCOMEC Pvt. Ltd.; Sr. No. 1K 162128

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,i,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,i,y</sub>” (MWh)</b>
Specific location	Project site	Project site
Calibration dates	06/03/2012 (valid till 05/03/2013)	06/03/2012 (valid till 05/03/2013)
Company performing the calibration	AGEH Engineers and Contractors (Calibration traceable to international standard and hence deemed acceptable).	AGEH Engineers and Contractors (Calibration traceable to international standard and hence deemed acceptable).
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The energy meter was functional throughout the monitoring period	The energy meter was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Value	Ex-ante	-
	Ex-post	20.96
Measuring / Monitoring frequency	Continuous at each trip	Continuous at each trip
Reporting frequency	Calculated at the end of the monitoring period	Calculated at the end of monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the invoices and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average CO<sub>2</sub> emission factor of fuel type i in year y “EF<sub>CO2,i,y</sub>” (tCO<sub>2</sub>/GJ)</b>	<b>Boiler operating hours of the Project activity in year y “h<sub>y</sub>”</b>
Value	Ex-ante	-
	Ex-post	NA (No fossil fuel has been used during the monitoring period)
Measuring / Monitoring frequency	NA	Daily (Boiler operating hours is monitored by SCADA system based on the operating hours of the draft fan of the boiler)
Reporting frequency	NA	Monthly
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	Yes
Does monitoring of the parameter involve sampling? (yes / no)	NA	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average CO<sub>2</sub> emission factor of fuel type i in year y “EF<sub>CO2,i,y</sub>” (tCO<sub>2</sub>/GJ)</b>	<b>Boiler operating hours of the Project activity in year y “h<sub>y</sub>”</b>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	31/03/2012 to 31/08/2012
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	Low risk

	Verified situation	Conclusion
<b>SECTION 4. Compliance with the calibration frequency requirements for measuring instruments</b>		
The "Monitoring Parameters and Calibration Checklist" in section 3 above shall be checked to determine if the calibration frequency specified in the applied monitoring methodology and/or monitoring plan is followed in the monitoring report and in the monitoring activities. Where a failure to comply with the required frequency is detected, or no frequency is mentioned in the monitoring report, please follow the checklist below:		
<p>4-5. If the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (that is, the results of delayed calibration are available), confirm that the following conservative approach has been adopted in the calculation of emission reductions:</p> <ul style="list-style-type: none"> <li>- If the delayed calibration did not show any errors in the measuring equipment, or the error was smaller than the maximum permissible error, have the PPs applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> <li>- If the delayed calibration identified an error greater than the maximum permissible error, have the PPs applied the error identified in the delayed calibration test to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> </ul> <p>Confirm that the error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer emission reductions being claimed;</p>	No delayed calibration was noted during this monitoring period. Hence this is not applicable.	NA



	Verified situation	Conclusion
<p>4-6. If the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification:</p> <ul style="list-style-type: none"> <li>c. Request the PPs to conduct the required calibration;</li> <li>d. On receipt of the calibration results, determine whether the PPs have calculated the emission reductions conservatively using the approach mentioned in section 4.1 above.</li> </ul>	Not Applicable.	NA
<p>4-7. If it is not possible for the PPs to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of the PPs, check if the PPs have prepared a temporary deviation or a 'Permanent changes from the monitoring plan and/or monitoring methodology application'.</p> <p>Follow the requirements for post registration changes in sections 3.10 to 3.19 above.</p>	Not Applicable.	NA
<p>4-8. If neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipment, determine whether the equipment is calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification. If neither local/national standards nor the manufacturer's specification are available, international standards may be used.</p>	Not Applicable.	NA

		Verified situation	Conclusion
<b>SECTION 5. Assessment of data and calculation of emission reductions</b>			
5-1. Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in line with the formulae and methods described in the monitoring plan and the applied methodology document?  Check consistency in the ERs spreadsheet.	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and the applicable methodological tools for the project activity are as follows:</p> <p><b><u>Baseline emissions:</u></b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity = 2727.23 tCO<sub>2</sub> – Calculation shown below</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity = 30.47 TJ – Calculation shown below</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant as per the included CPA-DD = 89.5 tCO<sub>2</sub>/TJ</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity as per the included CPA-DD = 100%</p> <p><math>EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}</math></p> <p>where</p> <p><math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{steam}</math> = Quantity of steam supplied in Tonnes = 12046.63 Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet = 666.13 kCal/kg</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg) = 61.86 kCal/kg</p>		CL-08 CL-02 OK

	Verified situation	Conclusion
	<p> <math>EG_{\text{thermal}} = 12046.63 * (666.13 - 61.86) * 4.186 * 10^{-6}</math>  <math>= 30.47 \text{ TJ}</math> </p> <p>           Note: Steam enthalpy is calculated at the weighted average steam pressure during the monitoring period from standard steam table for saturated steam. Similarly the enthalpy of the boiler feed water is determined at the weighted average feed water temperature during the monitoring period. The verification team independently calculated the steam enthalpy at the average steam pressure of 12.89 kg/cm<sup>2</sup> g using the web site - <a href="http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp">http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp</a> ; and found the steam enthalpy as 666.35 kCal/kg. Hence the enthalpy used by the CME is conservative.         </p> <p>           Therefore,  <math>BE_{\text{thermal,CO2,y}} = 30.47 / 100\% * 89.5</math>  <math>= 2727.23 \text{ tCO}_2</math> </p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p> <math>PE_{\text{EC,y}} = EC_{\text{PJ,j,y}} * EF_{\text{grid,CM,y}} * (1 + \text{TDL}_{\text{j,y}}) + EC_{\text{EL,j,y}} * EF_{\text{EL,j,y}} * (1 + \text{TDL}_{\text{j,y}})</math> </p> <p> <math>EC_{\text{PJ,j,y}}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid = 102.24 MWh         </p> <p> <math>EC_{\text{EL,j,y}}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) = 2.88 MWh         </p> <p> <math>EF_{\text{grid,CM,y}}</math> = Ex-ante Grid Emission Factor = 0.80 tCO<sub>2</sub>/MWh         </p> <p> <math>EF_{\text{EL,j,y}} = EF_{\text{EL,l,y}}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l) = 1.3 tCO<sub>2</sub>/MWh         </p>	

	Verified situation	Conclusion
	<p><math>TDL_{i,y}</math> = Average technical transmission and distribution losses for providing electricity to source i and/or j as per the included CPA-DD = 20%</p> <p><math>PE_{EC,y} = 102.24 * 0.80 * (1+20\%) + 2.88 * 1.30 * (1+20\%)</math>  <math>= 102.64 \text{ tCO}_2</math></p> <p><u>Project emissions from fossil fuel combustion</u></p> <p><math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math></p> <p>where  <math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p><math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr) = 0 Tonnes  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)</p> <p><math>COEF_{i,y} = NCV_{i,y} * EF_{CO2,i,y}</math>  where  <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)</p> <p>As there is fossil fuel consumption during the monitoring period,  <math>PE_{FC,j,y} = 0</math></p> <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math>  <math>= 102.64 + 0 = 102.64 \text{ tCO}_2</math></p> <p><u>Leakage:</u>  <math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math></p>	

	Verified situation	Conclusion
	<p> <math display="block">= EC_{LE,l,y} * EF_{EL,l,y} * (1+TDL_{l,y}) + N_{c,y} * AVDC_{y} * EF_{km,CO2} + N_{y} * AVD_{y} * EF_{km, CO2}</math> </p> <p>where</p> <p>LE<sub>y</sub> = Leakage emissions</p> <p>LE<sub>EC,y</sub> = Leakage emissions from electricity consumption</p> <p>LE<sub>collection,y</sub> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p>LE<sub>transportation, y</sub> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p>This CPA does not involves usage of any processed biomass (rice husk is the biomass residue used in the project boiler). Hence leakage emission due to processing biomass is not applicable.</p> <p>Again the biomass used in the project is not transported from beyond 200 km of the project site (biomass transported from within a distance of 21 km). Hence leakage emission due to transportation of biomass is neglected.</p> <p>Thus LE<sub>y</sub> = 0</p> <p>Emission reductions are calculated as follows:</p> <p> <math display="block">ER_y = BE_y - PE_y - LE_y</math> <math display="block">= 2727.23 - 102.64 - 0 = 2,624tCO_2 \text{ (rounded down value)}</math> </p> <p>CL 08 was raised as the ER calculation spreadsheet provided for the CPA had not included daily monitored data for steam quantity, temperature, pressure and feed water temperature to calculate the average of these parameters. ER calculation spreadsheet was adequately revised and the CL was closed.</p> <p>CL 02#2 was raised as, for the parameter “TD<sub>Li,y</sub> = TD<sub>Lj,y</sub>”, it was stated in the MR that it is used for Leakage emission calculation. But this parameter is also used for the calculation of project emission. CL was closed after appropriate revision in the MR.</p>	

	Verified situation	Conclusion
<p>5-2. Has the calculation tool been correctly documented? Check its consistency and formulae.</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The Monitoring Report is supported by Microsoft excel based spreadsheet for the calculation of emission reductions. The consistency and formula were verified and found to be accurate.</p>	<p>OK</p>
<p>5-3. Is a complete set of data available during the specified monitoring period? If only partial data is available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan proceed as follows:</p> <ol style="list-style-type: none"> <li>a. Check if sections 3.11 and/or 3.12 above are applicable and raise a CAR for the PPs to comply with these requirements.</li> <li>b. If sections 3.11 and 3.12 are not applicable or the answer to this question remains NO, a request for deviation is necessary.</li> </ol> <p>Conduct an assessment of the potential impacts of these changes in accordance to the procedures for Post Registration Changes.</p>	<p>Yes, the complete data set was available during the specified monitoring period.</p>	<p>OK</p>
<p>5-4. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?</p> <p>Please describe how LRQA has cross-checked reported data.</p>	<p>All the information provided in the Monitoring Report were cross-checked with the Plant log book records, purchase records (for biomass and fossil fuel), site visit and interview of the CPA implementer/CME.</p>	<p>OK</p>

	Verified situation	Conclusion
5-5. Have any assumptions used in emission calculations been justified?	All assumptions in the emission reduction calculation are consistent with assumptions taken in the registered monitoring plan and have reference to the applied methodology.	OK
5-6. Have appropriate emission factors, IPCC default values, and other reference values been correctly applied?	<p>The CME has applied the appropriate ex-ante fixed factors as stated in the included CPA-DD like:</p> <ul style="list-style-type: none"> <li>• The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity(<math>\eta_{BL,thermal}</math>)</li> <li>• CO<sub>2</sub> Emission Factor of the fossil fuel that would have been used in the baseline plant (<math>EF_{FF,CO_2}</math>)</li> <li>• Surplus availability of Biomass within identified region (<math>SA_k</math>)</li> <li>• Ex-ante Grid Emission Factor in a year y.</li> <li>• Emission Factor for fossil fuel based electricity generation for source j and/or l in year y (<math>EF_{EL,j,y} = EF_{EL,l,y}</math>)</li> <li>• Auxiliary Electricity Consumption for biomass processing, outside Project boundary. (<math>EC_{LE,l,y}</math>)</li> <li>• Average CO<sub>2</sub> emission factor for the trucks measured during the year y(<math>EF_{km,CO_2}</math>)</li> <li>• Average technical transmission and distribution losses for providing electricity to source l and/or j in year y(<math>TDL_{l,y} = TDL_{j,y}</math>)</li> <li>• Specific energy consumption of fuel type j of the Project activity in year y(<math>SEC_{PJ,j,y,measured}</math>)</li> </ul> <p>CL 02#3 was raised for the CME to clarify the appropriateness of the “Source of data” and “Additional comment” as stated in the MR for the parameters in section D.1, which are fixed ex-ante at the time of validation of the CPA.</p> <p>MR was suitably revised to close the finding.</p>	CL 02 OK

## 7.5 Appendix C3: Verification Protocol for CPA 4041-0003

	Verified situation	Conclusion
<b>SECTION 1. Project implementation in accordance with the registered PoA-DD &amp; CPA-DD</b>		
<b>General description of the project</b>		
1.1. Does the MR provide general information of the CPA and is it as per the CPA-DD included by CDM-EB or by a DOE <sup>31</sup> ?	<p>Yes, the Monitoring Report<sup>32</sup> provides the general information of the CPA. Details such as Title of the CPA, UNFCCC registration reference number, version number of the Monitoring Report, monitoring period, project participants, sectoral scope and estimated amount of GHG emission reductions. All the above details can be confirmed from the included CPA-DD through link in UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=W604YP71ETQMKGZAR5F2VHO9LCSIB3">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=W604YP71ETQMKGZAR5F2VHO9LCSIB3</a></p> <p>Title of the CPA is “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 011)” and it was included in the PoA on 23/03/2012 applying the baseline and monitoring methodology AMS-I.C, version 16 “Thermal energy production with or without electricity” as verified from the project page of the CPA. The project activity applies AMS-I.C, version 16. The project activity is installation and operation of a 8 TPH biomass (rice husk) fired boiler to meet the captive requirement of steam in the Rice bran cooking and solvent recovery. The project is located in Village – Kakkiralapally, Wardhannapet Mandal, Warrangal, Andhra Pradesh. The project is implemented by Mega Solvent Extractions Limited.</p>	OK
1.2. Is the general information provided in the MR in line with the PoA-DD registered by CDM-EB?	<p>Yes, the Monitoring Report is as per the PoA-DD registered by CDM-EB confirmed from the registered PoA-DD through link on UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=W604YP71ETQMKGZAR5F2VHO9LCSIB3">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=W604YP71ETQMKGZAR5F2VHO9LCSIB3</a></p>	OK
1.3. Is the Monitoring Report as per the standardised format (F-CDM-MR)? (EB 66 )	Yes, the Monitoring Report is as per the latest standardised format (F-CDM-MR) version 02.0 (EB66, Annex 20).	OK

<sup>31</sup> The first CPA is included by the CDM-EB along with registered PoA-DD and subsequent CPAs are included by DOEs.

<sup>32</sup> Monitoring Report for this CPA (CPA 4041-0003) refer to the Appendix-3 of the consolidated MR Version 4.0



	Verified situation	Conclusion
1.4. Is the monitoring report filled as per the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).	Yes, the MR is filled up as per the latest "Guidelines for completing the monitoring report form" EB 66, Annex 20. CAR 08 was raised as project page of the PoA on UNFCCC web site, the "Other Parties involved" is stated as "United Kingdom of Great Britain and Northern Ireland" and "Germany". But in the MR "Germany" is missing. CAR was closed as the MR is suitably revised.	CAR-08 OK
1.5. Is there any open issue in the validation / previous verification including FARs? (CDM VVS para. 213)	No No FAR was raised in the Validation report during the CPA inclusion by TUV Nord, the DOE for validation of the CPA. Further this being the first periodic verification, no open issues exists from earlier verification.	OK
<b>Implementation status of the CPA</b>		
1.6. Is the CPA location indicated same as that in the included CPA-DD? Confirm geographical coordinates	Yes, the project location is same as stated in the CPA-DD and this was verified during the on-site visit. The geographical coordinates of the project site are 17.8286° (17° 49' 43") North, 79.5886° (79° 35' 19") East. This was cross-checked from the wikimapia web site.	OK
1.7. Is the project boundary described in the same way as the included CPA-DD and registered PoA-DD? Please confirm each component based on the applied methodology.	Yes, the project boundary is described in the same way as in the included CPA-DD and registered PoA-DD. During the on-site assessment it was also confirmed the project boundary is in line with the applied methodology. The project boundary for this CPA includes the biomass storage area and feeding system, boiler house and the facility which is consuming the heat generated by the project.	OK
1.8. Has on-site fossil fuel consumption, if any, been monitored? Is any emission source missed? Check the site lay-out and confirm through site tour.	Fossil fuel consumption is required to be monitored in this project. It has been confirmed during the on-site visit and document review that no fossil fuel has been consumed at the CPA site by the project during the monitoring period. The verification team did not find any emission source attributable to the project activity which has been missed out and the same was confirmed during the on-site visit and review of the site lay-out diagram.	OK
1.9. Confirm contractors for equipment and installation works	It is confirmed that the project equipment i.e., 8 TPH boiler for the project is supplied by Thermax Limited and this was confirmed during the on-site visit interview with the project implementer and from the purchase order copy of the boiler issued by the project implementer dated 23/06/2008.	OK
1.10. Confirm conformance with baseline and monitoring	Conformance to the applicable methodology conditions for the CPA are as follows:	OK

	Verified situation		Conclusion
methodology - Applicability conditions. Please refer to the complete description of the applicability conditions and confirm that the CPA meets all the requirements.	<b>Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)</b>	<b>Means of Verification and Results</b>	
	<i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>	The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.	
	<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>	The total installed / rated capacity of the project equipment is 5.02 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .	
	<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>	The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.	
	<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>	The project does not use any charcoal.	
	The verification team confirms that the CPA conforms to all applicable condition of the applied methodology.		

	Verified situation	Conclusion
	Apart from the baseline and monitoring methodology applicability criteria as stated above, the verification team also verified the eligibility criteria stated in section B.2 of the included CPA-DD under "Monitoring Criteria" for the point numbers 1, 3.3, 3.4, 3.5, 16, 17 and 18 and found these to be valid for the project activity during the monitoring period. A declaration letter dated 11/12/2012 in this respect has also been submitted by the CME.	
1.11. Confirm use or no use of public funding and determine if there is no diversion of ODA to the CPA.	There is no use of public funding for the CPA. The same was confirmed during the interview with the CME and also a declaration in this respect has been provided by the CPA implementer.	OK
1.12. Check data in the MR and in the CPA-DD. Describe data and variables that are different from that stated in the included CPA-DD and cause an increase in emission reductions estimations.	<p>Data in the MR and CPA-DD fixed at validation stage are found to be consistent.</p> <p>The ex-ante estimated emission reductions during this monitoring period of 154 days are 4,650 tCO<sub>2</sub> (11022/365*154) and the actual emission reductions during this monitoring period are 675 tCO<sub>2</sub>. Hence the actual emission reductions during this monitoring are less than the estimated values as per the CPA-DD.</p> <p>However, the following findings were raised and successfully closed during the verification;</p> <ul style="list-style-type: none"> <li>3) CL 02 was raised as for the parameters like "CAP<sub>boiler</sub>" and "SEC<sub>PJ,y,measured</sub>", it was stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation.</li> <li>4) CL 05 was raised, as the NCV was taken directly taken from the laboratory report, values of parameters like hydrogen, oxygen and moisture content in the biomass are still reported in the MR, which is not required as per the registered CPA-DD.</li> </ul> <p>The MR was suitably revised and the revised MR was found to be in line with registered CPA-DD and hence above findings are closed.</p>	<p>CL-02 CL05 OK</p>
1.13. By means of an on-site visit: Is the general information of the project provided in the Monitoring report and is it as per the CPA-DD included by CDM-EB or by a DOE?	<p>Yes.</p> <p>The on-site visit for the CPA was conducted on 07/11/2012.</p> <p>The project activity comprises of a 8 TPH biomass (rice husk) fired boiler to meet the captive requirement of steam at the project site.</p>	<p>CAR-01 CAR-03 OK</p>

	Verified situation	Conclusion
<p>List each technical component and equipment and check design parameters and actual status of installation and / or operation.</p> <p>Please check to ensure that all physical features of the proposed CPA in the registered/included CPA-DD are in place and the PP has operated the proposed CPA as per the included CPA-DD.</p> <p>It may include but not limited to:</p> <ul style="list-style-type: none"> <li>the actual capacity and output</li> <li>plant load factor</li> <li>type of feedstock</li> <li>operation of other components / units within the project boundary which could affect functioning of the project plant.</li> </ul> <p>In cases where there are a large number of components and equipment items and the check of all of them is not an available option, then a random sampling check shall be performed. Justify here the sample chosen and describe the results.<sup>33</sup></p>	<p>During the verification, by the observation of equipment, interviews with relevant staff and the checking of technical specifications of main components, it was confirmed that the project activity has been implemented as described in the included CPA-DD.</p> <p>The project is operational. The project was commissioned on 26/12/2009 and the same was verified from the commissioning certificate issued by Thermax Limited.</p> <p>No change from the included CPA-DD of physical features which may impact the emission reduction of the project activity has been identified.</p> <ul style="list-style-type: none"> <li>Steam generation unit : 8 TPH boiler</li> <li>Net enthalpy supply by project : The ex-ante estimated annual enthalpy output from the project boiler is 130.057 TJ as per the included CPA-DD (which corresponds to 54.873 TJ for 154 days of this monitoring period) whereas actual enthalpy supplied by the boiler during this monitoring period was 8.144 TJ which is less than the ex-ante estimated value.</li> <li>Type of biomass fired in the boiler: As per the included CPA-DD, renewable biomass residue (rice husk) is to be fired in the boiler and it was noted that there was no deviation in the biomass firing during the monitoring period.</li> <li>As per the included CPA-DD, the project may fire fossil fuel (Coal) in the boiler. During this monitoring period, no fossil fuel has been fired in the project boiler as confirmed by the project implementer during the site visit.</li> </ul> <p>100% data is monitored for the CPA and hence no sampling plan is applicable.</p> <p>However, CAR 01 was raised as in section B.1 of the MR, the downtime time of the project boilers is not provided. Details are provided in the revised MR and the CAR was closed.</p> <p>Further, CAR 03 was raised as PP has considered a simple average of steam pressure, temperature and boiler feed water enthalpy, which are used for the calculation of net enthalpy supplied by the project boiler, which is not correct. The calculation approach was revised and a weighted average was considered for emission reduction. The CAR 03 was successfully closed.</p>	

<sup>33</sup> The sampling shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified situation	Conclusion
1.14. Have responsibilities for monitoring been described and specified?	<p>The responsibilities of monitoring have been provided and described in the Monitoring Report. The Monitoring Report and CDM documents clearly describe the responsibilities for monitoring.</p> <p>The project owner has identified the CDM team, the structure of which is given in Monitoring Report. During the verification, responsibilities for operational personnel, technical and support team have been verified and confirmed.</p> <p>The CDM team has been assigned the responsibility for measuring, recording and storage of the measured data. Data is kept in electronic format and paper format.</p>	OK
1.15. Are the responsibilities and authorities for monitoring and reporting in line with those stated in the monitoring plan of the included CPA-DD?	Yes, responsibilities and authorities for monitoring and reporting are in accordance with the included CPA-DD.	OK
<p>1.16. Check QA/QC, management systems. Are procedures described and specified in the MR? Are they consistently applied as described in the MP?</p> <p>a. documented instructions, management manual</p> <p>b. documentation</p> <p>c. data archiving</p> <p>d. monitoring report</p> <p>e. cross-checking</p> <p>f. energy balance analysis (as relevant)</p> <p>g. internal audits / verification and management review</p>	<p>QA/QC procedures include staff training, instrument calibration, cross-checking and data/documents archiving. They are consistent with the monitoring plan.</p> <p>The Monitoring Report describes the monitoring system, monitoring procedures, data collection and reporting, responsibilities of relevant staff/departments, calibrations that were implemented and QA/QC procedures including data cross-checking.</p> <p>By means of document review, onsite assessment and interviews, the verification team has confirmed that all the QA/QC measures, data archiving, monitoring report and internal audits are as per the registered monitoring plan of the registered PoA-DD and the included CPA-DD.</p> <p>However, CL 03 was raised as the “QA/QC procedure” &amp; “Purpose of data” for the quantity of biomass in MR was mentioned as “NA” and the same is not consistent with the monitoring plan of the included CPA-DD. Monitoring and recording frequency of these parameters were not mentioned in the MR. Also the values for these parameters as stated in the MR was incorrect as verified during the on-site visit and also with the documents provided.</p> <p>The MR was suitably revised to close the finding.</p>	<p>CL 03</p> <p>OK</p>

	Verified situation	Conclusion
1.17. Have the procedures for emergency and abnormal situations been established?	<p>As stated in section C of the MR, the procedure for non-conformance and corrective actions is in place for the project activity to mitigate any emergency and abnormal situations in monitoring as per the included CPA-DD.</p> <p>During the monitoring period, no emergency situation in monitoring has occurred.</p> <p>However, CAR 07 was raised as the CME needed to clarify why the details of the backup monitoring instruments (for steam pressure and temperature and feed water temperature) were not provided in the MR. Adequate justification was provided by the CME and the CAR was closed.</p>	CAR 07 OK
1.18. Has the system for qualification and training been established as relevant for the monitoring and management activities?	<p>The training and qualification of the project personnel has also been confirmed during interview of the operational personnel during the on-site visit. It is confirmed that they have sufficient knowledge, experience and competency to implement and maintain the plant operation including data monitoring and recording in line with the boiler operation and maintenance manual provided by the boiler supplier, and with CDM requirements.</p> <p>This is further verified by the evidence for training of the project personnel and the boiler attendants' certificates issued by Directorate of Steam Boilers (Government agency) for the boiler operators.</p>	OK
1.19. Check the environmental report, license, permit and compliance to the local environmental legislation (if relevant).	<p>The verification team has confirmed that the project meets the relevant local environmental legislation. The same was confirmed from the copy of the consent to operate issued by Andhra Pradesh Pollution Control Board vide letter dated 22/07/2011 valid up to 31/03/2012 also the CPA operator had further applied to the Andhra Pradesh Pollution Control Board on 15/03/2012 and the consent is not refused within 4 months of the application the consent is deemed given unconditionally<sup>34</sup>. Also valid boiler certificate from 27/07/2012 to 26/01/2013 issued by Directorate of Steam Boilers Department has been submitted for the operation of the boiler (evidence for application for boiler certificate submitted to Boiler Inspector on 16/01/2012, as the previous boiler certificate was valid from 27/01/2012 to 26/07/2012, and hence the validity is deemed for the monitoring period).</p>	OK

<sup>34</sup> As per section 25 of the Water (Prevention & Control of Pollution) Act 1974, if consent application is submitted to the State Pollution Control Board and the consent is not refused within 4 months, consent is deemed to be given unconditionally.

	Verified situation	Conclusion	
1.20. Check contribution to sustainable development, comparing those expected in the included CPA-DD and the actual status.	With the provision of employment opportunities by the project activity, there has been a contribution for the social and economic well-being of some local people. The project utilises renewable biomass to produce steam (thereby avoiding the fossil fuel usage) and this leads to environment well being by reduced environmental impact from fossil fuel use. Also the project uses renewable biomass technology which is deemed as a clean (as it displaces fossil fuel usage) and safe technology. Even though the sustainable development measures were not registered in the CPA-DD as a monitoring parameter, it was confirmed during the site visit that the CPA contributes to the sustainable development of the host country.	OK	
1.21. Check issues with local stakeholders, claims, complaints, etc.	It was confirmed by on-site interviews that there had been no claims and complaints from local stakeholders prior to the verification visit.	OK	
1.22. If from the above assessment the conclusion is that the implementation or operation of the CPA does not conform with the description contained in the included CPA-DD and/or corrections have been made to project information or parameters fixed at validation/inclusion, determine if these changes and/or corrections do not require prior approval by the board: <ul style="list-style-type: none"><li>- A request of approval is required if the boundary of a registered CDM PoA is changed to include an additional host party, in accordance with the project cycle procedure.</li><li>- A request for approval is required if the CME of a registered CDM PoA changes after the registration of the PoA.</li><li>- Any corrections to project information of an included CPA that do not affect the design of the project activity do not require prior approval by the Board.</li><li>- A request for approval is required if any of the three issues below is adversely impacted by the identified changes to the project design.</li></ul>			
1.23. The applicability and application of the applied methodology under which the CPA has been included:  Check if the project boundary has changed and if any of the parameters to assess the applicability conditions have changed.	No change in applicability and application of the applied methodology AMS-I.C. version 16, including the project boundary, is observed.	YES	NO
			X
1.24. Compliance of the included	No change in the eligibility criteria of the registered CPA, as defined in the registered PoA-DD, is	YES	NO

	Verified situation	Conclusion	
CPA to eligibility criteria as defined in the registered PoA-DD.  Check if any of the parameters to assess the PoA eligibility criteria have changed.	observed.		X
1.25. The additionality of the project activity:  Check if any of the input parameters to the investment analysis have changed. For barrier analysis, check if any information or data used in the barrier analysis has changed.	There is no change in the project design parameters as the project is implemented as per the included CPA-DD. Hence this is not applicable.	YES	NO
			X
1.26. The scale of the project activity.  Check if the project is still small scale or large scale after the implementation of the changes.	Small scale, as per the eligibility criteria for CPA inclusion and is in accordance with the methodology AMS-I C, version 16.	YES	NO
			X
If the answer to any of the above items is YES, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
1.27. If, from the above assessment, the conclusion is that the changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	



	Verified Situation	Conclusion
<b>SECTION 2. Compliance of the Monitoring Plan with the Monitoring Methodology including applicable Tool(s)</b>		
2.1. Is the monitoring plan of the included CPA-DD in accordance with the applied methodology?	Yes, it is confirmed that monitoring plan of the included CPA-DD is in accordance with the applied methodology, AMS-I.C, version 16.	OK
2.2. If the methodology provides different options (for example, use of default values or on-site measurements), has the Monitoring Report specified which option is used?	<p>Yes,</p> <p>The ex-ante parameters which are fixed for the crediting period at the time of CPA inclusion in the PoA as per the methodological tools are:</p> <ul style="list-style-type: none"> <li>• <math>CAP_{\text{boiler}}</math> (Rated capacity (thermal output) of the boiler of the Project activity)</li> <li>• <math>\eta_{\text{BL,thermal}}</math> (The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity)</li> <li>• <math>EF_{\text{FF,CO}_2}</math> (<math>\text{CO}_2</math> Emission Factor of the fossil fuel (Indian Coal) that would have been used in the baseline plant)</li> <li>• <math>SA_k</math> (Surplus availability of Biomass within 50 km radial distance)</li> <li>• <math>EF_{\text{grid,CM,y}}</math> (Ex-ante Grid Emission Factor in a year y)</li> <li>• <math>EF_{\text{EL,j,y}}</math> (Emission Factor for fossil fuel based electricity generation for source j in year y)</li> <li>• <math>EF_{\text{km,CO}_2}</math> (Average <math>\text{CO}_2</math> emission factor for the trucks measured during the year y)</li> <li>• <math>TDL_{\text{i,y}}</math> (Average technical transmission and distribution losses for providing electricity to source j in year y)</li> <li>• <math>SEC_{\text{PJ,j,y,measured}}</math> (Specific energy consumption of fuel type j of the Project activity in year y)</li> </ul> <p>Further, the verification team confirms that there is no deviation in the values of the ex-ante fixed parameters between the included CPA-DD and the MR.</p> <p>The parameters being monitored ex-post as per the monitoring methodology and the CPA-DD are:</p> <ul style="list-style-type: none"> <li>• Quantity of steam supplied in year y (<math>Q_{\text{steam}}</math>)</li> <li>• Average Steam Temperature at MSSV (Main steam stop valve) outlet during year (<math>T_{\text{steam}}</math>)</li> <li>• Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year (<math>P_{\text{steam}}</math>)</li> <li>• Average Feed Water Temperature at inlet of boiler (<math>T_{\text{FWB}}</math>)</li> <li>• Boiler operating hours of the project activity in year y (<math>h_y</math>)</li> </ul>	<p>CL-05</p> <p>OK</p>

	Verified Situation	Conclusion
	<ul style="list-style-type: none"> <li>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site (<math>Q_{ob,k}</math>)</li> <li>Quantity of subsequent delivery of fuel type k biomass at the Project site (<math>Q_{np,k}</math>)</li> <li>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site (<math>Q_{in,k}</math>)</li> <li>Quantity of biomass fuel type k consumed during the monitoring period (<math>Q_{c,k} = FC_{biomass,k,y}</math>)</li> <li>Quantity of stored fuel type fossil (Coal) i on the starting date of each monitoring period measured at the Project site (<math>Q_{ob,i}</math>) *</li> <li>Quantity of subsequent delivery of fuel type fossil fuel (Coal) i (<math>Q_{np,i}</math>) *</li> <li>Quantity of remaining fossil fuel type (Coal) i available at the end date of each monitored period measured at the Project site (<math>Q_{in,i}</math>) *</li> <li>Quantity of fossil fuel type i (Coal) consumed during the monitoring period (<math>Q_{c,i} = FC_{j,PJ,y}</math>) *</li> <li>Net calorific value of biomass fuel k used in the Project activity (NCV<sub>k</sub>) **</li> <li>Percentage of hydrogen in biomass fuel (Hydrogen) **</li> <li>Percentage oxygen in Biomass fuel (Oxygen)**</li> <li>Moisture content of the biomass residues (Moisture)**</li> <li>Weighted average net calorific value of the fuel (coal) type i in year y (NCV<sub>i,y</sub>) *</li> <li>Quantity of fossil fuel (Furnace oil) type i consumed in a process j during the year y (<math>FC_{i,j,y}</math>) *</li> <li>Auxiliary Electricity Consumption of the Project activity from the Grid in year y (<math>EC_{PJ,j,y}</math>)</li> <li>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) in a year y (<math>EC_{EL,j,y}</math>) ***</li> <li>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y (<math>AVD_{y,y}</math>)</li> <li>Number of truck trips during the year y (<math>N_{y,y}</math>)</li> <li>Weighted average CO<sub>2</sub> emission factor of fuel type i in year y (<math>EF_{CO2,i,y}</math>)</li> </ul> <p>These parameters are based on on-site measurement and have been verified during this verification.</p> <p>* No fossil fuel has been fired in the project boiler during this monitoring period</p> <p>** The laboratory report has directly provided the value of NCV. Hence Hydrogen, Oxygen and moisture are not required (which would be required in case NCV was not provided to be calculate</p>	

	Verified Situation	Conclusion
	<p>NCV from GCV and the above three parameters)</p> <p>*** Only grid electricity is consumed as auxiliary power during the monitoring period and no off grid power is used</p> <p>However, CL 05 was raised, since the NCV was taken directly from the laboratory report, yet the values of parameters like hydrogen, oxygen and moisture content in the biomass were reported in the MR, which is not required as per the registered CPA-DD. MR was suitably revised and the finding was closed.</p>	
2.3. Is all data collected and archived according to the tables in the applied Monitoring Methodology and is this included in the Monitoring Plan?	Yes, all the data is collected and archived in accordance to methodology and included in the monitoring plan. All the data will be archived until 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.	OK
<p>2.4. Check the calculation of emission reductions following the applied methodology:</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and applied for the project activity are as follows:</p> <p><b>Baseline emissions:</b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity during the year y (tCO<sub>2</sub>)</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity during the year y (TJ)</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant; tCO<sub>2</sub> / TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of</p>	CL-04 OK

	Verified Situation	Conclusion
	<p>the Project activity</p> $EG_{\text{thermal}} = Q_{\text{steam}} * (H_s - H_w) * 4.186 \times 10^{-6}$ <p>where</p> <p><math>EG_{\text{thermal}}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{\text{steam}}</math> = Quantity of steam supplied in Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet (kCal/kg)</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg)</p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> $PE_{EC,y} = EC_{PJ,j,y} * EF_{\text{grid},CM,y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})$ <p><math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid in year y</p> <p><math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set)</p> <p><math>EF_{\text{grid},CM,y}</math> (Ex-ante Grid Emission Factor in a year y)</p> <p><math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j in year y</p> <p><u>Project emissions from fossil fuel combustion</u></p> $PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}$ <p>where</p> <p><math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p>	

	Verified Situation	Conclusion
	<p> <math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit) </p> <p> <math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math>  where  <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ) </p> <p>Hence PE<sub>y</sub> (Total Project emissions) = PE<sub>EC,y</sub> + PE<sub>FC,i,y</sub></p> <p><b><u>Leakage:</u></b></p> <p> <math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math> </p> <p> <math>= EC_{LE,l,y} * EF_{EL,l,y} * (1+TDL_{l,y}) + N_{c,y} * AVDc_{,y} * EF_{km,CO2} + N_{,y} * AVD_{,y} * EF_{km, CO2}</math>  where  <math>LE_y</math> = Leakage emissions  <math>LE_{EC,y}</math> = Leakage emissions from electricity consumption in year y (tCO<sub>2</sub>/yr)  <math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site  <math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site  <math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source l in year y as a result of leakage (MWh/yr)  <math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source l in year y (tCO<sub>2</sub>/MWh)  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l in year y  <math>N_{c,y}</math> = Number of truck trips for collecting loose biomass during the year y  <math>AVDc_{,y}</math> = Average round trip distance between the biomass fuel supply sites and biomass collection site during the year y  <math>EF_{km,CO2}</math> = Average CO<sub>2</sub> emission factor for the trucks measured during year y  <math>N_{,y}</math> = Number of truck trips during the year y  <math>AVD_{,y}</math> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant during year y (km) </p>	

	Verified Situation	Conclusion
	<p>Emission reductions are calculated as follows:</p> $ER_y = BE_y - PE_y - LE_y$ <p>CL 01 was raised as in section E.5 of the MR, the calculation of the ex-ante emission reductions was not transparently presented. The revised MR clearly and transparently describes the ER calculation approach providing relevant equations in line with the included CPA-DD.</p>	
<p>2.5. List any monitoring aspect that is not specified in the methodology and check its compliance with the Monitoring Plan, for example:</p> <ul style="list-style-type: none"> <li>• additional monitoring parameters</li> <li>• monitoring frequency</li> <li>• calibration frequency.</li> </ul>	<p>No additional monitoring parameter is identified that is not specified in the approved methodology and the included CPA-DD available in the project page on UNFCCC website.</p> <p>The monitoring frequency and the calibration frequency specified are not less than the requirements of the approved methodology and the Monitoring plan in the included CPA-DD.</p>	OK

		Verified Situation	Conclusion
<b>SECTION 3. Compliance of Monitoring activities with the Monitoring Plan of the included CPA-DD</b>			
<p>3-1. Is the Monitored Data included in the Monitoring Report as per the Monitoring Plan or any accepted revised MP?</p> <p>3-2. Has the data been generated at the frequency required by the Monitoring Plan or any accepted revised MP?</p>	<p>Yes</p> <p>The monitored data included in section D.2 of the MR is as per the monitoring plan of the included CPA-DD.</p> <p>The values are indicated in the section D.2 of the Monitoring Report. At the site visit it was verified that data was generated at the required frequency as per the monitoring plan in the included CPA-DD.</p>		OK
<p>3-3. Has the monitoring been implemented in accordance with the monitoring plan contained in the included CPA-DD or any accepted revised MP?</p> <p>Confirm that the monitoring and reporting procedures have been implemented as documented and follow by PPs.</p>	<p>Yes, by means of document review, on-site assessment and interviews with the plant personnel, it was confirmed that the monitoring has been implemented in accordance with the monitoring plan contained in the included CPA-DD.</p> <p>It was also established that monitoring and reporting procedures have been implemented as documented by the CME and the CPA operator</p>		OK
<p>3-4. Have types of measurement instrumentation used been described and specified?</p>	<p>Yes the MR specifies and describes the use of different measurement instruments (Steam flow meter, RTD / Temperature gauge, Pressure transmitter / Pressure gauge, energy meter and weighbridge). The details of the measuring equipment are provided in the "Annex-1_4041-0003: Instrument Details" of the MR. The provided details have been verified during the on-site visit.</p>		OK
<p>3-5. Is the accuracy of equipment used for monitoring sufficient and regularly controlled and calibrated in line with the registered monitoring plan or any accepted revised MP?</p> <p>Check relevance of maintenance and calibration</p>	<p>Yes, the verification team confirmed through the on-site assessment and the review of evidence that the installation of the measuring devices has been completed and the equipment has been operated and maintained in normal operating conditions.</p> <p>The accuracy classes of all the monitoring equipment are found as per the monitoring plan of the included CPA-DD, or of higher accuracy as detailed in "Annex-1_4041-0003: Instrument Details" of the MR.</p> <p>It was confirmed that the information of the meters was consistent with that described in the</p>		<p>CL-07</p> <p>OK</p>

included in the monitoring plan. Check relevance of laboratory analysis if included in the monitoring plan.	<p>Monitoring Report.</p> <p>The CME has provided the calibration certificates of all the monitoring equipment and the verification team confirms the certificates to be appropriate and relevant.</p> <p>For further details of the calibration of the monitoring equipment please refer to section 3.19 of this report below.</p> <p>CL 07 was raised as the CME had not provided the credentials of the calibrating agencies and the laboratories, which have carried out the NCV analysis. Adequate information was provided by the CME and the CL was closed.</p> <p>For details please refer to Appendix D of this report.</p>	
3-6. If the monitoring plan of the CPA-DD refers to a sampling plan and monitoring is carried out for the chosen samples, ensure that the sampling is carried out as per the sampling plan <sup>35</sup> .	The monitoring plan of the CPA-DD does not refer to a sampling plan and the monitoring is carried out for 100% data for all the monitoring parameters.	NA
3-7. Check that responsibilities and authorities for monitoring and reporting are in line with the monitoring plan.  Are the monitoring results consistently recorded, reviewed and approved as stated in the CPA-DD or any accepted revised MP?	<p>Yes</p> <p>During the site visit, monitoring and reporting procedures were confirmed by the verification team through interview with the relevant plant personnel, CME and by document review.</p> <p>However the following CAR/CL were raised and successfully closed;</p> <ul style="list-style-type: none"> <li>CAR 02 was raised as the opening readings of the parameter “Q<sub>steam</sub>” and closing readings of the parameters “EC<sub>PJ,j,y</sub>” and “EC<sub>EL,j,y</sub>” have not been presented to the verification team.</li> <li>CL 02 was raised as for the parameters like “CAP<sub>boiler</sub>” and “SEC<sub>PJ,y,measured</sub>”, the CME had stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not used for baseline emission calculation.</li> <li>CL 05 was raised, since the NCV is taken directly taken from the laboratory report, however the values of parameters like hydrogen, oxygen and moisture content in the biomass were still reported in the MR, which is not required as per the registered CPA-DD.</li> </ul> <p>The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p> <p>For details please refer to Appendix D of this report.</p>	<p>CAR-02</p> <p>CL-02</p> <p>CL05</p> <p>OK</p>

<sup>35</sup> The sampling plan shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"



<p>3-8. Reporting period: Defined?</p> <p>If a monitoring period of a parameter more / less than a year is applied, check if the monitoring is in a complete and consistent manner?</p> <p>Is the monitoring period within the crediting period of the CPA and length of the registered PoA?</p>	<p>The monitoring period for the PoA is from 12/01/2011 to 31/08/2012. But for the CPA, the emission reduction starts from 31/03/2012 (i.e., the date of start of crediting period of the CPA) till 31/08/2012. Hence the monitoring period for the CPA is for 154 days which is less than a year. However, monitoring of all the parameters is complete, as there is no specific requirement in the methodology for annual reporting of any data. The verification team therefore confirms the monitoring to be complete and consistent and clearly defined in the MR.</p> <p>The monitoring period is within the crediting period of the CPA and also the length of the registered PoA.</p> <p>CL 09 was raised as the monitoring period of the CPA was not consistent with that of the PoA in the webhosted MR. The issue was addressed and the finding was successfully closed.</p>	<p>CL-09 OK</p>
<p>3-9. If the monitoring plan includes the determination of environmental and / or social indicators, have the sustainable development indicators been monitored in accordance with the monitoring plan of the included CPA-DD?</p>	<p>Not applicable</p>	<p>NA</p>
<p>3-10. Check monitoring of Environmental and Social indicators (if relevant)</p> <ul style="list-style-type: none"> <li>• implementation of measures</li> <li>• monitoring equipment</li> <li>• quality assurance procedures</li> <li>• external data.</li> </ul>	<p>Not applicable</p>	<p>NA</p>

Verified Situation		Conclusion	
<b>SECTION 2 and 3: Post Registration Changes</b>			
<p>3-11. If, from the above assessment in SECTIONS 2 and 3, the conclusion is that there are temporary deviations or permanent changes from the registered Monitoring Plan or Monitoring Methodology, determine if these deviations or changes require prior approval by the EB by answering the questions below.</p> <p>All the answers to the applicable questions below shall be explained and the reasons for each conclusion given in the “Verified situation” column.</p> <p><b>Temporary deviations from the registered monitoring plan or applied methodology:</b>  Prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES.</p>			
3-12. Have the PPs reported as zero any parameter related to baseline GHG emissions that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?	No temporary deviation is sought during this monitoring period	YES -	NO -
3-13. Have the PPs estimated (assuming that the source of the project GHG emissions operated at maximum capacity for the full period of the missing data) any parameter that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?  For project GHG emissions related to the consumption of electricity, the estimate shall include an addition of 10% to account for transmission and distribution losses.	No temporary deviation is sought during this monitoring period	YES -	NO -
<b>Permanent changes from the registered monitoring plan or applied methodology</b>			

		Verified Situation		Conclusion	
If the monitoring equipment actually installed has a lower accuracy level than the accuracy stipulated in the applied methodology and/or in the registered monitoring plan, and the monitoring equipment is under the control of the project participants, prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES:					
3-14. Have the PPs deducted from the measured value, for any parameter used for calculating baseline GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES	NO		
		-	-		
3-15. Have the PPs added to the measured value, for any parameter used for calculating project GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES	NO		
		-	-		
Changes to the monitoring of the included CPA of a type listed below do not require approval by the EB. Confirm in the conclusion column that the change is of the type in the table below and explain the reasons.					
3-16. Change of calibration frequency or practice for monitoring equipment not within the control of project participants	Not Applicable			NA	
3-17. Change of accuracy / type / model of meter(s) as per a power purchase agreement (PPA)	Not Applicable			NA	
3-18. Change of location of meter(s) as per a power purchase agreement (PPA)	Not Applicable			NA	
If the answer to any of the above items has been that approval from the EB is required, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.					

	Verified Situation	Conclusion
3-19. If, from the above assessment, the conclusion is that the temporary deviations or permanent changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA

### 3.19 Monitoring Parameters and Calibration Checklist:

Complete the following table for each parameter:

Data / Parameter (as in the MP)		Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Value	Ex-ante	52,212 per annum	207.47
	Ex-post	3,254.4	182.39 <sup>36</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		As per the monitoring plan of the included CPA-DD, the quantity of steam delivered by the project is measured by duly calibrated steam flow meter and the calibration certificate has been verified. Further, the verification team cross-checked the quantity of steam delivered by the project activity during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the steam temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.

<sup>36</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

Data / Parameter (as in the MP)	Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Steam flow meter Sr. No.: E8010620000	RTD Sr. No.: E8010620000 <sup>37</sup>
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?	± 2.3% Maximum (which is better than that stated in the CPA-DD of ±3%)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	31/03/2012 to 31/08/2012	31/03/2012 to 31/08/2012
Instrument type	Steam flow meter cum RTD	Steam flow meter cum RTD
Manufacturer, model and serial number	Make: Endress + Hauser; Sr. No.: E8010620000	Make: Endress + Hauser; Sr. No.: E8010620000
Specific location	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler
Calibration dates	13/10/2011 (valid till 12/10/2014)	13/10/2011 (valid till 12/10/2014)
Company performing the calibration	Manufacturer : Endress + Hauser (NABL accredited agency)	Manufacturer : Endress + Hauser (NABL accredited agency)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes

<sup>37</sup> A consolidated monitoring equipment is used by the CPA operator, which has inbuilt feature for measuring the both steam flow and the steam temperature. This was confirmed during the on-site visit and verification of the technical specification of the measuring equipment.

Data / Parameter (as in the MP)	Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Maintenance	The Steam flow meter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P <sub>steam</sub> ” (kg/cm <sup>2</sup> g)	Average Feed Water Temperature at inlet of boiler “T <sub>FWB</sub> ” (°C)
Value	Ex-ante	17.5	73
	Ex-post	10.94 <sup>38</sup>	66.84 <sup>39</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA

<sup>38</sup> The value is the weighted average of the daily recorded pressure readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily pressure readings was reported in the published MR which is incorrect. The CAR was closed after the pressure was revised as the weighted average of the daily readings during the monitoring period

<sup>39</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “<math>P_{\text{steam}}</math>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “<math>T_{\text{FWB}}</math>” (°C)</b>
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the steam pressure is measured by duly calibrated pressure transmitter and the calibration certificate has been verified. Further, the verification team cross-checked the steam pressure during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the feed water temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Pressure transmitter Sr. No. E8002C21129	RTD E8007F142EA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+/- 0.15% (which is better than 2% as stated in the CPA-DD)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	31/03/2012 to 31/08/2012	31/03/2012 to 31/08/2012
Instrument type	Pressure transmitter	RTD
Manufacturer, model and serial number	Endress + Hauser; Sr. No. Sr. No. E8002C21129	Endress + Hauser; Sr. No. E8007F142EA
Specific location	Project site, at the Main Steam Stop Valve (MSSV)	Project site, after the boiler feed water tank at the inlet of the boiler
Calibration dates	22/08/2011 (valid till 21/08/2014)	13/10/2011 (valid till 12/10/2014)
Company performing the calibration	Endress + Hauser (NABL accredited agency)	Endress + Hauser (NABL accredited agency)



<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “<math>P_{\text{steam}}</math>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “<math>T_{\text{FWB}}</math>” (°C)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the registered CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the registered CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The pressure transmitter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “<math>Q_{\text{ob},k}</math>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “<math>Q_{\text{np},k}</math>” (Tonnes)</b>
Value	Ex-ante	NA
	Ex-post	18.25
Measuring / Monitoring frequency	At the start of the monitoring period	866.85
Reporting frequency	Once during the monitoring period	Data is monitored and recorded for each truck delivery
		Each truck trip

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The opening balance of the biomass is measured by a calibrated weighbridge	Biomass procured is measured for each truck entering the plant premises by a calibrated weighbridge
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge; Sr. No. 950084373	Weighbridge; Sr. No. 950084373
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III <sup>40</sup>	Class III <sup>43</sup>
Period of operating time	31/03/2012 to 31/08/2012	31/03/2012 to 31/08/2012
Instrument type	Weighbridge	Weighbridge
Manufacturer, model and serial number	Essae Digitronics Private Limited; Sr. No. 950084373	Essae Digitronics Private Limited; Sr. No. 950084373
Specific location	At project site	At project site
Calibration dates	25/03/2012 (valid till 24/03/2013)	25/03/2012 (valid till 24/03/2013)
Company performing the calibration	Weights and Measure Department, Govt. of India	Weights and Measure Department, Govt. of India

<sup>40</sup> In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “<math>Q_{ob,k}</math>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “<math>Q_{np,k}</math>” (Tonnes)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The weighbridge was functional throughout the monitoring period	The weighbridge was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “<math>Q_{in,k}</math>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “<math>Q_{c,k}</math>” = “<math>FC_{biomass,k,y}</math>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	82.72
Measuring / Monitoring frequency	Measured at the end of the monitoring period	Calculated from the opening, received and closing balance of the biomass during the monitoring period
Reporting frequency	Once during the monitoring period	At the end of the monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The closing balance of the biomass is measured by a calibrated weighbridge	The quantity of biomass consumed is cross-checked with the invoices obtained from the fuel supplier and found to match
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge; Sr. No. 950084373	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable)	NA
Period of operating time	31/03/2012 to 31/08/2012	NA
Instrument type	Weighbridge	NA
Manufacturer, model and serial number	Essae Digitronics Private Limited; Sr. No. 950084373	NA
Specific location	At project site	NA
Calibration dates	25/03/2012 (valid till 24/03/2013)	NA
Company performing the calibration	Weights and Measure Department, Govt. of India	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The weighbridge was functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Yes. But this data is not used for emission reduction calculation.

Data / Parameter (as in the MP)		Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q <sub>ob,i</sub> ” (Tonnes)	Quantity of subsequent delivery of fuel type fossil fuel i “Q <sub>np,i</sub> ” (Tonnes)
Value	Ex-ante	-	-
	Ex-post	0	0
Measuring / Monitoring frequency		Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q<sub>ob,i</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i “Q<sub>np,i</sub>” (Tonnes)</b>
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site “Q<sub>in,i</sub>” (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period “Q<sub>c,i</sub>” = “FC<sub>i,PJ,y</sub>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	0
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site "<math>Q_{in,i}</math>" (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period "<math>Q_{c,i}</math>" = "<math>FC_{i,PJ,y}</math>" (Tonnes)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Net calorific value of biomass fuel k used in the Project activity “NCV <sub>k</sub> ” (TJ/Gg)	Percentage of hydrogen in biomass fuel “Hydrogen” (%)
Value	Ex-ante	11.85	3.01
	Ex-post	11	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency		Annually once	Annually once
Reporting frequency		Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		The NCV analysis is carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA



<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “NCV<sub>k</sub>” (TJ/Gg)</b>	<b>Percentage of hydrogen in biomass fuel “Hydrogen” (%)</b>
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen” (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Value	Ex-ante	31.2
	Ex-post	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency	Annually once	Annually once
Reporting frequency	Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen” (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Weighted average net calorific value of the fuel type i in year y “NCV <sub>i,y</sub> ” (TJ/Gg)	Quantity of fossil fuel type i consumed in a process j during the year y “FC <sub>i,j,y</sub> ”
Value	Ex-ante	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
	Ex-post	NA	
Measuring / Monitoring frequency		NA	NA
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA
Company performing the calibration		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/Gg)</b>	<b>Quantity of fossil fuel type i consumed in a process j during the year y “FC<sub>i,j,y</sub>”</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>” (MWh)</b>
Value	Ex-ante	598.6 per annum
	Ex-post	52.07
Measuring / Monitoring frequency	Continuous	Continuous
Reporting frequency	Monthly	Monthly However, CAR 02 was raised as the recording frequency of the monitoring parameter “EC <sub>EL,j,y</sub> ” has not been stated in the MR. CAR was closed after revision in the MR.
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>” (MWh)</b>
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The auxiliary electricity is measured by a calibrated energy meter	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Energy Meter; Sr. No. 203352/18503-2610	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class 1 (which is better than Class 2 stated in the CA-DD)	NA
Period of operating time	31/03/2012 to 31/08/2012	NA
Instrument type	Energy Meter	NA
Manufacturer, model and serial number	Conzerv; Sr. No. 203352/18503-2610	NA
Specific location	Project site	NA
Calibration dates	19/02/2012 (valid till 18/02/2013)	NA
Company performing the calibration	Schneider Electric (NABL accredited).	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.	NA
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The energy meter was functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>” (MWh)</b>
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Value	Ex-ante	-
	Ex-post	10.74
Measuring / Monitoring frequency	Continuous at each trip	Continuous at each trip
Reporting frequency	Calculated at the end of the monitoring period	Calculated at the end of monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)	The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the invoices and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average CO2 emission factor of fuel type i in year y “EF<sub>CO2,i,y</sub>” (tCO<sub>2</sub>/GJ)</b>	<b>Boiler operating hours of the Project activity in year y “h<sub>y</sub>”</b>
Value	Ex-ante	-
	Ex-post	NA (No fossil fuel has been used during the monitoring period)
Measuring / Monitoring frequency	NA	Daily (Boiler operating hours is monitored by SCADA system based on the operating hours of the draft fan of the boiler)

<sup>41</sup> Calculated for the monitoring period of 154 days for this CPA from the ex-ante estimated value of 7,200 tonnes for one year as per the registered CPA-DD

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average CO2 emission factor of fuel type i in year y “EF<sub>CO2,i,y</sub>” (tCO<sub>2</sub>/GJ)</b>	<b>Boiler operating hours of the Project activity in year y “h<sub>y</sub>”</b>
Reporting frequency	NA	Monthly
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	Yes
Does monitoring of the parameter involve sampling? (yes / no)	NA	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	01/05/2012 to 31/08/2012
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA



<b>Data / Parameter (as in the MP)</b>	<b>Weighted average CO2 emission factor of fuel type i in year y “EF<sub>CO2,i,y</sub>” (tCO<sub>2</sub>/GJ)</b>	<b>Boiler operating hours of the Project activity in year y “h<sub>y</sub>”</b>
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	Low risk

		Verified situation	Conclusion
<b>SECTION 4. Compliance with the calibration frequency requirements for measuring instruments</b>			
The “Monitoring Parameters and Calibration Checklist” in section 3 above shall be checked to determine if the calibration frequency specified in the applied monitoring methodology and/or monitoring plan is followed in the monitoring report and in the monitoring activities. Where a failure to comply with the required frequency is detected, or no frequency is mentioned in the monitoring report, please follow the checklist below:			
4-1.	<p>If the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (that is, the results of delayed calibration are available), confirm that the following conservative approach has been adopted in the calculation of emission reductions:</p> <ul style="list-style-type: none"> <li>- If the delayed calibration did not show any errors in the measuring equipment, or the error was smaller than the maximum permissible error, have the PPs applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> <li>- If the delayed calibration identified an error greater than the maximum permissible error, have the PPs applied the error identified in the delayed calibration test to the measured</li> </ul>	No delayed calibration was noted during this monitoring period. Hence this is not applicable.	NA

	Verified situation	Conclusion
<p>values taken during the period between the scheduled date of calibration and the actual date of calibration?</p> <p>Confirm that the error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer emission reductions being claimed;</p>		
<p>4-2. If the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification:</p> <ul style="list-style-type: none"> <li>a. Request the PPs to conduct the required calibration;</li> <li>b. On receipt of the calibration results, determine whether the PPs have calculated the emission reductions conservatively using the approach mentioned in section 4.1 above.</li> </ul>	Not Applicable.	NA

		Verified situation	Conclusion
4-3.	<p>If it is not possible for the PPs to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of the PPs, check if the PPs have prepared a temporary deviation or a 'Permanent changes from the monitoring plan and/or monitoring methodology application'.</p> <p>Follow the requirements for post registration changes in sections 3.10 to 3.19 above.</p>	Not Applicable.	NA
4-4.	<p>If neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipment, determine whether the equipment is calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification. If neither local/national standards nor the manufacturer's specification are available, international standards may be used.</p>	Not Applicable.	NA

	Verified situation	Conclusion
<b>SECTION 5. Assessment of data and calculation of emission reductions</b>		
<p>5-1. Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in line with the formulae and methods described in the monitoring plan and the applied methodology document?</p> <p>Check consistency in the ERs spreadsheet.</p>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and the applicable methodological tools for the project activity are as follows:</p> <p><b><u>Baseline emissions:</u></b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity = 675 tCO<sub>2</sub> – Calculation shown below</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity = 8.144 TJ – Calculation shown below</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant as per the included CPA-DD = 89.5 tCO<sub>2</sub>/TJ</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity as per the included CPA-DD = 100%</p> $EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}$ <p>where</p> <p><math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{steam}</math> = Quantity of steam supplied in Tonnes = 3254.4 Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet = 664.66 kCal/kg</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg) = 66.84 kCal/kg</p>	<p>CL-08 CL-02 OK</p>

	Verified situation	Conclusion
	<p> <math>EG_{\text{thermal}} = 3254.3 * (664.66 - 66.46) * 4.186 * 10^{-6}</math>  <math>= 8.144 \text{ TJ}</math> </p> <p>           Note: Steam enthalpy is calculated at the weighted average steam pressure during the monitoring period from standard steam table for saturated steam. Similarly the enthalpy of the boiler feed water is determined at the weighted average feed water temperature during the monitoring period. The verification team independently calculated the steam enthalpy at the average steam pressure of 12.89 kg/cm<sup>2</sup> g using the web site - <a href="http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp">http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp</a> ; and found the steam enthalpy as 664.98 kCal/kg. Hence the enthalpy used by the CME is conservative.         </p> <p>           Therefore,  <math>BE_{\text{thermal},\text{CO}_2,y} = 8.144 / 100\% * 89.5</math>  <math>= 728.89 \text{ tCO}_2</math> </p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p> <math>PE_{\text{EC},y} = EC_{\text{PJ},j,y} * EF_{\text{grid},\text{CM},y} * (1 + \text{TDL}_{j,y}) + EC_{\text{EL},j,y} * EF_{\text{EL},j,y} * (1 + \text{TDL}_{j,y})</math> </p> <p> <math>EC_{\text{PJ},j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid = 52.07 MWh         </p> <p> <math>EC_{\text{EL},j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) = 0 MWh         </p> <p> <math>EF_{\text{grid},\text{CM},y}</math> = Ex-ante Grid Emission Factor = 0.860 tCO<sub>2</sub>/MWh         </p> <p> <math>EF_{\text{EL},j,y} = EF_{\text{EL},l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l)  <math>= 1.3 \text{ tCO}_2/\text{MWh}</math> </p> <p> <math>\text{TDL}_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l         </p>	

	Verified situation	Conclusion
	<p>and/or j as per the included CPA-DD = 20%</p> $PE_{EC,y} = 52.07 * 0.860 * (1+20\%) + 0 * 1.30 * (1+20\%)$ $= 53.74 \text{ tCO}_2$ <p><u>Project emissions from fossil fuel combustion</u></p> $PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}$ <p>where</p> $PE_{FC,j,y} = \text{CO}_2 \text{ emissions from fossil fuel combustion in process j during the year y (tCO}_2\text{/yr)}$ $FC_{i,j,y} = \text{Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)}$ $= 0 \text{ Tonnes}$ $COEF_{i,y} = \text{The CO}_2 \text{ emission coefficient of fuel type i in year y (tCO}_2\text{ / mass or volume unit)}$ $COEF_{i,y} = NCV_{i,y} * EF_{CO2,i,y}$ <p>where</p> $NCV_{i,y} = \text{Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)}$ $EF_{CO2,i,y} = \text{weighted average CO}_2 \text{ emission factor of fuel type i in year y (tCO}_2\text{/GJ)}$ <p>As there is fossil fuel consumption during the monitoring period,</p> $PE_{FC,j,y} = 0$ <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math></p> $= 53.74 + 0 = 53.74 \text{ tCO}_2$ <p><u>Leakage:</u></p> $LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}$ $= EC_{LE,l,y} * EF_{EL,l,y} * (1+TDL_{l,y}) + N_{c,y} * AVDC_{c,y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km,CO2}$ <p>where</p>	

	Verified situation	Conclusion
	<p> <math>LE_y</math> = Leakage emissions  <math>LE_{EC,y}</math> = Leakage emissions from electricity consumption  <math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site  <math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site  This CPA does not involves usage of any processed biomass (rice husk is the biomass residue used in the project boiler). Hence leakage emission due to processing biomass is not applicable.  Again the biomass used in the project is not transported from beyond 200 km of the project site (biomass transported from within a distance of 11 km). Hence leakage emission due to transportation of biomass is neglected.  Thus <math>LE_y = 0</math> </p> <p> Emission reductions are calculated as follows:  <math>ER_y = BE_y - PE_y - LE_y</math>  <math>= 728.86 - 53.74 - 0 = 675 \text{ tCO}_2</math> (rounded down value) </p> <p> CL 08 was raised as the ER calculation spreadsheet provided for the CPA had not included daily monitored data for steam quantity, temperature, pressure and feed water temperature to calculate the average of these parameters. ER calculation spreadsheet was adequately revised and the CL was closed. </p> <p> CL 02#2 was raised as, for the parameter "<math>TD_{Li,y} = TD_{Lj,y}</math>", it was stated in the MR that it was used for Leakage emission calculation. But this parameter is also used for the calculation of project emission. CL was closed after appropriate revision in the MR. </p>	



	Verified situation	Conclusion
<p>5-2. Has the calculation tool been correctly documented? Check its consistency and formulae.</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The Monitoring Report is supported by Micro Soft excel based spreadsheet for the calculation of emission reductions. The consistency and formula were verified and found to be accurate.</p>	<p>OK</p>
<p>5-3. Is a complete set of data available during the specified monitoring period? If only partial data is available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan proceed as follows:</p> <ol style="list-style-type: none"> <li>a. Check if sections 3.11 and/or 3.12 above are applicable and raise a CAR for the PPs to comply with these requirements.</li> <li>b. If sections 3.11 and 3.12 are not applicable or the answer to this question remains NO, a request for deviation is necessary.</li> </ol> <p>Conduct an assessment of the potential impacts of these changes in accordance to the procedures for Post Registration Changes.</p>	<p>Yes, the complete data set was available during the specified monitoring period.</p>	<p>OK</p>

	Verified situation	Conclusion
<p>5-4. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?</p> <p>Please describe how LRQA has cross-checked reported data.</p>	All the information provided in the Monitoring Report were cross-checked with the Plant log book records, purchase records (for biomass and fossil fuel), site visit and interview of the CPA implementer/CME.	OK
<p>5-5. Have any assumptions used in emission calculations been justified?</p>	All assumptions in the emission reduction calculation are consistent with assumptions taken in the registered monitoring plan and have reference to the applied methodology.	OK
<p>5-6. Have appropriate emission factors, IPCC default values, and other reference values been correctly applied?</p>	<p>The CME has applied the appropriate ex-ante fixed factors as stated in the included CPA-DD like:</p> <ul style="list-style-type: none"> <li>• The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity(<math>\eta_{BL,thermal}</math>)</li> <li>• CO<sub>2</sub> Emission Factor of the fossil fuel that would have been used in the baseline plant (<math>EF_{FF,CO_2}</math>)</li> <li>• Surplus availability of Biomass within identified region (<math>SA_k</math>)</li> <li>• Ex-ante Grid Emission Factor in a year y.</li> <li>• Emission Factor for fossil fuel based electricity generation for source j and/or l in year y (<math>EF_{EL,j,y} = EF_{EL,l,y}</math>)</li> <li>• Auxiliary Electricity Consumption for biomass processing, outside Project boundary. (<math>EC_{LE,l,y}</math>)</li> <li>• Average CO<sub>2</sub> emission factor for the trucks measured during the year y (<math>EF_{km,CO_2}</math>)</li> <li>• Average technical transmission and distribution losses for providing electricity to source l and/or j in year y(<math>TDL_{l,y} = TDL_{j,y}</math>)</li> <li>• Specific energy consumption of fuel type j of the Project activity in year y(<math>SEC_{PJ,j,y,measured}</math>)</li> </ul> <p>CL 02#3 was raised for the CME to clarify the appropriateness of the “Source of data” and “Additional comment” as stated in the MR for the parameters in section D.1, which are fixed ex-ante at the time of validation of the CPA.</p> <p>MR was suitably revised and the finding was closed.</p>	<p>CL 02</p> <p>OK</p>

## 7.6 Appendix C4: Verification Protocol for CPA 4041-0005

	Verified situation	Conclusion
<b>SECTION 1. Project implementation in accordance with the registered PoA-DD &amp; CPA-DD</b>		
<b>General description of the project</b>		
1.1. Does the MR provide general information of the CPA and is it as per the CPA-DD included by CDM-EB or by a DOE <sup>42</sup> ?	<p>Yes, the Monitoring Report<sup>43</sup> provides the general information of the CPA. Details such as Title of the CPA, UNFCCC registration reference number, version number of the Monitoring Report, monitoring period, project participants, sectoral scope and estimated amount of GHG emission reductions. All the above details can be confirmed from the included CPA-DD through link in UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=5V890IQW7DP1JLU4EAY6HNO2S3CZRK">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=5V890IQW7DP1JLU4EAY6HNO2S3CZRK</a></p> <p>Title of the CPA is “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 004)” and it was included in the PoA on 30/04/2012 applying the baseline and monitoring methodology AMS-I.C, version 16 “Thermal energy production with or without electricity” as verified from the project page of the CPA. The project activity applies AMS-I.C, version 16. The project activity is installation and operation of a 3 TPH biomass briquette fired boiler to meet the captive requirement of steam in manufacturer of lactose powder plant, tablet manufacturing plant and in liquid manufacturing plant for manufacturing various syrups. The project is located in Village- Poicha (Rania), Taluka- Savli, Vadodra. The project is implemented by LACTOSE (INDIA) LIMITED.</p>	OK
1.2. Is the general information provided in the MR in line with the PoA-DD registered by CDM-EB?	<p>Yes, the Monitoring Report is as per the PoA-DD registered by CDM-EB confirmed from the registered PoA-DD through link on UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=5V890IQW7DP1JLU4EAY6HNO2S3CZRK">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=5V890IQW7DP1JLU4EAY6HNO2S3CZRK</a></p>	OK
1.3. Is the Monitoring report as per the standardised format (F-CDM-MR)? (EB 66 )	Yes, the Monitoring Report is as per the latest standardised format (F-CDM-MR) version 02.0 (EB66, Annex 20).	OK

<sup>42</sup> The first CPA is included by the CDM-EB along with registered PoA-DD and subsequent CPAs are included by DOEs.

<sup>43</sup> Monitoring Report for this CPA (CPA 4041-0005) refer to the Appendix-5 of the consolidated MR Version 4.0

	Verified situation	Conclusion
1.4. Is the monitoring report filled as per the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).	Yes, the MR is filled up as per the latest "Guidelines for completing the Monitoring Report form" EB 66, Annex 20. CAR 08 was raised as project page of the PoA on UNFCCC web site, the "Other Parties involved" is stated as "United Kingdom of Great Britain and Northern Ireland" and "Germany". But in the MR "Germany" is missing. CAR was closed as the MR was suitably revised.	CAR08 OK
1.5. Is there any open issue in the validation / previous verification including FARs? (CDM VVS para. 213)	No No FAR was raised in the Validation report during the CPA inclusion by TUV Nord, the DOE for validation of the CPA. Further this being the first periodic verification, no open issues exists from earlier verification.	OK
<b>Implementation status of the CPA</b>		
1.6. Is the CPA location indicated same as that in the included CPA-DD? Confirm geographical coordinates	Yes, the project location is same as stated in the CPA-DD and this was verified during the on-site visit. The geographical coordinates of the project site are 22.4755° (22° 28' 31.86") North, 73.1067° (73° 06' 24.11") East. This was cross-checked from the Google Earth web site.	OK
1.7. Is the project boundary described in the same way as the included CPA-DD and registered PoA-DD? Please confirm each component based on the applied methodology.	Yes, the project boundary is described in the same way as in the included CPA-DD and registered PoA-DD. During the on-site assessment it was also confirmed the project boundary is in line with the applied methodology. The project boundary for this CPA includes the biomass storage area and feeding system, boiler house and the facility which is consuming the heat generated by the project.	OK
1.8. Has on-site fossil fuel consumption, if any, been monitored? Is any emission source missed? Check the site lay-out and confirm through site tour.	Fossil fuel consumption is required to be monitored in this project. It has been confirmed during the on-site visit and document review that no fossil fuel has been consumed at the CPA site by the project during the monitoring period. The verification team did not find any emission source attributable to the project activity which has been missed out and the same was confirmed during the on-site visit and review of the site lay-out diagram.	OK
1.9. Confirm contractors for equipment and installation works	It is confirmed that the project equipment i.e., 3 TPH boiler for the project is supplied by Thermax Limited and this was confirmed during the on-site visit interview with the project implementer and from the purchase order copy of the boiler issued by the project implementer dated 19/07/2008.	OK
1.10. Confirm conformance with baseline and monitoring	Conformance to the applicable methodology conditions for the CPA are as follows:	OK

	Verified situation		Conclusion
methodology - Applicability conditions. Please refer to the complete description of the applicability conditions and confirm that the CPA meets all the requirements.	<b>Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)</b>	<b>Means of Verification and Results</b>	
	<i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>	The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.	
	<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>	The total installed / rated capacity of the project equipment is 1.88 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .	
	<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>	The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.	
	<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>	The project does not use any charcoal.	
	The verification team confirms that the CPA conforms to all applicable condition of the applied methodology.		

	Verified situation	Conclusion
	Apart from the baseline and monitoring methodology applicability criteria as stated above, the verification team also verified the eligibility criteria stated in section B.2 of the included CPA-DD under "Monitoring Criteria" for the point numbers 1, 3.3, 3.4, 3.5, 16, 17 and 18 and found these to be valid for the project activity during the monitoring period. A declaration letter dated 11/12/2012 in this respect has also been submitted by the CME.	
1.11. Confirm use or no use of public funding and determine if there is no diversion of ODA to the CPA.	There is no use of public funding for the CPA. The same was confirmed during the interview with the CME and also a declaration in this respect has been provided by the CPA implementer.	OK
1.12. Check data in the MR and in the CPA-DD. Describe data and variables that are different from that stated in the included CPA-DD and cause an increase in emission reductions estimations.	<p>Data in the MR and CPA-DD fixed at validation stage are found to be consistent.</p> <p>The ex-ante estimated emission reductions during this monitoring period of 123 days are 1,199 tCO<sub>2</sub> (3,557/365*123) and the actual emission reductions during this monitoring period are 467 tCO<sub>2</sub>. Hence the actual emission reductions during this monitoring are less than the estimated values as per the CPA-DD.</p> <p>However, the following findings were raised and successfully closed during the verification;</p> <ol style="list-style-type: none"> <li>1) CL 02 was raised for the parameters like "CAP<sub>boiler</sub>" and "SEC<sub>PJ,y,measured</sub>", it was stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation.</li> <li>2) CL 05 was raised, as although the NCV is taken directly taken from the laboratory report, values of parameters like hydrogen, oxygen and moisture content in the biomass are still reported in the MR, which is not required as per the included CPA-DD.</li> </ol> <p>The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD and hence above findings are closed.</p>	<p>CL02 CL05 OK</p>
1.13. By means of an on-site visit: Is the general information of the project provided in the Monitoring report and is it as per the CPA-DD included by CDM-	<p>Yes.</p> <p>The on-site visit for the CPA was conducted on 17/11/2012.</p> <p>The project activity comprises of the installation and operation of a 3 TPH biomass briquette fired</p>	<p><del>GAR-01</del> <del>GAR-03</del> OK</p>

	Verified situation	Conclusion
<p>EB or by a DOE?</p> <p>List each technical component and equipment and check design parameters and actual status of installation and / or operation.</p> <p>Please check to ensure that all physical features of the proposed CPA in the registered/included CPA-DD are in place and the PP has operated the proposed CPA as per the included CPA-DD.</p> <p>It may include but not limited to:</p> <ul style="list-style-type: none"> <li>the actual capacity and output</li> <li>plant load factor</li> <li>type of feedstock</li> <li>operation of other components / units within the project boundary which could affect functioning of the project plant.</li> </ul> <p>In cases where there are a large number of components and equipment items and the check of all of them is not an available option, then a random sampling check shall be performed. Justify here the sample chosen and describe the results.<sup>44</sup></p>	<p>boiler to meet the captive requirement of steam at the project site.</p> <p>During the verification, by the observation of equipment, interviews with relevant staff and the checking of technical specifications of main components, it was confirmed that the project activity has been implemented as described in the included CPA-DD.</p> <p>The project is operational. The project was commissioned on 30/08/2009 and the same was verified from the commissioning certificate issued by Thermax Limited.</p> <p>No change from the included CPA-DD of physical features which may impact the emission reduction of the project activity has been identified.</p> <ul style="list-style-type: none"> <li>Steam generation unit : 3 TPH boiler</li> <li>Net enthalpy supply by project activity : The ex-ante estimated annual enthalpy output from the project boiler is 48.771 TJ as per the included CPA-DD (which corresponds to 16.435 TJ for 123 days of this monitoring period) whereas actual enthalpy supplied by the boiler during this monitoring period was 6.774 TJ which is less than the ex-ante estimated value.</li> <li>Type of biomass fired in the boiler: As per the included CPA-DD, biomass briquette is to be fired in the boiler and it was noted that there was no deviation in the biomass firing during the monitoring period.</li> <li>As per the included CPA-DD, the project may fire fossil fuel (Coal) in the boiler. During this monitoring period, no fossil fuel has been fired in the project boiler heater as confirmed by the project implementer during the site visit.</li> </ul> <p>100% data is monitored for the CPA and hence no sampling plan is applicable.</p> <p>However, CAR 01 was raised as in section B.1 of the MR, the downtime time of the project boiler was not provided. Details are provided in the revised MR and the CAR was closed.</p> <p>Further, CAR 03 was raised as PP has considered a simple average of steam pressure, temperature and boiler feed water enthalpy, which are used for the calculation of net enthalpy supplied by the project boiler, which was not correct. The calculation approach was revised and a weighted average</p>	

<sup>44</sup> The sampling shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified situation	Conclusion
	was considered for emission reduction. The CAR 03 wa successfully closed.	
1.14. Have responsibilities for monitoring been described and specified?	<p>The responsibilities of monitoring have been provided and described in the Monitoring Report. The Monitoring Report and CDM documents clearly describe the responsibilities for monitoring.</p> <p>The project owner has identified the CDM team, the structure of which is given in Monitoring Report. During the verification, responsibilities for operational personnel, technical and support team have been verified and confirmed.</p> <p>The CDM team has been assigned the responsibility for measuring, recording and storage of the measured data. Data is kept in electronic format and paper format.</p>	OK
1.15. Are the responsibilities and authorities for monitoring and reporting in line with those stated in the monitoring plan of the included CPA-DD?	Yes, responsibilities and authorities for monitoring and reporting are in accordance with included CPA-DD.	OK
1.16. Check QA/QC, management systems. Are procedures described and specified in the MR? Are they consistently applied as described in the MP?	<p>QA/QC procedures include staff training, instrument calibration, cross-checking and data/documents archiving. They are consistent with the monitoring plan.</p> <p>The Monitoring Report describes the monitoring system, monitoring procedures, data collection and reporting, responsibilities of relevant staff/departments, calibrations that were implemented and QA/QC procedures including data cross-checking.</p> <p>By means of document review, onsite assessment and interviews, the verification team has confirmed that all the QA/QC measures, data archiving, monitoring report and internal audits are as per the registered monitoring plan of the registered PoA-DD and the included CPA-DD.</p> <p>However, CL 03 was raised as the "QA/QC procedure" &amp; "Purpose of data" for the quantity of biomass in MR was mentioned as "NA" and the same is not consistent with the monitoring plan of the included CPA-DD. Monitoring and recording frequency of these parameters were not mentioned in the MR. Also the values for these parameters as stated in the MR was incorrect as verified during the on-site visit and also with the documents provided.</p> <p>The MR was suitably revised to close the finding.</p>	CL-03 OK



	Verified situation	Conclusion
1.17. Have the procedures for emergency and abnormal situations been established?	<p>As stated in section C of the MR, the procedure for non-conformance and corrective actions is in place for the project activity to mitigate any emergency and abnormal situations in monitoring as per the included CPA-DD.</p> <p>During the monitoring period, energy meter for auxiliary consumption of electricity for the boiler was out of order on 31/08/2012. As per the CPA-DD, The CME has rightly considered the auxiliary energy consumption based on the connected load of the auxiliary equipment of 18.07 kW and multiplying it by 24 hours to get auxiliary consumption of 433.68 kWh and this value is added in project emission calculation. All other monitoring equipment were under normal operating conditions during the monitoring period.</p> <p>However, CAR 07 was raised as the CME needed to clarify why the details of the backup monitoring instruments (for steam pressure and temperature and feed water temperature) were not provided in the MR. Adequate justification was provided by the CME and the CAR was closed.</p>	<p><del>CAR-07</del></p> <p>OK</p>
1.18. Has the system for qualification and training been established as relevant for the monitoring and management activities?	<p>The training and qualification of the project personnel has also been confirmed during interview of the operational personnel during the on-site visit. It is confirmed that they have sufficient knowledge, experience and competency to implement and maintain the plant operation including data monitoring and recording in line with the boiler operation and maintenance manual provided by the boiler supplier, and with CDM requirements.</p> <p>This is further verified by the evidence for training of the project personnel and the boiler attendants' certificates issued by Directorate of Steam Boilers (Government agency) for the boiler operators.</p>	OK
1.19. Check the environmental report, license, permit and compliance to the local environmental legislation (if relevant).	The verification team has confirmed that the project meets the relevant local environmental legislation. This was confirmed from the copy of the consent to operate valid from 05/06/2009 to 05/02/2014 issued by Gujarat Pollution Control Board. Also a copy of certificate for the use of the boiler for the period from 15/07/2011 to 14/07/2012 and 14/07/2012 to 13/07/2013 issued by Directorate of Steam Boilers Department has been submitted.	OK

	Verified situation	Conclusion	
1.20. Check contribution to sustainable development, comparing those expected in the included CPA-DD and the actual status.	With the provision of employment opportunities by the project activity, there has been a contribution for the social and economic well-being of some local people. The project utilises renewable biomass to produce steam (thereby avoiding the fossil fuel usage) and this leads to environment well being by reduced environmental impact from fossil fuel use. Also the project uses renewable biomass technology which is deemed as a clean (as it displaces fossil fuel usage) and safe technology.  Even though the sustainable development measures were not registered in the CPA-DD as a monitoring parameter, it was confirmed during the site visit that the CPA contributes to the sustainable development of the host country.	OK	
1.21. Check issues with local stakeholders, claims, complaints, etc.	It was confirmed by on-site interviews that there had been no claims and complaints from local stakeholders prior to the verification visit.	OK	
1.22. If from the above assessment the conclusion is that the implementation or operation of the CPA does not conform with the description contained in the included CPA-DD and/or corrections have been made to project information or parameters fixed at validation/inclusion, determine if these changes and/or corrections do not require prior approval by the board: <ul style="list-style-type: none"><li>- A request of approval is required if the boundary of a registered CDM PoA is changed to include an additional host party, in accordance with the project cycle procedure.</li><li>- A request for approval is required if the CME of a registered CDM PoA changes after the registration of the PoA.</li><li>- Any corrections to project information of an included CPA that do not affect the design of the project activity do not require prior approval by the Board.</li><li>- A request for approval is required if any of the three issues below is adversely impacted by the identified changes to the project design.</li></ul>			
1.23. The applicability and application of the applied methodology under which the CPA has been included:  Check if the project boundary has changed and if any of the parameters to assess the applicability conditions have changed.	No change in applicability and application of the applied methodology AMS-I.C. version 16, including the project boundary, is observed.	YES	NO
			X
1.24. Compliance of the included	No change in the eligibility criteria of the registered CPA, as defined in the registered PoA-DD, is	YES	NO

	Verified situation	Conclusion	
CPA to eligibility criteria as defined in the registered PoA-DD.  Check if any of the parameters to assess the PoA eligibility criteria have changed.	observed.		X
1.25. The additionality of the project activity:  Check if any of the input parameters to the investment analysis have changed. For barrier analysis, check if any information or data used in the barrier analysis has changed.	There is no change in the project design parameters as the project is implemented as per the included CPA-DD. Hence this is not applicable.	YES	NO
			X
1.26. The scale of the project activity.  Check if the project is still small scale or large scale after the implementation of the changes.	Small scale, as per the eligibility criteria for CPA inclusion and is in accordance with the methodology AMS-I C, version 16.	YES	NO
			X
If the answer to any of the above items is YES, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
1.27. If, from the above assessment, the conclusion is that the changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	

		Verified Situation	Conclusion
<b>SECTION 2. Compliance of the Monitoring Plan with the Monitoring Methodology including applicable Tool(s)</b>			
2.1. Is the monitoring plan of the included CPA-DD in accordance with the applied methodology?	Yes, it is confirmed that monitoring plan of the included CPA-DD is in accordance with the applied methodology, AMS-I.C, version 16.		OK
2.2. If the methodology provides different options (for example, use of default values or on-site measurements), has the Monitoring Report specified which option is used?	<p>Yes,</p> <p>The ex-ante parameters which are fixed for the crediting period at the time of CPA inclusion in the PoA as per the methodological tools are:</p> <ul style="list-style-type: none"> <li>• <math>CAP_{\text{boiler}}</math> (Rated capacity (thermal output) of the boiler of the Project activity)</li> <li>• <math>\eta_{\text{BL,thermal}}</math> (The Efficiency of the plant using fossil fuel (Furnace Oil) that would have been used in the absence of the Project activity)</li> <li>• <math>EF_{\text{FF,CO}_2}</math> (<math>\text{CO}_2</math> Emission Factor of the fossil fuel that would have been used in the baseline plant)</li> <li>• <math>SA_k</math> (Surplus availability of Biomass within 50 km radial distance)</li> <li>• <math>EF_{\text{grid,CM,y}}</math> (Ex-ante Grid Emission Factor in a year y)</li> <li>• <math>EF_{\text{EL,j,y}} = EF_{\text{EL,l,y}}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)</li> <li>• <math>EC_{\text{LE,l,y}}</math> (Auxiliary Electricity Consumption for biomass processing, outside Project boundary)</li> <li>• <math>EF_{\text{km,CO}_2}</math> (Average <math>\text{CO}_2</math> emission factor for the trucks measured during the year y)</li> <li>• <math>TDL_{\text{l,y}} = TDL_{\text{j,y}}</math> (Average technical transmission and distribution losses for providing electricity to source l and/or j in year y)</li> <li>• <math>SEC_{\text{PJ,j,y,measured}}</math> (Specific energy consumption of fuel type j of the Project activity in year y)</li> </ul> <p>Further, the verification team confirms that there is no deviation in the values of the ex-ante fixed parameters between the included CPA-DD and the MR.</p> <p>The parameters being monitored ex-post as per the monitoring methodology and the CPA-DD are:</p> <ul style="list-style-type: none"> <li>• Quantity of steam supplied in year y (<math>Q_{\text{steam}}</math>)</li> <li>• Average Steam Temperature at MSSV (Main steam stop valve) outlet during year (<math>T_{\text{steam}}</math>)</li> <li>• Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year (<math>P_{\text{steam}}</math>)</li> </ul>		<p>CL-05</p> <p>OK</p>

	Verified Situation	Conclusion
	<ul style="list-style-type: none"> <li>• Average Feed Water Temperature at inlet of boiler (<math>T_{FWB}</math>)</li> <li>• Boiler operating hours of the project activity in year y (<math>h_y</math>)</li> <li>• Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site (<math>Q_{ob,k}</math>)</li> <li>• Quantity of subsequent delivery of fuel type k biomass at the Project site (<math>Q_{np,k}</math>)</li> <li>• Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site (<math>Q_{in,k}</math>)</li> <li>• Quantity of biomass fuel type k consumed during the monitoring period (<math>Q_{c,k} = FC_{biomass,k,y}</math>)</li> <li>• Quantity of stored fuel type fossil (Coal) i on the starting date of each monitoring period measured at the Project site (<math>Q_{ob,i}</math>)</li> <li>• Quantity of subsequent delivery of fuel type fossil fuel (Coal) i (<math>Q_{np,i}</math>)</li> <li>• Quantity of remaining fossil fuel type (Coal) i available at the end date of each monitored period measured at the Project site (<math>Q_{in,i}</math>)</li> <li>• Quantity of fossil fuel type i (Coal) consumed during the monitoring period (<math>Q_{c,i} = FC_{i,PJ,y}</math>)</li> <li>• Net calorific value of biomass fuel k used in the Project activity. ( <math>NCV_k</math> )</li> <li>• Percentage of hydrogen in biomass fuel (Hydrogen) **</li> <li>• Percentage oxygen in Biomass fuel (Oxygen) **</li> <li>• Moisture content of the biomass residues (Moisture) **</li> <li>• Weighted average net calorific value of the fuel (coal) type i in year y (<math>NCV_{i,y}</math>)</li> <li>• Quantity of fossil fuel (Furnace oil) type i consumed in a process j during the year y (<math>FC_{i,j,y}</math>)</li> <li>• Auxiliary Electricity Consumption of the Project activity from the Grid in year y (<math>EC_{PJ,j,y}</math>)</li> <li>• Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) in a year y (<math>EC_{EL,j,y}</math>)</li> <li>• Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y (<math>AVD_{,y}</math>)</li> <li>• Number of truck trips during the year y (<math>N_{,y}</math>)</li> <li>• Average round trip distance (from and to) between the biomass fuel supply sites and the site of biomass processing in year y (<math>AVD_{c,y}</math>)</li> <li>• Number of truck trips during the transportation of biomass to the biomass processing site in year y (<math>N_{c,y}</math>)</li> </ul>	

	Verified Situation	Conclusion
	<ul style="list-style-type: none"> <li>Weighted average mass fraction of carbón in fuel type i in year y (<math>w_{C,i,y}</math>) *</li> <li>Weighted average CO<sub>2</sub> emission factor of fuel type i in year y (<math>EF_{CO_2,i,y}</math>)</li> </ul> <p>These parameters are based on on-site measurement and have been verified during this verification.</p> <p>* No fossil fuel has been fired in the project boiler during this monitoring period</p> <p>** The laboratory report has directly provided the value of NCV. Hence Hydrogen , Oxygen and moisture are not required (which would be required in case NCV was not provided to be calculate NCV from GCV and the above three parameters)</p> <p>However, CL05 was raised, since the NCV was taken directly from the laboratory report, yet the values of parameters like hydrogen, oxygen and moisture content in the biomass were reported in the MR, which is not required as per the included CPA-DD. MR was suitably revised and the finding was closed.</p>	
2.3. Is all data collected and archived according to the tables in the applied Monitoring Methodology and is this included in the Monitoring Plan?	Yes, all the data is collected and archived in accordance to methodology and included in the monitoring plan. All the data will be archived until 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.	OK
2.4. Check the calculation of emission reductions following the applied methodology: <ul style="list-style-type: none"> <li>baseline emissions</li> <li>project emissions</li> <li>leakage</li> <li>emission reductions of the project.</li> </ul>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and applied for the project activity are as follows:</p> <p><b>Baseline emissions:</b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> $BE_{thermal,CO_2,y} = \text{The baseline emissions from steam/heat displaced by the Project activity during the year y (tCO}_2\text{)}$ $EG_{thermal,y} = \text{The net quantity of steam/heat supplied by the Project activity during the year y (TJ)}$	CL01 OK

	Verified Situation	Conclusion
	<p> <math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant; tCO<sub>2</sub> / TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used </p> <p> <math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity </p> <p> <math>EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}</math> </p> <p>           where  <math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)  <math>Q_{steam}</math> = Quantity of steam supplied in Tonnes  <math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet (kCal/kg)  <math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg) </p> <p> <b><u>Project emissions:</u></b> </p> <p> <u>Project emissions due to electricity consumption:</u> </p> <p> <math>PE_{EC,y} = EC_{PJ,j,y} * EF_{grid,CM,y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})</math> </p> <p> <math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid in year y  <math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set)  <math>EF_{grid,CM,y}</math> (Ex-ante Grid Emission Factor in a year y)  <math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j in year y </p> <p> <u>Project emissions from fossil fuel combustion</u> </p>	

	Verified Situation	Conclusion
	<p> <math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math>            where  <math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)  <math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)  <math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math>            where  <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)            Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math>  <u><b>Leakage:</b></u>  <math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math>  <math>= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVDC_{y,y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km,CO2}</math>            where  <math>LE_y</math> = Leakage emissions  <math>LE_{EC,y}</math> = Leakage emissions from electricity consumption in year y (tCO<sub>2</sub>/yr)  <math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site  <math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site  <math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source l in year y as a result of leakage (MWh/yr)  <math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source l in year y (tCO<sub>2</sub>/MWh)  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l in year y  <math>N_{c,y}</math> = Number of truck trips for collecting loose biomass during the year y         </p>	



	Verified Situation	Conclusion
	<p>AVDc<sub>y</sub> = Average round trip distance between the biomass fuel supply sites and biomass collection site during the year y</p> <p>EF<sub>km,CO2</sub> = Average CO<sub>2</sub> emission factor for the trucks measured during year y</p> <p>N<sub>y</sub> = Number of truck trips during the year y</p> <p>AVD<sub>y</sub> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant during year y (km)</p> <p>Emission reductions are calculated as follows:  <math>ER_y = BE_y - PE_y - LE_y</math></p> <p>CL 01 was raised as, in section E.5 of the MR, the calculation of the ex-ante emission reductions was not transparently presented. The revised MR clearly and transparently describes the ER calculation approach providing relevant equations in line with the included CPA-DD.</p>	
<p>2.5. List any monitoring aspect that is not specified in the methodology and check its compliance with the Monitoring Plan, for example:</p> <ul style="list-style-type: none"> <li>• additional monitoring parameters</li> <li>• monitoring frequency</li> <li>• calibration frequency.</li> </ul>	<p>No additional monitoring parameter is identified that is not specified in the approved methodology and the included CPA-DD available in the project page on UNFCCC website.</p> <p>The monitoring frequency and the calibration frequency specified are not less than the requirements of the approved methodology and the Monitoring plan in the included CPA-DD.</p>	OK

		Verified Situation	Conclusion
<b>SECTION 3. Compliance of Monitoring activities with the Monitoring Plan of the included CPA-DD</b>			
3-1. Is the Monitored Data included in the Monitoring Report as per the Monitoring Plan or any accepted revised MP?	Yes	The monitored data included in section D.2 of the MR is as per the monitoring plan of the included CPA-DD.  The values are indicated in the section D.2 of the Monitoring Report. At the site visit it was verified that data was generated at the required frequency as per the monitoring plan in the included CPA-DD.	OK
3-2. Has the data been generated at the frequency required by the Monitoring Plan or any accepted revised MP?			
3-3. Has the monitoring been implemented in accordance with the monitoring plan contained in the included CPA-DD or any accepted revised MP? Confirm that the monitoring and reporting procedures have been implemented as documented and follow by PPs.	Yes, by means of document review, on-site assessment and interviews with the plant personnel, it was confirmed that the monitoring has been implemented in accordance with the monitoring plan contained in the included CPA-DD.  It was also established that monitoring and reporting procedures have been implemented as documented by the CME and the CPA operator.		OK
3-4. Have types of measurement instrumentation used been described and specified?	Yes, the MR specifies and describes the use of different measurement instruments (Steam flow meter, RTD / Temperature gauge, Pressure transmitter / Pressure gauge, energy meter and weighbridge). The details of the measuring equipment are provided in the "Annex-1_4041-0005: Instrument Details" of the MR. The provided details have been verified during the on-site visit.		OK
3-5. Is the accuracy of equipment used for monitoring sufficient and regularly controlled and calibrated in line with the registered monitoring plan or any accepted revised MP? Check relevance of maintenance and calibration	Yes, the verification team confirmed through the on-site assessment and the review of evidence that the installation of the measuring devices has been completed and the equipment has been operated and maintained in normal operating conditions.  The accuracy classes of all the monitoring equipment are found as per the monitoring plan of the included CPA-DD, or of higher accuracy as detailed in "Annex-1_4041-0005: Instrument Details" of the MR.  It was confirmed that the information of the meters was consistent with that described in the		CL-07 OK

	Verified Situation	Conclusion
included in the monitoring plan. Check relevance of laboratory analysis if included in the monitoring plan.	Monitoring Report. The CME has provided the calibration certificates of all the monitoring equipment and the verification team confirms the certificates to be appropriate and relevant. For further details of the calibration of the monitoring equipment please refer to section 3.19 of this report below. CL 07 was raised as the CME had not provided the credentials of the calibrating agencies and the laboratories, which have carried out the NCV analysis. Adequate information was provided by the CME and the CL was closed. For details please refer to Appendix D of this report.	
3-6. If the monitoring plan of the CPA-DD refers to a sampling plan and monitoring is carried out for the chosen samples, ensure that the sampling is carried out as per the sampling plan <sup>45</sup> .	The monitoring plan of the CPA-DD does not refer to a sampling plan and the monitoring is carried out for 100% data for all the monitoring parameters.	NA
3-7. Check that responsibilities and authorities for monitoring and reporting are in line with the monitoring plan. Are the monitoring results consistently recorded, reviewed and approved as stated in the CPA-DD or any accepted revised MP?	Yes During the site visit, monitoring and reporting procedures were confirmed by the verification team through interview with the relevant plant personnel, CME and by document review. However, the following CAR/CLs were raised and successfully closed;  <ol style="list-style-type: none"> <li>1) CAR 02 was raised as the opening readings of the parameter "Q<sub>steam</sub>" and closing readings of the parameters "EC<sub>PJ,j,y</sub>" and "EC<sub>EL,j,y</sub>" have not been presented to the verification team.</li> <li>2) CL 02 was raised as for the parameters like "CAP<sub>boiler</sub>" and "SEC<sub>PJ,y,measured</sub>" CME had stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation.</li> <li>3) CL 05 was raised since the NCV was taken directly taken from the laboratory report, however the values of parameters like hydrogen, oxygen and moisture content in the biomass were reported in the MR, which is not required as per the included CPA-DD.</li> </ol> The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD. For details please refer to Appendix D of this report.	CAR 02 CL 02 CL 05 OK

<sup>45</sup> The sampling plan shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified Situation	Conclusion
<p>3-8. Reporting period: Defined? If a monitoring period of a parameter more / less than a year is applied, check if the monitoring is in a complete and consistent manner? Is the monitoring period within the crediting period of the CPA and length of the registered PoA?</p>	<p>The monitoring period for the PoA is from 12/01/2011 to 31/08/2012. But for the CPA, the emission reduction starts from 01/05/2012 (i.e., the date of start of crediting period of the CPA) till 31/08/2012. Hence the monitoring period for the CPA is for 123 days which is less than a year. However, monitoring of all the parameters is complete, as there is no specific requirement in the methodology for annual reporting of any data. The verification team therefore confirms the monitoring to be complete and consistent and clearly defined in the MR.</p> <p>The monitoring period is within the crediting period of the CPA and also the length of the registered PoA.</p> <p>CL 09 was raised as the monitoring period of the CPA is not consistent with that of the PoA in the webhosted MR. The issue has been addressed and the finding was successfully closed.</p>	<p>CL-09 OK</p>
<p>3-9. If the monitoring plan includes the determination of environmental and / or social indicators, have the sustainable development indicators been monitored in accordance with the monitoring plan of the included CPA-DD?</p>	<p>Not applicable</p>	<p>NA</p>
<p>3-10. Check monitoring of Environmental and Social indicators (if relevant)</p> <ul style="list-style-type: none"> <li>• implementation of measures</li> <li>• monitoring equipment</li> <li>• quality assurance procedures</li> <li>• external data.</li> </ul>	<p>Not applicable</p>	<p>NA</p>

		Verified Situation	Conclusion	
<b>SECTION 2 and 3: Post Registration Changes</b>				
<p>3-11. If, from the above assessment in SECTIONS 2 and 3, the conclusion is that there are temporary deviations or permanent changes from the registered Monitoring Plan or Monitoring Methodology, determine if these deviations or changes require prior approval by the EB by answering the questions below.</p> <p>All the answers to the applicable questions below shall be explained and the reasons for each conclusion given in the “Verified situation” column.</p> <p><b>Temporary deviations from the registered monitoring plan or applied methodology:</b>  Prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES.</p>				
3-12. Have the PPs reported as zero any parameter related to baseline GHG emissions that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?	No temporary deviation is sought during this monitoring period	YES	NO	
		-	-	
3-13. Have the PPs estimated (assuming that the source of the project GHG emissions operated at maximum capacity for the full period of the missing data) any parameter that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?  For project GHG emissions related to the consumption of electricity, the estimate shall include an addition of 10% to account for transmission and distribution losses.	No temporary deviation is sought during this monitoring period	YES	NO	
		-	-	
<b>Permanent changes from the registered monitoring plan or applied methodology</b>				
<p>If the monitoring equipment actually installed has a lower accuracy level than the accuracy stipulated in the applied methodology and/or in the registered monitoring plan, and the monitoring equipment is under the control of the project participants, prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES:</p>				
3-14. Have the PPs deducted from the measured	No permanent change in the monitoring plan is observed during this monitoring period	YES	NO	

	Verified Situation	Conclusion	
value, for any parameter used for calculating baseline GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?		-	-
3-15. Have the PPs added to the measured value, for any parameter used for calculating project GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES	NO
		-	-
Changes to the monitoring of the included CPA of a type listed below do not require approval by the EB. Confirm in the conclusion column that the change is of the type in the table below and explain the reasons.			
3-16. Change of calibration frequency or practice for monitoring equipment not within the control of project participants	Not Applicable	NA	
3-17. Change of accuracy / type / model of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
3-18. Change of location of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
If the answer to any of the above items has been that approval from the EB is required, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			

	Verified Situation	Conclusion
3-19. If, from the above assessment, the conclusion is that the temporary deviations or permanent changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA

### 3.19 Monitoring Parameters and Calibration Checklist:

Complete the following table for each parameter:

Data / Parameter (as in the MP)		Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Value	Ex-ante	19,296 per annum	185.14
	Ex-post	2658.69	161.9 <sup>46</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		<p>As per the monitoring plan of the included CPA-DD, the quantity of steam delivered by the project is measured by duly calibrated steam flow meter and the calibration certificate has been verified.</p> <p>Further, the verification team cross-checked the quantity of steam delivered by the project activity during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.</p>	<p>As per the monitoring plan of the included CPA-DD, the steam temperature is measured by duly calibrated RTD and the calibration certificate has been verified.</p> <p>Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.</p>
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Steam flow meter Sr. No.: E400D220000	RTD Sr. No.: E400D220000 <sup>47</sup>

<sup>46</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised and successfully closed by the CME



<b>Data / Parameter (as in the MP)</b>	<b>Quantity of steam supplied in year y “Q<sub>steam</sub>” (Tonnes)</b>	<b>Average Steam Temperature at MSSV (Main steam stop valve) outlet “T<sub>steam</sub>” (°C)</b>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+ 2.3% Maximum (which is better than that stated in the CPA-DD of +3%)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	01/05/2012 to 31/08/2012	01/05/2012 to 31/08/2012
Instrument type	Steam flow meter cum RTD	Steam flow meter cum RTD
Manufacturer, model and serial number	Make: Endress + Hauser; Sr. No.: E400D220000	Make: Endress + Hauser; Sr. No.: E400D220000
Specific location	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler
Calibration dates	25/04/2011 (valid till 24/04/2014)	25/04/2011 (valid till 24/04/2014)
Company performing the calibration	Manufacturer : Endress + Hauser (NABL accredited)	Manufacturer: Endress + Hauser (NABL accredited)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the registered CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the registered CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes

<sup>47</sup> A consolidated monitoring equipment is used by the CPA operator, which has inbuilt feature for measuring the both steam flow and the steam temperature. This was confirmed during the on-site visit and verification of the technical specification of the measuring equipment.

Data / Parameter (as in the MP)	Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Maintenance	The Steam flow meter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P <sub>steam</sub> ” (kg/cm <sup>2</sup> g)	Average Feed Water Temperature at inlet of boiler “T <sub>FWB</sub> ” (°C)
Value	Ex-ante	10.54	60
	Ex-post	5.82 <sup>48</sup>	50.54 <sup>49</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically

<sup>48</sup> The value is the weighted average of the daily recorded pressure readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised and successfully closed by the CME

<sup>49</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised and successfully closed by the CME

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P<sub>steam</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “T<sub>FWB</sub>” (°C)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the steam pressure is measured by duly calibrated pressure transmitter and the calibration certificate has been verified. Further, the verification team cross-checked the steam pressure during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the feed water temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Pressure transmitter Sr. No. C-907 DE 01052	RTD Sr. No. TS/02
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	± 1% (which is better than 2% as stated in the CPA-DD)	Class B (which is same as stated in the CPA-DD)
Period of operating time	01/05/2012 to 31/08/2012	01/05/2012 to 31/08/2012
Instrument type	Pressure transmitter	RTD
Manufacturer, model and serial number	Endress + Hauser; Sr. No. C-907 DE 01052	Endress + Hauser; Sr. No. TS/02
Specific location	Project site, at the Main Steam Stop Valve (MSSV)	Project site, after the boiler feed water tank at the inlet of the boiler
Calibration dates	06/10/2011 (valid till 05/10/2012)	16/04/2012 (valid till 15/10/2012)
Company performing the calibration	J.Y.Tech Services (Calibration is traceable to national standard – National Physical Laboratory and hence deemed acceptable)	J.Y.Tech Services (Calibration is traceable to national standard – National Physical Laboratory and hence deemed acceptable)

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P<sub>steam</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “T<sub>FWB</sub>” (°C)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the registered CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the registered CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the six months frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The pressure transmitter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Value	Ex-ante	NA
	Ex-post	52.3
Measuring / Monitoring frequency	At the start of the monitoring period	609.85
Reporting frequency	Once during the monitoring period	Data is monitored and recorded for each truck delivery
		Each truck trip

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The opening balance of the biomass is measured by a calibrated weighbridge	Biomass procured is measured for each truck entering the plant premises by a calibrated weighbridge
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge; Sr. No. 1103028-A	Weighbridge; Sr. No. 1103028-A
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III <sup>43</sup>	Class III <sup>50</sup>
Period of operating time	01/05/2012 to 31/08/2012	01/05/2012 to 31/08/2012
Instrument type	Weighbridge	Weighbridge
Manufacturer, model and serial number	Jaypan; Sr. No. 1103028-A	Jaypan; Sr. No. 1103028-A
Specific location	Adjacent to project site	Adjacent to project site
Calibration dates	21/11/2011 (valid till 20/11/2012)	21/11/2011 (valid till 20/11/2012)
Company performing the calibration	Weights and Measure Department, Govt. of India	Weights and Measure Department, Govt. of India

<sup>50</sup> In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable.

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The weighbridge was functional throughout the monitoring period	The weighbridge was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Value	Ex-ante	NA
	Ex-post	60.345
Measuring / Monitoring frequency	Measured at the end of the monitoring period	3955.17 per annum
Reporting frequency	Once during the monitoring period	601.81
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Calculated from the opening, received and closing balance of the biomass during the monitoring period
Does monitoring of the parameter involve sampling? (yes / no)	No	At the end of the monitoring period
Population Size	NA	Yes
Sample Size	NA	No
Confidence level	NA	NA
Margin of error	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The closing balance of the biomass is measured by a calibrated weighbridge	The quantity of biomass consumed is cross-checked with the invoices obtained from the fuel supplier and found to match
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge; Sr. No. 1103028-A	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable.	NA
Period of operating time	01/05/2012 to 31/08/2012	NA
Instrument type	Weighbridge	NA
Manufacturer, model and serial number	Jaypan; Sr. No. 1103028-A	NA
Specific location	Adjacent to project site	NA
Calibration dates	21/11/2011 (valid till 20/11/2012)	NA
Company performing the calibration	Weights and Measure Department, Govt. of India	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The weighbridge was functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low Risk as this data is not used for emission reduction calculation.

Data / Parameter (as in the MP)		Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q <sub>ob,i</sub> ” (Tonnes)	Quantity of subsequent delivery of fuel type fossil fuel i “Q <sub>np,i</sub> ” (Tonnes)
Value	Ex-ante	-	-
	Ex-post	0	0
Measuring / Monitoring frequency		Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA



<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q<sub>ob,i</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i “Q<sub>np,i</sub>” (Tonnes)</b>
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site “Q<sub>in,i</sub>” (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period “Q<sub>c,i</sub>” = “FC<sub>i,PJ,y</sub>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	0
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site “<math>Q_{in,i}</math>”  (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period “<math>Q_{c,i}</math>” = “<math>FC_{i,PJ,y}</math>”  (Tonnes)</b>
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Net calorific value of biomass fuel k used in the Project activity “NCV <sub>k</sub> ”  (TJ/Gg)	Percentage of hydrogen in biomass fuel “Hydrogen”  (%)
Value	Ex-ante	14.84	4.63
	Ex-post	15.95	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency		Annually once	Annually once
Reporting frequency		Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		The NCV analysis is carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “NCV<sub>k</sub>”  (TJ/Gg)</b>	<b>Percentage of hydrogen in biomass fuel “Hydrogen”  (%)</b>
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	NA
Key reporting risks	Low risk	NA

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen”  (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Value	Ex-ante	39.15
	Ex-post	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency	Annually once	Annually once
Reporting frequency	Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel "Oxygen"  (%)</b>	<b>Moisture content of the biomass residues "Moisture"</b>
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The NCV analysis is carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL	The NCV analysis is carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Weighted average net calorific value of the fuel type i in year y “NCV <sub>i,y</sub> ” (TJ/Gg)	Quantity of fossil fuel type i consumed in a process j during the year y “FC <sub>i,j,y</sub> ”
Value	Ex-ante	-	-
	Ex-post	-	-
Measuring / Monitoring frequency		Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA
Company performing the calibration		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/Gg)</b>	<b>Quantity of fossil fuel type i consumed in a process j during the year y “FC<sub>i,j,y</sub>”</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>		<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>” (MWh)</b>
Value	Ex-ante	130.1 per annum	0
	Ex-post	11.15	0.96
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Monthly	Monthly
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>”  (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>”  (MWh)</b>
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically CAR 02 was raised as the recording frequency of the monitoring parameter “EC <sub>EL,j,y</sub> ” has not been stated in the MR.
QA/QC How are values verified? (Cross-checked, double- checked,...)	The auxiliary electricity is measured by a calibrated energy meter	The auxiliary electricity is measured by a calibrated energy meter
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Energy Meter; Sr. No. 08-09-ENT-383	Energy Meter; Sr. No. 07-09-ENT-6744
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?	0.5s (which is better than Class 2 stated in the CPA-DD)	0.5s (which is better than Class 2 stated in the CPA- DD)
Period of operating time	01/05/2012 to 31/08/2012	01/05/2012 to 31/08/2012
Instrument type	Energy Meter	Energy Meter
Manufacturer, model and serial number	Trinity Energy Systems Private Limited; Sr. No. 08-09-ENT-383	Trinity Energy Systems Private Limited; Sr. No. 07- 09-ENT-6744
Specific location	Project site	Project site
Calibration dates	01/05/2012 (valid till 30/04/2013)	01/05/2012 (valid till 30/04/2013)
Company performing the calibration	Manufacturer: Trinity Energy Systems Private Limited (Calibration is traceable to international standard and hence deemed acceptable).	Manufacturer: Trinity Energy Systems Private Limited (Calibration is traceable to international standard and hence deemed acceptable).
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.
Is calibration valid for the whole reporting period?	Yes	Yes



<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>”  (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>”  (MWh)</b>
Maintenance	The energy meter was functional throughout the monitoring period	The energy meter was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>”  (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Value	Ex-ante	-
	Ex-post	51
Measuring / Monitoring frequency	Continuous at each trip	Continuous at each trip
Reporting frequency	Calculated at the end of the monitoring period	Calculated at the end of monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>”  (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the invoices and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average round trip distance (from and to) between the biomass fuel supply sites and the site of biomass processing in year y “AVD <sub>c,y</sub> ”  (km)	Number of truck trips during the transportation of biomass to the biomass  processing site in year y “N <sub>c,y</sub> ”
Value	Ex-ante	-	-
	Ex-post	71.06	123
Measuring / Monitoring frequency		Continuous at each trip	Continuous at each trip
Reporting frequency		Calculated at the end of monitoring period	Calculated at the end of monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the quantity of biomass combusted and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Average round trip distance (from and to) between the biomass fuel supply sites and the site of biomass processing in year y “AVD<sub>C,y</sub>”  (km)</b>	<b>Number of truck trips during the transportation of biomass to the biomass  processing site in year y “N<sub>C,y</sub>”</b>
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average mass fraction of carbon in fuel type i in year y “w<sub>C,i,y</sub>”</b>	<b>Weighted average CO2 emission factor of fuel type i in year y “EF<sub>CO2,i,y</sub>” (tCO<sub>2</sub>/GJ)</b>
Value	Ex-ante	-
	Ex-post	NA (No fossil fuel has been used during the monitoring period)
Measuring / Monitoring frequency	NA	NA
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average mass fraction of carbon in fuel type i in year y “w<sub>C,i,y</sub>”</b>	<b>Weighted average CO2 emission factor of fuel type i in year y “EF<sub>CO2,i,y</sub>” (tCO<sub>2</sub>/GJ)</b>
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Boiler operating hours of the Project activity in year y “h <sub>y</sub> ”
Value	Ex-ante	7,200 per annum
	Ex-post	2,109
Measuring / Monitoring frequency		Daily (Boiler operating hours is monitored by SCADA system based on the operating hours of the draft fan of the boiler)
Reporting frequency		Monthly
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes
Does monitoring of the parameter involve sampling? (yes / no)		No
Population Size		NA
Sample Size		NA
Confidence level		NA
Margin of error		NA
Recording (Manually / electronically / ...)		Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA
Period of operating time		01/05/2012 to 31/08/2012
Instrument type		NA
Manufacturer, model and serial number		NA
Specific location		NA
Calibration dates		NA

<b>Data / Parameter (as in the MP)</b>	<b>Boiler operating hours of the Project activity in year y “h<sub>y</sub>”</b>
Company performing the calibration	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA
Is calibration valid for the whole reporting period?	NA
Maintenance	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA
Key reporting risks	Low risk

	Verified situation	Conclusion
<b>SECTION 4. Compliance with the calibration frequency requirements for measuring instruments</b>		
The "Monitoring Parameters and Calibration Checklist" in section 3 above shall be checked to determine if the calibration frequency specified in the applied monitoring methodology and/or monitoring plan is followed in the monitoring report and in the monitoring activities. Where a failure to comply with the required frequency is detected, or no frequency is mentioned in the monitoring report, please follow the checklist below:		
<p>4-1. If the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (that is, the results of delayed calibration are available), confirm that the following conservative approach has been adopted in the calculation of emission reductions:</p> <ul style="list-style-type: none"> <li>- If the delayed calibration did not show any errors in the measuring equipment, or the error was smaller than the maximum permissible error, have the PPs applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> <li>- If the delayed calibration identified an error greater than the maximum permissible error, have the PPs applied the error identified in the delayed calibration test to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> </ul> <p>Confirm that the error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer emission reductions being</p>	No delayed calibration was noted during this monitoring period. Hence this is not applicable.	NA



	Verified situation	Conclusion
claimed;		
<p>4-2. If the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification:</p> <ul style="list-style-type: none"> <li>c. Request the PPs to conduct the required calibration;</li> <li>d. On receipt of the calibration results, determine whether the PPs have calculated the emission reductions conservatively using the approach mentioned in section 4.1 above.</li> </ul>	Not Applicable.	NA
<p>4-3. If it is not possible for the PPs to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of the PPs, check if the PPs have prepared a temporary deviation or a 'Permanent changes from the monitoring plan and/or monitoring methodology application'.</p> <p>Follow the requirements for post registration changes in sections 3.10 to 3.19 above.</p>	Not Applicable.	NA

	Verified situation	Conclusion
4-4. If neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipment, determine whether the equipment is calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification. If neither local/national standards nor the manufacturer's specification are available, international standards may be used.	Not Applicable.	NA

	Verified situation	Conclusion
<b>SECTION 5. Assessment of data and calculation of emission reductions</b>		
<p>5-1. Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in line with the formulae and methods described in the monitoring plan and the applied methodology document?</p> <p>Check consistency in the ERs spreadsheet.</p>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and the applicable methodological tools for the project activity are as follows:</p> <p><b>Baseline emissions:</b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity = 511.41 tCO<sub>2</sub> – Calculation shown below</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity = 6.774 TJ – Calculation shown below</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant as per the included CPA-DD = 75.5 tCO<sub>2</sub>/TJ</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity as per the included CPA-DD = 100%</p> <p><math>EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}</math></p>	<p>CAR-04 CL-08 CL02 OK</p>

<sup>51</sup> During the monitoring period, energy meter for auxiliary consumption of electricity for the boiler was out of order on 31/08/2012. As per the CPA-DD, the CME has rightly considered the auxiliary energy consumption based on the connected load of the auxiliary equipment of 18.07 kW and multiplying it by 24 hours to get auxiliary consumption of 433.68 kWh and this value is added in project emission calculation.

<sup>52</sup> As per the included CPA-DD, for calculation of the parameter “EC<sub>LE,i,y</sub>”, during the first periodic verification, declaration has been taken from the briquette supplier, Vivek Industries vide letter dated 13/10/2012 stating the electricity consumption for biomass processing is @0.035 MWh/tonnes. Hence for this monitoring period, the electricity due to processing of biomass has been calculated by multiplying this value with the quantity of briquette consumed during this monitoring period (601.81 tonnes) i.e. 0.035 \* 601.81 = 21.06 MWh

	Verified situation	Conclusion
	<p>where</p> <p><math>EG_{\text{thermal}}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{\text{steam}}</math> = Quantity of steam supplied in Tonnes = 2658.69 Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet = 659.17 kCal/kg</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg) = 50.54 kCal/kg</p> <p><math>EG_{\text{thermal}} = 2658.69 * (659.17 - 50.54) * 4.186 * 10^{-6}</math></p> <p>= 6.774 TJ</p> <p>Note: Steam enthalpy is calculated at the weighted average steam pressure during the monitoring period from standard steam table for saturated steam. Similarly the enthalpy of the boiler feed water is determined at the weighted average feed water temperature during the monitoring period. The verification team independently calculated the steam enthalpy at the average steam pressure of 7.41 kg/cm<sup>2</sup> g using the web site - <a href="http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp">http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp</a> ; and found the steam enthalpy as 659.72 kCal/kg. Hence the enthalpy used by the CME is conservative.</p> <p>Therefore,</p> <p><math>BE_{\text{thermal,CO}_2,y} = 6.774 / 100\% * 75.5</math></p> <p>= 511.41 tCO<sub>2</sub></p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p><math>PE_{EC,y} = EC_{PJ,j,y} * EF_{\text{grid,CM},y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})</math></p> <p><math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid = 11.15 MWh<sup>51</sup></p>	

	Verified situation	Conclusion
	<p> <math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) = 0.96 MWh  <math>EF_{grid,CM,y}</math> = Ex-ante Grid Emission Factor = 0.80 tCO<sub>2</sub>/MWh  <math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l) = 0.4 tCO<sub>2</sub>/MWh  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j as per the included CPA-DD = 20% </p> <p> <math>PE_{EC,y} = 11.15 * 0.80 * (1+20\%) + 0.96 * 0.4 * (1+20\%)</math>  <math>= 11.17 \text{ tCO}_2</math> </p> <p><u>Project emissions from fossil fuel combustion</u></p> <p> <math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math> </p> <p>where  <math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p> <math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr) = 0 Tonnes  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit) </p> <p> <math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math>  Where  <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ) </p> <p>As there is fossil fuel consumption during the monitoring period,</p> <p><math>PE_{FC,j,y} = 0</math></p>	

	Verified situation	Conclusion
	<p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math>  <math>= 11.17 + 0 = 11.17 \text{ tCO}_2</math></p> <p><b>Leakage:</b></p> <p><math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math></p> <p><math>= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVD_{c,y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km,CO2}</math></p> <p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p><math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p><math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source as a result of leakage = 21.06 MWh<sup>52</sup></p> <p><math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source as per included CPA-DD = 0.80 (tCO<sub>2</sub>/MWh)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity as per included CPA-DD = 20%</p> <p><math>N_{c,y}</math> = Number of truck trips for collecting loose biomass = 123</p> <p><math>AVD_{c,y}</math> = Average round trip distance between the biomass fuel supply sites and biomass collection site = 71.06 km</p> <p><math>EF_{km,CO2}</math> = Average CO<sub>2</sub> emission factor for the trucks as per the included CPA-DD = 0.0005152 tCO<sub>2</sub>/km</p> <p><math>N_{y,y}</math> = Number of truck trips for supplying the biomass briquette to the project site = 51</p> <p><math>AVD_{y,y}</math> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant = 300 km</p>	

	Verified situation	Conclusion
	<p> <math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math>  <math>= 21.06 * 0.8 (1+20\%) + 123 * 71.06 * 0.0005152 + 51 * 300 * 0.0005152</math>  <math>= 20.23 + 4.50 + 7.88 = 32.61 \text{ tCO}_2</math> </p> <p>Emission reductions are calculated as follows:</p> <p> <math>ER_y = BE_y - PE_y - LE_y</math>  <math>= 511.41 - 11.17 - 32.61 = 467 \text{ tCO}_2 \text{ (rounded down value)}</math> </p> <p>CAR 04#1 was raised as non consideration of leakage due to processing and transportation (where availability of surplus biomass is more than 25%) for the CPA is not justified in the MR. The finding was successfully closed after appropriate revision in the MR / ER spreadsheet.</p> <p>CAR 04#2 was raised as the value of the parameter “<math>EC_{LE,i,y}</math>” was not consistent with the CPA-DD and the CAR was closed after appropriate revision in the MR.</p> <p>CL 08 was raised as the ER calculation spreadsheet provided for the CPA had not included daily monitored data for steam quantity, temperature, pressure and feed water temperature to calculate the average of these parameters. ER calculation spreadsheet was adequately revised and the CL was closed.</p> <p>CL 02#2 was raised as, for the parameter “<math>TD_{Li,y} = TD_{Lj,y}</math>”, it was stated in the MR that it is used for Leakage emission calculation. But this parameter is also used for the calculation of project emission. CL was closed after appropriate revision in the MR.</p>	
<p>5-2. Has the calculation tool been correctly documented? Check its consistency and formulae.</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The Monitoring Report is supported by Micro Soft excel based spreadsheet for the calculation of emission reductions. The consistency and formula were verified and found to be accurate.</p>	OK

	Verified situation	Conclusion
<p>5-3. Is a complete set of data available during the specified monitoring period? If only partial data is available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan proceed as follows:</p> <ul style="list-style-type: none"> <li>a. Check if sections 3.11 and/or 3.12 above are applicable and raise a CAR for the PPs to comply with these requirements.</li> <li>b. If sections 3.11 and 3.12 are not applicable or the answer to this question remains NO, a request for deviation is necessary.</li> </ul> <p>Conduct an assessment of the potential impacts of these changes in accordance to the procedures for Post Registration Changes.</p>	Yes, the complete data set was available during the specified monitoring period.	OK
<p>5-4. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?</p> <p>Please describe how LRQA has cross-checked reported data.</p>	All the information provided in the Monitoring Report were cross-checked with the Plant log book records, purchase records (for biomass and fossil fuel), site visit and interview of the CPA implementer/CME.	OK
<p>5-5. Have any assumptions used in emission calculations been justified?</p>	All assumptions in the emission reduction calculation are consistent with assumptions taken in the registered monitoring plan and have reference to the applied methodology.	OK



	Verified situation	Conclusion
5-6. Have appropriate emission factors, IPCC default values, and other reference values been correctly applied?	<p>The CME has applied the appropriate ex-ante fixed factors as stated in the included CPA-DD like:</p> <ul style="list-style-type: none"> <li>• The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity(<math>\eta_{BL,thermal}</math>)</li> <li>• CO<sub>2</sub> Emission Factor of the fossil fuel that would have been used in the baseline plant (<math>EF_{FF,CO_2}</math>)</li> <li>• Surplus availability of Biomass within identified region (<math>SA_k</math>)</li> <li>• Ex-ante Grid Emission Factor in a year y.</li> <li>• Emission Factor for fossil fuel based electricity generation for source j and/or l in year y (<math>EF_{EL,j,y} = EF_{EL,l,y}</math>)</li> <li>• Auxiliary Electricity Consumption for biomass processing, outside Project boundary. (<math>EC_{LE,l,y}</math>)</li> <li>• Average CO<sub>2</sub> emission factor for the trucks measured during the year y(<math>EF_{km,CO_2}</math>)</li> <li>• Average technical transmission and distribution losses for providing electricity to source l and/or j in year y(<math>TDL_{l,y} = TDL_{j,y}</math>)</li> <li>• Specific energy consumption of fuel type j of the Project activity in year y(<math>SEC_{PJ,j,y,measured}</math>)</li> </ul> <p>CAR 04 #2 was raised as the value of the parameter “<math>EC_{LE,l,y}</math>” reported in the published MR was not consistent with the CPA-DD.</p> <p>CL 02#3 was rasied for the CME to clarify the appropriateness of the “Source of data” and “Additional comment” as stated in the MR for the parameters in section D.1, which are fixed ex-ante at the time of validation of the CPA.</p> <p>MR was suitably revised and the findings were closed.</p>	<p><del>CAR 04</del> CL 02 OK</p>

## 7.7 Appendix C5: Verification Protocol for CPA 4041-0006

	Verified situation	Conclusion
<b>SECTION 1. Project implementation in accordance with the registered PoA-DD &amp; CPA-DD</b>		
<b>General description of the project</b>		
1.1. Does the MR provide general information of the CPA and is it as per the CPA-DD included by CDM-EB or by a DOE <sup>53</sup> ?	Yes, the Monitoring Report <sup>54</sup> provides the general information of the CPA. Details such as Title of the CPA, UNFCCC registration reference number, version number of the Monitoring Report, monitoring period, project participants, sectoral scope and estimated amount of GHG emission reductions. All the above details can be confirmed from the included CPA-DD through link in UNFCCC site: <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=1W04BLP79KGZ582MSUOHVD6QYJXAT_C">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=1W04BLP79KGZ582MSUOHVD6QYJXAT_C</a> Title of the CPA is “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 006)” and it was included in the PoA on 30/04/2012 applying the baseline and monitoring methodology AMS-I.C, version 16 “Thermal energy production with or without electricity” as verified from the project page of the CPA. The project activity applies AMS-I.C, version 16. The project activity is installation and operation of a 3 TPH biomass (rice husk) fired boiler to meet the captive requirement of steam in poultry feed processing and Palletizing. The project is located in Village-Chenjerla, Manakondur Mandal, District Karimnagar, Andhra Pradesh. The project is implemented by Sneha Farms Private Limited.	OK
1.2. Is the general information provided in the MR in line with the PoA-DD registered by CDM-EB?	Yes, the Monitoring Report is as per the PoA-DD registered by CDM-EB confirmed from the registered PoA-DD through link on UNFCCC site: <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=1W04BLP79KGZ582MSUOHVD6QYJXAT_C">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=1W04BLP79KGZ582MSUOHVD6QYJXAT_C</a>	OK
1.3. Is the Monitoring report as per the standardised format (F-CDM-MR)? (EB 66 )	Yes, the Monitoring Report is as per the latest standardised format (F-CDM-MR) version 02.0 (EB66, Annex 20).	OK
1.4. Is the monitoring report filled as	Yes, the MR is filled up as per the latest “Guidelines for completing the Monitoring Report form” EB	<del>CAR-08</del>

<sup>53</sup> The first CPA is included by the CDM-EB along with registered PoA-DD and subsequent CPAs are included by DOEs.

<sup>54</sup> Monitoring Report for this CPA (CPA 4041-0006) refers to the Appendix-5 of the consolidated MR Version 4.0

	Verified situation		Conclusion		
per the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).	66, Annex 20. CAR 08 was raised as project page of the PoA on UNFCCC web site, the “Other Parties involved” is stated as “United Kingdom of Great Britain and Northern Ireland” and “Germany”. But in the MR “Germany” is missing. CAR was closed as the MR was suitably revised.		OK		
1.5. Is there any open issue in the validation / previous verification including FARs? (CDM VVS para. 213)	No FAR was raised in the Validation report during the CPA inclusion by TUV Nord, the DOE for validation of the CPA. Further this being the first periodic verification, no open issues exists from earlier verification.		OK		
Implementation status of the CPA					
1.6. Is the CPA location indicated same as that in the included CPA-DD? Confirm geographical coordinates	Yes, the project location is same as stated in the CPA-DD and this was verified during the on-site visit. The geographical coordinates of the project site are 18.3541 <sup>0</sup> (18° 21’ 15”) North, 79.5886 <sup>0</sup> (79° 14’ 41”) East. This was cross-checked from the Google Earth web site.		OK		
1.7. Is the project boundary described in the same way as the included CPA-DD and registered PoA-DD? Please confirm each component based on the applied methodology.	Yes, the project boundary is described in the same way as in the included CPA-DD and registered PoA-DD. During the on-site assessment it was also confirmed the project boundary is in line with the applied methodology. The project boundary for this CPA includes the biomass storage area and feeding system, boiler house and the facility which is consuming the heat generated by the project.		OK		
1.8. Has on-site fossil fuel consumption, if any, been monitored? Is any emission source missed? Check the site lay-out and confirm through site tour.	Fossil fuel consumption is required to be monitored in this project. It has been confirmed during the on-site visit and document review that no fossil fuel has been consumed at the CPA site by the project during the monitoring period. The verification team did not find any emission source attributable to the project activity which has been missed out and the same was confirmed during the on-site visit and review of the site lay-out diagram.		OK		
1.9. Confirm contractors for equipment and installation works	It is confirmed that the project equipment i.e., 3TPH boiler for the project is supplied by Thermax Limited and this was confirmed during the on-site visit interview with the project implementer and from the purchase order copy of the boiler issued by the project implementer dated 13/01/2010.		OK		
1.10. Confirm conformance with baseline and monitoring methodology - Applicability conditions. Please refer to the	Conformance to the applicable methodology conditions for the CPA are as follows: <table><tr><td><b>Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)</b></td><td><b>Means of Verification and Results</b></td></tr></table>		<b>Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)</b>	<b>Means of Verification and Results</b>	OK
<b>Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)</b>	<b>Means of Verification and Results</b>				

	Verified situation			Conclusion
complete description of the applicability conditions and confirm that the CPA meets all the requirements.	<i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>	The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.		
	<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>	The total installed / rated capacity of the project equipment is 1.88 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .		
	<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>	The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.		
	<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>	The project does not use any charcoal.		
	The verification team confirms that the CPA conforms to all applicable condition of the applied methodology.			
	Apart from the baseline and monitoring methodology applicability criteria as stated above, the verification team also verified the eligibility criteria stated in section B.2 of the included CPA-DD under “Monitoring Criteria” for the point numbers 1, 3.3, 3.4, 3.5, 16, 17 and 18 and found these to be valid for the project activity during the monitoring period. A declaration letter dated 11/12/2012 in this			

	Verified situation	Conclusion
	respect has also been submitted by the CME.	
1.11. Confirm use or no use of public funding and determine if there is no diversion of ODA to the CPA.	There is no use of public funding for the CPA. The same was confirmed during the interview with the CME and also a declaration in this respect has been provided by the CPA implementer.	OK
1.12. Check data in the MR and in the CPA-DD. Describe data and variables that are different from that stated in the included CPA-DD and cause an increase in emission reductions estimations.	<p>Data in the MR and CPA-DD fixed at validation stage are found to be consistent.</p> <p>The ex-ante estimated emission reductions during this monitoring period of 123 days are 1,319 tCO<sub>2</sub> (3917/365*123) and the actual emission reductions during this monitoring period are 398 tCO<sub>2</sub>. Hence the actual emission reductions during this monitoring are less than the estimated values as per the CPA-DD.</p> <p>However, the following findings were raised and successfully closed during the verification;</p> <ol style="list-style-type: none"> <li>1) CL 02 was raised for the parameters like "CAP<sub>boiler</sub>" and "SEC<sub>PJ,y,measured</sub>", it was stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation.</li> <li>2) CL 05 was raised, as the NCV is taken directly taken from the laboratory report, values of parameters like hydrogen, oxygen and moisture content in the biomass are still reported in the MR, which is not required as per the included CPA-DD.</li> </ol> <p>The MR was suitably revised and the revised MR was found to be in line with included CPA-DD and above findings are closed.</p>	<del>CL-02</del> <del>CL-05</del> OK
1.13. By means of an on-site visit: Is the general information of the project provided in the Monitoring report and is it as per the CPA-DD included by CDM-EB or by a DOE?  List each technical component and equipment and check design parameters and actual status of installation and / or	<p>Yes.</p> <p>The on-site visit for the CPA was conducted on 07/11/2012.</p> <p>The project activity comprises of the installation and operation of a 3 TPH biomass (rice husk) fired boiler to meet the captive requirement of steam at the project site.</p> <p>During the verification, by the observation of equipment, interviews with relevant staff and the checking of technical specifications of main components, it was confirmed that the project activity has been implemented as described in the included CPA-DD.</p>	<del>CAR-01</del> <del>CAR-03</del> OK

<sup>55</sup> The sampling shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified situation	Conclusion
<p>operation.</p> <p>Please check to ensure that all physical features of the proposed CPA in the registered/included CPA-DD are in place and the PP has operated the proposed CPA as per the included CPA-DD.</p> <p>It may include but not limited to:</p> <ul style="list-style-type: none"> <li>the actual capacity and output</li> <li>plant load factor</li> <li>type of feedstock</li> <li>operation of other components / units within the project boundary which could affect functioning of the project plant.</li> </ul> <p>In cases where there are a large number of components and equipment items and the check of all of them is not an available option, then a random sampling check shall be performed. Justify here the sample chosen and describe the results.<sup>55</sup></p>	<p>The project is operational. The project was commissioned on 19/09/2010 and the same was verified from the commissioning certificate issued by Thermax Limited.</p> <p>No change from the included CPA-DD of physical features which may impact the emission reduction of the project activity has been identified.</p> <ul style="list-style-type: none"> <li>Steam generation unit : 3 TPH boiler</li> <li>Net enthalpy supply by project : The ex-ante estimated annual enthalpy output from the project boiler is 46.567 TJ as per the included CPA-DD (which corresponds to 15.69 TJ for 123 days of this monitoring period) whereas actual enthalpy supplied by the boiler during this monitoring period was 4.93 TJ which is less than the ex-ante estimated value.</li> <li>Type of biomass fired in the boiler: As per the included CPA-DD, renewable biomass residue (rice husk) is to be fired in the boiler and it was noted that there was no deviation in the biomass firing during the monitoring period.</li> <li>As per the included CPA-DD, the project may fire fossil fuel (Coal) in the boiler. During this monitoring period, no fossil fuel has been fired in the project boiler heater as confirmed by the project implementer during the site visit.</li> </ul> <p>100% data is monitored for the CPA and hence no sampling plan is applicable.</p> <p>However, CAR 01 was raised as in section B.1 of the MR; the downtime time of the project boilers is not provided. Details are provided in the revised MR and the CAR was closed.</p> <p>Further, CAR 03 was raised as PP has considered a simple average of steam pressure; temperature and boiler feed water enthalpy, which are used for the calculation of net enthalpy supplied by the project boiler, which is not correct. The calculation approach was revised and a weighted average was considered for emission reduction. The CAR 03 was successfully closed.</p>	
<p>1.14. Have responsibilities for monitoring been described and specified?</p>	<p>The responsibilities of monitoring have been provided and described in the Monitoring Report. The Monitoring Report and CDM documents clearly describe the responsibilities for monitoring.</p> <p>The project owner has identified the CDM team, the structure of which is given in Monitoring Report. During the verification, responsibilities for operational personnel, technical and support team have been verified and confirmed.</p> <p>The CDM team has been assigned the responsibility for measuring, recording and storage of the measured data. Data is kept in electronic format and paper format.</p>	OK

	Verified situation	Conclusion
1.15. Are the responsibilities and authorities for monitoring and reporting in line with those stated in the monitoring plan of the included CPA-DD?	Yes, responsibilities and authorities for monitoring and reporting are in accordance with included CPA-DD.	OK
1.16. Check QA/QC, management systems. Are procedures described and specified in the MR? Are they consistently applied as described in the MP? a. documented instructions, management manual b. documentation c. data archiving d. monitoring report e. cross-checking f. energy balance analysis (as relevant) g. internal audits / verification and management review	<p>QA/QC procedures include staff training, instrument calibration, cross-checking and data/documents archiving. They are consistent with the monitoring plan.</p> <p>The Monitoring Report describes the monitoring system, monitoring procedures, data collection and reporting, responsibilities of relevant staff/departments, calibrations that were implemented and QA/QC procedures including data cross-checking.</p> <p>By means of document review, onsite assessment and interviews, the verification team has confirmed that all the QA/QC measures, data archiving, monitoring and internal audits are as per the registered monitoring plan of the registered PoA-DD and the included CPA-DD.</p> <p>However, CL 03 was raised as the “QA/QC procedure” &amp; “Purpose of data” for the quantity of biomass in the MR was mentioned as “NA” and the same is not consistent with the monitoring plan of the included CPA-DD. Monitoring and recording frequency of these parameters were not mentioned in the MR. Also the values for these parameters as stated in the MR was incorrect as verified during the on-site visit and also with the documents provided.</p> <p>The MR was suitably revised to close the finding.</p>	<del>CL-03</del> OK
1.17. Have the procedures for emergency and abnormal situations been established?	<p>As stated in section C of the MR, the procedure for non-conformance and corrective actions is in place for the project activity to mitigate any emergency and abnormal situations in monitoring as per the included CPA-DD.</p> <p>During the monitoring period, energy meter for auxiliary consumption of electricity for the boiler was not in place from 01/05/2012 to 11/05/2012. As per the CPA-DD, The CME has rightly considered the auxiliary energy consumption based on the connected load of the auxiliary equipment of 30.2 kW and multiplying it by 109 hours of boiler operation during this period to get auxiliary consumption of 3291.8 kWh and this value is added in project emission calculation. All other monitoring equipment were under normal operating conditions during the monitoring period.</p> <p>However, CAR 07 was raised as the CME needed to clarify why the details of the backup monitoring</p>	<del>CAR-07</del> OK

	Verified situation	Conclusion
	instruments (for steam pressure and temperature and feed water temperature) were not provided in the MR. Adequate justification was provided by the CME and the CAR was closed.	
1.18. Has the system for qualification and training been established as relevant for the monitoring and management activities?	<p>The training and qualification of the project personnel has also been confirmed during interview of the operational personnel during the on-site visit. It is confirmed that they have sufficient knowledge, experience and competency to implement and maintain the plant operation including data monitoring and recording in line with the boiler operation and maintenance manual provided by the boiler supplier, and with CDM requirements.</p> <p>This is further verified by the evidence for training of the project personnel and the boiler attendants' certificates issued by Directorate of Steam Boilers (Government agency) for the boiler operators.</p>	OK
1.19. Check the environmental report, license, permit and compliance to the local environmental legislation (if relevant).	The verification team has confirmed that the project meets the relevant local environmental legislation. This was confirmed from the copy of the consent to operate issued by Andhra Pradesh Pollution Control Board valid from 10/02/2012 to 30/09/2012. Also copy of boiler certificate valid from 07/03/2012 to 06/09/2012 issued by Directorate of Steam Boilers Department has been submitted for the operation of the boiler.	OK
1.20. Check contribution to sustainable development, comparing those expected in the included CPA-DD and the actual status.	<p>With the provision of employment opportunities by the project activity, there has been a contribution for the social and economic well-being of some local people.. The project utilises renewable biomass to produce steam (thereby avoiding the fossil fuel usage) and this leads to environment well being by reduced environmental impact from fossil fuel use. Also the project uses renewable biomass technology which is deemed as a clean (as it displaces fossil fuel usage) and safe technology.</p> <p>Even though the sustainable development measures were not registered in the CPA-DD as a monitoring parameter, it was confirmed during the site visit that the CPA contributes to the sustainable development of the host country.</p>	OK
1.21. Check issues with local stakeholders, claims, complaints, etc.	It was confirmed by on-site interviews that there had been no claims and complaints from local stakeholders prior to the verification visit.	OK



	Verified situation	Conclusion	
1.22. If from the above assessment the conclusion is that the implementation or operation of the CPA does not conform with the description contained in the included CPA-DD and/or corrections have been made to project information or parameters fixed at validation/inclusion, determine if these changes and/or corrections do not require prior approval by the board: <ul style="list-style-type: none"><li>- A request of approval is required if the boundary of a registered CDM PoA is changed to include an additional host party, in accordance with the project cycle procedure.</li><li>- A request for approval is required if the CME of a registered CDM PoA changes after the registration of the PoA.</li><li>- Any corrections to project information of an included CPA that do not affect the design of the project activity do not require prior approval by the Board.</li><li>- A request for approval is required if any of the three issues below is adversely impacted by the identified changes to the project design.</li></ul>			
1.23. The applicability and application of the applied methodology under which the CPA has been included:  Check if the project boundary has changed and if any of the parameters to assess the applicability conditions have changed.	No change in applicability and application of the applied methodology AMS-I.C. version 16, including the project boundary, is observed.	YES	NO
			X
1.24. Compliance of the included CPA to eligibility criteria as defined in the registered PoA-DD.  Check if any of the parameters to assess the PoA eligibility criteria have changed.	No change in the eligibility criteria of the registered CPA, as defined in the registered PoA-DD, is observed.	YES	NO
			X
1.25. The additionality of the project activity:  Check if any of the input parameters to the investment analysis have changed. For barrier analysis, check if any information or data used in the	There is no change in the project design parameters as the project is implemented as per the included CPA-DD. Hence this is not applicable.	YES	NO
			X

	Verified situation	Conclusion	
barrier analysis has changed.			
1.26. The scale of the project activity. Check if the project is still small scale or large scale after the implementation of the changes.	Small scale, as per the eligibility criteria for CPA inclusion and is in accordance with the methodology AMS-I C, version 16.	YES	NO
			X
If the answer to any of the above items is YES, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
1.27. If, from the above assessment, the conclusion is that the changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	

	Verified Situation	Conclusion
<b>SECTION 2. Compliance of the Monitoring Plan with the Monitoring Methodology including applicable Tool(s)</b>		
2.1. Is the monitoring plan of the included CPA-DD in accordance with the applied methodology?	Yes, it is confirmed that monitoring plan of the included CPA-DD is in accordance with the applied methodology, AMS-I.C, version 16.	OK
2.2. If the methodology provides different options (for example, use of default values or on-site measurements), has the Monitoring Report specified which option is used?	<p>Yes,</p> <p>The ex-ante parameters which are fixed for the crediting period at the time of CPA inclusion in the PoA as per the methodological tools are:</p> <ul style="list-style-type: none"> <li>• <math>CAP_{\text{boiler}}</math> (Rated capacity (thermal output) of the boiler of the Project activity)</li> <li>• <math>\eta_{\text{BL,thermal}}</math> (The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity)</li> <li>• <math>EF_{\text{FF,CO}_2}</math> (<math>\text{CO}_2</math> Emission Factor of the fossil fuel (Indian Coal) that would have been used in the baseline plant)</li> <li>• <math>SA_k</math> (Surplus availability of Biomass)</li> <li>• <math>EF_{\text{grid,CM,y}}</math> (Ex-ante Grid Emission Factor in a year y)</li> <li>• <math>EF_{\text{EL,j,y}}</math> (Emission Factor for fossil fuel based electricity generation for source j in year y)</li> <li>• <math>EF_{\text{km,CO}_2}</math> (Average <math>\text{CO}_2</math> emission factor for the trucks measured during the year y)</li> <li>• <math>TDL_{i,y}</math> (Average technical transmission and distribution losses for providing electricity to source j in year y)</li> <li>• <math>SEC_{\text{PJ,j,y,measured}}</math> (Specific energy consumption of fuel type j of the Project activity in year y)</li> </ul> <p>Further, the verification team confirms that there is no deviation in the values of the ex-ante fixed parameters between the included CPA-DD and the MR.</p> <p>The parameters being monitored ex-post as per the monitoring methodology and the CPA-DD are:</p> <ul style="list-style-type: none"> <li>• Quantity of steam supplied in year y (<math>Q_{\text{steam}}</math>)</li> <li>• Average Steam Temperature at MSSV (Main steam stop valve) outlet during year (<math>T_{\text{steam}}</math>)</li> <li>• Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet</li> </ul>	<p>GL-05</p> <p>OK</p>

	Verified Situation	Conclusion
	<p>during year (<math>P_{\text{steam}}</math> )</p> <ul style="list-style-type: none"> <li>• Average Feed Water Temperature at inlet of boiler (<math>T_{\text{FWB}}</math> )</li> <li>• Boiler operating hours of the project activity in year y (<math>h_y</math>)</li> <li>• Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob},k}</math> )</li> <li>• Quantity of subsequent delivery of fuel type k biomass at the Project site (<math>Q_{\text{np},k}</math> )</li> <li>• Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in},k}</math> )</li> <li>• Quantity of biomass fuel type k consumed during the monitoring period (<math>Q_{\text{c},k} = FC_{\text{biomass},k,y}</math> )</li> <li>• Net calorific value of biomass fuel k used in the Project activity ( <math>NCV_k</math> ) *</li> <li>• Percentage of hydrogen in biomass fuel (Hydrogen) *</li> <li>• Percentage oxygen in Biomass fuel (Oxygen)*</li> <li>• Moisture content of the biomass residues (Moisture)*</li> <li>• Auxiliary Electricity Consumption of the Project activity from the Grid in year y (<math>EC_{\text{PJ},j,y}</math>)</li> <li>• Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) in a year y (<math>EC_{\text{EL},j,y}</math>)</li> <li>• Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y (<math>AVD_{,y}</math>)</li> <li>• Number of truck trips during the year y (<math>N_{,y}</math>)</li> <li>• Weighted average <math>\text{CO}_2</math> emission factor of fuel type i in year y (<math>EF_{\text{CO}_2,i,y}</math>)**</li> </ul> <p>These parameters are based on on-site measurement and have been verified during this verification.</p> <p>* The laboratory report has directly provided the value of NCV. Hence Hydrogen, Oxygen and moisture are not required (which would be required in case NCV was not provided to be calculate NCV from GCV and the above three parameters)</p> <p>** No fossil fuel has been fired in the project boiler during this monitoring period</p>	

	Verified Situation	Conclusion
	However, CL 05 was raised, since the NCV was taken directly from the laboratory report, yet the values of parameters like hydrogen, oxygen and moisture content in the biomass were reported in the MR, which is not required as per the included CPA-DD. MR was suitably revised and the finding was closed.	
2.3. Is all data collected and archived according to the tables in the applied Monitoring Methodology and is this included in the Monitoring Plan?	Yes, all the data is collected and archived in accordance to methodology and included in the monitoring plan. All the data will be archived until 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.	OK
2.4. Check the calculation of emission reductions following the applied methodology: <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and applied for the project activity are as follows:</p> <p><b><u>Baseline emissions:</u></b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity during the year y (tCO<sub>2</sub>)</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity during the year y (TJ)</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant; tCO<sub>2</sub> / TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity</p> <p><math>EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}</math></p>	GL-01 OK

	Verified Situation	Conclusion
	<p>where</p> <p><math>EG_{\text{thermal}}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{\text{steam}}</math> = Quantity of steam supplied in Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet (kCal/kg)</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg)</p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> $PE_{EC,y} = EC_{PJ,j,y} * EF_{\text{grid},CM,y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})$ <p><math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid in year y</p> <p><math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set)</p> <p><math>EF_{\text{grid},CM,y}</math> (Ex-ante Grid Emission Factor in a year y)</p> <p><math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j in year y</p> <p><u>Project emissions from fossil fuel combustion</u></p> $PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}$ <p>where</p> <p><math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p>	

	Verified Situation	Conclusion
	<p> <math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)   <math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math>  Where  <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)   Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math> </p> <p><b><u>Leakage:</u></b></p> <p> <math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math>   <math>= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVDC_{y,y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km,CO2}</math>  where  <math>LE_y</math> = Leakage emissions  <math>LE_{EC,y}</math> = Leakage emissions from electricity consumption in year y (tCO<sub>2</sub>/yr)  <math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site  <math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site  <math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source l in year y as a result of leakage (MWh/yr)  <math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source l in year y (tCO<sub>2</sub>/MWh)  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l in year y </p>	

	Verified Situation	Conclusion
	<p> <math>N_{c,y}</math> = Number of truck trips for collecting loose biomass during the year y  <math>AVD_{c,y}</math> = Average round trip distance between the biomass fuel supply sites and biomass collection site during the year y  <math>EF_{km,CO_2}</math> = Average <math>CO_2</math> emission factor for the trucks measured during year y  <math>N_{y,y}</math> = Number of truck trips during the year y  <math>AVD_{y,y}</math> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant during year y (km) </p> <p>Emission reductions are calculated as follows:  <math>ER_y = BE_y - PE_y - LE_y</math></p> <p>However, CL 01 was raised as in section E.5 of the MR, the calculation of the ex-ante emission reductions was not transparently presented. The revised MR clearly and transparently describes the ER calculation approach providing relevant equations in line with the included CPA-DD.</p>	
<p>2.5. List any monitoring aspect that is not specified in the methodology and check its compliance with the Monitoring Plan, for example:</p> <ul style="list-style-type: none"> <li>• additional monitoring parameters</li> <li>• monitoring frequency</li> <li>• calibration frequency.</li> </ul>	<p>No additional monitoring parameter is identified that is not specified in the approved methodology and the included CPA-DD available in the project page on UNFCCC website.</p> <p>The monitoring frequency and the calibration frequency specified are not less than the requirements of the approved methodology and the Monitoring plan in the included CPA-DD.</p>	OK



		Verified Situation	Conclusion
<b>SECTION 3. Compliance of Monitoring activities with the Monitoring Plan of the included CPA-DD</b>			
3-1. Is the Monitored Data included in the Monitoring Report as per the Monitoring Plan or any accepted revised MP?	Yes	The monitored data included in section D.2 of the MR is as per the monitoring plan of the included CPA-DD.	OK
3-2. Has the data been generated at the frequency required by the Monitoring Plan or any accepted revised MP?		The values are indicated in the section D.2 of the Monitoring Report. At the site visit it was verified that data was generated at the required frequency as per the monitoring plan in the included CPA-DD.	
3-3. Has the monitoring been implemented in accordance with the monitoring plan contained in the included CPA-DD or any accepted revised MP?  Confirm that the monitoring and reporting procedures have been implemented as documented and follow by PPs.	Yes, by means of document review, on-site assessment and interviews with the plant personnel, it was confirmed that the monitoring has been implemented in accordance with the monitoring plan contained in the included CPA-DD.  It was also established that monitoring and reporting procedures have been implemented as documented by the CME and the CPA operator		OK
3-4. Have types of measurement instrumentation used been described and specified?	Yes the MR specifies and describes the use of different measurement instruments (Steam flow meter, RTD / Temperature gauge, Pressure transmitter / Pressure gauge, energy meter and weighbridge). The details of the measuring equipment are provided in the "Annex-1_4041-0006: Instrument Details" of the MR. The provided details have been verified during the on-site visit.		OK
3-5. Is the accuracy of equipment used for monitoring sufficient and regularly controlled and calibrated in line with the registered monitoring plan or any accepted revised MP?  Check relevance of maintenance and calibration included in the monitoring plan.  Check relevance of laboratory analysis if included in the monitoring plan.	Yes, the verification team confirmed through the on-site assessment and the review of evidence that the installation of the measuring devices has been completed and the equipment has been operated and maintained in normal operating conditions.  The accuracy classes of all the monitoring equipment are found as per the monitoring plan of the included CPA-DD, or of higher accuracy as detailed in "Annex-1_4041-0006: Instrument Details" of the MR.  It was confirmed that the information of the meters was consistent with that described in the Monitoring Report.  The CME has provided the calibration certificates of all the monitoring equipment		<del>CL-07</del> OK

	Verified Situation	Conclusion
	<p>and the verification team confirms the certificates to be appropriate and relevant. For further details of the calibration of the monitoring equipment please refer to section 3.19 of this report below.</p> <p>Nevertheless, CL 07 was raised as the CME had not provided the credentials of the calibrating agencies and the laboratories, which have carried out the NCV analysis. Adequate information was provided by the CME and the CL was closed.</p> <p>For details please refer to Appendix D of this report.</p>	
3-6. If the monitoring plan of the CPA-DD refers to a sampling plan and monitoring is carried out for the chosen samples, ensure that the sampling is carried out as per the sampling plan <sup>56</sup> .	The monitoring plan of the CPA-DD does not refer to a sampling plan and the monitoring is carried out for 100% data for all the monitoring parameters.	NA
3-7. Check that responsibilities and authorities for monitoring and reporting are in line with the monitoring plan. Are the monitoring results consistently recorded, reviewed and approved as stated in the CPA-DD or any accepted revised MP?	<p>Yes</p> <p>During the site visit, monitoring and reporting procedures were confirmed by the verification team through interview with the relevant plant personnel, CME and by document review.</p> <p>However, the following CAR/CL were raised and successfully closed;</p> <ul style="list-style-type: none"> <li>CAR 02 was raised as the opening readings of the parameter "Q<sub>steam</sub>" and closing readings of the parameters "EC<sub>PJ,j,y</sub>" and "EC<sub>EL,j,y</sub>" have not been presented to the verification team.</li> <li>CL 02 was raised as for the parameters like "CAP<sub>boiler</sub>" and "SEC<sub>PJ,y,measured</sub>", the CME had stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not used for baseline emission calculation.</li> </ul> <p>The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p>	<p><del>CAR 02</del></p> <p><del>CL 02</del></p> <p>OK</p>

<sup>56</sup> The sampling plan shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified Situation	Conclusion
	For details please refer to Appendix D of this report.	
<p>3-8. Reporting period: Defined?</p> <p>If a monitoring period of a parameter more / less than a year is applied, check if the monitoring is in a complete and consistent manner?</p> <p>Is the monitoring period within the crediting period of the CPA and length of the registered PoA?</p>	<p>The monitoring period for the PoA is from 12/01/2011 to 31/08/2012. But for the CPA, the emission reduction starts from 01/05/2012 (i.e., the date of start of crediting period of the CPA) till 31/08/2012. Hence the monitoring period for the CPA is for 123 days which is less than a year. However, monitoring of all the parameters is complete, as there is no specific requirement in the methodology for annual reporting of any data. The verification team therefore, confirms the monitoring to be complete and consistent and clearly defined in the MR.</p> <p>The monitoring period is within the crediting period of the CPA and also the length of the registered PoA.</p> <p>Nevertheless, CL 09 was raised as the monitoring period of the CPA is not consistent with that of the PoA in the webhosted MR. The issue has been addressed and the finding was successfully closed.</p>	<p><del>CL-09</del> OK</p>
<p>3-9. If the monitoring plan includes the determination of environmental and / or social indicators, have the sustainable development indicators been monitored in accordance with the monitoring plan of the included CPA-DD?</p>	Not applicable	NA
<p>3-10. Check monitoring of Environmental and Social indicators (if relevant)</p> <ul style="list-style-type: none"> <li>• implementation of measures</li> <li>• monitoring equipment</li> <li>• quality assurance procedures</li> <li>• external data.</li> </ul>	Not applicable	NA

		Verified Situation	Conclusion	
<b>SECTION 2 and 3: Post Registration Changes</b>				
<p>3-11. If, from the above assessment in SECTIONS 2 and 3, the conclusion is that there are temporary deviations or permanent changes from the registered Monitoring Plan or Monitoring Methodology, determine if these deviations or changes require prior approval by the EB by answering the questions below.</p> <p>All the answers to the applicable questions below shall be explained and the reasons for each conclusion given in the “Verified situation” column.</p> <p><b>Temporary deviations from the registered monitoring plan or applied methodology:</b>  Prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES.</p>				
3-12. Have the PPs reported as zero any parameter related to baseline GHG emissions that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?	No temporary deviation is sought during this monitoring period	YES	NO	
		-	-	
3-13. Have the PPs estimated (assuming that the source of the project GHG emissions operated at maximum capacity for the full period of the missing data) any parameter that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?  For project GHG emissions related to the consumption of electricity, the estimate shall include an addition of 10% to account for transmission and distribution losses.	No temporary deviation is sought during this monitoring period	YES	NO	
		-	-	
<b>Permanent changes from the registered monitoring plan or applied methodology</b>				
<p>If the monitoring equipment actually installed has a lower accuracy level than the accuracy stipulated in the applied methodology and/or in the registered monitoring plan, and the monitoring equipment is under the control of the project participants, prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES:</p>				
3-14. Have the PPs deducted from the measured	No permanent change in the monitoring plan is observed during this monitoring	YES	NO	

		Verified Situation	Conclusion	
value, for any parameter used for calculating baseline GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	period		-	-
3-15. Have the PPs added to the measured value, for any parameter used for calculating project GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES	NO	
		-	-	
Changes to the monitoring of the included CPA of a type listed below do not require approval by the EB. Confirm in the conclusion column that the change is of the type in the table below and explain the reasons.				
3-16. Change of calibration frequency or practice for monitoring equipment not within the control of project participants	Not Applicable	NA		
3-17. Change of accuracy / type / model of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA		
3-18. Change of location of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA		
If the answer to any of the above items has been that approval from the EB is required, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.				
3-19. If, from the above assessment, the conclusion is that the temporary deviations or permanent changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA		

### 3.19 Monitoring Parameters and Calibration Checklist:

Complete the following table for each parameter:

Data / Parameter (as in the MP)		Quantity of steam supplied in year y " $Q_{\text{steam}}$ " (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet " $T_{\text{steam}}$ " ( $^{\circ}\text{C}$ )
Value	Ex-ante	19,200 per annum	164.7
	Ex-post	1,889.38	169.16 <sup>57</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		As per the monitoring plan of the included CPA-DD, the quantity of steam delivered by the project is measured by duly calibrated steam flow meter and the calibration certificate has been verified. Further, the verification team cross-checked the quantity of steam delivered by the project activity during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the steam temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.

<sup>57</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of steam supplied in year y “Q<sub>steam</sub>” (Tonnes)</b>	<b>Average Steam Temperature at MSSV (Main steam stop valve) outlet “T<sub>steam</sub>” (°C)</b>
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Steam flow meter Sr. No.: E8010720000	RTD Sr. No.: E8010720000 <sup>58</sup>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+/- 2.3% Maximum (which is better than that stated in the CPA-DD of +/-3%)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	01/05/2012 to 31/08/2012	01/05/2012 to 31/08/2012
Instrument type	Steam flow meter cum RTD	Steam flow meter cum RTD
Manufacturer, model and serial number	Make: Endress + Hauser; Sr. No.: E8010720000	Make: Endress + Hauser; Sr. No.: E8010720000
Specific location	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler
Calibration dates	11/08/2011 (valid till 10/08/2014)	11/08/2011 (valid till 10/08/2014)
Company performing the calibration	Manufacturer Endress + Hauser (NABL accredited)	Manufacturer Endress + Hauser (NABL accredited)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes

<sup>58</sup> A consolidated monitoring equipment is used by the CPA operator, which has inbuilt feature for measuring the both steam flow and the steam temperature. This was confirmed during the on-site visit and verification of the technical specification of the measuring equipment.

Data / Parameter (as in the MP)	Quantity of steam supplied in year y " $Q_{\text{steam}}$ " (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet " $T_{\text{steam}}$ " ( $^{\circ}\text{C}$ )
Maintenance	The Steam flow meter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year " $P_{\text{steam}}$ " ( $\text{kg}/\text{cm}^2 \text{ g}$ )	Average Feed Water Temperature at inlet of boiler " $T_{\text{FWB}}$ " ( $^{\circ}\text{C}$ )
Value	Ex-ante	6	80
	Ex-post	7.44 <sup>59</sup>	38.24 <sup>60</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA

<sup>59</sup> The value is the weighted average of the daily recorded pressure readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily pressure readings was reported in the published MR which is incorrect. The CAR was closed after the pressure was revised as the weighted average of the daily readings during the monitoring period

<sup>60</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period



<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “<math>P_{\text{steam}}</math>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “<math>T_{\text{FWB}}</math>” (°C)</b>
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the steam pressure is measured by duly calibrated pressure transmitter and the calibration certificate has been verified. Further, the verification team cross-checked the steam pressure during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the feed water temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Pressure transmitter Sr. No. E8002D21129	RTD E80081142EA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+/- 0.15% (which is better than 2% as stated in the CPA-DD)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	01/05/2012 to 31/08/2012	01/05/2012 to 31/08/2012
Instrument type	Pressure transmitter	RTD
Manufacturer, model and serial number	Endress + Hauser; Sr. No. E8002D21129	Endress + Hauser; Sr. No. E80081142EA
Specific location	Project site, at the Main Steam Stop Valve (MSSV)	Project site, after the boiler feed water tank at the inlet of the boiler
Calibration dates	22/08/2011 (valid till 21/08/2014)	13/10/2011 (valid till 12/10/2014)
Company performing the calibration	Endress + Hauser (NABL accredited)	Endress + Hauser (NABL accredited)

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “<math>P_{\text{steam}}</math>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “<math>T_{\text{FWB}}</math>” (°C)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The pressure transmitter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q <sub>ob,k</sub> ” (Tonnes)	Quantity of subsequent delivery of fuel type k biomass at the Project site “Q <sub>np,k</sub> ” (Tonnes)
Value	Ex-ante	NA	NA
	Ex-post	41.62	658.67
Measuring / Monitoring frequency		At the start of the monitoring period	Data is monitored and recorded for each truck delivery
Reporting frequency		Once during the monitoring period	Each truck trip
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		The opening balance of the biomass is measured by a calibrated weighbridge	Biomass procured is measured for each truck entering the plant premises by a calibrated weighbridge
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Weighbridge; Sr. No. 2730090466	Weighbridge; Sr. No. 2730090466
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		Class III <sup>61</sup>	Class III <sup>69</sup>
Period of operating time		01/05/2012 to 31/08/2012	01/05/2012 to 31/08/2012
Instrument type		Weighbridge	Weighbridge
Manufacturer, model and serial number		Metler; Sr. No. 2730090466	Metler; Sr. No. 2730090466

<sup>61</sup> (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable)

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Specific location	At project site	At project site
Calibration dates	21/03/2012 (valid till 20/03/2013)	21/03/2012 (valid till 20/03/2013)
Company performing the calibration	Weights and Measure Department, Govt. of India	Weights and Measure Department, Govt. of India
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The weighbridge was functional throughout the monitoring period	The weighbridge was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	31.45
Measuring / Monitoring frequency	Measured at the end of the monitoring period	5,788 per annum
Reporting frequency	Once during the monitoring period	668.84
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Calculated from the opening, received and closing balance of the biomass during the monitoring period
Does monitoring of the parameter involve sampling? (yes / no)	No	At the end of the monitoring period
Population Size	NA	Yes
		No
		NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The closing balance of the biomass is measured by a calibrated weighbridge	The quantity of biomass consumed is cross-checked with the invoices obtained from the fuel supplier and found to match
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge; Sr. No. 2730090466	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III	NA
Period of operating time	01/05/2012 to 31/08/2012	NA
Instrument type	Weighbridge	NA
Manufacturer, model and serial number	Metler; Sr. No. 2730090466	NA
Specific location	At project site	NA
Calibration dates	21/03/2012 (valid till 20/03/2013)	NA
Company performing the calibration	Weights and Measure Department, Govt. of India	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The weighbridge was functional throughout the monitoring period	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “NCV<sub>k</sub>” (TJ/Gg)</b>	<b>Percentage of hydrogen in biomass fuel “Hydrogen” (%)</b>
Value	Ex-ante	11.85
	Ex-post	11.50
Measuring / Monitoring frequency	Annually once	3.01
Reporting frequency	Annually	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Annually once
Does monitoring of the parameter involve sampling? (yes / no)	No	Annually
Population Size	NA	Yes
Sample Size	NA	No
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	The NCV analysis is carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “NCV<sub>k</sub>” (TJ/Gg)</b>	<b>Percentage of hydrogen in biomass fuel “Hydrogen” (%)</b>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen” (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Value	Ex-ante	31.2
	Ex-post	9.8
Measuring / Monitoring frequency	Annually once	Annually once
Reporting frequency	Annually	Annually

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen” (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA



<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen” (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/Gg)</b>	<b>Quantity of fossil fuel type i consumed in a process j during the year y “FC<sub>i,j,y</sub>”</b>
Value	Ex-ante	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
	Ex-post	NA
Measuring / Monitoring frequency	NA	NA
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/Gg)</b>	<b>Quantity of fossil fuel type i consumed in a process j during the year y “FC<sub>i,j,y</sub>”</b>
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>		<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>” (MWh)</b>
Value	Ex-ante	241.6 per annum	0
	Ex-post	29.40	7.68
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Monthly	Monthly However, CAR 02 was raised as the recording frequency of the monitoring parameter “EC <sub>EL,j,y</sub> ” has not been stated in the MR. CAR was closed after revision in the MR.

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>” (MWh)</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The auxiliary electricity is measured by a calibrated energy meter	The auxiliary electricity is measured by a calibrated energy meter
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Energy Meter; Sr. No. 34120331355	Energy Meter; Sr. No. 34120331355
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class 1 (which is better than Class 2 stated in the CPA-DD)	Class 1 (which is better than Class 2 stated in the CPA-DD)
Period of operating time	01/05/2012 to 31/08/2012	01/05/2012 to 31/08/2012
Instrument type	Energy Meter	Energy Meter
Manufacturer, model and serial number	Schneider Electric Pvt. Ltd.: Sr. No. 34120331355	Schneider Electric Pvt. Ltd.: Sr. No. 34120331355
Specific location	Project site	Project site
Calibration dates	13/02/2012 (valid till 12/02/2013)	13/02/2012 (valid till 12/02/2013)
Company performing the calibration	Schneider Electric Pvt. Ltd (NABL accredited)	Schneider Electric Pvt. Ltd (NABL accredited)

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,y</sub>” (MWh)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The energy meter was functional throughout the monitoring period (except from 01/05/2012 to 11/05/2012 the meter was not in place and for this period, auxiliary electricity has been calculated as per the emergency preparedness plan in the CPA-DD).	The energy meter was functional throughout the monitoring period (except from 01/05/2012 to 11/05/2012 the meter was not in place and for this period, auxiliary electricity has been calculated as per the emergency preparedness plan in the CPA-DD).
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Value	Ex-ante	-
	Ex-post	90
Measuring / Monitoring frequency	Continuous at each trip	Continuous at each trip
Reporting frequency	Calculated at the end of the monitoring period	Calculated at the end of monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the invoices and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Boiler operating hours of the Project activity in year y “h<sub>y</sub>”</b>
Value	Ex-ante 8,000 per annum
	Ex-post 2,019
Measuring / Monitoring frequency	Daily (Boiler operating hours is monitored by SCADA system based on the operating hours of the draft fan of the boiler)
Reporting frequency	Monthly
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No
Population Size	NA
Sample Size	NA
Confidence level	NA
Margin of error	NA
Recording (Manually / electronically / ...)	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA

<b>Data / Parameter (as in the MP)</b>	<b>Boiler operating hours of the Project activity in year y “h<sub>y</sub>”</b>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA
Period of operating time	01/05/2012 to 31/08/2012
Instrument type	NA
Manufacturer, model and serial number	NA
Specific location	NA
Calibration dates	NA
Company performing the calibration	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA
Is calibration valid for the whole reporting period?	NA
Maintenance	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes
Key reporting risks	Low risk

	Verified situation	Conclusion
<b>SECTION 4. Compliance with the calibration frequency requirements for measuring instruments</b>		
The “Monitoring Parameters and Calibration Checklist” in section 3 above shall be checked to determine if the calibration frequency specified in the applied monitoring methodology and/or monitoring plan is followed in the monitoring report and in the monitoring activities. Where a failure to comply with the required frequency is detected, or no frequency is mentioned in the monitoring report, please follow the checklist below:		
<p>4-1. If the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (that is, the results of delayed calibration are available), confirm that the following conservative approach has been adopted in the calculation of emission reductions:</p> <ul style="list-style-type: none"> <li>- If the delayed calibration did not show any errors in the measuring equipment, or the error was smaller than the maximum permissible error, have the PPs applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> <li>- If the delayed calibration identified an error greater than the maximum permissible error, have the PPs applied the error identified in the delayed calibration test to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> </ul> <p>Confirm that the error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer emission reductions being claimed;</p>	No delayed calibration was noted during this monitoring period. Hence this is not applicable.	NA



	Verified situation	Conclusion
<p>4-2. If the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification:</p> <ul style="list-style-type: none"> <li>e. Request the PPs to conduct the required calibration;</li> <li>f. On receipt of the calibration results, determine whether the PPs have calculated the emission reductions conservatively using the approach mentioned in section 4.1 above.</li> </ul>	Not Applicable.	NA
<p>4-3. If it is not possible for the PPs to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of the PPs, check if the PPs have prepared a temporary deviation or a 'Permanent changes from the monitoring plan and/or monitoring methodology application'.</p> <p>Follow the requirements for post registration changes in sections 3.10 to 3.19 above.</p>	Not Applicable.	NA
<p>4-4. If neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipment, determine whether the equipment is calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification. If neither local/national standards nor the manufacturer's specification are available, international standards may be used.</p>	Not Applicable.	NA

		Verified situation	Conclusion
<b>SECTION 5. Assessment of data and calculation of emission reductions</b>			
5-1. Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in line with the formulae and methods described in the monitoring plan and the applied methodology document?  Check consistency in the ERs spreadsheet.	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and the applicable methodological tools for the project activity are as follows:</p> <p><b><u>Baseline emissions:</u></b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity = 441.06 tCO<sub>2</sub> – Calculation shown below</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity = 4.93 TJ – Calculation shown below</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant as per the included CPA-DD = 89.5 tCO<sub>2</sub>/TJ</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity as per the included CPA-DD = 100%</p> $EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}$ <p>where</p>		CAR-04 CL-08 CL-02 OK

<sup>62</sup> During the monitoring period, energy meter for auxiliary consumption of electricity for the boiler was not installed for the period from 01/05/2012 to 11/05/2012. As per the CPA-DD, the CME has rightly considered the auxiliary energy consumption based on the connected load of the auxiliary equipment of 30.2 kW and multiplying it by boiler running hours during this period of 109 hours to get auxiliary consumption of 3291.80 kWh and this value is added in project emission calculation.

	Verified situation	Conclusion
	<p> <math>EG_{\text{thermal}}</math> = Net quantity of heat supplied by the Project activity (TJ)  <math>Q_{\text{steam}}</math> = Quantity of steam supplied in Tonnes = 1889.38 Tonnes  <math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet = 661.34 kCal/kg  <math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg) = 38.24 kCal/kg </p> <p> <math>EG_{\text{thermal}} = 1889.38 * (661.34 - 38.24) * 4.186 * 10^{-6}</math>  <math>= 4.93 \text{ TJ}</math> </p> <p> Note: Steam enthalpy is calculated at the weighted average steam pressure during the monitoring period from standard steam table for saturated steam. Similarly the enthalpy of the boiler feed water is determined at the weighted average feed water temperature during the monitoring period. The verification team independently calculated the steam enthalpy at the average steam pressure of 12.89 kg/cm<sup>2</sup> g using the web site - <a href="http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp">http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp</a> ; and found the steam enthalpy as 661.48 kCal/kg. Hence the enthalpy used by the CME is conservative. </p> <p> Therefore,  <math>BE_{\text{thermal,CO2,y}} = 4.93 / 100\% * 89.5</math>  <math>= 441.06 \text{ tCO}_2</math> </p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p> <math>PE_{\text{EC,y}} = EC_{\text{PJ,j,y}} * EF_{\text{grid,CM,y}} * (1 + \text{TDL}_{\text{j,y}}) + EC_{\text{EL,j,y}} * EF_{\text{EL,j,y}} * (1 + \text{TDL}_{\text{j,y}})</math> </p> <p> <math>EC_{\text{PJ,j,y}}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid = 29.40 MWh<sup>62</sup> </p>	

	Verified situation	Conclusion
	<p> <math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) = 7.68 MWh  <math>EF_{grid,CM,y}</math> = Ex-ante Grid Emission Factor = 0.860 tCO<sub>2</sub>/MWh  <math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l) = 1.3 tCO<sub>2</sub>/MWh  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j as per the included CPA-DD = 20% </p> <p> <math>PE_{EC,y} = 29.40 * 0.860 * (1+20\%) + 7.68 * 1.30 * (1+20\%)</math>  <math>= 42.33 \text{ tCO}_2</math> </p> <p><u>Project emissions from fossil fuel combustion</u></p> <p> <math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math> </p> <p>where  <math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p> <math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr) = 0 Tonnes  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit) </p> <p> <math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math>  Where  <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ) </p> <p>The boiler of this project is Huskpac type which means there is no possibility of firing fossil fuel (coal) in this boiler. Hence no Project emissions due to fossil fuel combustions are there for this CPA.</p>	

	Verified situation	Conclusion
	<p><math>PE_{FC,j,y} = 0</math></p> <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math>  <math>= 42.33 + 0 = 42.33 \text{ tCO}_2</math></p> <p><b><u>Leakage:</u></b></p> <p><math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math></p> <p><math>= EC_{LE,l,y} * EF_{EL,l,y} * (1+TDL_{l,y}) + N_{c,y} * AVDC_{y,y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km,CO2}</math></p> <p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p><math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p>This CPA does not involves usage of any processed biomass (rice husk is the biomass residue used in the project boiler). Hence leakage emission due to processing biomass is not applicable.</p> <p>Again the biomass used in the project is not transported from beyond 200 km of the project site (biomass transported from within a distance of 90 km). Hence leakage emission due to transportation of biomass is neglected.</p> <p>Thus <math>LE_y = 0</math></p> <p>Emission reductions are calculated as follows:</p> <p><math>ER_y = BE_y - PE_y - LE_y</math>  <math>= 441.06 - 42.33 - 0 = 398 \text{ tCO}_2</math> (rounded down value)</p> <p>However, the following CARs/CLs were raised:</p> <p>CAR 04#1 was raised as non consideration of leakage due to processing and</p>	

	Verified situation	Conclusion
	<p>transportation (where availability of surplus biomass is more than 25%) for the CPA is not justified in the MR. The finding was successfully closed after appropriate revision in the MR / ER spreadsheet.</p> <p>CL 08 was raised as the ER calculation spreadsheet provided for the CPA had not included daily monitored data for steam quantity, temperature, pressure and feed water temperature to calculate the average of these parameters. ER calculation spreadsheet was adequately revised and the CL was closed.</p> <p>CL 02#2 was raised as, for the parameter "<math>TD_{Li,y} = TD_{Lj,y}</math>", it was stated in the MR that it is used for Leakage emission calculation. But this parameter is also used for the calculation of project emission. CL was closed after appropriate revision in the MR.</p>	
<p>5-2. Has the calculation tool been correctly documented? Check its consistency and formulae.</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The Monitoring Report is supported by Micro Soft excel based spreadsheet for the calculation of emission reductions. The consistency and formula were verified and found to be accurate.</p>	OK

	Verified situation	Conclusion
<p>5-3. Is a complete set of data available during the specified monitoring period? If only partial data is available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan proceed as follows:</p> <ul style="list-style-type: none"> <li>a. Check if sections 3.11 and/or 3.12 above are applicable and raise a CAR for the PPs to comply with these requirements.</li> <li>b. If sections 3.11 and 3.12 are not applicable or the answer to this question remains NO, a request for deviation is necessary.</li> </ul> <p>Conduct an assessment of the potential impacts of these changes in accordance to the procedures for Post Registration Changes.</p>	Yes, the complete data set was available during the specified monitoring period.	OK
<p>5-4. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?</p> <p>Please describe how LRQA has cross-checked reported data.</p>	All the information provided in the Monitoring Report were cross-checked with the Plant log book records, purchase records (for biomass and fossil fuel), site visit and interview of the CPA implementer/CME.	OK
<p>5-5. Have any assumptions used in emission calculations been justified?</p>	All assumptions in the emission reduction calculation are consistent with assumptions taken in the registered monitoring plan and have reference to the applied methodology.	OK

	Verified situation	Conclusion
5-6. Have appropriate emission factors, IPCC default values, and other reference values been correctly applied?	<p>The CME has applied the appropriate ex-ante fixed factors as stated in the included CPA-DD like:</p> <ul style="list-style-type: none"> <li>• The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity(<math>\eta_{BL,thermal}</math>)</li> <li>• CO<sub>2</sub> Emission Factor of the fossil fuel that would have been used in the baseline plant (<math>EF_{FF,CO_2}</math>)</li> <li>• Surplus availability of Biomass within identified region (<math>SA_k</math>)</li> <li>• Ex-ante Grid Emission Factor in a year y.</li> <li>• Emission Factor for fossil fuel based electricity generation for source j and/or l in year y (<math>EF_{EL,j,y} = EF_{EL,l,y}</math>)</li> <li>• Auxiliary Electricity Consumption for biomass processing, outside Project boundary. (<math>EC_{LE,l,y}</math>)</li> <li>• Average CO<sub>2</sub> emission factor for the trucks measured during the year y(<math>EF_{km,CO_2}</math>)</li> <li>• Average technical transmission and distribution losses for providing electricity to source l and/or j in year y(<math>TDL_{l,y} = TDL_{j,y}</math>)</li> <li>• Specific energy consumption of fuel type j of the Project activity in year y(<math>SEC_{PJ,j,y,measured}</math>)</li> </ul> <p>CL 02#3 was raised for the CME to clarify the appropriateness of the “Source of data” and “Additional comment” as stated in the MR for the parameters in section D.1, which are fixed ex-ante at the time of validation of the CPA.</p> <p>MR was suitably revised and the finding was closed.</p>	CL 02 OK



## 7.8 Appendix C6: Verification Protocol for CPA 4041-0007

	Verified situation	Conclusion
<b>SECTION 1. Project implementation in accordance with the registered PoA-DD &amp; CPA-DD</b>		
<b>General description of the project</b>		
1.1. Does the MR provide general information of the CPA and is it as per the CPA-DD included by CDM-EB or by a DOE <sup>63</sup> ?	<p>Yes, the Monitoring Report<sup>64</sup> provides the general information of the CPA. Details such as Title of the CPA, UNFCCC registration reference number, version number of the Monitoring Report, monitoring period, project participants, sectoral scope and estimated amount of GHG emission reductions. All the above details can be confirmed from the included CPA-DD through link in UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=S7ENUT8QG95POYLR6XKZ2IC3VBW1FH">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=S7ENUT8QG95POYLR6XKZ2IC3VBW1FH</a></p> <p>Title of the CPA is “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 007)” and it was included in the PoA on 30/04/2012 applying the baseline and monitoring methodology AMS-I.C, version 16 “Thermal energy production with or without electricity” as verified from the project page of the CPA. The project activity applies AMS-I.C, version 16. The project activity is installation and operation of a 12 TPH biomass (rice husk) fired boiler to meet the captive requirement of steam in the production of oil &amp; de oiled cake (DOC) through solvent extraction process from castor seeds, soyabean, sunflower seeds etc. The project is located in Village - Chraura, Rania, District – Kanpur Dehat, Uttar Pradesh. The project is implemented by Swadisht Oils (P) Limited.</p>	OK
1.2. Is the general information provided in the MR in line with the PoA-DD registered by CDM-EB?	<p>Yes, the Monitoring Report is as per the PoA-DD registered by CDM-EB confirmed from the registered PoA-DD through link on UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=S7ENUT8QG95POYLR6XKZ2IC3VBW1FH">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=S7ENUT8QG95POYLR6XKZ2IC3VBW1FH</a></p>	OK
1.3. Is the Monitoring Report as per the standardised format (F-CDM-MR)? (EB 66 )	Yes, the Monitoring Report is as per the latest standardised format (F-CDM-MR) version 02.0 (EB66, Annex 20).	OK

<sup>63</sup> The first CPA is included by the CDM-EB along with registered PoA-DD and subsequent CPAs are included by DOEs.

<sup>64</sup> Monitoring Report for this CPA (CPA 4041-0007) refers to the Appendix-6 of the consolidated MR Version 4.0

	Verified situation	Conclusion
1.4. Is the Monitoring Report filled as per the "Guidelines for completing the Monitoring Report form" (EB 66, Annex 20).	Yes, the MR is filled up as per the latest "Guidelines for completing the Monitoring Report form" EB 66, Annex 20. CAR 08 was raised as project page of the PoA on UNFCCC web site, the "Other Parties involved" is stated as "United Kingdom of Great Britain and Northern Ireland" and "Germany". But in the MR "Germany" is missing. CAR was closed as the MR was suitably revised.	CAR08 OK
1.5. Is there any open issue in the validation / previous verification including FARs? (CDM VVS para. 213)	No No FAR was raised in the Validation report during the CPA inclusion by TUV Nord, the DOE for validation of the CPA. Further this being the first periodic verification, no open issues exists from earlier verification.	OK
<b>Implementation status of the CPA</b>		
1.6. Is the CPA location indicated same as that in the included CPA-DD? Confirm geographical coordinates	Yes, the project location is same as stated in the CPA-DD and this was verified during the on-site visit. The geographical coordinates of the project site are 26.4211 <sup>0</sup> (26° 25' 16.27") North, 80.1091 <sup>0</sup> (80° 06' 33.02") East. This was cross-checked from the Google Earth web site.	OK
1.7. Is the project boundary described in the same way as the included CPA-DD and registered PoA-DD? Please confirm each component based on the applied methodology.	Yes, the project boundary is described in the same way as in the included CPA-DD and registered PoA-DD. During the on-site assessment it was also confirmed the project boundary is in line with the applied methodology. The project boundary for this CPA includes the biomass storage area and feeding system, boiler house and the facility which is consuming the heat generated by the project.	OK
1.8. Has on-site fossil fuel consumption, if any, been monitored? Is any emission source missed? Check the site lay-out and confirm through site tour.	Fossil fuel consumption is required to be monitored in this project. It has been confirmed during the on-site visit and document review that no fossil fuel has been consumed at the CPA site by the project during the monitoring period. The verification team did not find any emission source attributable to the project activity which has been missed out and the same was confirmed during the on-site visit and review of the site lay-out diagram.	OK
1.9. Confirm contractors for equipment and installation works	It is confirmed that the project equipment i.e., 12 TPH boiler for the project is supplied by Thermax Limited and this was confirmed during the on-site visit interview with the project implementer and from the purchase order copy of the boiler issued by the project implementer dated 29/03/2008.	OK
1.10. Confirm conformance with baseline and monitoring	Conformance to the applicable methodology conditions for the CPA are as follows:	OK

	Verified situation		Conclusion
methodology - Applicability conditions. Please refer to the complete description of the applicability conditions and confirm that the CPA meets all the requirements.	<b>Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)</b>	<b>Means of Verification and Results</b>	
	<i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>	The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.	
	<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>	The total installed / rated capacity of the project equipment is 7.52 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .	
	<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>	The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.	
	<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>	The project does not use any charcoal.	
	The verification team confirms that the CPA conforms to all applicable condition of the applied methodology.		
Apart from the baseline and monitoring methodology applicability criteria as stated above, the			

	Verified situation	Conclusion
	verification team also verified the eligibility criteria stated in section B.2 of the included CPA-DD under "Monitoring Criteria" for the point numbers 1, 3.3, 3.4, 3.5, 16, 17 and 18 and found these to be valid for the project activity during the monitoring period. A declaration letter dated 11/12/2012 in this respect has also been submitted by the CME.	
1.11. Confirm use or no use of public funding and determine if there is no diversion of ODA to the CPA.	There is no use of public funding for the CPA. The same was confirmed during the interview with the CME and also a declaration in this respect has been provided by the CPA implementer.	OK
1.12. Check data in the MR and in the CPA-DD. Describe data and variables that are different from that stated in the included CPA-DD and cause an increase in emission reductions estimations.	<p>Data in the MR and CPA-DD fixed at validation stage are found to be consistent.</p> <p>The ex-ante estimated emission reductions during this monitoring period of 123 days are 5,738 tCO<sub>2</sub> (17,030/365*123) and the actual emission reductions during this monitoring period are 773 tCO<sub>2</sub>. Hence the actual emission reductions during this monitoring are less than the estimated values as per the CPA-DD.</p> <p>However, the following findings were raised and successfully closed during the verification;</p> <ol style="list-style-type: none"> <li>1) CL 02 was raised for the parameters like "CAP<sub>boiler</sub>" and "SEC<sub>PJ,y,measured</sub>", it was stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation.</li> <li>2) CL 05 was raised, as the NCV is taken directly taken from the laboratory report, values of parameters like hydrogen, oxygen and moisture content in the biomass are still reported in the MR, which is not required as per the included CPA-DD.</li> </ol> <p>The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p>	<p>CL02 CL05 OK</p>
1.13. By means of an on-site visit: Is the general information of the project provided in the Monitoring Report and is it as per the CPA-DD included by CDM-EB or by a DOE?	<p>Yes.</p> <p>The on-site visit for the CPA was conducted on 09/11/2012.</p> <p>The project activity comprises of the installation and operation of a 12 TPH biomass (rice husk) fired boiler to meet the captive requirement of steam at the project site.</p>	<p>CAR 01 CAR 03 OK</p>

	Verified situation	Conclusion
<p>List each technical component and equipment and check design parameters and actual status of installation and / or operation.</p> <p>Please check to ensure that all physical features of the proposed CPA in the registered/included CPA-DD are in place and the PP has operated the proposed CPA as per the included CPA-DD.</p> <p>It may include but not limited to:</p> <ul style="list-style-type: none"> <li>the actual capacity and output</li> <li>plant load factor</li> <li>type of feedstock</li> <li>operation of other components / units within the project boundary which could affect functioning of the project plant.</li> </ul> <p>In cases where there are a large number of components and equipment items and the check of all of them is not an available option, then a random sampling check shall be performed. Justify here the sample chosen and describe the results.<sup>65</sup></p>	<p>During the verification, by the observation of equipment, interviews with relevant staff and the checking of technical specifications of main components, it was confirmed that the project activity has been implemented as described in the included CPA-DD.</p> <p>The project is operational. The project was commissioned on 20/02/2009 and the same was verified from the commissioning certificate issued by Thermax Limited.</p> <p>No change from the included CPA-DD of physical features which may impact the emission reduction of the project activity has been identified.</p> <ul style="list-style-type: none"> <li>Steam generation unit : 12TPH boiler</li> <li>Net enthalpy supply by project activity : The ex-ante estimated annual enthalpy output from the project boiler is 203.214 TJ as per the included CPA-DD (which corresponds to 68.48 TJ for 123 days of this monitoring period) whereas actual enthalpy supplied by the boiler during this monitoring period was 9.094 TJ which is less than the ex-ante estimated value.</li> <li>Type of biomass fired in the boiler: As per the included CPA-DD, renewable biomass residue (rice husk) is to be fired in the project boiler and it was noted that there was no deviation in the biomass firing during the monitoring period.</li> <li>As per the included CPA-DD, the project may fire fossil fuel (Coal) in the boiler. During this monitoring period, no fossil fuel has been fired in the project boiler as confirmed by the project implementer during the site visit.</li> </ul> <p>100% data is monitored for the CPA and hence no sampling plan is applicable.</p> <p>However, CAR 01 was raised as in section B.1 of the MR, the downtime time of the project boiler is not provided. Details are provided in the revised MR and the CAR was closed.</p> <p>Further, CAR 03 was raised as PP has considered a simple average of steam pressure, temperature and boiler feed water enthalpy, which are used for the calculation of net enthalpy supplied by the project boiler, which is not correct. The calculation approach was revised and a weighted average was considered for emission reduction. The CAR 03 was successfully closed.</p>	

<sup>65</sup> The sampling shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified situation	Conclusion
1.14. Have responsibilities for monitoring been described and specified?	<p>The responsibilities of monitoring have been provided and described in the Monitoring Report. The Monitoring Report and CDM documents clearly describe the responsibilities for monitoring.</p> <p>The project owner has identified the CDM team, the structure of which is given in Monitoring Report. During the verification, responsibilities for operational personnel, technical and support team have been verified and confirmed.</p> <p>The CDM team has been assigned the responsibility for measuring, recording and storage of the measured data. Data is kept in electronic format and paper format.</p>	OK
1.15. Are the responsibilities and authorities for monitoring and reporting in line with those stated in the monitoring plan of the included CPA-DD?	Yes, responsibilities and authorities for monitoring and reporting are in accordance with included CPA-DD.	OK
1.16. Check QA/QC, management systems. Are procedures described and specified in the MR? Are they consistently applied as described in the MP? <ul style="list-style-type: none"> <li>a. documented instructions, management manual</li> <li>b. documentation</li> <li>c. data archiving</li> <li>d. monitoring report</li> <li>e. cross-checking</li> <li>f. energy balance analysis (as relevant)</li> <li>g. internal audits / verification and management review</li> </ul>	<p>QA/QC procedures include staff training, instrument calibration, cross-checking and data/documents archiving. They are consistent with the monitoring plan.</p> <p>The Monitoring Report describes the monitoring system, monitoring procedures, data collection and reporting, responsibilities of relevant staff/departments, calibrations that were implemented and QA/QC procedures including data cross-checking.</p> <p>By means of document review, onsite assessment and interviews, the verification team has confirmed that all the QA/QC measures, data archiving, monitoring report and internal audits are as per the registered monitoring plan of the registered PoA-DD and the included CPA-DD.</p> <p>However, CL 03 was raised as the “QA/QC procedure” &amp; “Purpose of data” for the quantity of biomass in MR was mentioned as “NA” and the same is not consistent with the monitoring plan of the included CPA-DD. Monitoring and recording frequency of these parameters were not mentioned in the MR. Also the values for these parameters as stated in the MR was incorrect as verified during the on-site visit and also with the documents provided.</p> <p>Also CL 04 was raised for the quantity of biomass and the fossil fuel consumed by the project activity, under “QA/QC procedures” in the MRs it was stated “The quantity of biomass consumed can be cross-checked with payment receipt /invoice obtained from the fuel supplier” whereas in the included CPA-DDs it is stated “This can be verified with the help of steam generation and steam to fuel ratio”.</p>	<del>CL-03</del> <del>CL-04</del> OK

	Verified situation	Conclusion
	The MR was suitably revised to close the finding.	
1.17. Have the procedures for emergency and abnormal situations been established?	<p>As stated in section C of the MR, the procedure for non-conformance and corrective actions is in place for the project activity to mitigate any emergency and abnormal situations in monitoring as per the included CPA-DD.</p> <p>During the monitoring period, no emergency situation in monitoring has occurred.</p> <p>However, CAR 07 was raised as the CME needed to clarify why the details of the backup monitoring instruments (for steam pressure and temperature and feed water temperature) were not provided in the MR. Adequate justification was provided by the CME and the CAR was closed.</p>	<p><del>CAR 07</del></p> <p>OK</p>
1.18. Has the system for qualification and training been established as relevant for the monitoring and management activities?	<p>The training and qualification of the project personnel has also been confirmed during interview of the operational personnel during the on-site visit. It is confirmed that they have sufficient knowledge, experience and competency to implement and maintain the plant operation including data monitoring and recording in line with boiler operation and maintenance manual provided by the boiler supplier, and with CDM requirements.</p> <p>This is further verified by the evidence for training of the project personnel and the boiler attendants' certificates issued by Directorate of Steam Boilers (Government agency) for the boiler operators.</p>	OK
1.19. Check the environmental report, license, permit and compliance to the local environmental legislation (if relevant).	The verification team has confirmed that the project meets the relevant local environmental legislation. This was confirmed from the copy of the consent to operate issued by Uttar Pradesh Pollution Control Board valid from 01/01/2012 to 31/12/2012. Also copy of boiler certificate for the operation of the boiler valid from 29/02/2012 to 09/02/2013 issued by Directorate of Steam Boilers Department has been submitted.	OK
1.20. Check contribution to sustainable development, comparing those expected in the included CPA-DD and the actual status.	<p>With the provision of employment opportunities by the project activity, there has been a contribution for the social and economic well-being of some local people.. The project utilises renewable biomass to produce steam (thereby avoiding the fossil fuel usage) and this leads to environment well being by reduced environmental impact from fossil fuel use. Also the project uses renewable biomass technology which is deemed as a clean (as it displaces fossil fuel usage) and safe technology.</p> <p>Even though the sustainable development measures were not registered in the CPA-DD as a monitoring parameter, it was confirmed during the site visit that the CPA contributes to the sustainable development of the host country.</p>	OK
1.21. Check issues with local stakeholders, claims,	It was confirmed by on-site interviews that there had been no claims and complaints from local stakeholders prior to the verification visit.	OK

	Verified situation	Conclusion	
complaints, etc.			
<p>1.22. If from the above assessment the conclusion is that the implementation or operation of the CPA does not conform with the description contained in the included CPA-DD and/or corrections have been made to project information or parameters fixed at validation/inclusion, determine if these changes and/or corrections do not require prior approval by the board:</p> <ul style="list-style-type: none"> <li>- A request of approval is required if the boundary of a registered CDM PoA is changed to include an additional host party, in accordance with the project cycle procedure.</li> <li>- A request for approval is required if the CME of a registered CDM PoA changes after the registration of the PoA.</li> <li>- Any corrections to project information of an included CPA that do not affect the design of the project activity do not require prior approval by the Board.</li> <li>- A request for approval is required if any of the three issues below is adversely impacted by the identified changes to the project design.</li> </ul>			
<p>1.23. The applicability and application of the applied methodology under which the CPA has been included:</p> <p>Check if the project boundary has changed and if any of the parameters to assess the applicability conditions have changed.</p>	No change in applicability and application of the applied methodology AMS-I.C. version 16, including the project boundary, is observed.	YES	NO
			X
<p>1.24. Compliance of the included CPA to eligibility criteria as defined in the registered PoA-DD.</p> <p>Check if any of the parameters to assess the PoA eligibility criteria have changed.</p>	No change in the eligibility criteria of the registered CPA, as defined in the registered PoA-DD, is observed.	YES	NO
			X
<p>1.25. The additionality of the project activity:</p> <p>Check if any of the input parameters to the investment analysis have</p>	There is no change in the project design parameters as the project is implemented as per the included CPA-DD. Hence this is not applicable.	YES	NO
			X



	Verified situation	Conclusion	
changed. For barrier analysis, check if any information or data used in the barrier analysis has changed.			
1.26. The scale of the project activity.  Check if the project is still small scale or large scale after the implementation of the changes.	Small scale, as per the eligibility criteria for CPA inclusion and is in accordance with the methodology AMS-I C, version 16.	YES	NO
			X
If the answer to any of the above items is YES, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
1.27. If, from the above assessment, the conclusion is that the changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	

	Verified Situation	Conclusion
<b>SECTION 2. Compliance of the Monitoring Plan with the Monitoring Methodology including applicable Tool(s)</b>		
2.1. Is the monitoring plan of the included CPA-DD in accordance with the applied methodology?	Yes, it is confirmed that monitoring plan of the included CPA-DD is in accordance with the applied methodology, AMS-I.C, version 16.	OK
2.2. If the methodology provides different options (for example, use of default values or on-site measurements), has the Monitoring Report specified which option is used?	<p>Yes,</p> <p>The ex-ante parameters which are fixed for the crediting period at the time of CPA inclusion in the PoA as per the methodological tools are:</p> <ul style="list-style-type: none"> <li>• <math>CAP_{\text{boiler}}</math> (Rated capacity (thermal output) of the boiler of the Project activity)</li> <li>• <math>\eta_{\text{BL,thermal}}</math> (The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity)</li> <li>• <math>EF_{\text{FF,CO}_2}</math> (<math>\text{CO}_2</math> Emission Factor of the fossil fuel (Indian Coal) that would have been used in the baseline plant)</li> <li>• <math>SA_k</math> (Surplus availability of Biomass within 75 km radial distance)</li> <li>• <math>EF_{\text{grid,CM,y}}</math> (Ex-ante Grid Emission Factor in a year y)</li> <li>• <math>EF_{\text{EL,j,y}} = EF_{\text{EL,l,y}}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)</li> <li>• <math>EC_{\text{LE,l,y}}</math> (Auxiliary Electricity Consumption for biomass processing, outside Project boundary)</li> <li>• <math>EF_{\text{km,CO}_2}</math> (Average <math>\text{CO}_2</math> emission factor for the trucks measured during the year y)</li> <li>• <math>TDL_{i,y} = TDL_{j,y}</math> (Average technical transmission and distribution losses for providing electricity to source l and/or j in year y)</li> <li>• <math>SEC_{\text{PJ,j,y,measured}}</math> (Specific energy consumption of fuel type j of the Project activity in year y)</li> </ul> <p>Further, the verification team confirms that there is no deviation in the values of the ex-ante fixed parameters between the included CPA-DD and the MR.</p> <p>The parameters being monitored ex-post as per the monitoring methodology and the CPA-DD are:</p> <ul style="list-style-type: none"> <li>• Quantity of steam supplied in year y (<math>Q_{\text{steam}}</math>)</li> <li>• Average Steam Temperature at MSSV (Main steam stop valve) outlet during year (<math>T_{\text{steam}}</math>)</li> </ul>	<p>CL-05</p> <p>OK</p>

	Verified Situation	Conclusion
	<ul style="list-style-type: none"> <li>• Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year (<math>P_{\text{steam}}</math>)</li> <li>• Average Feed Water Temperature at inlet of boiler (<math>T_{\text{FWB}}</math>)</li> <li>• Boiler operating hours of the project activity in year y (<math>h_y</math>)</li> <li>• Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob},k}</math>)</li> <li>• Quantity of subsequent delivery of fuel type k biomass at the Project site (<math>Q_{\text{np},k}</math>)</li> <li>• Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in},k}</math>)</li> <li>• Quantity of biomass fuel type k consumed during the monitoring period (<math>Q_{\text{c},k} = FC_{\text{biomass},k,y}</math>)</li> <li>• Quantity of stored fuel type fossil (Coal) i on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob},i}</math>) *</li> <li>• Quantity of subsequent delivery of fuel type fossil fuel (Coal) i (<math>Q_{\text{np},i}</math>) *</li> <li>• Quantity of remaining fossil fuel type (Coal) i available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in},i}</math>) *</li> <li>• Quantity of fossil fuel type i (Coal) consumed during the monitoring period (<math>Q_{\text{c},i} = FC_{i,PJ,y}</math>) *</li> <li>• Net calorific value of biomass fuel k used in the Project activity.( <math>NCV_k</math>)</li> <li>• Percentage of hydrogen in biomass fuel (Hydrogen) **</li> <li>• Percentage oxygen in Biomass fuel (Oxygen) **</li> <li>• Moisture content of the biomass residues (Moisture) **</li> <li>• Weighted average net calorific value of the fuel (coal) type i in year y (<math>NCV_{i,y}</math>) *</li> <li>• Quantity of fossil fuel (Furnace oil) type i consumed in a process j during the year y (<math>FC_{i,j,y}</math>) *</li> <li>• Auxiliary Electricity Consumption of the Project activity from the Grid in year y (<math>EC_{PJ,j,y}</math>)</li> <li>• Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) in a year y (<math>EC_{EL,j,y}</math>)</li> <li>• Average return trip distance (from and to) between the source of the</li> </ul>	

	Verified Situation	Conclusion
	<p>biomass and the site of the Project plant during the year y (<math>AVD_{y,y}</math>)</p> <ul style="list-style-type: none"> <li>• Number of truck trips during the year y (<math>N_{y,y}</math>)</li> <li>• Average round trip distance (from and to) between the biomass fuel supply sites and the site of biomass processing in year y (<math>AVD_{c,y}</math>)</li> <li>• Number of truck trips during the transportation of biomass to the biomass processing site in year y (<math>N_{c,y}</math>)</li> <li>• Weighted average <math>CO_2</math> emission factor of fuel type i in year y (<math>EF_{CO_2,i,y}</math>)</li> </ul> <p>These parameters are based on on-site measurement and have been verified during this verification.</p> <p>* No fossil fuel has been fired in the project boiler during this monitoring period</p> <p>** The laboratory report has directly provided the value of NCV. Hence Hydrogen, Oxygen and moisture are not required (which would be required in case NCV was not provided to be calculate NCV from GCV and the above three parameters)</p> <p>However, CL 05 was raised, since the although NCV was taken directly from the laboratory report, yet values of parameters like hydrogen, oxygen and moisture content in the biomass werel reported in the MR, which is not required as per the included CPA-DD.</p> <p>CL was closed after appropriate revision of the MR.</p>	
2.3. Is all data collected and archived according to the tables in the applied Monitoring Methodology and is this included in the Monitoring Plan?	Yes, all the data is collected and archived in accordance to methodology and included in the monitoring plan. All the data will be archived until 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.	OK
2.4. Check the calculation of emission reductions following the applied methodology: <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and applied for the project activity are as follows:</p> <p><b><u>Baseline emissions:</u></b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$	<p>CL04</p> <p>OK</p>

	Verified Situation	Conclusion
	<p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity during the year y (tCO<sub>2</sub>)</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity during the year y (TJ)</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant; tCO<sub>2</sub> / TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity</p> <p><math>EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}</math></p> <p>where</p> <p><math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{steam}</math> = Quantity of steam supplied in Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet (kCal/kg)</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg)</p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p><math>PE_{EC,y} = EC_{PJ,j,y} * EF_{grid,CM,y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})</math></p> <p><math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid in year y</p> <p><math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid</p>	

	Verified Situation	Conclusion
	<p>Captive Power Plant (Diesel Generator set)</p> <p><math>EF_{grid,CM,y}</math> (Ex-ante Grid Emission Factor in a year y)</p> <p><math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j in year y</p> <p><u>Project emissions from fossil fuel combustion</u></p> <p><math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math></p> <p>where</p> <p><math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p><math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)</p> <p><math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)</p> <p><math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math></p> <p>Where</p> <p><math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)</p> <p><math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)</p> <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math></p> <p><u>Leakage:</u></p> <p><math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math></p> <p><math>= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVD_{c,y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km,CO2}</math></p>	

	Verified Situation	Conclusion
	<p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption in year <math>y</math> (tCO<sub>2</sub>/yr)</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p><math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p><math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source <math>l</math> in year <math>y</math> as a result of leakage (MWh/yr)</p> <p><math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source <math>l</math> in year <math>y</math> (tCO<sub>2</sub>/MWh)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source <math>l</math> in year <math>y</math></p> <p><math>N_{c,y}</math> = Number of truck trips for collecting loose biomass during the year <math>y</math></p> <p><math>AVD_{c,y}</math> = Average round trip distance between the biomass fuel supply sites and biomass collection site during the year <math>y</math></p> <p><math>EF_{km,CO_2}</math> = Average CO<sub>2</sub> emission factor for the trucks measured during year <math>y</math></p> <p><math>N_{,y}</math> = Number of truck trips during the year <math>y</math></p> <p><math>AVD_{,y}</math> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant during year <math>y</math> (km)</p> <p>Emission reductions are calculated as follows:</p> <p><math>ER_y = BE_y - PE_y - LE_y</math></p> <p>However, CL 01 was raised as in section E.5 of the MR, the calculation of the ex-ante emission reductions was not transparently presented. The revised MR clearly and transparently describes the ER calculation approach providing relevant equations in line with the included CPA-DD.</p>	
<p>2.5. List any monitoring aspect that is not specified in the methodology and check its compliance with the Monitoring Plan, for example:</p> <ul style="list-style-type: none"> <li>• additional monitoring parameters</li> <li>• monitoring frequency</li> <li>• calibration frequency.</li> </ul>	<p>No additional monitoring parameter is identified that is not specified in the approved methodology and the included CPA-DD available in the project page on UNFCCC website.</p> <p>The monitoring frequency and the calibration frequency specified are not less than the requirements of the approved methodology and the Monitoring plan in the included CPA-DD.</p>	OK

	Verified Situation	Conclusion
<b>SECTION 3. Compliance of Monitoring activities with the Monitoring Plan of the included CPA-DD</b>		
<p>3-1. Is the Monitored Data included in the Monitoring Report as per the Monitoring Plan or any accepted revised MP?</p> <p>3-2. Has the data been generated at the frequency required by the Monitoring Plan or any accepted revised MP?</p>	<p>Yes</p> <p>The monitored data included in section D.2 of the MR is as per the monitoring plan of the included CPA-DD.</p> <p>The values are indicated in the section D.2 of the Monitoring Report. At the site visit it was verified that data was generated at the required frequency as per the monitoring plan in the included CPA-DD.</p> <p>However, CAR 06 was raised because as per the included CPA-DD the parameter “H<sub>y</sub>” (Boiler operating hours of the project activity in year y”) is a monitoring parameter. But this parameter has not been provided in the MR.</p> <p>CAR was closed after appropriate revision in the MR.</p>	<p><del>CAR-06</del> OK</p>
<p>3-3. Has the monitoring been implemented in accordance with the monitoring plan contained in the included CPA-DD or any accepted revised MP?</p> <p>Confirm that the monitoring and reporting procedures have been implemented as documented and follow by PPs.</p>	<p>Yes, by means of document review, on-site assessment and interviews with the plant personnel, it was confirmed that the monitoring has been implemented in accordance with the monitoring plan contained in the included CPA-DD.</p> <p>It was also established that monitoring and reporting procedures have been implemented as documented by the CME and the CPA operator.</p>	<p>OK</p>
<p>3-4. Have types of measurement instrumentation used been described and specified?</p>	<p>Yes the MR specifies and describes the use of different measurement instruments (Steam flow meter, RTD / Temperature gauge, Pressure transmitter / Pressure gauge, energy meter and weighbridge). The details of the measuring equipment are provided in the “Annex-1_4041-0007: Instrument Details” of the MR. The provided details have been verified during the on-site visit.</p> <p>However, CAR 07 was raised as the details of the monitoring instrument like Feed water temperature and weighbridge were not stated in the MR. The CAR was closed as the revised MR states the details of these instruments.</p>	<p><del>CAR-07</del> OK</p>



	Verified Situation	Conclusion
<p>3-5. Is the accuracy of equipment used for monitoring sufficient and regularly controlled and calibrated in line with the registered monitoring plan or any accepted revised MP?</p> <p>Check relevance of maintenance and calibration included in the monitoring plan.</p> <p>Check relevance of laboratory analysis if included in the monitoring plan.</p>	<p>Yes, the verification team confirmed through the on-site assessment and the review of evidence that the installation of the measuring devices has been completed and the equipment has been operated and maintained in normal operating conditions.</p> <p>The accuracy classes of all the monitoring equipment are found as per the monitoring plan of the included CPA-DD, or of higher accuracy as detailed in "Annex-1_4041-0007: Instrument Details" of the MR.</p> <p>It was confirmed that the information of the meters was consistent with that described in the Monitoring Report.</p> <p>The CME has provided the calibration certificates of all the monitoring equipment and the verification team confirms the certificates to be appropriate and relevant.</p> <p>For further details of the calibration of the monitoring equipment please refer to section 3.19 of this report below.</p> <p>Nevertheless, CL 07 was raised as The CME has not provided the credentials of the calibrating agencies and the laboratories, which have carried out the NCV analysis. Adequate information was provided by the CME and the CL was closed. For details please refer to Appendix D of this report.</p>	<p>CL-07 OK</p>
<p>3-6. If the monitoring plan of the CPA-DD refers to a sampling plan and monitoring is carried out for the chosen samples, ensure that the sampling is carried out as per the sampling plan<sup>66</sup>.</p>	<p>The monitoring plan of the CPA-DD does not refers to a sampling plan and the monitoring is carried out for 100% data for all the monitoring parameters.</p>	<p>NA</p>
<p>3-7. Check that responsibilities and authorities for monitoring and reporting are in line with the monitoring plan.</p> <p>Are the monitoring results consistently recorded, reviewed and approved as stated in the CPA-DD or any accepted revised MP?</p>	<p>Yes</p> <p>During the site visit, monitoring and reporting procedures were confirmed by the verification team through interview with the relevant plant personnel, CME and by document review.</p> <p>However, the following CAR/CLs were raised and successfully closed;</p> <ul style="list-style-type: none"> <li>CAR 02 was raised as the opening readings of the parameter "<math>Q_{\text{steam}}</math>" and closing readings of the parameters "<math>EC_{PJ,j,y}</math>" and "<math>EC_{EL,j,y}</math>" have not been presented to the verification team.</li> </ul>	<p>CAR-02 CL-02 CL-05 OK</p>

<sup>66</sup> The sampling plan shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified Situation	Conclusion
	<ul style="list-style-type: none"> <li>CL 02 was raised as for the parameters like “CAP<sub>boiler</sub>” and “SEC<sub>PJ,y,measured</sub>” CME had stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation.</li> <li>CL 05 was raised, as although NCV is taken directly taken from the laboratory report, values of parameters like hydrogen, oxygen and moisture content in the biomass are still reported in the MR, which is not required as per the included CPA-DD.</li> </ul> <p>The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p>	
<p>3-8. Reporting period: Defined?</p> <p>If a monitoring period of a parameter more / less than a year is applied, check if the monitoring is in a complete and consistent manner?</p> <p>Is the monitoring period within the crediting period of the CPA and length of the registered PoA?</p>	<p>The monitoring period for the PoA is from 12/01/2011 to 31/08/2012. But for the CPA, the emission reduction starts from 01/05/2012 (i.e., the date of start of crediting period of the CPA) till 31/08/2012. Hence the monitoring period for the CPA is for 123 days which is less than a year. However, monitoring of all the parameters is complete, as there is no specific requirement in the methodology for annual reporting of any data. The verification team therefore, confirms the monitoring to be complete and consistent and clearly defined in the MR.</p> <p>The monitoring period is within the crediting period of the CPA and also the length of the registered PoA.</p> <p>Nevertheless, CL 09 was raised as the monitoring period of the CPA was not consistent with that of the PoA in the webhosted MR. The issue has been addressed and the finding was successfully closed.</p>	<p>CL-09 OK</p>
<p>3-9. If the monitoring plan includes the determination of environmental and / or social indicators, have the sustainable development indicators been monitored in accordance with the monitoring plan of the included CPA-DD?</p>	Not applicable	NA
<p>3-10. Check monitoring of Environmental and Social indicators (if relevant)</p> <ul style="list-style-type: none"> <li>implementation of measures</li> <li>monitoring equipment</li> </ul>	Not applicable	NA

	Verified Situation	Conclusion
<ul style="list-style-type: none"> <li>quality assurance procedures</li> <li>external data.</li> </ul>		

	Verified Situation	Conclusion				
<b>SECTION 2 and 3: Post Registration Changes</b>						
<p>3-11. If, from the above assessment in SECTIONS 2 and 3, the conclusion is that there are temporary deviations or permanent changes from the registered Monitoring Plan or Monitoring Methodology, determine if these deviations or changes require prior approval by the EB by answering the questions below. All the answers to the applicable questions below shall be explained and the reasons for each conclusion given in the “Verified situation” column.</p> <p><b>Temporary deviations from the registered monitoring plan or applied methodology:</b>  Prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES.</p>						
3-12. Have the PPs reported as zero any parameter related to baseline GHG emissions that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?	No temporary deviation is sought during this monitoring period	<table> <tr> <th>YES</th><th>NO</th></tr> <tr> <td>-</td><td>-</td></tr> </table>	YES	NO	-	-
YES	NO					
-	-					
<p>3-13. Have the PPs estimated (assuming that the source of the project GHG emissions operated at maximum capacity for the full period of the missing data) any parameter that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?</p> <p>For project GHG emissions related to the consumption of electricity, the estimate shall include an addition of 10% to account for transmission and distribution losses.</p>	No temporary deviation is sought during this monitoring period	<table> <tr> <th>YES</th><th>NO</th></tr> <tr> <td>-</td><td>-</td></tr> </table>	YES	NO	-	-
YES	NO					
-	-					

Verified Situation		Conclusion	
<b>Permanent changes from the registered monitoring plan or applied methodology</b>			
If the monitoring equipment actually installed has a lower accuracy level than the accuracy stipulated in the applied methodology and/or in the registered monitoring plan, and the monitoring equipment is under the control of the project participants, prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES:			
3-14. Have the PPs deducted from the measured value, for any parameter used for calculating baseline GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES -	NO -
3-15. Have the PPs added to the measured value, for any parameter used for calculating project GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES -	NO -
Changes to the monitoring of the included CPA of a type listed below do not require approval by the EB. Confirm in the conclusion column that the change is of the type in the table below and explain the reasons.			
3-16. Change of calibration frequency or practice for monitoring equipment not within the control of project participants	Not Applicable	NA	
3-17. Change of accuracy / type / model of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
3-18. Change of location of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
If the answer to any of the above items has been that approval from the EB is required, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			

	Verified Situation	Conclusion
3-19. If, from the above assessment, the conclusion is that the temporary deviations or permanent changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA

### 3.19 Monitoring Parameters and Calibration Checklist:

Complete the following table for each parameter:

Data / Parameter (as in the MP)		Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Value	Ex-ante	80,306 per annum	207.47
	Ex-post	3571.99	187.38 <sup>67</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		As per the monitoring plan of the included CPA-DD, the quantity of steam delivered by the project is measured by duly calibrated steam flow meter and the calibration certificate has been verified.  Further, the verification team cross-checked the quantity of steam delivered by the project activity during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the steam temperature is measured by duly calibrated RTD and the calibration certificate has been verified.  Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Steam flow meter Sr. No.: EC01F720000	RTD Sr. No.: EC01F720000 <sup>68</sup>

<sup>67</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised and successfully closed by the CME

<sup>68</sup> A consolidated monitoring equipment is used by the CPA operator, which has inbuilt feature for measuring the both steam flow and the steam temperature. This was confirmed during the on-site visit and verification of the technical specification of the measuring equipment.

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of steam supplied in year y “Q<sub>steam</sub>” (Tonnes)</b>	<b>Average Steam Temperature at MSSV (Main steam stop valve) outlet “T<sub>steam</sub>” (°C)</b>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+ 2.3% Maximum (which is better than that stated in the CPA-DD of +3%)	+ Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	01/05/2012 to 31/08/2012	01/05/2012 to 31/08/2012
Instrument type	Steam flow meter cum RTD	Steam flow meter cum RTD
Manufacturer, model and serial number	Make: Endress + Hauser; Sr. No.: EC01F720000	Make: Endress + Hauser; Sr. No.: EC01F720000
Specific location	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler
Calibration dates	11/01/2012 (valid till 10/01/2015)	11/01/2012 (valid till 10/01/2015)
Company performing the calibration	Manufacturer Endress + Hauser (NABL accredited)	Manufacturer Endress + Hauser (NABL accredited)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The Steam flow meter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period

Data / Parameter (as in the MP)	Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P <sub>steam</sub> ” (kg/cm <sup>2</sup> g)	Average Feed Water Temperature at inlet of boiler “T <sub>FWB</sub> ” (°C)
Value	Ex-ante	17.5	63.55
	Ex-post	11.14 <sup>69</sup>	56.59 <sup>70</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically

<sup>69</sup> The value is the weighted average of the daily recorded pressure readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised and successfully closed by the CME

<sup>70</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised and successfully closed by the CME



<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P<sub>steam</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “T<sub>FWB</sub>” (°C)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the steam pressure is measured by duly calibrated pressure transmitter and the calibration certificate has been verified. Further, the verification team cross-checked the steam pressure during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the feed water temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Pressure transmitter Sr. No. EC175A01052	RTD G-189
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	± 0.5% (which is better than 2% as stated in the CPA-DD)	Class B (which is same as stated in the CPA-DD)
Period of operating time	01/05/2012 to 31/08/2012	01/05/2012 to 31/08/2012
Instrument type	Pressure transmitter	RTD
Manufacturer, model and serial number	Endress + Hauser; Sr. No. Sr. No. EC175A01052	Endress + Hauser; Sr. No. Sr. No. G-189
Specific location	Project site, at the Main Steam Stop Valve (MSSV)	Project site, after the boiler feed water tank at the inlet of the boiler
Calibration dates	23/11/2011 (valid till 22/11/2014)	01/04/2012 (valid till 31/03/2013)
Company performing the calibration	Manufacturer Endress + Hauser (NABL accredited)	Nutech Engineers (ISO certified company and calibrated is traceable to international standard and hence deemed acceptable)

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P<sub>steam</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “T<sub>FWB</sub>” (°C)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer’s specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer’s specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The pressure transmitter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q <sub>ob,k</sub> ” (Tonnes)	Quantity of subsequent delivery of fuel type k biomass at the Project site “Q <sub>np,k</sub> ” (Tonnes)
Value	Ex-ante	NA	NA
	Ex-post	405.61	1990.70
Measuring / Monitoring frequency		At the start of the monitoring period	Data is monitored and recorded for each truck delivery
Reporting frequency		Once during the monitoring period	Each truck trip
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		The opening balance of the biomass is measured by a calibrated weighbridge	Biomass procured is measured for each truck entering the plant premises by a calibrated weighbridge
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Weighbridge; Sr. No. 95008311	Weighbridge; Sr. No. 95008311

Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III <sup>83</sup>	Class III <sup>71</sup>
Period of operating time	01/05/2012 to 31/08/2012	01/05/2012 to 31/08/2012
Instrument type	Weighbridge	Weighbridge
Manufacturer, model and serial number	Essae; Sr. No. 95008311	Essae; Sr. No. 95008311
Specific location	At project site	At project site
Calibration dates	02/01/2012 (valid till 01/01/2013)	02/01/2012 (valid till 01/01/2013)
Company performing the calibration	Weights and Measure Department, Govt. of India	Weights and Measure Department, Govt. of India
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The weighbridge was functional throughout the monitoring period	The weighbridge was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<sup>71</sup> In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable.

Data / Parameter (as in the MP)		Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site " $Q_{in,k}$ " (Tonnes)	Quantity of biomass fuel type k consumed during the monitoring period " $Q_{c,k}$ " = " $FC_{biomass,k,y}$ " (Tonnes)
Value	Ex-ante	NA	20,880 per annum
	Ex-post	348.32	2047.99
Measuring / Monitoring frequency		Measured at the end of the monitoring period	Calculated from the opening, received and closing balance of the biomass during the monitoring period
Reporting frequency		Once during the monitoring period	At the end of the monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		The closing balance of the biomass is measured by a calibrated weighbridge	The quantity of biomass consumed is cross- checked with the invoices obtained from the fuel supplier and found to match
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Weighbridge; Sr. No. 95008311	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department , Govt. of India. Hence the accuracy class is deemed acceptable.	NA
Period of operating time		01/05/2012 to 31/08/2012	NA
Instrument type		Weighbridge	NA
Manufacturer, model and serial number		Essae; Sr. No. 95008311	NA
Specific location		At project site	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Calibration dates	02/01/2012 (valid till 01/01/2013)	NA
Company performing the calibration	Weights and Measure Department, Govt. of India	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The weighbridge was functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low Risk as this data is not used for emission reduction calculation.

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q<sub>ob,i</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i “Q<sub>np,i</sub>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	0
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA
Population Size	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site "Q<sub>ob,i</sub>" (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i "Q<sub>np,i</sub>" (Tonnes)</b>
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site " $Q_{in,i}$ " (Tonnes)	Quantity of fossil fuel type i consumed during the monitoring period " $Q_{c,i}$ " = " $FC_{i,PJ,y}$ " (Tonnes)
Value	Ex-ante	-	0
	Ex-post	0	0
Measuring / Monitoring frequency		Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA
Company performing the calibration		NA	NA



<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site “<math>Q_{in,i}</math>” (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period “<math>Q_{c,i}</math>” = “<math>FC_{i,PJ,y}</math>” (Tonnes)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “<math>NCV_k</math>” (TJ/Gg)</b>	<b>Percentage of hydrogen in biomass fuel “Hydrogen” (%)</b>
Value	Ex-ante	11.85
	Ex-post	13.06
Measuring / Monitoring frequency	Annually once	3.01
Reporting frequency	Annually	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Annually once
Does monitoring of the parameter involve sampling? (yes / no)	No	Annually
Population Size	NA	Yes
Sample Size	NA	No
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically

<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “NCV<sub>k</sub>” (TJ/Gg)</b>	<b>Percentage of hydrogen in biomass fuel “Hydrogen” (%)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	The NCV analysis is carried out by third party laboratory Quality Services and Solutions which is accredited by NABL	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	NA
Key reporting risks	Low risk	NA

Data / Parameter (as in the MP)		Percentage of Oxygen in biomass fuel "Oxygen" (%)	Moisture content of the biomass residues "Moisture"
Value	Ex-ante	31.2	9.8
	Ex-post	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency		Annually once	Annually once
Reporting frequency		Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen” (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/Gg)</b>	<b>Quantity of fossil fuel type i consumed in a process j during the year y “FC<sub>i,j,y</sub>”</b>
Value	Ex-ante	-
	Ex-post	-
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA

<b>Data / Parameter (as in the MP)</b>	Weighted average net calorific value of the fuel type i in year y "NCV <sub>i,y</sub> " (TJ/Gg)	Quantity of fossil fuel type i consumed in a process j during the year y "FC <sub>i,j,y</sub> "
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC <sub>PJ,j,y</sub> ” (MWh)	Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC <sub>EL,j,y</sub> ” (MWh)
Value	Ex-ante	1205 per annum	0
	Ex-post	28.89	8.30
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Monthly	Monthly
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically CAR 02 was raised as the recording frequency of the monitoring parameter “EC <sub>EL,j,y</sub> ” has not been stated in the MR.
QA/QC How are values verified? (Cross-checked, double- checked,...)		The auxiliary electricity is measured by a calibrated energy meter	The auxiliary electricity is measured by a calibrated energy meter
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Energy Meter; Sr. No. 34120630706	Energy Meter; Sr. No. 34120630706
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		Class 1.0 (which is better than Class 2 stated in the CPA-DD)	Class 1.0 (which is better than Class 2 stated in the CPA-DD)
Period of operating time		01/05/2012 to 31/08/2012	01/05/2012 to 31/08/2012
Instrument type		Energy Meter	Energy Meter
Manufacturer, model and serial number		Schneider Electric; Sr. No. 34120630706	Schneider Electric; Sr. No. 34120630706
Specific location		Project site	Project site

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,i,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,i,y</sub>” (MWh)</b>
Calibration dates	07/03/2012 (valid till 06/03/2013)	07/03/2012 (valid till 06/03/2013)
Company performing the calibration	Manufacturer Schneider Electric Pvt. Ltd. (NABL accredited)	Manufacturer Schneider Electric Pvt. Ltd. (NABL accredited)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The energy meter was functional throughout the monitoring period	The energy meter was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Value	Ex-ante	-
	Ex-post	70.61
Measuring / Monitoring frequency	Continuous at each trip	Continuous at each trip
Reporting frequency	Calculated at the end of the monitoring period	Calculated at the end of monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>”  (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the invoices and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA



<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>”  (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Weighted average CO2 emission factor of fuel type i in year y “EF <sub>CO2,i,y</sub> ” (tCO <sub>2</sub> /GJ)
Value	Ex-ante	-
	Ex-post	NA (No fossil fuel has been used during the monitoring period)
Measuring / Monitoring frequency		NA
Reporting frequency		NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA
Does monitoring of the parameter involve sampling? (yes / no)		NA
Population Size		NA
Sample Size		NA
Confidence level		NA
Margin of error		NA
Recording (Manually / electronically / ...)		NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average CO2 emission factor of fuel type i in year y “EF<sub>CO2,i,y</sub>” (tCO<sub>2</sub>/GJ)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA
Period of operating time	NA
Instrument type	NA
Manufacturer, model and serial number	NA
Specific location	NA
Calibration dates	NA
Company performing the calibration	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA
Is calibration valid for the whole reporting period?	NA
Maintenance	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA
Key reporting risks	NA

	Verified situation	Conclusion
<b>SECTION 4. Compliance with the calibration frequency requirements for measuring instruments</b>		
The “Monitoring Parameters and Calibration Checklist” in section 3 above shall be checked to determine if the calibration frequency specified in the applied monitoring methodology and/or monitoring plan is followed in the monitoring report and in the monitoring activities. Where a failure to comply with the required frequency is detected, or no frequency is mentioned in the monitoring report, please follow the checklist below:		
<p>4-1. If the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (that is, the results of delayed calibration are available), confirm that the following conservative approach has been adopted in the calculation of emission reductions:</p> <ul style="list-style-type: none"> <li>- If the delayed calibration did not show any errors in the measuring equipment, or the error was smaller than the maximum permissible error, have the PPs applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> <li>- If the delayed calibration identified an error greater than the maximum permissible error, have the PPs applied the error identified in the delayed calibration test to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> </ul> <p>Confirm that the error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer emission reductions being claimed;</p>	No delayed calibration was noted during this monitoring period. Hence this is not applicable.	NA

	Verified situation	Conclusion
<p>4-2. If the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification:</p> <ul style="list-style-type: none"> <li>g. Request the PPs to conduct the required calibration;</li> <li>h. On receipt of the calibration results, determine whether the PPs have calculated the emission reductions conservatively using the approach mentioned in section 4.1 above.</li> </ul>	Not Applicable.	NA
<p>4-3. If it is not possible for the PPs to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of the PPs, check if the PPs have prepared a temporary deviation or a 'Permanent changes from the monitoring plan and/or monitoring methodology application'.</p> <p>Follow the requirements for post registration changes in sections 3.10 to 3.19 above.</p>	Not Applicable.	NA
<p>4-4. If neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipment, determine whether the equipment is calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification. If neither local/national standards nor the manufacturer's specification are available, international standards may be used.</p>	Not Applicable.	NA

	Verified situation	Conclusion
<b>SECTION 5. Assessment of data and calculation of emission reductions</b>		
<p>5-1. Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in line with the formulae and methods described in the monitoring plan and the applied methodology document?</p> <p>Check consistency in the ERs spreadsheet.</p>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and the applicable methodological tools for the project activity are as follows:</p> <p><b><u>Baseline emissions:</u></b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity = 813.95 tCO<sub>2</sub> – Calculation shown below</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity = 9.094 TJ – Calculation shown below</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant as per the included CPA-DD = 89.5 tCO<sub>2</sub>/TJ</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity as per the included CPA-DD = 100%</p> $EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}$ <p>where</p> <p><math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{steam}</math> = Quantity of steam supplied in Tonnes = 3571.99 Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet = 664.81 kCal/kg</p>	<p>CAR-04 CL-08 CL02 OK</p>

	Verified situation	Conclusion
	<p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg) = 56.59 kCal/kg</p> <p><math>EG_{\text{thermal}} = 3571.99 * (664.81 - 56.59) * 4.186 * 10^{-6}</math></p> <p>= 9.094 TJ</p> <p>Note: Steam enthalpy is calculated at the weighted average steam pressure during the monitoring period from standard steam table for saturated steam. Similarly the enthalpy of the boiler feed water is determined at the weighted average feed water temperature during the monitoring period. The verification team independently calculated the steam enthalpy at the average steam pressure of 11.14kg/cm<sup>2</sup> g using the web site - <a href="http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp">http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp</a> ; and found the steam enthalpy as 665.11 kCal/kg. Hence the enthalpy used by the CME is conservative.</p> <p>Therefore,</p> <p><math>BE_{\text{thermal,CO2,y}} = 9.094 / 100 * 89.5</math>  <math>= 813.95 \text{ tCO}_2</math></p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p><math>PE_{\text{EC,y}} = EC_{\text{PJ,j,y}} * EF_{\text{grid,CM,y}} * (1 + \text{TDL}_{\text{j,y}}) + EC_{\text{EL,j,y}} * EF_{\text{EL,j,y}} * (1 + \text{TDL}_{\text{j,y}})</math></p> <p><math>EC_{\text{PJ,j,y}}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid  = 28.89 MWh</p> <p><math>EC_{\text{EL,j,y}}</math> = Auxiliary Electricity Consumption of the Project activity from the off</p>	

	Verified situation	Conclusion
	<p>grid Captive Power Plant (Diesel Generator set) = 8.30 MWh</p> <p><math>EF_{grid,CM,y}</math> = Ex-ante Grid Emission Factor = 0.80 tCO<sub>2</sub>/MWh</p> <p><math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l) = 1.3 tCO<sub>2</sub>/MWh</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j as per the included CPA-DD = 20%</p> <p><math>PE_{EC,y} = 28.89 * 0.80 * (1+20\%) + 8.30 * 1.3 * (1+20\%)</math>  <math>= 40.68 \text{ tCO}_2</math></p> <p><u>Project emissions from fossil fuel combustion</u></p> <p><math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math></p> <p>where</p> <p><math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p><math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr) = 0 Tonnes</p> <p><math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)</p> <p><math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math></p> <p>Where</p> <p><math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)</p> <p><math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)</p> <p>As there is fossil fuel consumption during the monitoring period,</p> <p><math>PE_{FC,j,y} = 0</math></p>	

	Verified situation	Conclusion
	<p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,i,y}</math>  <math>= 40.68 + 0 = 40.68 \text{ tCO}_2</math></p> <p><b>Leakage:</b></p> <p><math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math></p> <p><math>= EC_{LE,i,y} * EF_{EL,i,y} * (1 + TDL_{i,y}) + N_{c,y} * AVD_{c,y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km,CO2}</math></p> <p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p><math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p><math>EC_{LE,i,y}</math> = Net increase in electricity consumption of source as a result of leakage</p> <p>This CPA does not involves usage of any processed biomass (rice husk is the biomass residue used in the project boiler). Hence leakage emission due to processing biomass is not applicable.</p> <p>Again the biomass used in the project is not transported from beyond 200 km of the project site (biomass transported from within a distance of 70.61 km). Hence leakage emission due to transportation of biomass is neglected.</p> <p><math>LE_y = 0</math></p> <p>Emission reductions are calculated as follows:</p> <p><math>ER_y = BE_y - PE_y - LE_y</math>  <math>= 813.95 - 40.68 - 0 = 773 \text{ tCO}_2</math> (rounded down value)</p> <p>CAR 04#1 was raised as non consideration of leakage due to processing and transportation (where availability of surplus biomass is more than 25%) for the</p>	



	Verified situation	Conclusion
	<p>CPA was not justified in the MR. The finding was successfully closed after appropriate revision in the MR / ER spreadsheet.</p> <p>CL 08 was raised as the ER calculation spreadsheet provided for the CPA have not included daily monitored data for steam quantity, temperature, pressure and feed water temperature to calculate the average of these parameters. The ER calculation spreadsheet was adequately revised and the CL was closed.</p> <p>CL 02#2 was raised for the parameter "<math>TD_{Li,y} = TD_{Lj,y}</math>", it was stated in the MR that it is used for Leakage emission calculation. But this parameter is also used for the calculation of project emission. CL was closed after appropriate revision in the MR.</p>	
<p>5-2. Has the calculation tool been correctly documented? Check its consistency and formulae.</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The Monitoring Report is supported by Micro Soft excel based spreadsheet for the calculation of emission reductions. The consistency and formula were verified and found to be accurate.</p>	OK
<p>5-3. Is a complete set of data available during the specified monitoring period? If only partial data is available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan proceed as follows:</p> <ol style="list-style-type: none"> <li>a. Check if sections 3.11 and/or 3.12 above are applicable and raise a CAR for the PPs to comply with these requirements.</li> <li>b. If sections 3.11 and 3.12 are not applicable or the answer to this question remains NO, a request for deviation is necessary.</li> </ol> <p>Conduct an assessment of the potential impacts of these changes in accordance to the procedures for Post Registration Changes.</p>	<p>Yes, the complete data set was available during the specified monitoring period.</p>	OK

	Verified situation	Conclusion
<p>5-4. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?</p> <p>Please describe how LRQA has cross-checked reported data.</p>	All the information provided in the Monitoring Report were cross-checked with the Plant log book records, purchase records (for biomass and fossil fuel), site visit and interview of the CPA implementer/CME.	OK
5-5. Have any assumptions used in emission calculations been justified?	All assumptions in the emission reduction calculation are consistent with assumptions taken in the registered monitoring plan and have reference to the applied methodology.	OK
5-6. Have appropriate emission factors, IPCC default values, and other reference values been correctly applied?	<p>The CME has applied the appropriate ex-ante fixed factors as stated in the included CPA-DD like:</p> <ul style="list-style-type: none"> <li>• The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity(<math>\eta_{BL,thermal}</math>)</li> <li>• CO<sub>2</sub> Emission Factor of the fossil fuel that would have been used in the baseline plant (<math>EF_{FF,CO2}</math>)</li> <li>• Surplus availability of Biomass within identified region (<math>SA_k</math>)</li> <li>• Ex-ante Grid Emission Factor in a year y.</li> <li>• Emission Factor for fossil fuel based electricity generation for source j and/or l in year y (<math>EF_{EL,j,y} = EF_{EL,l,y}</math>)</li> <li>• Auxiliary Electricity Consumption for biomass processing, outside Project boundary. (<math>EC_{LE,l,y}</math>)</li> <li>• Average CO<sub>2</sub> emission factor for the trucks measured during the year y(<math>EF_{km,CO2}</math>)</li> <li>• Average technical transmission and distribution losses for providing electricity to source l and/or j in year y(<math>TDL_{l,y} = TDL_{j,y}</math>)</li> <li>• Specific energy consumption of fuel type j of the Project activity in year y(<math>SEC_{PJ,j,y,measured}</math>)</li> </ul> <p>CL 02#3 was raised for the CME to clarify the appropriateness of the “Source of data” and “Additional comment” as stated in the MR for the parameters in section D.1, which are fixed ex-ante at the time of validation of the CPA.</p> <p>MR was suitably revised and the finding was closed.</p>	CL-02 OK

## 7.9 Appendix C7: Verification Protocol for CPA 4041-0009

	Verified situation	Conclusion
<b>SECTION 1. Project implementation in accordance with the registered PoA-DD &amp; CPA-DD</b>		
<b>General description of the project</b>		
1.1. Does the MR provide general information of the CPA and is it as per the CPA-DD included by CDM-EB or by a DOE <sup>72</sup> ?	<p>Yes, the Monitoring Report <sup>73</sup> provides the general information of the CPA. Details such as Title of the CPA, UNFCCC registration reference number, version number of the Monitoring Report, monitoring period, project participants, sectoral scope and estimated amount of GHG emission reductions. All the above details can be confirmed from the included CPA-DD through link in UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=GKM2BJ9UZC8F4EH0LQTW163AOXNDRY">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=GKM2BJ9UZC8F4EH0LQTW163AOXNDRY</a></p> <p>Title of the CPA is “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 005)” and it was included in the PoA on 31/05/2012 applying the baseline and monitoring methodology AMS-I.C, version 16 “Thermal energy production with or without electricity” as verified from the project page of the CPA. The project activity applies AMS-I.C, version 16. The project activity is installation and operation of one 6 TPH boiler and one 8 TPH biomass (rice husk) fired boiler to meet the captive requirement of steam in Extruded floating fish feed manufacturing process-proportionate mixing of grains, grinding, cooking, sizing, drying, cooling &amp; packing. The project is located in Village Chevuru, Sriharipuram Panchayat, Taluka Mudinepalli Mandal, District Krishna, Andhra Pradesh. The project is implemented by Growel Feeds Private Limited.</p>	OK
1.2. Is the general information provided in the MR in line with the PoA-DD registered by CDM-EB?	<p>Yes, the Monitoring Report is as per the PoA-DD registered by CDM-EB confirmed from the registered PoA-DD through link on UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=GKM2BJ9UZC8F4EH0LQTW163AOXNDRY">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=GKM2BJ9UZC8F4EH0LQTW163AOXNDRY</a></p>	OK
1.3. Is the Monitoring report as per the standardised format (F-	Yes, the Monitoring Report is as per the latest standardised format (F-CDM-MR) version 02.0 (EB66, Annex 20).	OK

<sup>72</sup> The first CPA is included by the CDM-EB along with registered PoA-DD and subsequent CPAs are included by DOEs.

<sup>73</sup> Monitoring Report for this CPA (CPA 4041-0009) refers to the Appendix-7 of the consolidated MR Version 4.0

	Verified situation	Conclusion
CDM-MR)? (EB 66 )		
1.4. Is the monitoring report filled as per the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).	Yes, the MR is filled up as per the latest "Guidelines for completing the monitoring report form" EB 66, Annex 20. CAR 08 was raised as project page of the PoA on UNFCCC web site, the "Other Parties involved" is stated as "United Kingdom of Great Britain and Northern Ireland" and "Germany". But in the MR "Germany" is missing. CAR was closed as the MR was suitably revised.	<del>CAR 08</del> OK
1.5. Is there any open issue in the validation / previous verification including FARs? (CDM VVS para. 213)	No No FAR was raised in the Validation report during the CPA inclusion by TUV Nord, the DOE for validation of the CPA. Further this being the first periodic verification, no open issues exists from earlier verification.	OK
<b>Implementation status of the CPA</b>		
1.6. Is the CPA location indicated same as that in the included CPA-DD? Confirm geographical coordinates	Yes, the project location is same as stated in the CPA-DD and this was verified during the on-site visit. The geographical coordinates of the project site are 16.4236° (16°25'25") North, 81.1580° (81°09'29") East. This was cross-checked from the wikimapia web site.	OK
1.7. Is the project boundary described in the same way as the included CPA-DD and registered PoA-DD? Please confirm each component based on the applied methodology.	Yes, the project boundary is described in the same way as in the included CPA-DD and registered PoA-DD. During the on-site assessment it was also confirmed the project boundary is in line with the applied methodology. The project boundary for this CPA includes the biomass storage area and feeding system, boiler house and the facility which is consuming the heat generated by the project.	OK
1.8. Has on-site fossil fuel consumption, if any, been monitored? Is any emission source missed? Check the site lay-out and confirm through site tour.	Fossil fuel consumption is required to be monitored in this project. It has been confirmed during the on-site visit and document review that no fossil fuel has been consumed at the CPA site by the project during the monitoring period. The verification team did not find any emission source attributable to the project activity which has been missed out and the same was confirmed during the on-site visit and review of the site lay-out diagram.	OK
1.9. Confirm contractors for equipment and installation works	It is confirmed that the project equipment i.e., one 6 TPH boiler and one 8 TPH boiler for the project is supplied by Thermax Limited and this was confirmed during the on-site visit interview with the project implementer and from the purchase order copies of the boilers issued by the project implementer dated 07/07/2008 and 03/06/2010, respectively..	OK

	Verified situation	Conclusion										
1.10. Confirm conformance with baseline and monitoring methodology - Applicability conditions. Please refer to the complete description of the applicability conditions and confirm that the CPA meets all the requirements.	Conformance to the applicable methodology conditions for the CPA are as follows:	OK										
	<table><tr><th>Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)</th><th>Means of Verification and Results</th></tr><tr><td><i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i></td><td>The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.</td></tr><tr><td><i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i></td><td>The total installed / rated capacity of the project equipment is 8.79 MW<sub>thermal</sub> which is less than 45 MW<sub>thermal</sub>.</td></tr><tr><td><i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i></td><td>The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.</td></tr><tr><td><i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i></td><td>The project does not use any charcoal.</td></tr></table>		Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)	Means of Verification and Results	<i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>	The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.	<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>	The total installed / rated capacity of the project equipment is 8.79 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .	<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>	The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.	<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>	The project does not use any charcoal.
	Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)		Means of Verification and Results									
	<i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>		The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.									
	<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>		The total installed / rated capacity of the project equipment is 8.79 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .									
	<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>		The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.									
	<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>		The project does not use any charcoal.									
The verification team confirms that the CPA conforms to all applicable condition												

	Verified situation	Conclusion
	<p>of the applied methodology.</p> <p>Apart from the baseline and monitoring methodology applicability criteria as stated above, the verification team also verified the eligibility criteria stated in section B.2 of the included CPA-DD under "Monitoring Criteria" for the point numbers 1, 3.3, 3.4, 3.5, 16, 17 and 18 and found these to be valid for the project activity during the monitoring period. A declaration letter dated 11/12/2012 in this respect has also been submitted by the CME.</p>	
1.11. Confirm use or no use of public funding and determine if there is no diversion of ODA to the CPA.	There is no use of public funding for the CPA. The same was confirmed during the interview with the CME and also a declaration in this respect has been provided by the CPA implementer.	OK
1.12. Check data in the MR and in the CPA-DD. Describe data and variables that are different from that stated in the included CPA-DD and cause an increase in emission reductions estimations.	<p>Data in the MR and CPA-DD fixed at validation stage are found to be consistent.</p> <p>The ex-ante estimated emission reductions during this monitoring period of 92 days are 3,200 tCO<sub>2</sub> (12696/365*92) and the actual emission reductions during this monitoring period are 740 tCO<sub>2</sub>. Hence the actual emission reductions during this monitoring are less than the estimated values as per the CPA-DD.</p> <p>However, CL 02 was raised for the parameters like "CAP<sub>boiler</sub>" and "SEC<sub>PJ,y,measured</sub>", it was stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation. The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p>	CL-02 OK
1.13. By means of an on-site visit: Is the general information of the project provided in the Monitoring Report and is it as per the CPA-DD included by CDM-EB or by a DOE? List each technical component and equipment and check design parameters and actual	<p>Yes. The on-site visit for the CPA was conducted on 08/11/2012.</p> <p>The project activity comprises of the installation and operation of one 6 TPH and one 8 TPH biomass (rice husk) fired boilers to meet the captive requirement of steam at the project site.</p> <p>During the verification, by the observation of equipment, interviews with relevant staff and the checking of technical specifications of main components, it was confirmed that the project activity has been implemented as described in the included CPA-DD.</p> <p>The project is operational. The 6 TPH boiler was commissioned on 27/01/2010 and the 8 TPH boiler</p>	CAR-01 CAR-03 OK

<sup>74</sup> The sampling shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified situation	Conclusion
<p>status of installation and / or operation.</p> <p>Please check to ensure that all physical features of the proposed CPA in the registered/included CPA-DD are in place and the PP has operated the proposed CPA as per the included CPA-DD.</p> <p>It may include but not limited to:</p> <ul style="list-style-type: none"> <li>the actual capacity and output</li> <li>plant load factor</li> <li>type of feedstock</li> <li>operation of other components / units within the project boundary which could affect functioning of the project plant.</li> </ul> <p>In cases where there are a large number of components and equipment items and the check of all of them is not an available option, then a random sampling check shall be performed. Justify here the sample chosen and describe the results.<sup>74</sup></p>	<p>was commissioned on 25/03/2011 and the same was verified from the commissioning certificate issued by Thermax Limited.</p> <p>No change from the included CPA-DD of physical features which may impact the emission reduction of the project activity has been identified.</p> <ul style="list-style-type: none"> <li><u>Steam generation units :</u> <ol style="list-style-type: none"> <li><u>6 TPH boiler</u> Net enthalpy supply by boiler : The ex-ante estimated annual enthalpy output from the project boiler is 64.819 TJ as per the included CPA-DD (which corresponds to 16.338 TJ for 92 days of this monitoring period) whereas actual enthalpy supplied by the boiler during this monitoring period was 8.741 TJ which is less than the ex-ante estimated value.</li> <li><u>8 TPH boiler</u> Net enthalpy supply by boiler : The ex-ante estimated annual enthalpy output from the project boiler is 91.91 TJ as per the included CPA-DD (which corresponds to 23.16 TJ for 92 days of this monitoring period) whereas actual enthalpy supplied by the boiler during this monitoring period was 13.41 TJ which is less than the ex-ante estimated value.</li> </ol> </li> <li>Type of biomass fired in the boiler : As per the included CPA-DD, renewable biomass residue (rice husk) is to be fired in the boilers and it was noted that there was no deviation in the biomass firing during the monitoring period.</li> <li>As per the included CPA-DD, the project may fire fossil fuel (Coal) in the boiler. During this monitoring period, no fossil fuel has been fired in the project boiler as confirmed by the project implementer during the site visit.</li> </ul> <p>100% data is monitored for the CPA and hence no sampling plan is applicable.</p> <p>However, CAR 01 was raised as in section B.1 of the MR, the downtime time of the project boilers is not provided. Details are provided in the revised MR and the CAR was closed.</p> <p>Further, CAR 03 was raised as PP has considered a simple average of steam pressure, temperature and boiler feed water enthalpy, which are used for the calculation of net enthalpy supplied by the project boiler, which is not correct. The calculation approach was revised and a weighted average was considered for emission reduction. The CAR 03 was successfully closed.</p>	

	Verified situation	Conclusion
1.14. Have responsibilities for monitoring been described and specified?	<p>The responsibilities of monitoring have been provided and described in the Monitoring Report. The Monitoring Report and CDM documents clearly describe the responsibilities for monitoring.</p> <p>The project owner has identified the CDM team, the structure of which is given in Monitoring Report. During the verification, responsibilities for operational personnel, technical and support team have been verified and confirmed.</p> <p>The CDM team has been assigned the responsibility for measuring, recording and storage of the measured data. Data is kept in electronic format and paper format.</p>	OK
1.15. Are the responsibilities and authorities for monitoring and reporting in line with those stated in the monitoring plan of the included CPA-DD?	Yes, responsibilities and authorities for monitoring and reporting are in accordance with included CPA-DD.	OK
1.16. Check QA/QC, management systems. Are procedures described and specified in the MR? Are they consistently applied as described in the MP? <ul style="list-style-type: none"> <li>a. documented instructions, management manual</li> <li>b. documentation</li> <li>c. data archiving</li> <li>d. monitoring report</li> <li>e. cross-checking</li> <li>f. energy balance analysis (as relevant)</li> <li>g. internal audits / verification and management review</li> </ul>	<p>QA/QC procedures include staff training, instrument calibration, cross-checking and data/documents archiving. They are consistent with the monitoring plan.</p> <p>The Monitoring Report describes the monitoring system, monitoring procedures, data collection and reporting, responsibilities of relevant staff/departments, calibrations that were implemented and QA/QC procedures including data cross-checking.</p> <p>By means of document review, onsite assessment and interviews, the verification team has confirmed that all the QA/QC measures, data archiving, monitoring report and internal audits are as per the registered monitoring plan of the registered PoA-DD and the included CPA-DD.</p> <p>However, CL 03 was raised as the “QA/QC procedure” &amp; “Purpose of data” for the quantity of biomass in MR was mentioned as “NA” and the same is not consistent with the monitoring plan of the included CPA-DD. Monitoring and recording frequency of these parameters were not mentioned in the MR. Also the values for these parameters as stated in the MR was incorrect as verified during the on-site visit and also with the documents provided.</p> <p>The MR was suitably revised to close the finding.</p>	<del>CL-03</del> OK
1.17. Have the procedures for emergency and abnormal situations been established?	As stated in section C of the MR, the procedure for non-conformance and corrective actions is in place for the project activity to mitigate any emergency and abnormal situations in monitoring as per the included CPA-DD.	<del>CAR-07</del> OK



	Verified situation	Conclusion
	<p>During the monitoring period, no emergency situation in monitoring has occurred.</p> <p>However, CAR 07 was raised as the CME needed to clarify why the details of the backup monitoring instruments (for steam pressure and temperature and feed water temperature) were not provided in the MR. Adequate justification was provided by the CME and the CAR was closed.</p>	
1.18. Has the system for qualification and training been established as relevant for the monitoring and management activities?	<p>The training and qualification of the project personnel has also been confirmed during interview of the operational personnel during the on-site visit. It is confirmed that they have sufficient knowledge, experience and competency to implement and maintain the plant operation including data monitoring and recording in line with boiler operation and maintenance manual provided by the boiler supplier, and with CDM requirements.</p> <p>This is further verified by the evidence for training of the project personnel and the boiler attendants' certificates issued by Directorate of Steam Boilers (Government agency) for the boiler operators.</p>	OK
1.19. Check the environmental report, license, permit and compliance to the local environmental legislation (if relevant).	The verification team has confirmed that the project meets the relevant local environmental legislation. The same was confirmed from the copy of the consent to operate issued by Andhra Pradesh Pollution Control Board valid from 14/06/2011 to 28/02/2014. Also copy of boiler certificate valid from 19/04/2012 to 01/10/2012 for 6 TPH boiler and from 02/05/2012 to 01/11/2012 for 8 TPH boiler issued by Directorate of Steam Boilers Department has been submitted for the operation of the boiler.	OK
1.20. Check contribution to sustainable development, comparing those expected in the included CPA-DD and the actual status.	<p>With the provision of employment opportunities by the project activity, there has been a contribution for the social and economic well-being of some local people.. The project utilises renewable biomass to produce steam (thereby avoiding the fossil fuel usage) and this leads to environment well being by reduced environmental impact from fossil fuel use. Also the project uses renewable biomass technology which is deemed as a clean (as it displaces fossil fuel usage) and safe technology.</p> <p>Even though the sustainable development measures were not registered in the CPA-DD as a monitoring parameter, it was confirmed during the site visit that the CPA contributes to the sustainable development of the host country.</p>	OK
1.21. Check issues with local stakeholders, claims, complaints, etc.	It was confirmed by on-site interviews that there had been no claims and complaints from local stakeholders prior to the verification visit.	OK

	Verified situation	Conclusion	
1.22. If from the above assessment the conclusion is that the implementation or operation of the CPA does not conform with the description contained in the included CPA-DD and/or corrections have been made to project information or parameters fixed at validation/inclusion, determine if these changes and/or corrections do not require prior approval by the board: <ul style="list-style-type: none"><li>- A request of approval is required if the boundary of a registered CDM PoA is changed to include an additional host party, in accordance with the project cycle procedure.</li><li>- A request for approval is required if the CME of a registered CDM PoA changes after the registration of the PoA.</li><li>- Any corrections to project information of an included CPA that do not affect the design of the project activity do not require prior approval by the Board.</li><li>- A request for approval is required if any of the three issues below is adversely impacted by the identified changes to the project design.</li></ul>			
1.23. The applicability and application of the applied methodology under which the CPA has been included:  Check if the project boundary has changed and if any of the parameters to assess the applicability conditions have changed.	No change in applicability and application of the applied methodology AMS-I.C. version 16, including the project boundary, is observed.	YES	NO
			X
1.24. Compliance of the included CPA to eligibility criteria as defined in the registered PoA-DD.  Check if any of the parameters to assess the PoA eligibility criteria have changed.	No change in the eligibility criteria of the registered CPA, as defined in the registered PoA-DD, is observed.	YES	NO
			X
1.25. The additionality of the project activity:  Check if any of the input parameters to the investment analysis have changed. For barrier analysis, check if any information or data used in the	There is no change in the project design parameters as the project is implemented as per the included CPA-DD. Hence this is not applicable.	YES	NO
			X

	Verified situation	Conclusion	
barrier analysis has changed.			
1.26. The scale of the project activity. Check if the project is still small scale or large scale after the implementation of the changes.	Small scale, as per the eligibility criteria for CPA inclusion and is in accordance with the methodology AMS-I C, version 16.	YES	NO
			X
If the answer to any of the above items is YES, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
1.27. If, from the above assessment, the conclusion is that the changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	

	Verified Situation	Conclusion
<b>SECTION 2. Compliance of the Monitoring Plan with the Monitoring Methodology including applicable Tool(s)</b>		
2.1. Is the monitoring plan of the included CPA-DD in accordance with the applied methodology?	Yes, it is confirmed that monitoring plan of the included CPA-DD is in accordance with the applied methodology, AMS-I.C, version 16.	OK
2.2. If the methodology provides different options (for example, use of default values or on-site measurements), has the Monitoring Report specified which option is used?	<p>Yes,</p> <p>The ex-ante parameters which are fixed for the crediting period at the time of CPA inclusion in the PoA as per the methodological tools are:</p> <ul style="list-style-type: none"> <li>• <math>CAP_{boiler}</math> (Rated capacity (thermal output) of the boiler of the Project activity)</li> <li>• <math>CAP_{boiler, old}</math> (Rated capacity (output) of the existing renewable fuel fired boiler)</li> <li>• <math>CAP_{boiler, add}</math> (Rated capacity (output) of the Boiler added to the existing renewable facility)</li> <li>• <math>\eta_{BL, thermal}</math> (The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity)</li> <li>• <math>EF_{FF, CO_2}</math> (<math>CO_2</math> Emission Factor of the fossil fuel (Indian Coal) that would have been used in the baseline plant)</li> <li>• <math>SA_k</math> (Surplus availability of Biomass)</li> <li>• <math>EF_{grid, CM, y}</math> (Ex-ante Grid Emission Factor in a year y)</li> <li>• <math>EF_{EL, j, y}</math> (Emission Factor for fossil fuel based electricity generation for source j in year y)</li> <li>• <math>EF_{km, CO_2}</math> (Average <math>CO_2</math> emission factor for the trucks measured during the year y)</li> <li>• <math>TDL_{i, y}</math> (Average technical transmission and distribution losses for providing electricity to source j in year y)</li> <li>• <math>SEC_{PJ, j, y, measured}</math> (Specific energy consumption of fuel type j of the Project activity in year y)</li> </ul> <p>Further, the verification team confirms that there is no deviation in the values of the ex-ante fixed parameters between the included CPA-DD and the MR.</p>	OK

	Verified Situation	Conclusion
	<p>The parameters being monitored ex-post as per the monitoring methodology and the CPA-DD are:</p> <p><b><u>For 6 TPH Boiler</u></b></p> <ul style="list-style-type: none"> <li>• Quantity of steam supplied in year y (<math>Q_{\text{steam}}</math>)</li> <li>• Average Steam Temperature at MSSV (Main steam stop valve) outlet during year (<math>T_{\text{steam}}</math>)</li> <li>• Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year (<math>P_{\text{steam}}</math>)</li> <li>• Average Feed Water Temperature at inlet of boiler (<math>T_{\text{FWB}}</math>)</li> <li>• Boiler operating hours of the project activity in year y (<math>h_y</math>)</li> </ul> <p><b><u>For 8 TPH Boiler</u></b></p> <ul style="list-style-type: none"> <li>• Quantity of steam produced by an existing renewable energy unit in year y (<math>Q_{\text{steam old,y}}</math>)</li> <li>• Quantity of steam generated by additional renewable energy unit at an existing renewable energy production facility in year y (<math>Q_{\text{steam add,y}}</math>)</li> <li>• Steam Temperature at MSSV (Main steam stop valve) outlet of an existing renewable energy production facility in year y (<math>T_{\text{steam, old,y}}</math>)</li> <li>• Steam Temperature at MSSV (Main steam stop valve) outlet of additional renewable energy unit (Boiler) at an existing renewable energy production facility in year y (<math>T_{\text{steam,add,y}}</math>)</li> <li>• Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet of an existing renewable energy production facility (<math>P_{\text{steam, old,y}}</math>)</li> <li>• Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet of additional renewable energy unit (Boiler) at an existing renewable energy production facility in year y (<math>P_{\text{steam, add,y}}</math>)</li> </ul>	

	Verified Situation	Conclusion
	<ul style="list-style-type: none"> <li>• Average Feed Water Temperature at inlet an existing renewable energy production facility (boiler) in year y (<math>T_{FWB, old, y}</math>)</li> <li>• Average Feed Water Temperature at inlet of additional renewable energy unit (boiler) at an existing renewable energy production facility in year y (<math>T_{FWB, add, y}</math>)</li> <li>• Boiler operating hours of the existing renewable facility in a year y (<math>h_{old, y}</math>)</li> <li>• Boiler operating hours of the renewable energy unit in a year y (<math>h_{add, y}</math>)</li> </ul> <p><b><u>Monitoring parameters for 6 TPH and 8 TPH Boiler:</u></b></p> <ul style="list-style-type: none"> <li>• Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site (<math>Q_{ob, k}</math>)</li> <li>• Quantity of subsequent delivery of fuel type k biomass at the Project site (<math>Q_{np, k}</math>)</li> <li>• Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site (<math>Q_{in, k}</math>)</li> <li>• Quantity of biomass fuel type k consumed during the monitoring period (<math>Q_{c, k}</math>)</li> <li>• Quantity of stored fuel type fossil (Coal) i on the starting date of each monitoring period measured at the Project site (<math>Q_{ob, i}</math>) **</li> <li>• Quantity of subsequent delivery of fuel type fossil fuel (Coal) i (<math>Q_{np, i}</math>) **</li> <li>• Quantity of remaining fossil fuel type (Coal) i available at the end date of each monitored period measured at the Project site (<math>Q_{in, i}</math>) **</li> <li>• Quantity of fossil fuel type i (Coal) consumed during the monitoring period (<math>Q_{c, i} = FC_{j, P, j, y}</math>) **</li> <li>• Net calorific value of biomass fuel k used in the Project activity (<math>NCV_k</math>) *</li> <li>• Percentage of hydrogen in biomass fuel (Hydrogen) *</li> <li>• Percentage oxygen in Biomass fuel (Oxygen)*</li> <li>• Moisture content of the biomass residues (Moisture)*</li> <li>• Weighted average net calorific value of the fuel type i in year y (<math>NCV_{i, y}</math>) **</li> </ul>	

	Verified Situation	Conclusion
	<ul style="list-style-type: none"> <li>• Auxiliary Electricity Consumption of the Project activity from the Grid in year y (<math>EC_{PJ,j,y}</math>)</li> <li>• Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) in a year y (<math>EC_{EL,j,y}</math>)</li> <li>• Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y (<math>AVD_{,y}</math>)</li> <li>• Number of truck trips during the year y (<math>N_{,y}</math>)</li> <li>• Weighted average CO<sub>2</sub> emission factor of fuel type i in year y (<math>EF_{CO_2,i,y}</math>)**</li> </ul> <p>These parameters are based on on-site measurement and have been verified during this verification.</p> <p>* The laboratory report has directly provided the value of NCV. Hence Hydrogen, Oxygen and moisture are not required (which would be required in case NCV was not provided to be calculate NCV from GCV and the above three parameters)</p> <p>** No fossil fuel has been fired in the project boiler during this monitoring period</p>	
2.3. Is all data collected and archived according to the tables in the applied Monitoring Methodology and is this included in the Monitoring Plan?	Yes, all the data is collected and archived in accordance to methodology and included in the monitoring plan. All the data will be archived until 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.	OK
2.4. Check the calculation of emission reductions following the applied methodology: <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and applied for the project activity are as follows:</p> <p><b><u>Baseline emissions:</u></b></p> <p><b><u>For 6 TPH Boiler:</u></b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$	<del>CL-01</del> OK

	Verified Situation	Conclusion
	<p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity during the year y (tCO<sub>2</sub>)</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity during the year y (TJ)</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant; tCO<sub>2</sub> / TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity</p> <p><math>EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}</math></p> <p>where</p> <p><math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{steam}</math> = Quantity of steam supplied in Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet (kCal/kg)</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg)</p> <p><b><u>For 8 TPH Boiler:</u></b></p> <p><math>EG_{thermal,add,y} = EG_{thermal,PJ,y} - EG_{thermal,old,y}</math></p> <p>Where:</p>	



	Verified Situation	Conclusion
	<p> <math>EG_{thermal,add,y}</math> = Net increase in thermal energy generation at existing plant in year y that should be considered as energy baseline (<math>EG_{BL}</math>) (TJ)  <math>EG_{thermal,PJ,y}</math> = Total actual thermal energy produced in year y by all units, existing and new Project units (TJ)  <math>EG_{thermal,old,y}</math> = Estimated thermal energy that would have been produced by existing units (installed before the Project activity) in year y in the absence of the Project activity (TJ) </p> <p>The value <math>EG_{thermal,old,y}</math> is given by</p> <p> <math>EG_{thermal,old,y} = \text{MAX} (EG_{thermal,actual,y}, EG_{thermal,estimated,y})</math> </p> <p> <math>EG_{thermal,actual,y}</math> = The actual, measured thermal energy production of the existing units in year y (TJ)  <math>EG_{thermal,estimated,y}</math> = The estimated thermal energy that would have been produced by the existing units under the observed availability of the renewable resource for year y (TJ) </p> <p>For Boiler <math>EG_{thermal,add,y} = Q_{steam,add} * (H_s - H_w) * 4.186 * 10^{-6} + EG_{thermal,old,y}</math></p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p> <math>PE_{EC,y} = EC_{PJ,j,y} * EF_{grid,CM,y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})</math> </p> <p> <math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid in year y  <math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set)  <math>EF_{grid,CM,y}</math> (Ex-ante Grid Emission Factor in a year y) </p>	

	Verified Situation	Conclusion
	<p> <math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j in year y </p> <p><u>Project emissions from fossil fuel combustion</u></p> <p> <math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math> </p> <p>where  <math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p> <math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit) </p> <p> <math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math>  Where  <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ) </p> <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math></p> <p><u>Leakage:</u></p> <p> <math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math> </p> <p> <math>= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVDC_{y,y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km,CO2}</math>  where </p>	

	Verified Situation	Conclusion
	<p> <math>LE_y</math> = Leakage emissions  <math>LE_{EC,y}</math> = Leakage emissions from electricity consumption in year <math>y</math> (tCO<sub>2</sub>/yr)  <math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site  <math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site  <math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source <math>l</math> in year <math>y</math> as a result of leakage (MWh/yr)  <math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source <math>l</math> in year <math>y</math> (tCO<sub>2</sub>/MWh)  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source <math>l</math> in year <math>y</math>  <math>N_{c,y}</math> = Number of truck trips for collecting loose biomass during the year <math>y</math>  <math>AVDc,y</math> = Average round trip distance between the biomass fuel supply sites and biomass collection site during the year <math>y</math>  <math>EF_{km,CO2}</math> = Average CO<sub>2</sub> emission factor for the trucks measured during year <math>y</math>  <math>N_y</math> = Number of truck trips during the year <math>y</math>  <math>AVD_y</math> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant during year <math>y</math> (km) </p> <p>Emission reductions are calculated as follows:  <math>ER_y = BE_y - PE_y - LE_y</math></p> <p>However, CL 01 was raised as in section E.5 of the MR, the calculation of the ex-ante emission reductions was not transparently presented. The revised MR clearly and transparently describes the ER calculation approach providing relevant equations in line with the included CPA-DD.</p>	

	Verified Situation	Conclusion
<p>2.5. List any monitoring aspect that is not specified in the methodology and check its compliance with the Monitoring Plan, for example:</p> <ul style="list-style-type: none"> <li>• additional monitoring parameters</li> <li>• monitoring frequency</li> <li>• calibration frequency.</li> </ul>	<p>No additional monitoring parameter is identified that is not specified in the approved methodology and the included CPA-DD available in the project page on UNFCCC website.</p> <p>The monitoring frequency and the calibration frequency specified are not less than the requirements of the approved methodology and the Monitoring plan in the included CPA-DD.</p>	OK

	Verified Situation	Conclusion
<b>SECTION 3. Compliance of Monitoring activities with the Monitoring Plan of the included CPA-DD</b>		
<p>3-1. Is the Monitored Data included in the Monitoring Report as per the Monitoring Plan or any accepted revised MP?</p> <p>3-2. Has the data been generated at the frequency required by the Monitoring Plan or any accepted revised MP?</p>	<p>Yes</p> <p>The monitored data included in section D.2 of the MR is as per the monitoring plan of the included CPA-DD.</p> <p>The values are indicated in the section D.2 of the Monitoring Report. At the site visit it was verified that data was generated at the required frequency as per the monitoring plan in the included CPA-DD.</p>	OK
<p>3-3. Has the monitoring been implemented in accordance with the monitoring plan contained in the included CPA-DD or any accepted revised MP?</p> <p>Confirm that the monitoring and reporting procedures have been implemented as documented and follow by PPs.</p>	<p>Yes, by means of document review, on-site assessment and interviews with the plant personnel, it was confirmed that the monitoring has been implemented in accordance with the monitoring plan contained in the included CPA-DD.</p> <p>It was also established that monitoring and reporting procedures have been implemented as documented by the CME and the CPA operator</p>	OK
<p>3-4. Have types of measurement instrumentation used been described and specified?</p>	<p>Yes the MR specifies and describes the use of different measurement instruments (Steam flow meter, RTD / Temperature gauge, Pressure transmitter / Pressure gauge, energy meter and weighbridge). The details of the measuring equipment are provided in the "Annex-1_4041-0009: Instrument Details" of the MR. The provided details have been verified during the on-site visit.</p>	OK

	Verified Situation	Conclusion
<p>3-5. Is the accuracy of equipment used for monitoring sufficient and regularly controlled and calibrated in line with the registered monitoring plan or any accepted revised MP?</p> <p>Check relevance of maintenance and calibration included in the monitoring plan.</p> <p>Check relevance of laboratory analysis if included in the monitoring plan.</p>	<p>Yes, the verification team confirmed through the on-site assessment and the review of evidence that the installation of the measuring devices has been completed and the equipment has been operated and maintained in normal operating conditions.</p> <p>The accuracy classes of all the monitoring equipment are found as per the monitoring plan of the included CPA-DD, or of higher accuracy as detailed in "Annex-1_4041-0009: Instrument Details" of the MR.</p> <p>It was confirmed that the information of the meters was consistent with that described in the Monitoring Report.</p> <p>The CME has provided the calibration certificates of all the monitoring equipment and the verification team confirms the certificates to be appropriate and relevant. For further details of the calibration of the monitoring equipment please refer to section 3.19 of this report below.</p> <p>Nevertheless, CL 07 was raised as The CME has not provided the credentials of the calibrating agencies and the laboratories, which have carried out the NCV analysis. Adequate information was provided by the CME and the CL was closed. For details please refer to Appendix D of this report.</p>	<p>GL-07 OK</p>
<p>3-6. If the monitoring plan of the CPA-DD refers to a sampling plan and monitoring is carried out for the chosen samples, ensure that the sampling is carried out as per the sampling plan<sup>75</sup>.</p>	<p>The monitoring plan of the CPA-DD does not refer to a sampling plan and the monitoring is carried out for 100% data for all the monitoring parameters.</p>	<p>NA</p>

<sup>75</sup> The sampling plan shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified Situation	Conclusion
<p>3-7. Check that responsibilities and authorities for monitoring and reporting are in line with the monitoring plan.</p> <p>Are the monitoring results consistently recorded, reviewed and approved as stated in the CPA-DD or any accepted revised MP?</p>	<p>Yes</p> <p>During the site visit, monitoring and reporting procedures were confirmed by the verification team through interview with the relevant plant personnel, CME and by document review.</p> <p>However, the following CAR/CL were raised and successfully closed;</p> <ul style="list-style-type: none"> <li>CAR 02 was raised as the opening readings of the parameter "<math>Q_{\text{steam}}</math>" and closing readings of the parameters "<math>EC_{PJ,j,y}</math>" and "<math>EC_{EL,j,y}</math>" have not been presented to the verification team.</li> <li>CL 02 was raised as for the parameters like "<math>CAP_{\text{boiler}}</math>" and "<math>SEC_{PJ,y,\text{measured}}</math>", the CME has stated that these are being used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not used for baseline emission calculation.</li> </ul> <p>The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p>	<p><del>CAR 02</del></p> <p><del>CL 02</del></p> <p>OK</p>
<p>3-8. Reporting period: Defined?</p> <p>If a monitoring period of a parameter more / less than a year is applied, check if the monitoring is in a complete and consistent manner?</p> <p>Is the monitoring period within the crediting period of the CPA and length of the registered PoA?</p>	<p>The monitoring period for the PoA is from 12/01/2011 to 31/08/2012. But for the CPA, the emission reduction starts from 01/06/2012 (i.e., the date of start of crediting period of the CPA) till 31/08/2012. Hence the monitoring period for the CPA is for 92 days which is less than a year. However, monitoring of all the parameters is complete, as there is no specific requirement in the methodology for annual reporting of any data. The verification team therefore, confirms the monitoring to be complete and consistent and clearly defined in the MR.</p> <p>The monitoring period is within the crediting period of the CPA and also the length of the registered PoA.</p> <p>Nevertheless, CL 09 was raised as the monitoring period of the CPA is not consistent with that of the PoA in the webhosted MR. The issue has been addressed and the finding was successfully closed.</p>	<p><del>CL 09</del></p> <p>OK</p>

	Verified Situation	Conclusion
3-9. If the monitoring plan includes the determination of environmental and / or social indicators, have the sustainable development indicators been monitored in accordance with the monitoring plan of the included CPA-DD?	Not applicable	NA
3-10. Check monitoring of Environmental and Social indicators (if relevant) <ul style="list-style-type: none"> <li>• implementation of measures</li> <li>• monitoring equipment</li> <li>• quality assurance procedures</li> <li>• external data.</li> </ul>	Not applicable	NA



		Verified Situation	Conclusion
<b>SECTION 2 and 3: Post Registration Changes</b>			
<p>3-11. If, from the above assessment in SECTIONS 2 and 3, the conclusion is that there are temporary deviations or permanent changes from the registered Monitoring Plan or Monitoring Methodology, determine if these deviations or changes require prior approval by the EB by answering the questions below.</p> <p>All the answers to the applicable questions below shall be explained and the reasons for each conclusion given in the “Verified situation” column.</p> <p><b>Temporary deviations from the registered monitoring plan or applied methodology:</b>  Prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES.</p>			
3-12. Have the PPs reported as zero any parameter related to baseline GHG emissions that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?	No temporary deviation is sought during this monitoring period	YES -	NO -
3-13. Have the PPs estimated (assuming that the source of the project GHG emissions operated at maximum capacity for the full period of the missing data) any parameter that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?  For project GHG emissions related to the consumption of electricity, the estimate shall include an addition of 10% to account for transmission and distribution losses.	No temporary deviation is sought during this monitoring period	YES -	NO -
<b>Permanent changes from the registered monitoring plan or applied methodology</b>			
<p>If the monitoring equipment actually installed has a lower accuracy level than the accuracy stipulated in the applied methodology and/or in the registered monitoring plan, and the monitoring equipment is under the control of the project participants, prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES:</p>			
3-14. Have the PPs deducted from the measured	No permanent change in the monitoring plan is observed during this monitoring	YES	NO

	Verified Situation	Conclusion	
value, for any parameter used for calculating baseline GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	period	-	-
3-15. Have the PPs added to the measured value, for any parameter used for calculating project GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES	NO
		-	-
Changes to the monitoring of the included CPA of a type listed below do not require approval by the EB. Confirm in the conclusion column that the change is of the type in the table below and explain the reasons.			
3-16. Change of calibration frequency or practice for monitoring equipment not within the control of project participants	Not Applicable	NA	
3-17. Change of accuracy / type / model of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
3-18. Change of location of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
If the answer to any of the above items has been that approval from the EB is required, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
3-19. If, from the above assessment, the conclusion is that the temporary deviations or permanent changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	

### 3.19 Monitoring Parameters and Calibration Checklist:

Complete the following table for each parameter:

#### For 6 TPH Boiler:

Data / Parameter (as in the MP)		Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Value	Ex-ante	26,072 per annum	183.20
	Ex-post	3,515.12	171.81 <sup>76</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		As per the monitoring plan of the included CPA-DD, the quantity of steam delivered by the project is measured by duly calibrated steam flow meter and the calibration certificate has been verified. Further, the verification team cross-checked the quantity of steam delivered by the project activity during the site visit with the plant log books and the data transferred to the CME server through	As per the monitoring plan of the included CPA-DD, the steam temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.

<sup>76</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

Data / Parameter (as in the MP)	Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
	internet connectivity and found the values to be correct.	
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Steam flow meter Sr. No.: EC03DD20000	RTD Sr. No.: EC03DD20000 <sup>77</sup>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	± 2.3% Maximum (which is better than that stated in the CPA-DD of ±3%)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	Steam flow meter cum RTD	Steam flow meter cum RTD
Manufacturer, model and serial number	Make: Endress + Hauser; Sr. No.: EC03DD20000	Make: Endress + Hauser; Sr. No.: EC03DD20000
Specific location	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler
Calibration dates	25/01/2012 (valid till 24/01/2015)	25/01/2012 (valid till 24/01/2015)
Company performing the calibration	Manufacturer Endress + Hauser (NABL accredited)	Manufacturer Endress + Hauser (NABL accredited)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.

<sup>77</sup> A consolidated monitoring equipment is used by the CPA operator, which has inbuilt feature for measuring the both steam flow and the steam temperature. This was confirmed during the on-site visit and verification of the technical specification of the measuring equipment.

Data / Parameter (as in the MP)	Quantity of steam supplied in year y " $Q_{\text{steam}}$ " (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet " $T_{\text{steam}}$ " ( $^{\circ}\text{C}$ )
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The Steam flow meter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year " $P_{\text{steam}}$ " ( $\text{kg}/\text{cm}^2 \text{ g}$ )	Average Feed Water Temperature at inlet of boiler " $T_{\text{FWB}}$ " ( $^{\circ}\text{C}$ )
Value	Ex-ante	10	70
	Ex-post	8.06 <sup>78</sup>	67.99 <sup>79</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA

<sup>78</sup> The value is the weighted average of the daily recorded pressure readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily pressure readings was reported in the published MR which is incorrect. The CAR was closed after the pressure was revised as the weighted average of the daily readings during the monitoring period

<sup>79</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “<math>P_{\text{steam}}</math>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “<math>T_{\text{FWB}}</math>” (°C)</b>
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the steam pressure is measured by duly calibrated pressure transmitter and the calibration certificate has been verified. Further, the verification team cross-checked the steam pressure during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the feed water temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Pressure transmitter Sr. No. E8004221129	RTD Sr. No. E80080142EA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+/- 0.15% (which is better than 2% as stated in the CPA-DD)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	Pressure transmitter	RTD
Manufacturer, model and serial number	Endress + Hauser; Sr. No. Sr. No. E8004221129	Endress + Hauser; Sr. No. E80080142EA
Specific location	Project site, at the Main Steam Stop Valve (MSSV)	Project site, after the boiler feed water tank at the inlet of the boiler
Calibration dates	30/08/2011 (valid till 29/08/2014)	30/09/2011 (valid till 29/09/2014)
Company performing the calibration	Endress + Hauser (NABL accredited)	Endress + Hauser (NABL accredited)

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P<sub>steam</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “T<sub>FWB</sub>” (°C)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The pressure transmitter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Boiler operating hours of the Project activity in year y “h<sub>y</sub>”</b>
Value	Ex-ante
	Ex-post
Measuring / Monitoring frequency	Daily (Boiler operating hours is monitored by SCADA system based on the operating hours of the draft fan of the boiler)
Reporting frequency	Monthly

<b>Data / Parameter (as in the MP)</b>	<b>Boiler operating hours of the Project activity in year y “h<sub>y</sub>”</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No
Population Size	NA
Sample Size	NA
Confidence level	NA
Margin of error	NA
Recording (Manually / electronically / ...)	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA
Period of operating time	01/06/2012 to 31/08/2012
Instrument type	NA
Manufacturer, model and serial number	NA
Specific location	NA
Calibration dates	NA
Company performing the calibration	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA
Is calibration valid for the whole reporting period?	NA
Maintenance	NA



Data / Parameter (as in the MP)	Boiler operating hours of the Project activity in year y “h <sub>y</sub> ”
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes
Key reporting risks	Low risk

**Monitoring parameters for 8 TPH Boiler:**

Data / Parameter (as in the MP)		Quantity of steam produced by an existing renewable energy unit “Q <sub>steam,old,u</sub> ” (Tonnes)	Quantity of steam generated by additional renewable energy unit at an existing renewable energy production facility “Q <sub>steam,add,u</sub> ” (Tonnes)
Value	Ex-ante	26,072 per annum	36,971 per annum
	Ex-post	3,515.12	5,412.05
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of steam produced by an existing renewable energy unit “<math>Q_{\text{steam,old,u}}</math>” (Tonnes)</b>	<b>Quantity of steam generated by additional renewable energy unit at an existing renewable energy production facility “<math>Q_{\text{steam,add,u}}</math>” (Tonnes)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the quantity of steam delivered by the project is measured by duly calibrated steam flow meter and the calibration certificate has been verified. Further, the verification team cross-checked the quantity of steam delivered by the project activity during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the steam temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Steam flow meter Sr. No.: EC03DD20000	Steam flow meter Sr. No.: E8010120000
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+/- 2.3% Maximum (which is better than that stated in the CPA-DD of +/-3%)	+/- 2.3% Maximum (which is better than that stated in the CPA-DD of +/-3%)
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	Steam flow meter	Steam flow meter
Manufacturer, model and serial number	Make: Endress + Hauser; Sr. No.: EC03DD20000	Make: Endress + Hauser; Sr. No.: E8010120000
Specific location	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler
Calibration dates	25/01/2012 (valid till 24/01/2015)	23/09/2011 (valid till 22/09/2014)
Company performing the calibration	Manufacturer Endress + Hauser (NABL accredited)	Manufacturer Endress + Hauser (NABL accredited)

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of steam produced by an existing renewable energy unit “<math>Q_{\text{steam,old,u}}</math>” (Tonnes)</b>	<b>Quantity of steam generated by additional renewable energy unit at an existing renewable energy production facility “<math>Q_{\text{steam,add,u}}</math>” (Tonnes)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The Steam flow meter was functional throughout the monitoring period	The Steam flow meter was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average Steam Temperature at MSSV (Main steam stop valve) outlet of an existing renewable energy production facility “T <sub>steam,old,y</sub> ” (kg/cm <sup>2</sup> g)	Average Steam Temperature at MSSV (Main steam stop valve) outlet of additional renewable energy unit (Boiler) at an existing renewable energy production facility “T <sub>steam,add,y</sub> ” (kg/cm <sup>2</sup> g)
Value	Ex-ante	183.20	183.20
	Ex-post	171.81 <sup>80</sup>	172.57 <sup>81</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically

<sup>80</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

<sup>81</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Temperature at MSSV (Main steam stop valve) outlet of an existing renewable energy production facility “T<sub>steam,old,y</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Average Steam Temperature at MSSV (Main steam stop valve) outlet of additional renewable energy unit (Boiler) at an existing renewable energy production facility “T<sub>steam,add,y</sub>” (kg/cm<sup>2</sup> g)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the steam temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	RTD Sr. No.: EC03DD20000	RTD Sr. No.: E8010120000
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class A (which is better than Class B as stated in the CPA-DD)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	RTD	RTD
Manufacturer, model and serial number	Make: Endress + Hauser; Sr. No.: EC03DD20000	Endress + Hauser; Sr. No. E8010120000
Specific location	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler	Project site, after the boiler feed water tank at the inlet of the boiler
Calibration dates	25/01/2012 (valid till 24/01/2015)	23/09/2011 (valid till 22/09/2014)
Company performing the calibration	Manufacturer Endress + Hauser (NABL accredited)	Endress + Hauser (NABL accredited)

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Temperature at MSSV (Main steam stop valve) outlet of an existing renewable energy production facility “T<sub>steam,objd,y</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Average Steam Temperature at MSSV (Main steam stop valve) outlet of additional renewable energy unit (Boiler) at an existing renewable energy production facility “T<sub>steam,add,y</sub>” (kg/cm<sup>2</sup> g)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The RTD was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet of an existing renewable energy production facility “P <sub>steam,old,y</sub> ” (kg/cm <sup>2</sup> g)	Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet of additional renewable energy unit (boiler) at an existing renewable energy production facility “P <sub>steam,add,y</sub> ” (kg/cm <sup>2</sup> g)
Value	Ex-ante	10	10
	Ex-post	8.06 <sup>82</sup>	8.30 <sup>83</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		As per the monitoring plan of the included CPA-DD, the steam pressure is measured by duly calibrated pressure transmitter and the calibration certificate has been verified. Further, the verification team cross-checked the steam pressure during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the steam pressure is measured by duly calibrated pressure transmitter and the calibration certificate has been verified. Further, the verification team cross-checked the steam pressure during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.

<sup>82</sup> The value is the weighted average of the daily recorded pressure readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily pressure readings was reported in the published MR which is incorrect. The CAR was closed after the pressure was revised as the weighted average of the daily readings during the monitoring period

<sup>83</sup> The value is the weighted average of the daily recorded pressure readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily pressure readings was reported in the published MR which is incorrect. The CAR was closed after the pressure was revised as the weighted average of the daily readings during the monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet of an existing renewable energy production facility “P<sub>steam,qld,y</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet of additional renewable energy unit (boiler) at an existing renewable energy production facility “P<sub>steam,add,y</sub>” (kg/cm<sup>2</sup> g)</b>
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Pressure transmitter Sr. No. E8004221129	Pressure transmitter Sr. No. F1000E21129
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+/- 0.15% (which is better than 2% as stated in the CPA-DD)	+/- 0.15% (which is better than 2% as stated in the CPA-DD)
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	Pressure transmitter	Pressure transmitter
Manufacturer, model and serial number	Endress + Hauser; Sr. No. E8004221129	Endress + Hauser; Sr. No. F1000E21129
Specific location	Project site, at the Main Steam Stop Valve (MSSV)	Project site, at the Main Steam Stop Valve (MSSV)
Calibration dates	30/08/2011 (valid till 29/08/2014)	17/01/2012 (valid till 16/01/2015)
Company performing the calibration	Endress + Hauser (NABL accredited)	Endress + Hauser (NABL accredited)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The pressure transmitter was functional throughout the monitoring period	The pressure transmitter was functional throughout the monitoring period



<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet of an existing renewable energy production facility “P<sub>steam,qld,y</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet of additional renewable energy unit (boiler) at an existing renewable energy production facility “P<sub>steam,add,y</sub>” (kg/cm<sup>2</sup> g)</b>
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Average Feed Water Temperature at inlet an existing renewable energy production facility (boiler) “T<sub>FWB,,old,y</sub>” (°C)</b>	<b>Average Feed Water Temperature at inlet of additional renewable energy unit (boiler) at an existing renewable energy production facility “T<sub>FWB,,add,y</sub>”</b>
Value	Ex-ante	70
	Ex-post	67.99 <sup>84</sup>
Measuring / Monitoring frequency	Continuous	Continuous
Reporting frequency	Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA

<sup>84</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

<sup>85</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Average Feed Water Temperature at inlet an existing renewable energy production facility (boiler) “T<sub>FWB,,old,y</sub>” (°C)</b>	<b>Average Feed Water Temperature at inlet of additional renewable energy unit (boiler) at an existing renewable energy production facility “T<sub>FWB,,add,y</sub>”</b>
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the feed water temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the feed water temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	RTD E80080142EA	RTD E8007C142EA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class A (which is better than Class B as stated in the CPA-DD)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	RTD	RTD
Manufacturer, model and serial number	Endress + Hauser; Sr. No. E8004221129	Endress + Hauser; Sr. No. E8007C142EA
Specific location	Project site, after the boiler feed water tank at the inlet of the boiler	Project site, after the boiler feed water tank at the inlet of the boiler
Calibration dates	30/09/2011 (29/09/2014)	22/09/2011 (valid till 21/09/2014)
Company performing the calibration	Endress + Hauser (NABL accredited)	Endress + Hauser (NABL accredited)

<b>Data / Parameter (as in the MP)</b>	<b>Average Feed Water Temperature at inlet an existing renewable energy production facility (boiler) “T<sub>FWB,,old,y</sub>” (°C)</b>	<b>Average Feed Water Temperature at inlet of additional renewable energy unit (boiler) at an existing renewable energy production facility “T<sub>FWB,,add,y</sub>”</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The RTD was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>		<b>Boiler operating hours of the existing renewable facility in year a y “h<sub>,old,y</sub>” (hours)</b>	<b>Boiler operating hours of the renewable energy unit in a year y “h<sub>,add,y</sub>” (hours)</b>
Value	Ex-ante	7,200 per annum	7,200 per annum
	Ex-post	1,192	1,422
Measuring / Monitoring frequency		Daily	Daily
Reporting frequency		Monthly	Monthly

<b>Data / Parameter (as in the MP)</b>	<b>Boiler operating hours of the existing renewable facility in year y “h<sub>old,y</sub>” (hours)</b>	<b>Boiler operating hours of the renewable energy unit in a year y “h<sub>add,y</sub>” (hours)</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA

Data / Parameter (as in the MP)	Boiler operating hours of the existing renewable facility in year y “h <sub>old,y</sub> ” (hours)	Boiler operating hours of the renewable energy unit in a year y “h <sub>add,y</sub> ” (hours)
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

**Monitoring parameters for 6 TPH and 8 TPH Boilers:**

Data / Parameter (as in the MP)		Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q <sub>ob,k</sub> ” (Tonnes)	Quantity of subsequent delivery of fuel type k biomass at the Project site “Q <sub>np,k</sub> ” (Tonnes)
Value	Ex-ante	NA	NA
	Ex-post	145.44	1,955
Measuring / Monitoring frequency		At the start of the monitoring period	Data is monitored and recorded for each truck delivery
Reporting frequency		Once during the monitoring period	Each truck trip
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		The opening balance of the biomass is measured by a calibrated weighbridge	Biomass procured is measured for each truck entering the plant premises by a calibrated weighbridge
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Weighbridge; Sr. No. 950094510	Weighbridge; Sr. No. 950094510

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department , Govt. of India. Hence the accuracy class is deemed acceptable)	Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department , Govt. of India. Hence the accuracy class is deemed acceptable)
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	Weighbridge	Weighbridge
Manufacturer, model and serial number	EDPL; Sr. No. 950094510	EDPL; Sr. No. 950094510
Specific location	At project site	At project site
Calibration dates	03/03/2012 (valid till 02/03/2013)	03/03/2012 (valid till 02/03/2013)
Company performing the calibration	Weights and Measure Department, Govt. of India	Weights and Measure Department, Govt. of India
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The weighbridge was functional throughout the monitoring period	The weighbridge was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site " $Q_{in,k}$ " (Tonnes)	Quantity of biomass fuel type k consumed during the monitoring period " $Q_{c,k}$ " = " $FC_{biomass,k,y}$ " (Tonnes)
Value	Ex-ante	-	21,924 per annum
	Ex-post	129.86	1,971; For 6 TPH Boiler : 778 For 8 TPH Boiler : 1,193
Measuring / Monitoring frequency		Measured at the end of the monitoring period	Calculated from the opening, received and closing balance of the biomass during the monitoring period
Reporting frequency		Once during the monitoring period	At the end of the monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		The closing balance of the biomass is measured by a calibrated weighbridge	The quantity of biomass consumed is cross- checked with the invoices obtained from the fuel supplier and found to match
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Weighbridge; Sr. No. 950094510	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department , Govt. of India. Hence the accuracy class is deemed acceptable)	NA
Period of operating time		01/06/2012 to 31/08/2012	NA
Instrument type		Weighbridge	NA
Manufacturer, model and serial number		EDPL; Sr. No. 950094510	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Specific location	At project site	NA
Calibration dates	03/03/2012 (valid till 02/03/2013)	NA
Company performing the calibration	Weights and Measure Department, Govt. of India	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The weighbridge was functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q<sub>ob,i</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i “Q<sub>np,i</sub>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	0
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA



<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q<sub>ob,i</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i “Q<sub>np,i</sub>” (Tonnes)</b>
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site " $Q_{in,i}$ " (Tonnes)	Quantity of fossil fuel type i consumed during the monitoring period " $Q_{c,i}$ " = " $FC_{i,PJ,y}$ " (Tonnes)
Value	Ex-ante	-	0
	Ex-post	0	0
Measuring / Monitoring frequency		Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site "<math>Q_{in,i}</math>" (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period "<math>Q_{c,i}</math>" = "<math>FC_{i,PJ,y}</math>" (Tonnes)</b>
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity "<math>NCV_k</math>" (TJ/Gg)</b>	<b>Percentage of hydrogen in biomass fuel "Hydrogen" (%)</b>
Value	Ex-ante	11.85
	Ex-post	11.50
		- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency	Annually once	Annually once
Reporting frequency	Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	NA

<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “NCV<sub>k</sub>” (TJ/Gg)</b>	<b>Percentage of hydrogen in biomass fuel “Hydrogen” (%)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	The NCV analysis is carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Percentage of Oxygen in biomass fuel “Oxygen” (%)	Moisture content of the biomass residues “Moisture”
Value	Ex-ante	31.2	9.8

Data / Parameter (as in the MP)		Percentage of Oxygen in biomass fuel "Oxygen" (%)	Moisture content of the biomass residues "Moisture"
	Ex-post	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency		Annually once	Annually once
Reporting frequency		Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA
Company performing the calibration		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen” (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/Gg)</b>
Value	Ex-ante
	Ex-post
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA
Population Size	NA
Sample Size	NA
Confidence level	NA
Margin of error	NA
Recording (Manually / electronically / ...)	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/Gg)</b>
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA
Period of operating time	NA
Instrument type	NA
Manufacturer, model and serial number	NA
Specific location	NA
Calibration dates	NA
Company performing the calibration	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA
Is calibration valid for the whole reporting period?	NA
Maintenance	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA
Key reporting risks	NA

Data / Parameter (as in the MP)		Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC <sub>PJ,j,y</sub> ” (MWh)	Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC <sub>EL,j,y</sub> ” (MWh)
Value	Ex-ante	For 6 TPH: 523.4 per annum For 8 TPH: 765.1 per annum	0
	Ex-post	91.32 For 6 TPH : 31.97 For 8 TPH : 59.35	0 (during this monitoring there was no captive fossil fuel electricity consumption for the auxiliary of the two project boilers)
Measuring / Monitoring frequency		Continuous	NA
Reporting frequency		Monthly	Monthly However, CAR 02 was raised as the recording frequency of the monitoring parameter “EC <sub>EL,j,y</sub> ” has not been stated in the MR. CAR was closed after revision in the MR.
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	NA
Does monitoring of the parameter involve sampling? (yes / no)		No	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	NA
QA/QC How are values verified? (Cross-checked, double- checked,...)		The auxiliary electricity is measured by a calibrated energy meter	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Energy Meters; For 6TPH boiler - Sr. No. 1L262663 For 8 TPH boiler - Sr. No. 11262653	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		Class 1 (which is better than Class 2 stated in the CA-DD)	NA
Period of operating time		01/06/2012 to 31/08/2012	NA



<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,i,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,i,y</sub>” (MWh)</b>
Instrument type	Energy Meter	NA
Manufacturer, model and serial number	6 TPH – SOCOMEC Sr. No. 1L262663  8 TPH - HPL SOCOMEC Sr. No. 1L262653	NA
Specific location	Project site	NA
Calibration dates	For 6 TPH – 30/04/2012 (valid till 29/04/2013) For 8 TPH - 30/04/2012 (valid till 29/04/2013)	NA
Company performing the calibration	TVL Electricals (Approved by Government of Andhra Pradesh and calibration is traceable to international standard and hence deemed acceptable)	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	As per the CPA-DD, calibration frequency should be as per manufacturer’s specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The energy meters were functional throughout the monitoring period.	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	NA
Key reporting risks	Low risk	NA

Data / Parameter (as in the MP)		Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD <sub>y</sub> ” (km)	Number of truck trips during the year y “N <sub>y</sub> ”
Value	Ex-ante	-	-
	Ex-post	13.11	265 For 6 TPH : 105 For 8 TPH : 160
Measuring / Monitoring frequency		Continuous at each trip	Continuous at each trip
Reporting frequency		Calculated at the end of the monitoring period	Calculated at the end of monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the invoices and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

	Verified situation	Conclusion
<b>SECTION 4. Compliance with the calibration frequency requirements for measuring instruments</b>		
The “Monitoring Parameters and Calibration Checklist” in section 3 above shall be checked to determine if the calibration frequency specified in the applied monitoring methodology and/or monitoring plan is followed in the monitoring report and in the monitoring activities. Where a failure to comply with the required frequency is detected, or no frequency is mentioned in the monitoring report, please follow the checklist below:		
<p>4-1. If the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (that is, the results of delayed calibration are available), confirm that the following conservative approach has been adopted in the calculation of emission reductions:</p> <ul style="list-style-type: none"> <li>- If the delayed calibration did not show any errors in the measuring equipment, or the error was smaller than the maximum permissible error, have the PPs applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> <li>- If the delayed calibration identified an error greater than the maximum permissible error, have the PPs applied the error identified in the delayed calibration test to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> </ul> <p>Confirm that the error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer emission reductions being claimed;</p>	No delayed calibration was noted during this monitoring period. Hence this is not applicable.	NA

	Verified situation	Conclusion
<p>4-2. If the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification:</p> <ul style="list-style-type: none"> <li>i. Request the PPs to conduct the required calibration;</li> <li>j. On receipt of the calibration results, determine whether the PPs have calculated the emission reductions conservatively using the approach mentioned in section 4.1 above.</li> </ul>	Not Applicable.	NA
<p>4-3. If it is not possible for the PPs to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of the PPs, check if the PPs have prepared a temporary deviation or a 'Permanent changes from the monitoring plan and/or monitoring methodology application'.</p> <p>Follow the requirements for post registration changes in sections 3.10 to 3.19 above.</p>	Not Applicable.	NA
<p>4-4. If neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipment, determine whether the equipment is calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification. If neither local/national standards nor the manufacturer's specification are available, international standards may be used.</p>	Not Applicable.	NA

	Verified situation	Conclusion
<b>SECTION 5. Assessment of data and calculation of emission reductions</b>		
<p>5-1. Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in line with the formulae and methods described in the monitoring plan and the applied methodology document?</p> <p>Check consistency in the ERs spreadsheet.</p>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and the applicable methodological tools for the project activity are as follows:</p> <p><b><u>Baseline emissions:</u></b></p> <p><b><u>For 6 TPH boiler:</u></b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity = 782.36 tCO<sub>2</sub> – Calculation shown below</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity = 8.741 TJ – Calculation shown below</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant as per the included CPA-DD = 89.5 tCO<sub>2</sub>/TJ</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity as per the included CPA-DD = 100%</p> $EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}$ <p>where</p> <p><math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{steam}</math> = Quantity of steam supplied in Tonnes = 3515.12 Tonnes</p>	<p>CAR-04 CL-08 CL-02 OK</p>

	Verified situation	Conclusion
	<p> <math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet  = 662.07 kCal/kg  <math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg) = 67.99 kCal/kg    <math>EG_{thermal} = 3515.12 * (662.07 - 67.99) * 4.186 * 10^{-6}</math>    = 8.741 TJ    Note: Steam enthalpy is calculated at the weighted average steam pressure during the monitoring period from standard steam table for saturated steam. Similarly the enthalpy of the boiler feed water is determined at the weighted average feed water temperature during the monitoring period. The verification team independently calculated the steam enthalpy at the average steam pressure of 8.06 kg/cm<sup>2</sup> g using the web site - <a href="http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp">http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp</a> ; and found the steam enthalpy as 661.48 kCal/kg. Hence the enthalpy used by the CME is conservative.    Therefore,  <math>BE_{thermal,CO2,y} = 8.74/100\% * 89.5</math>  = 782.36 tCO<sub>2</sub>    <b><u>For 8 TPH boiler:</u></b>    <math>EG_{thermal,add,y} = EG_{thermal,pj,y} - EG_{thermal,old,y}</math>    <math>EG_{thermal,add,y}</math> = Net increase in thermal energy generation at existing plant in year y that should be considered as energy baseline (<math>EG_{BL}</math>) (TJ)  <math>EG_{thermal,pj,y}</math> = Total actual thermal energy produced in year y by all units, existing and new Project units (TJ)  <math>EG_{thermal,old,y}</math> = Estimated thermal energy that would have been produced by </p>	

	Verified situation	Conclusion
	<p>existing units (installed before the Project activity) in year y in the absence of the Project activity; TJ</p> <p>The value <math>EG_{thermal,old,y}</math> is given by</p> $EG_{thermal,old,y} = \text{MAX} (EG_{thermal,actual,y}, EG_{thermal,estimated,y})$ <p><math>EG_{thermal,actual,y}</math> = The actual, measured thermal energy production of the existing units in year y (TJ)  <math>EG_{thermal,estimated,y}</math> = The estimated thermal energy that would have been produced by the existing units under the observed availability of the renewable resource for year y (TJ)</p> <p><math>EG_{thermal,actual,y} = 8.741 \text{ TJ}</math></p> <p><math>EG_{thermal,estimated,y} = 16.15 \text{ TJ}</math></p> <p><math>EG_{thermal,estimated,y}</math> is calculated based on the rated capacity of the existing boiler, its operational hours in this monitoring period and specific enthalpy of evaporation at atmospheric pressure.  Thus,  <math display="block">EG_{thermal,old,y} = \text{MAX} (EG_{thermal,actual,y}, EG_{thermal,estimated,y}) = 16.15 \text{ TJ}.</math></p> $EG_{thermal,PJ,y} = Q_{steam, add} * (H_s - H_w) * 4.186 \times 10^{-6} + EG_{thermal,old,y}$ <p><math>EG_{thermal,PJ,y}</math> = Net quantity of heat supplied by the Project activity  <math>Q_{steam}</math> = Quantity of steam supplied in Tonnes  <math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet (kCal/kg)  <math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg)  <math>EG_{thermal,actual,y}</math> is determined from Plant record  <math>EG_{thermal,estimated,y}</math> is determined from the rated capacity (output) and the operating parameter of the existing Boiler</p>	



	Verified situation	Conclusion
	<p> <math>Q_{\text{Steam,add,y}} : 5,412.05 \text{ Tonnes}</math>  <math>H_{\text{s,add,y}} : 6,62.31 \text{ kCal/Kg}</math>  <math>H_{\text{w,add,y}} : 70.52 \text{ kCal/Kg}</math>  <math>\eta_{\text{BL,Thermal}} : 100\%</math>  <math>EF_{\text{FF,CO}_2} : 89.5 \text{ tCO}_2/\text{TJ}</math> </p> <p> <math>EG_{\text{thermal,PJ,y}} = (5,412.05 * (662.31 - 70.52) * 4.186 \times 10^{-6}) + (3515.12 * (662.07 - 67.99) * 4.186 \times 10^{-6})</math>  <math>= 13.41 + 8.741</math>  <math>= 22.15 \text{ TJ.}</math> </p> <p>Therefore,</p> <p> <math>EG_{\text{thermal,add,y}} = EG_{\text{thermal,PJ,y}} - EG_{\text{thermal,old,y}}</math>  <math>= 22.15 - 16.15</math>  <math>= 6.00 \text{ TJ}</math> </p> <p>The Baseline is calculated as per the paragraph 15 of the methodology <math>EG_{\text{thermal,y}}</math>  <math>= EG_{\text{thermal,add,y}}</math></p> <p>Hence;</p> <p> <math>BE_{\text{thermal,CO}_2,y} = (6.00 / 100 \%) * 89.5</math>  <math>= 536.96 \text{ tCO}_2</math> </p> <p>Thus total <math>BE_{\text{thermal,CO}_2,y} = (782.36 + 536.96)</math>  <math>= 1,319.33 \text{ tCO}_2</math></p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p><u>For 6 TPH boiler:</u></p> <p> <math>PE_{\text{EC,y}} = EC_{\text{PJ,j,y}} * EF_{\text{grid,CM,y}} * (1 + \text{TDL}_{\text{j,y}}) + EC_{\text{EL,j,y}} * EF_{\text{EL,j,y}} * (1 + \text{TDL}_{\text{j,y}})</math> </p> <p><math>EC_{\text{PJ,j,y}} = \text{Auxiliary Electricity Consumption of the Project activity from the Grid} =</math></p>	

	Verified situation	Conclusion
	<p>40.33 MWh</p> <p><math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) = 0 MWh</p> <p><math>EF_{grid,CM,y}</math> = Ex-ante Grid Emission Factor = 0.860 tCO<sub>2</sub>/MWh</p> <p><math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l) = 1.3 tCO<sub>2</sub>/MWh</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j as per the included CPA-DD = 20%</p> <p><math>PE_{EC,y} = 40.33 * 0.860 * (1+20\%) + 0 * 1.30 * (1+20\%)</math>  <math>= 41.62 \text{ tCO}_2</math></p> <p><u>For 8 TPH boiler:</u></p> <p><math>PE_{EC,y} = EC_{PJ,j,y} * EF_{grid,CM,y} * (1+TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1+TDL_{j,y})</math></p> <p><math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid = 72.17 MWh</p> <p><math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) = 0 MWh</p> <p><math>EF_{grid,CM,y}</math> = Ex-ante Grid Emission Factor = 0.860 tCO<sub>2</sub>/MWh</p> <p><math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l) = 1.3 tCO<sub>2</sub>/MWh</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j as per the included CPA-DD = 20%</p> <p><math>PE_{EC,y} = 72.17 * 0.860 * (1+20\%) + 0 * 1.30 * (1+20\%)</math>  <math>= 74.48 \text{ tCO}_2</math></p>	

	Verified situation	Conclusion
	<p>Hence total project emissions due to electricity consumption</p> $PE_{EC,y} = 41.62 + 74.48 = 116.10 \text{ tCO}_2$ <p><u>Project emissions from fossil fuel combustion</u></p> $PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}$ <p>where  <math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p><math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr) = 0 Tonnes  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)</p> <p><math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math>  Where  <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)</p> <p>The boiler of this project is Huskpac type which means there is no possibility of firing fossil fuel (coal) in this boiler. Hence no Project emissions due to fossil fuel combustions are there for this CPA.</p> <p><math>PE_{FC,j,y} = 0</math></p> <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math>  = 116.10 + 0 = 116.10 tCO<sub>2</sub></p>	

	Verified situation	Conclusion
	<p><b><u>Leakage:</u></b></p> $LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}$ $= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVDC_{c,y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km, CO2}$ <p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p><math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p>This CPA does not involves usage of any processed biomass (rice husk is the biomass residue used in the project boiler). Hence leakage emission due to processing biomass is not applicable.</p> <p>Again the biomass used in the project is not transported from beyond 200 km of the project site (biomass transported from within a distance of 14 km). Hence leakage emission due to transportation of biomass is neglected.</p> <p>Thus <math>LE_y = 0</math></p> <p>Emission reductions are calculated as follows:</p> $ER_y = BE_y - PE_y - LE_y$ $= 1319.33 - 116.10 - 0 = 1202 \text{ tCO}_2 \text{ (rounded down value)}$ <p>However, the following CAR/CLs were raised:</p> <p>CAR 04#1 was raised as non consideration of leakage due to processing and transportation (where availability of surplus biomass is more than 25%) for the CPA was not justified in the MR. The finding was successfully closed after appropriate revision in the MR / ER spreadsheet.</p>	

	Verified situation	Conclusion
	<p>CL 08 was raised as the ER calculation spreadsheet provided for the CPA had not included daily monitored data for steam quantity, temperature, pressure and feed water temperature to calculate the average of these parameters. ER calculation spreadsheet was adequately revised and the CL was closed.</p> <p>CL 02#2 was raised as, for the parameter "<math>TD_{L,i,y} = TD_{L,j,y}</math>", it was stated in the MR that it is used for Leakage emission calculation. But this parameter is also used for the calculation of project emission. CL was closed after appropriate revision in the MR.</p>	
<p>5-2. Has the calculation tool been correctly documented? Check its consistency and formulae.</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	The Monitoring Report is supported by Micro Soft excel based spreadsheet for the calculation of emission reductions. The consistency and formula were verified and found to be accurate.	OK
<p>5-3. Is a complete set of data available during the specified monitoring period? If only partial data is available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan proceed as follows:</p> <ol style="list-style-type: none"> <li>a. Check if sections 3.11 and/or 3.12 above are applicable and raise a CAR for the PPs to comply with these requirements.</li> <li>b. If sections 3.11 and 3.12 are not applicable or the answer to this question remains NO, a request for deviation is necessary.</li> </ol> <p>Conduct an assessment of the potential impacts of these changes in accordance to the procedures for Post Registration Changes.</p>	Yes, the complete data set was available during the specified monitoring period.	OK

	Verified situation	Conclusion
<p>5-4. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?</p> <p>Please describe how LRQA has cross-checked reported data.</p>	All the information provided in the Monitoring Report were cross-checked with the Plant log book records, purchase records (for biomass and fossil fuel), site visit and interview of the CPA implementer/CME.	OK
5-5. Have any assumptions used in emission calculations been justified?	All assumptions in the emission reduction calculation are consistent with assumptions taken in the registered monitoring plan and have reference to the applied methodology.	OK
5-6. Have appropriate emission factors, IPCC default values, and other reference values been correctly applied?	<p>The CME has applied the appropriate ex-ante fixed factors as stated in the included CPA-DD like:</p> <ul style="list-style-type: none"> <li>• The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity (<math>\eta_{BL,thermal}</math>)</li> <li>• CO<sub>2</sub> Emission Factor of the fossil fuel that would have been used in the baseline plant (<math>EF_{FF,CO_2}</math>)</li> <li>• Surplus availability of Biomass within identified region (<math>SA_k</math>)</li> <li>• Ex-ante Grid Emission Factor in a year y.</li> <li>• Emission Factor for fossil fuel based electricity generation for source j and/or l in year y (<math>EF_{EL,j,y} = EF_{EL,l,y}</math>)</li> <li>• Auxiliary Electricity Consumption for biomass processing, outside Project boundary. (<math>EC_{LE,l,y}</math>)</li> <li>• Average CO<sub>2</sub> emission factor for the trucks measured during the year y (<math>EF_{km,CO_2}</math>)</li> <li>• Average technical transmission and distribution losses for providing electricity to source l and/or j in year y (<math>TDL_{l,y} = TDL_{j,y}</math>)</li> <li>• Specific energy consumption of fuel type j of the Project activity in year y (<math>SEC_{PJ,j,y,measured}</math>)</li> </ul> <p>CL 02#3 was raised for the CME to clarify the appropriateness of the “Source of data” and “Additional comment” as stated in the MR for the parameters in section D.1, which are fixed ex-ante at the time of validation of the CPA.</p> <p>MR suitably revised and the CL was closed.</p>	CL 02 OK

## 7.10 Appendix C8: Verification Protocol for CPA 4041-0011

	Verified situation	Conclusion
<b>SECTION 1. Project implementation in accordance with the registered PoA-DD &amp; CPA-DD</b>		
<b>General description of the project</b>		
1.1. Does the MR provide general information of the CPA and is it as per the CPA-DD included by CDM-EB or by a DOE <sup>86</sup> ?	<p>Yes, the Monitoring Report<sup>87</sup> provides the general information of the CPA. Details such as Title of the CPA, UNFCCC registration reference number, version number of the Monitoring Report, monitoring period, project participants, sectoral scope and estimated amount of GHG emission reductions. All the above details can be confirmed from the included CPA-DD through link in UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=DKWA3ERVNJ2S71089QG65IHP4OLMTX">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=DKWA3ERVNJ2S71089QG65IHP4OLMTX</a></p> <p>Title of the CPA is “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 010)” and it was included in the PoA on 31/05/2012 applying the baseline and monitoring methodology AMS-I.C, version 16 “Thermal energy production with or without electricity” as verified from the project page of the CPA. The project activity applies AMS-I.C, version 16. The project activity is installation and operation of one 8 TPH boiler and one 0.4 million kCal/hour thermic fluid heater (rice husk) fired to meet the captive requirement of steam in Manufacture of vegetable oil by solvent extraction of soya bean seeds, ground nut seeds, Mustard Seeds etc.. The project is located in Sri Ganganagar, Rajasthan. The project is implemented by Shree GRG Oil Mill.</p>	OK
1.2. Is the general information provided in the MR in line with the PoA-DD registered by CDM-EB?	<p>Yes, the Monitoring Report is as per the PoA-DD registered by CDM-EB confirmed from the registered PoA-DD through link on UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=DKWA3ERVNJ2S71089QG65IHP4OLMTX">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=DKWA3ERVNJ2S71089QG65IHP4OLMTX</a></p>	OK
1.3. Is the Monitoring report as per the standardised format (F-CDM-MR)? (EB 66 )	Yes, the Monitoring Report is as per the latest standardised format (F-CDM-MR) version 02.0 (EB66, Annex 20).	OK
1.4. Is the monitoring report filled as per the "Guidelines for completing the monitoring report	Yes, the MR is filled up as per the latest “Guidelines for completing the Monitoring Report form” EB 66, Annex 20.	<del>CAR-08</del> OK

<sup>86</sup> The first CPA is included by the CDM-EB along with registered PoA-DD and subsequent CPAs are included by DOEs.

<sup>87</sup> Monitoring Report for this CPA (CPA 4041-0011) refers to the Appendix-8 of the consolidated MR Version 4.0

	Verified situation	Conclusion
form" (EB 66, Annex 20).	CAR 08 was raised as project page of the PoA on UNFCCC web site, the "Other Parties involved" is stated as "United Kingdom of Great Britain and Northern Ireland" and "Germany". But in the MR "Germany" is missing. CAR was closed as the MR was suitably revised.	
1.5. Is there any open issue in the validation / previous verification including FARs? (CDM VVS para. 213)	No No FAR was raised in the Validation report during the CPA inclusion by TUV Nord, the DOE for validation of the CPA. Further this being the first periodic verification, no open issues exists from earlier verification.	OK
<b>Implementation status of the CPA</b>		
1.6. Is the CPA location indicated same as that in the included CPA-DD? Confirm geographical coordinates	Yes, the project location is same as stated in the CPA-DD and this was verified during the on-site visit. The geographical coordinates of the project site are 29.8668° (29° 52' 00.50") North, 73.9239° (73° 55' 26.17") East. This was cross-checked from the Google Earth web site.	OK
1.7. Is the project boundary described in the same way as the included CPA-DD and registered PoA-DD? Please confirm each component based on the applied methodology.	Yes, the project boundary is described in the same way as in the included CPA-DD and registered PoA-DD. During the on-site assessment it was also confirmed the project boundary is in line with the applied methodology. The project boundary for this CPA includes the biomass storage area and feeding system, boiler house and the facility which is consuming the heat generated by the project.	OK
1.8. Has on-site fossil fuel consumption, if any, been monitored? Is any emission source missed? Check the site lay-out and confirm through site tour.	Fossil fuel consumption is required to be monitored in this project. It has been confirmed during the on-site visit and document review that no fossil fuel has been consumed at the CPA site by the project during the monitoring period. The verification team did not find any emission source attributable to the project activity which has been missed out and the same was confirmed during the on-site visit and review of the site lay-out diagram.	OK
1.9. Confirm contractors for equipment and installation works	It is confirmed that the project equipment i.e., one 8 TPH boiler and one 0.4 million kCal/hour heater, for the project, is supplied by Thermax Limited and this was confirmed during the on-site visit interview with the project implementer and from the purchase order copies of the boiler and heater issued by the project implementer dated 28/11/2008.	OK
1.10. Confirm conformance with baseline and monitoring methodology - Applicability	Conformance to the applicable methodology conditions for the CPA are as follows:	OK



	Verified situation		Conclusion
conditions. Please refer to the complete description of the applicability conditions and confirm that the CPA meets all the requirements.	<b>Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)</b>	<b>Means of Verification and Results</b>	
	<i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>	The project activity comprises renewable biomass fired boiler and heater that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.	
	<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>	The total installed / rated capacity of the project equipment is 5.48 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .	
	<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>	The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.	
	<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>	The project does not use any charcoal.	
	The verification team confirms that the CPA conforms to all applicable condition of the applied methodology.		

	Verified situation	Conclusion
	Apart from the baseline and monitoring methodology applicability criteria as stated above, the verification team also verified the eligibility criteria stated in section B.2 of the included CPA-DD under "Monitoring Criteria" for the point numbers 1, 3.3, 3.4, 3.5, 16, 17 and 18 and found these to be valid for the project activity during the monitoring period. A declaration letter dated 11/12/2012 in this respect has also been submitted by the CME.	
1.11. Confirm use or no use of public funding and determine if there is no diversion of ODA to the CPA.	There is no use of public funding for the CPA. The same was confirmed during the interview with the CME and also a declaration in this respect has been provided by the CPA implementer.	OK
1.12. Check data in the MR and in the CPA-DD. Describe data and variables that are different from that stated in the included CPA-DD and cause an increase in emission reductions estimations.	<p>Data in the MR and CPA-DD fixed at validation stage are found to be consistent.</p> <p>The ex-ante estimated emission reductions during this monitoring period of 92 days are 3,258 tCO<sub>2</sub> (12928/365*92) and the actual emission reductions during this monitoring period are 2,021 tCO<sub>2</sub>. Hence the actual emission reductions during this monitoring are less than the estimated values as per the CPA-DD.</p> <p>However, CL 02 was raised as for the parameters like "CAP<sub>boiler</sub>" and "SEC<sub>PJ,y,measured</sub>", it was stated that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation. The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p>	CL-02 OK
1.13. By means of an on-site visit: Is the general information of the project provided in the Monitoring Report and is it as per the CPA-DD included by CDM-EB or by a DOE? List each technical component and equipment and check design parameters and actual status of installation and / or	<p>Yes.</p> <p>The on-site visit for the CPA was conducted on 07/11/2012.</p> <p>The project activity comprises of the installation and operation of one 8 TPH and one 0.4 million kCal/hour biomass (rice husk) fired boiler and heater respectively to meet the captive requirement of steam at the project site.</p> <p>During the verification, by the observation of equipment, interviews with relevant staff and the checking of technical specifications of main components, it was confirmed that the project activity has been implemented as described in the included CPA-DD.</p>	CAR-01 CAR-03 OK

<sup>88</sup> The sampling shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified situation	Conclusion
<p>operation.</p> <p>Please check to ensure that all physical features of the proposed CPA in the registered/included CPA-DD are in place and the PP has operated the proposed CPA as per the included CPA-DD.</p> <p>It may include but not limited to:</p> <ul style="list-style-type: none"> <li>the actual capacity and output</li> <li>plant load factor</li> <li>type of feedstock</li> <li>operation of other components / units within the project boundary which could affect functioning of the project plant.</li> </ul> <p>In cases where there are a large number of components and equipment items and the check of all of them is not an available option, then a random sampling check shall be performed. Justify here the sample chosen and describe the results.<sup>88</sup></p>	<p>The project is operational. The 8 TPH boiler was commissioned on 08/08/2009 and the 0.4 million kCal/hour heater was commissioned on 23/09/2009 and the same was verified from the commissioning certificate issued by Thermax Limited.</p> <p>No change from the included CPA-DD of physical features which may impact the emission reduction of the project activity has been identified.</p> <ul style="list-style-type: none"> <li><u>Heat generation units :</u> <ol style="list-style-type: none"> <li><u>8 TPH boiler</u> Net enthalpy supply by boiler : The ex-ante estimated annual enthalpy output from the project boiler is 144.507 TJ as per the included CPA-DD (which corresponds to 36.42 TJ for 92 days of this monitoring period) whereas actual enthalpy supplied by the boiler during this monitoring period was 20.81 TJ which is less than the ex-ante estimated value.</li> <li><u>0.4 million kCal/hour heater</u> Net enthalpy supply by heater : The ex-ante estimated annual enthalpy output from the project boiler is 13.395 TJ as per the included CPA-DD (which corresponds to 3.376 TJ for 92 days of this monitoring period) whereas actual enthalpy supplied by the boiler during this monitoring period was 1.22 TJ which is less than the ex-ante estimated value.</li> </ol> </li> <li>Type of biomass fired in the boiler / heater : As per the included CPA-DD, renewable biomass residue rice husk and / or mustard husk is to be fired in boiler and rice husk in Heater and it was noted that there was no deviation in the biomass firing during the monitoring period.</li> <li>As per the included CPA-DD, the project may fire fossil fuel (Coal) in the boiler. During this monitoring period, no fossil fuel has been fired in the project boiler/ heater as confirmed by the project implementer during the site visit.</li> </ul> <p>100% data is monitored for the CPA and hence no sampling plan is applicable.</p> <p>However, CAR 01 was raised as in section B.1 of the MR, the downtime time of the project boilers is not provided. Details are provided in the revised MR and the CAR was closed.</p> <p>Further, CAR 03 was raised as PP has considered a simple average of steam pressure, temperature and boiler feed water enthalpy, which are used for the calculation of net enthalpy supplied by the project boiler, which is not correct. The calculation approach was revised and a weighted average</p>	

	Verified situation	Conclusion
	was considered for emission reduction. The CAR 03 was successfully closed.	
1.14. Have responsibilities for monitoring been described and specified?	<p>The responsibilities of monitoring have been provided and described in the Monitoring Report. The Monitoring Report and CDM documents clearly describe the responsibilities for monitoring.</p> <p>The project owner has identified the CDM team, the structure of which is given in Monitoring Report. During the verification, responsibilities for operational personnel, technical and support team have been verified and confirmed.</p> <p>The CDM team has been assigned the responsibility for measuring, recording and storage of the measured data. Data is kept in electronic format and paper format.</p>	OK
1.15. Are the responsibilities and authorities for monitoring and reporting in line with those stated in the monitoring plan of the included CPA-DD?	Yes, responsibilities and authorities for monitoring and reporting are in accordance with included CPA-DD.	OK
<p>1.16. Check QA/QC, management systems. Are procedures described and specified in the MR? Are they consistently applied as described in the MP?</p> <p>a. documented instructions, management manual</p> <p>b. documentation</p> <p>c. data archiving</p> <p>d. monitoring report</p> <p>e. cross-checking</p> <p>f. energy balance analysis (as relevant)</p> <p>g. internal audits / verification and management review</p>	<p>QA/QC procedures include staff training, instrument calibration, cross-checking and data/documents archiving. They are consistent with the monitoring plan.</p> <p>The Monitoring Report describes the monitoring system, monitoring procedures, data collection and reporting, responsibilities of relevant staff/departments, calibrations that were implemented and QA/QC procedures including data cross-checking.</p> <p>By means of document review, onsite assessment and interviews, the verification team has confirmed that all the QA/QC measures, data archiving, monitoring report and internal audits are as per the registered monitoring plan of the registered PoA-DD and the included CPA-DD.</p> <p>However, CL 03 was raised as the "QA/QC procedure" &amp; "Purpose of data" for the quantity of biomass in MR was mentioned as "NA" and the same is not consistent with the monitoring plan of the included CPA-DD. Monitoring and recording frequency of these parameters were not mentioned in the MR. Also the values for these parameters as stated in the MR was incorrect as verified during the on-site visit and also with the documents provided.</p> <p>The MR was suitably revised to close the finding.</p>	<p><del>CL-03</del></p> <p>OK</p>
1.17. Have the procedures for emergency and abnormal	As stated in section C of the MR, the procedure for non-conformance and corrective actions is in place for the project activity to mitigate any emergency and abnormal situations in monitoring as per	<p><del>CAR-07</del></p> <p>OK</p>

	Verified situation	Conclusion
situations been established?	<p>the included CPA-DD.</p> <p>During the monitoring period, no emergency situation in monitoring has occurred.</p> <p>However, CAR 07 was raised as the CME needed to clarify why the details of the backup monitoring instruments (for steam pressure and temperature and feed water temperature) were not being provided in the MR. Adequate justification was provided by the CME and the CAR was closed.</p>	
1.18. Has the system for qualification and training been established as relevant for the monitoring and management activities?	<p>The training and qualification of the project personnel has also been confirmed during interview of the operational personnel during the on-site visit. It is confirmed that they have sufficient knowledge, experience and competency to implement and maintain the plant operation including data monitoring and recording in line with boiler operation and maintenance manual provided by the boiler supplier, and with CDM requirements.</p> <p>This is further verified by the evidence for training of the project personnel and the boiler attendants' certificates issued by Directorate of Steam Boilers (Government agency) for the boiler operators.</p>	OK
1.19. Check the environmental report, license, permit and compliance to the local environmental legislation (if relevant).	The verification team has confirmed that the project meets the relevant local environmental legislation. The same was confirmed from the copy of the consent to operate issued by Rajasthan Pollution Control Board valid from 22/06/2010 to 31/05/2013. Also copy of boiler certificate valid from 20/07/2011 to 02/07/2012 and from 30/07/2012 to 02/07/2013 (the CPA implementer had made the application for renewal of the certificate on 28/06/2012 and hence deemed acceptable) issued by Directorate of Steam Boilers Department has been submitted for the operation of the boiler.	OK
1.20. Check contribution to sustainable development, comparing those expected in the included CPA-DD and the actual status.	<p>With the provision of employment opportunities by the project activity, there has been a contribution for the social and economic well-being of some local people.. The project utilises renewable biomass to produce steam (thereby avoiding the fossil fuel usage) and this leads to environment well being by reduced environmental impact from fossil fuel use. Also the project uses renewable biomass technology which is deemed as a clean (as it displaces fossil fuel usage) and safe technology.</p> <p>Even though the sustainable development measures were not registered in the CPA-DD as a monitoring parameter, it was confirmed during the site visit that the CPA contributes to the sustainable development of the host country.</p>	OK
1.21. Check issues with local stakeholders, claims, complaints, etc.	It was confirmed by on-site interviews that there had been no claims and complaints from local stakeholders prior to the verification visit.	OK

	Verified situation	Conclusion	
1.22. If from the above assessment the conclusion is that the implementation or operation of the CPA does not conform with the description contained in the included CPA-DD and/or corrections have been made to project information or parameters fixed at validation/inclusion, determine if these changes and/or corrections do not require prior approval by the board: <ul style="list-style-type: none"><li>- A request of approval is required if the boundary of a registered CDM PoA is changed to include an additional host party, in accordance with the project cycle procedure.</li><li>- A request for approval is required if the CME of a registered CDM PoA changes after the registration of the PoA.</li><li>- Any corrections to project information of an included CPA that do not affect the design of the project activity do not require prior approval by the Board.</li><li>- A request for approval is required if any of the three issues below is adversely impacted by the identified changes to the project design.</li></ul>			
1.23. The applicability and application of the applied methodology under which the CPA has been included:  Check if the project boundary has changed and if any of the parameters to assess the applicability conditions have changed.	No change in applicability and application of the applied methodology AMS-I.C. version 16, including the project boundary, is observed.	YES	NO
			X
1.24. Compliance of the included CPA to eligibility criteria as defined in the registered PoA-DD.  Check if any of the parameters to assess the PoA eligibility criteria have changed.	No change in the eligibility criteria of the registered CPA, as defined in the registered PoA-DD, is observed.	YES	NO
			X
1.25. The additionality of the project activity:  Check if any of the input parameters to the investment analysis have changed. For barrier analysis, check if any information or data used in the	There is no change in the project design parameters as the project is implemented as per the included CPA-DD. Hence this is not applicable.	YES	NO
			X

	Verified situation	Conclusion	
barrier analysis has changed.			
1.26. The scale of the project activity. Check if the project is still small scale or large scale after the implementation of the changes.	Small scale, as per the eligibility criteria for CPA inclusion and is in accordance with the methodology AMS-I C, version 16.	YES	NO
			X
If the answer to any of the above items is YES, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
1.27. If, from the above assessment, the conclusion is that the changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	

		Verified Situation	Conclusion
<b>SECTION 2. Compliance of the Monitoring Plan with the Monitoring Methodology including applicable Tool(s)</b>			
2.1. Is the monitoring plan of the included CPA-DD in accordance with the applied methodology?	Yes, it is confirmed that monitoring plan of the included CPA-DD is in accordance with the applied methodology, AMS-I.C, version 16.		OK
2.2. If the methodology provides different options (for example, use of default values or on-site measurements), has the Monitoring Report specified which option is used?	<p>Yes,</p> <p>The ex-ante parameters which are fixed for the crediting period at the time of CPA inclusion in the PoA as per the methodological tools are:</p> <ul style="list-style-type: none"> <li>• <math>CAP_{\text{boiler}}</math> (Rated capacity (thermal output) of the boiler of the Project activity)</li> <li>• <math>CAP_{\text{heater}}</math> (Rated capacity (thermal output) of the heater of the project activity)</li> <li>• <math>\eta_{\text{BL,thermal}}</math> (The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity)</li> <li>• <math>EF_{\text{FF,CO}_2}</math> (<math>\text{CO}_2</math> Emission Factor of the fossil fuel (Indian Coal) that would have been used in the baseline plant)</li> <li>• <math>SA_k</math> (Surplus availability of Biomass within 50 km radial distance)</li> <li>• <math>EF_{\text{grid,CM,y}}</math> (Ex-ante Grid Emission Factor in a year y)</li> <li>• <math>EF_{\text{EL,j,y}}</math> (Emission Factor for fossil fuel based electricity generation for source j in year y)</li> <li>• <math>EF_{\text{km,CO}_2}</math> (Average <math>\text{CO}_2</math> emission factor for the trucks measured during the year y)</li> <li>• <math>TDL_{i,y}</math> (Average technical transmission and distribution losses for providing electricity to source j in year y)</li> <li>• <math>Cp_{i,\text{out}}</math> (Specific heat of the heat transfer fluid at heater outlet)</li> <li>• <math>\delta_{i,\text{out}}</math> (Density of heat transfer fluid at <math>T_{\text{out}}</math> temperature of the heater (<math>\text{kg/m}^3</math>))</li> <li>• <math>SEC_{\text{PJ,j,y,measured}}</math> (Specific energy consumption of fuel type j of the Project activity in year y)</li> </ul> <p>Further, the verification team confirms that there is no deviation in the values of the ex-ante fixed parameters between the included CPA-DD and the MR.</p> <p>The parameters being monitored ex-post as per the monitoring methodology and the CPA-DD are:</p> <ul style="list-style-type: none"> <li>• Quantity of steam supplied in year y (<math>Q_{\text{steam}}</math>)</li> <li>• Average Steam Temperature at MSSV (Main steam stop valve) outlet during year (<math>T_{\text{steam}}</math>)</li> </ul>		OK



	Verified Situation	Conclusion
	<ul style="list-style-type: none"> <li>• Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year (<math>P_{\text{steam}}</math>)</li> <li>• Average Feed Water Temperature at inlet of boiler (<math>T_{\text{FWB}}</math>)</li> <li>• Flow of heat transfer fluid at the heater outlet (<math>Q_{\text{flow}}</math>)</li> <li>• Average Inlet Temperature of the heat transfer fluid at the inlet of the heater (<math>T_{\text{in}}</math>)</li> <li>• Average Temperature of the heat transfer fluid at the outlet of the heater (<math>T_{\text{out}}</math>)</li> <li>• Boiler / Heater operating hours of the project activity in year <math>y</math> (<math>h_y</math>)</li> <li>• Quantity of stored fuel type biomass rice husk on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob, rice husk}}</math>)</li> <li>• Quantity of stored fuel type biomass mustard husk on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob, mustard husk}}</math>)</li> <li>• Quantity of subsequent delivery of fuel type rice husk biomass at the Project site (<math>Q_{\text{np, rice husk}}</math>)</li> <li>• Quantity of subsequent delivery of fuel type mustard husk biomass at the Project site (<math>Q_{\text{np, mustard husk}}</math>)</li> <li>• Quantity of remaining biomass fuel type rice husk available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in, rice husk}}</math>)</li> <li>• Quantity of remaining biomass fuel type mustard husk available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in, mustard husk}}</math>)</li> <li>• Quantity of biomass fuel type rice husk consumed during the monitoring period (<math>Q_{\text{c, rice husk}}</math>)</li> <li>• Quantity of biomass fuel type rice husk consumed during the monitoring period for boiler (<math>Q_{\text{c, rice husk, B, y}}</math>)</li> <li>• Quantity of biomass fuel type rice husk consumed during the monitoring period for Heater (<math>Q_{\text{c, rice husk, H, y}}</math>)</li> <li>• Quantity of biomass fuel type mustard husk consumed during the monitoring period for boiler (<math>Q_{\text{c, mustard husk}}</math>)</li> <li>• Quantity of stored fuel type fossil (Coal) <math>i</math> on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob, i}}</math>) **</li> <li>• Quantity of subsequent delivery of fuel type fossil fuel (Coal) <math>i</math> (<math>Q_{\text{np, i}}</math>) **</li> <li>• Quantity of remaining fossil fuel type (Coal) <math>i</math> available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in, i}}</math>) **</li> </ul>	

	Verified Situation	Conclusion
	<ul style="list-style-type: none"> <li>Quantity of fossil fuel type i (Coal) consumed during the monitoring period (<math>Q_{c,i} = FC_{j,PJ,y}</math>) **</li> <li>Quantity of fossil fuel type I consumed during the monitoring period for boiler (<math>Q_{c,i,B}</math>) **</li> <li>Quantity of fossil fuel type I consumed during the monitoring period for heater (<math>Q_{c,i,H}</math>) **</li> <li>Net calorific value of rice husk used in the Project activity (<math>NCV_{rice\ husk}</math>) *</li> <li>Net calorific value of mustard husk used in the Project activity (<math>NCV_{mustard\ husk}</math>) *</li> <li>Percentage of hydrogen in biomass fuel rice husk (<math>Hydrogen_{rice\ husk}</math>) *</li> <li>Percentage oxygen in Biomass fuel rice husk (<math>Oxygen_{rice\ husk}</math>) *</li> <li>Moisture content of the biomass residues rice husk (<math>Moisture_{rice\ husk}</math>) *</li> <li>Percentage of hydrogen in biomass fuel rice husk (<math>Hydrogen_{mustard\ husk}</math>) *</li> <li>Percentage oxygen in Biomass fuel rice husk (<math>Oxygen_{mustard\ husk}</math>) *</li> <li>Moisture content of the biomass residues rice husk (<math>Moisture_{mustard\ husk}</math>) *</li> <li>Weighted average net calorific value of the fuel type i in year y (<math>NCV_{i,y}</math>) **</li> <li>Quantity of fossil fuel type i consumed in a process j during the year y (<math>FC_{i,j,y}</math>)</li> <li>Auxiliary Electricity Consumption of the Project activity from the Grid in year y (<math>EC_{PJ,j,y}</math>)</li> <li>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) in a year y (<math>EC_{EL,j,y}</math>)</li> <li>Average return trip distance (from and to) between the source of the biomass (rice husk) and the site of the Project plant during the year y (<math>AVD_{y, rice\ husk}</math>)</li> <li>Number of truck trips during the year y rice husk (<math>N_{y, rice\ husk}</math>)</li> <li>Average return trip distance (from and to) between the source of the biomass (mustard husk) and the site of the Project plant during the year y (<math>AVD_{y, mustard\ husk}</math>)</li> <li>Number of truck trips during the year y mustard husk (<math>N_{y, mustard\ husk}</math>)</li> <li>Weighted average CO<sub>2</sub> emission factor of fuel type i in year y (<math>EF_{CO2,i,y}</math>) **</li> </ul> <p>These parameters are based on on-site measurement and have been verified during this verification.</p> <p>* The laboratory report has directly provided the value of NCV. Hence Hydrogen, Oxygen and moisture are not required (which would be required in case NCV was not provided to be calculate NCV from GCV and the above three parameters)</p> <p>** No fossil fuel has been fired in the project boiler during this monitoring period</p>	

	Verified Situation	Conclusion
2.3. Is all data collected and archived according to the tables in the applied Monitoring Methodology and is this included in the Monitoring Plan?	Yes, all the data is collected and archived in accordance to methodology and included in the monitoring plan. All the data will be archived until 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.	OK
2.4. Check the calculation of emission reductions following the applied methodology: <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and applied for the project activity are as follows:</p> <p><b><u>Baseline emissions:</u></b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity during the year y (tCO<sub>2</sub>)</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity during the year y (TJ)</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant; tCO<sub>2</sub> / TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity</p> <p><b><u>For Boiler:</u></b></p> $EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}$	<p>GL-01</p> <p>OK</p>

	Verified Situation	Conclusion
	<p>where</p> <p><math>EG_{\text{thermal}}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{\text{steam}}</math> = Quantity of steam supplied in Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet (kCal/kg)</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg)</p> <p><b><u>For Heater:</u></b></p> <p><math>EG_{\text{thermal}} = Q_{\text{flow}} * Cp_{\text{out}} * \delta_{\text{out}} * (T_{\text{out}} - T_{\text{in}}) * 4.186 \times 10^{-6}</math></p> <p><math>Q_{\text{flow}}</math> Flow of heat transfer fluid at the heater outlet (<math>m^3</math>).</p> <p><math>Cp_{\text{out}}</math> The specific heat of heat transfer fluid at <math>T_{\text{out}}</math> temperature (kCal/kg. <math>^{\circ}\text{C}</math>).</p> <p><math>\delta_{\text{out}}</math> Density of heat transfer fluid at <math>T_{\text{out}}</math> temperature of the heater (<math>kg/m^3</math>).at the outlet of the heater (<math>kg/m^3</math>).</p> <p><math>T_{\text{out}}</math> Temperature of the heat transfer fluid at the outlet of the heater (<math>^{\circ}\text{C}</math>).</p> <p><math>T_{\text{in}}</math> Temperature of the heat transfer fluid at the inlet of the heater (<math>^{\circ}\text{C}</math>).</p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p><math>PE_{EC,y} = EC_{PJ,j,y} * EF_{\text{grid},CM,y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})</math></p> <p><math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid in year y</p> <p><math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set)</p> <p><math>EF_{\text{grid},CM,y}</math> (Ex-ante Grid Emission Factor in a year y)</p> <p><math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l</p>	

	Verified Situation	Conclusion
	<p>and/or j in year y</p> <p><u>Project emissions from fossil fuel combustion</u></p> $PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}$ <p>where</p> <p><math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p><math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)</p> <p><math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)</p> <p><math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math></p> <p>Where</p> <p><math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)</p> <p><math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)</p> <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math></p> <p><u>Leakage:</u></p> $LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}$ $= EC_{LE,l,y} * EF_{EL,l,y} * (1+TDL_{l,y}) + N_{c,y} * AVDC_{y} * EF_{km,CO2} + N_{y} * AVD_{y} * EF_{km, CO2}$ <p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption in year y (tCO<sub>2</sub>/yr)</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p><math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p><math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source l in year y as a result of leakage (MWh/yr)</p>	

		Verified Situation	Conclusion
	<p> <math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source <math>l</math> in year <math>y</math> (tCO<sub>2</sub>/MWh)  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source <math>l</math> in year <math>y</math>  <math>N_{c,y}</math> = Number of truck trips for collecting loose biomass during the year <math>y</math>  <math>AVDc_{,y}</math> = Average round trip distance between the biomass fuel supply sites and biomass collection site during the year <math>y</math>  <math>EF_{km,CO_2}</math> = Average CO<sub>2</sub> emission factor for the trucks measured during year <math>y</math>  <math>N_{,y}</math> = Number of truck trips during the year <math>y</math>  <math>AVD_{,y}</math> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant during year <math>y</math> (km)  Emission reductions are calculated as follows:  <math>ER_y = BE_y - PE_y - LE_y</math> </p> <p>However, CL 01 was raised as in section E.5 of the MR, the calculation of the ex-ante emission reductions is not transparently presented. The revised MR clearly and transparently describes the ER calculation approach providing relevant equations in line with the included CPA-DD.</p>		
2.5. List any monitoring aspect that is not specified in the methodology and check its compliance with the Monitoring Plan, for example:	<ul style="list-style-type: none"> <li>• additional monitoring parameters</li> <li>• monitoring frequency</li> <li>• calibration frequency.</li> </ul>	<p>No additional monitoring parameter is identified that is not specified in the approved methodology and the included CPA-DD available in the project page on UNFCCC website.</p> <p>The monitoring frequency and the calibration frequency specified are not less than the requirements of the approved methodology and the Monitoring plan in the included CPA-DD.</p>	OK

		Verified Situation	Conclusion
<b>SECTION 3. Compliance of Monitoring activities with the Monitoring Plan of the included CPA-DD</b>			
<p>3-1. Is the Monitored Data included in the Monitoring Report as per the Monitoring Plan or any accepted revised MP?</p> <p>3-2. Has the data been generated at the frequency required by the Monitoring Plan or any accepted revised MP?</p>	<p>Yes</p> <p>The monitored data included in section D.2 of the MR is as per the monitoring plan of the included CPA-DD.</p> <p>The values are indicated in the section D.2 of the Monitoring Report. At the site visit it was verified that data was generated at the required frequency as per the monitoring plan in the included CPA-DD.</p>		OK
<p>3-3. Has the monitoring been implemented in accordance with the monitoring plan contained in the included CPA-DD or any accepted revised MP?</p> <p>Confirm that the monitoring and reporting procedures have been implemented as documented and follow by PPs.</p>	<p>Yes, by means of document review, on-site assessment and interviews with the plant personnel, it was confirmed that the monitoring has been implemented in accordance with the monitoring plan contained in the included CPA-DD.</p> <p>It was also established that monitoring and reporting procedures have been implemented as documented by the CME and the CPA operator</p>		OK
<p>3-4. Have types of measurement instrumentation used been described and specified?</p>	<p>Yes the MR specifies and describes the use of different measurement instruments (Steam flow meter, RTD / Temperature gauge, Pressure transmitter / Pressure gauge, energy meter and weighbridge). The details of the measuring equipment are provided in the "Annex-1_4041-0011: Instrument Details" of the MR. The provided details have been verified during the on-site visit.</p>		OK
<p>3-5. Is the accuracy of equipment used for monitoring sufficient and regularly controlled and calibrated in line with the registered monitoring plan or any accepted revised MP?</p> <p>Check relevance of maintenance and calibration included in the monitoring plan.</p>	<p>Yes, the verification team confirmed through the on-site assessment and the review of evidence that the installation of the measuring devices has been completed and the equipment has been operated and maintained in normal operating conditions.</p> <p>The accuracy classes of all the monitoring equipment are found as per the monitoring plan of the included CPA-DD, or of higher accuracy as detailed in "Annex-1_4041-0011: Instrument Details" of the MR.</p> <p>It was confirmed that the information of the meters was consistent with that described in the Monitoring Report.</p>		<p>CL-07</p> <p>OK</p>

	Verified Situation	Conclusion
Check relevance of laboratory analysis if included in the monitoring plan.	<p>The CME has provided the calibration certificates of all the monitoring equipment and the verification team confirms the certificates to be appropriate and relevant.</p> <p>For further details of the calibration of the monitoring equipment please refer to section 3.19 of this report below.</p> <p>Nevertheless, CL 07 was raised as CME had not provided the credentials of the calibrating agencies and the laboratories, which have carried out the NCV analysis. Adequate information was provided by the CME and the CL was closed. For details please refer to Appendix D of this report.</p>	
3-6. If the monitoring plan of the CPA-DD refers to a sampling plan and monitoring is carried out for the chosen samples, ensure that the sampling is carried out as per the sampling plan <sup>89</sup> .	The monitoring plan of the CPA-DD does not refer to a sampling plan and the monitoring is carried out for 100% data for all the monitoring parameters.	NA
<p>3-7. Check that responsibilities and authorities for monitoring and reporting are in line with the monitoring plan.</p> <p>Are the monitoring results consistently recorded, reviewed and approved as stated in the CPA-DD or any accepted revised MP?</p>	<p>Yes</p> <p>During the site visit, monitoring and reporting procedures were confirmed by the verification team through interview with the relevant plant personnel, CME and by document review.</p> <p>However, the following CAR/CL were raised and successfully closed;</p> <ul style="list-style-type: none"> <li>CAR 02 was raised as the opening readings of the parameter “Q<sub>steam</sub>” and closing readings of the parameters “EC<sub>PJ,j,y</sub>” and “EC<sub>EL,j,y</sub>” have not been presented to the verification team.</li> <li>CL 02 was raised as for the parameters like “CAP<sub>boiler</sub>” and “SEC<sub>PJ,y,measured</sub>”, the CME had stated in the MR that these were used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not used for baseline emission calculation.</li> </ul> <p>The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p>	<p>CAR 02</p> <p>CL 02</p> <p>OK</p>

<sup>89</sup> The sampling plan shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"



	Verified Situation	Conclusion
<p>3-8.Reporting period: Defined? If a monitoring period of a parameter more / less than a year is applied, check if the monitoring is in a complete and consistent manner? Is the monitoring period within the crediting period of the CPA and length of the registered PoA?</p>	<p>The monitoring period for the PoA is from 12/01/2011 to 31/08/2012. But for the CPA, the emission reduction starts from 01/06/2012 (i.e., the date of start of crediting period of the CPA) till 31/08/2012. Hence the monitoring period for the CPA is for 92 days which is less than a year. However, monitoring of all the parameters is complete, as there is no specific requirement in the methodology for annual reporting of any data. The verification team therefore, confirms the monitoring to be complete and consistent and clearly defined in the MR.</p> <p>The monitoring period is within the crediting period of the CPA and also the length of the registered PoA.</p> <p>Nevertheless, CL 09 was raised as the monitoring period of the CPA is not consistent with that of the PoA in the webhosted MR. The issue has been addressed and the finding was successfully closed.</p>	<p>CL-09 OK</p>
<p>3-9.If the monitoring plan includes the determination of environmental and / or social indicators, have the sustainable development indicators been monitored in accordance with the monitoring plan of the included CPA-DD?</p>	<p>Not applicable</p>	<p>NA</p>
<p>3-10. Check monitoring of Environmental and Social indicators (if relevant)</p> <ul style="list-style-type: none"> <li>• implementation of measures</li> <li>• monitoring equipment</li> <li>• quality assurance procedures</li> <li>• external data.</li> </ul>	<p>Not applicable</p>	<p>NA</p>

		Verified Situation		Conclusion	
SECTION 2 and 3: Post Registration Changes					
3-11. If, from the above assessment in SECTIONS 2 and 3, the conclusion is that there are temporary deviations or permanent changes from the registered Monitoring Plan or Monitoring Methodology, determine if these deviations or changes require prior approval by the EB by answering the questions below. All the answers to the applicable questions below shall be explained and the reasons for each conclusion given in the “Verified situation” column.					
Temporary deviations from the registered monitoring plan or applied methodology: Prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES.					
3-12. Have the PPs reported as zero any parameter related to baseline GHG emissions that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?	No temporary deviation is sought during this monitoring period	YES		NO	
		-		-	
3-13. Have the PPs estimated	No temporary deviation is sought during this monitoring period	YES		NO	

		Verified Situation	Conclusion	
(assuming that the source of the project GHG emissions operated at maximum capacity for the full period of the missing data) any parameter that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?  For project GHG emissions related to the consumption of electricity, the estimate shall include an addition of 10% to account for transmission and distribution losses.			-	-
<b>Permanent changes from the registered monitoring plan or applied methodology</b>				
If the monitoring equipment actually installed has a lower accuracy level than the accuracy stipulated in the applied methodology and/or in the registered monitoring plan, and the monitoring equipment is under the control of the project participants, prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES:				
3-14. Have the PPs deducted from the measured value, for any parameter used for calculating baseline GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period		YES	NO
			-	-
3-15. Have the PPs added to the measured value, for any parameter used for calculating project GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period		YES	NO
			-	-

	Verified Situation	Conclusion
Changes to the monitoring of the included CPA of a type listed below do not require approval by the EB. Confirm in the conclusion column that the change is of the type in the table below and explain the reasons.		
3-16. Change of calibration frequency or practice for monitoring equipment not within the control of project participants	Not Applicable	NA
3-17. Change of accuracy / type / model of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA
3-18. Change of location of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA
If the answer to any of the above items has been that approval from the EB is required, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.		
3-19. If, from the above assessment, the conclusion is that the temporary deviations or permanent changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA

### 3.19 Monitoring Parameters and Calibration Checklist:

Complete the following table for each parameter:

Data / Parameter (as in the MP)		Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Value	Ex-ante	58,740 per annum	207.47
	Ex-post	8354.35	191.24 <sup>90</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		As per the monitoring plan of the included CPA-DD, the quantity of steam delivered by the project is measured by duly calibrated steam flow meter and the calibration certificate has been verified. Further, the verification team cross-checked the quantity of steam delivered by the project activity during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the steam temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.

<sup>90</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of steam supplied in year y “Q<sub>steam</sub>” (Tonnes)</b>	<b>Average Steam Temperature at MSSV (Main steam stop valve) outlet “T<sub>steam</sub>” (°C)</b>
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Steam flow meter Sr. No.: E8010420000	RTD Sr. No.: E8010420000 <sup>91</sup>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+/- 2.3% Maximum (which is better than that stated in the CPA-DD of +/-3%)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	Steam flow meter cum RTD	Steam flow meter cum RTD
Manufacturer, model and serial number	Make: Endress + Hauser; Sr. No.: E8010420000	Make: Endress + Hauser; Sr. No.: E8010420000
Specific location	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler
Calibration dates	23/09/2011 (valid till 22/09/2014)	23/09/2011 (valid till 22/09/2014)
Company performing the calibration	Manufacturer Endress + Hauser (NABL accredited)	Manufacturer Endress + Hauser (NABL accredited)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes

<sup>91</sup> A consolidated monitoring equipment is used by the CPA operator, which has inbuilt feature for measuring the both steam flow and the steam temperature. This was confirmed during the on-site visit and verification of the technical specification of the measuring equipment.

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of steam supplied in year y “Q<sub>steam</sub>” (Tonnes)</b>	<b>Average Steam Temperature at MSSV (Main steam stop valve) outlet “T<sub>steam</sub>” (°C)</b>
Maintenance	The Steam flow meter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P<sub>steam</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “T<sub>FWB</sub>” (°C)</b>
Value	Ex-ante	17.5
	Ex-post	12.45 <sup>92</sup>
Measuring / Monitoring frequency	Continuous	80
Reporting frequency	Daily	70.62 <sup>93</sup>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Continuous
Does monitoring of the parameter involve sampling? (yes / no)	No	Daily
Population Size	NA	Yes
Sample Size	NA	No
Confidence level	NA	NA

<sup>92</sup> The value is the weighted average of the daily recorded pressure readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily pressure readings was reported in the published MR which is incorrect. The CAR was closed after the pressure was revised as the weighted average of the daily readings during the monitoring period

<sup>93</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “<math>P_{\text{steam}}</math>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “<math>T_{\text{FWB}}</math>” (°C)</b>
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the steam pressure is measured by duly calibrated pressure transmitter and the calibration certificate has been verified. Further, the verification team cross-checked the steam pressure during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the feed water temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Pressure transmitter Sr. No. E8002B21129	RTD Sr. No. E8007D142EA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+/- 0.15% (which is better than 2% as stated in the CPA-DD)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	Pressure transmitter	RTD
Manufacturer, model and serial number	Endress + Hauser; Sr. No. E8002B21129	Endress + Hauser; Sr. No. E8007D142EA
Specific location	Project site, at the Main Steam Stop Valve (MSSV)	Project site, after the boiler feed water tank at the inlet of the boiler
Calibration dates	22/08/2011 (valid till 21/08/2014)	23/02/2012 (valid till 22/01/2015)
Company performing the calibration	Endress + Hauser (NABL accredited)	Endress + Hauser (NABL accredited)



Data / Parameter (as in the MP)	Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “ $P_{\text{steam}}$ ” (kg/cm <sup>2</sup> g)	Average Feed Water Temperature at inlet of boiler “ $T_{\text{FWB}}$ ” (°C)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it is confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The pressure transmitter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Flow of heat transfer fluid at the heater outlet “ $Q_{\text{flow}}$ ” (m <sup>3</sup> /hr)	Boiler/heater operating hours of the Project activity in year y “ $h_y$ ” (hour)
Value	Ex-ante	-	Boiler: 8000 per anum Heater: 8000 per anum
	Ex-post	Thermic fluid flow has been recorded every 15 minutes to calculate the net enthalpy. For the details of this parameter, the ER spreadsheet may be referred	Boiler: 2,016 Heater: 459
Measuring / Monitoring frequency		Continuous	Daily
Reporting frequency		Monthly	Monthly

<b>Data / Parameter (as in the MP)</b>	<b>Flow of heat transfer fluid at the heater outlet “<math>Q_{flow}</math>” (m<sup>3</sup>/hr)</b>	<b>Boiler/heater operating hours of the Project activity in year y “h<sub>y</sub>” (hour)</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The flow is measured with a calibrated flow meter	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Differential Pressure transmitter	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+/- 0.075 % (which is better than that stated in the CPA-DD of +/-3%)	NA
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	Differential Pressure transmitter	NA
Manufacturer, model and serial number	Rosemount (EMERSON Process Management); Sr. No. 08146022	NA
Specific location	At plant site	NA
Calibration dates	22/11/2011 (valid till 21/05/2013)	NA
Company performing the calibration	EMERSON Process Management (Accredited by National Institute of Standards and Technology, U.S Department of Commerce and hence deemed acceptable)	NA

<b>Data / Parameter (as in the MP)</b>	<b>Flow of heat transfer fluid at the heater outlet “<math>Q_{flow}</math>” (<math>m^3/hr</math>)</b>	<b>Boiler/heater operating hours of the Project activity in year y “<math>h_y</math>” (hour)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that the equipment is to be calibrated every sixteen months. Therefore it is confirmed that the once in sixteen months frequency of calibration is acceptable and is in line with the registered monitoring plan.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The differential pressure transmitter was functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Average Inlet Temperature of the heat transfer fluid at the inlet of the heater “<math>T_{in}</math>” (<math>^{\circ}C</math>)</b>	<b>Average Inlet Temperature of the heat transfer fluid at the outlet of the heater “<math>T_{out}</math>” (<math>^{\circ}C</math>)</b>
Value	Ex-ante	-
	Ex-post	Thermic fluid inlet temperature has been recorded every 15 minutes to calculate the net enthalpy. For the details of this parameter, the ER spreadsheet may be referred
Measuring / Monitoring frequency	Continuous	Continuous
Reporting frequency	Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No

<b>Data / Parameter (as in the MP)</b>	<b>Average Inlet Temperature of the heat transfer fluid at the inlet of the heater “T<sub>in</sub>” (°C)</b>	<b>Average Inlet Temperature of the heat transfer fluid at the outlet of the heater “T<sub>out</sub>” (°C)</b>
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the inlet thermic fluid temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the inlet thermic fluid temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the outlet thermic fluid temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the outlet thermic fluid temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	RTD Sr. No.: RTD-PT-100-3210/RTD-100068	RTD Sr. No.: RTD-PT-100-3210/RTD-100066
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class II (which is equivalent to Class B as stated in the CPA-DD)	Class II (which is equivalent to Class B as stated in the CPA-DD)
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	RTD	RTD
Manufacturer, model and serial number	WAREE	WAREE
Specific location	At the Heater inlet	At the heater outlet
Calibration dates	10/04/2012 (valid till 09/04/2013)	10/04/2012 (valid till 09/04/2013)
Company performing the calibration	Narendra Tanwar, Chartered Engineer, Accredited by Govt. of India and hence deemed competent and acceptable	Narendra Tanwar, Chartered Engineer, Accredited by Govt. of India and hence deemed competent and acceptable

<b>Data / Parameter (as in the MP)</b>	<b>Average Inlet Temperature of the heat transfer fluid at the inlet of the heater “T<sub>in</sub>” (°C)</b>	<b>Average Inlet Temperature of the heat transfer fluid at the outlet of the heater “T<sub>out</sub>” (°C)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The RTD was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k (Rice Husk) on the starting date of this monitoring period measured at the Project site “Q<sub>ob, rice husk</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type rice husk at the Project site “Q<sub>np, rice husk</sub>” (Tonnes)</b>
Value	Ex-ante	NA
	Ex-post	274.89
Measuring / Monitoring frequency	At the start of the monitoring period	Data is monitored and recorded for each truck delivery
Reporting frequency	Once during the monitoring period	Each truck trip

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k (Rice Husk) on the starting date of this monitoring period measured at the Project site "Q<sub>ob, rice husk</sub>" (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type rice husk at the Project site "Q<sub>np, rice husk</sub>" (Tonnes)</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The opening balance of the biomass is measured by calibrated weighbridges	Biomass procured is measured for each truck entering the plant premises by calibrated weighbridges
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge	Weighbridge
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department , Govt. of India. Hence the accuracy class is deemed acceptable)	Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department , Govt. of India. Hence the accuracy class is deemed acceptable)
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	Weighbridge	Weighbridge
Manufacturer, model and serial number	1) Avery India Ltd. EBO5S121 2) TEF Systems - B110325	1) Avery India Ltd. EBO5S121 2) TEF Systems - B110325
Specific location	At project site	At project site
Calibration dates	20/12/2011 (valid till 19/12/2012)	20/12/2011 (valid till 19/12/2012)
Company performing the calibration	Weights and Measure Department, Govt. of India	Weights and Measure Department, Govt. of India

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k (Rice Husk) on the starting date of this monitoring period measured at the Project site "<math>Q_{ob, rice\ husk}</math>" (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type rice husk at the Project site "<math>Q_{np, rice\ husk}</math>" (Tonnes)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The weighbridges were functional throughout the monitoring period	The weighbridges were functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type rice husk available at the end date of each monitored period measured at the Project site "<math>Q_{in, rice\ husk}</math>" (Tonnes)</b>	<b>Quantity of biomass fuel type rice husk consumed during the monitoring period "<math>Q_{c, rice\ husk} = "FC_{biomass, rice\ husk, y}"</math> (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	78.89
Measuring / Monitoring frequency	Measured at the end of the monitoring period	Calculated from the opening, received and closing balance of the biomass during the monitoring period
Reporting frequency	Once during the monitoring period	At the end of the monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type rice husk available at the end date of each monitored period measured at the Project site “<math>Q_{in, rice\ husk}</math>” (Tonnes)</b>	<b>Quantity of biomass fuel type rice husk consumed during the monitoring period “<math>Q_{c, rice\ husk}</math>” = “<math>FC_{biomass, rice\ husk, y}</math>” (Tonnes)</b>
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The closing balance of the biomass is measured by calibrated weighbridge	The quantity of biomass consumed is cross-checked with the invoices obtained from the fuel supplier and found to match
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department , Govt. of India. Hence the accuracy class is deemed acceptable)	NA
Period of operating time	01/06/2012 to 31/08/2012	NA
Instrument type	Weighbridge	NA
Manufacturer, model and serial number	1) Avery India Ltd. EBO5S121 2) TEF Systems - B110325	NA
Specific location	At project site	NA
Calibration dates	20/12/2011 (valid till 19/12/2012)	NA
Company performing the calibration	Weights and Measure Department, Govt. of India	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The weighbridges were functional throughout the monitoring period	NA



<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type rice husk available at the end date of each monitored period measured at the Project site “<math>Q_{in, rice\ husk}</math>” (Tonnes)</b>	<b>Quantity of biomass fuel type rice husk consumed during the monitoring period “<math>Q_{c, rice\ husk}</math>” = “<math>FC_{biomass, rice\ husk, y}</math>” (Tonnes)</b>
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass (Mustard Husk) on the starting date of this monitoring period measured at the Project site “<math>Q_{ob, mustard\ husk}</math>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type mustard husk at the Project site “<math>Q_{np, mustard\ husk}</math>” (Tonnes)</b>
Value	Ex-ante	NA
	Ex-post	1202.59
Measuring / Monitoring frequency	At the start of the monitoring period	Data is monitored and recorded for each truck delivery
Reporting frequency	Once during the monitoring period	Each truck trip
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The opening balance of the biomass is measured by calibrated weighbridges	Biomass procured is measured for each truck entering the plant premises by calibrated weighbridges
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge;	Weighbridge

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass (Mustard Husk) on the starting date of this monitoring period measured at the Project site “Q<sub>ob,mustard husk</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type mustard husk at the Project site “Q<sub>np,mustard husk</sub>” (Tonnes)</b>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable)	Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable)
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	Weighbridge	Weighbridge
Manufacturer, model and serial number	1) Avery India Ltd. EBO5S121 2) TEF Systems - B110325	1) Avery India Ltd. EBO5S121 2) TEF Systems - B110325
Specific location	At project site	At project site
Calibration dates	20/12/2011 (valid till 19/12/2012)	20/12/2011 (valid till 19/12/2012)
Company performing the calibration	Weights and Measure Department, Govt. of India	Weights and Measure Department, Govt. of India
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The weighbridges were functional throughout the monitoring period	The weighbridges were functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Quantity of remaining biomass fuel type mustard husk available at the end date of each monitored period measured at the Project site “ $Q_{in, \text{mustard husk}}$ ” (Tonnes)	Quantity of biomass fuel type k (rice husk) husk consumed during the monitoring period for boiler “ $Q_{c, \text{rice husk}, B}$ ” = “ $FC_{\text{biomass, rice husk}, B, y}$ ” (Tonnes)
Value	Ex-ante	-	-
	Ex-post	1200.10	0
Measuring / Monitoring frequency		Measured at the end of the monitoring period	Calculated from the opening, received and closing balance of the biomass during the monitoring period
Reporting frequency		Once during the monitoring period	At the end of the monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		The closing balance of the biomass is measured by calibrated weighbridges	The quantity of biomass consumed is cross- checked with the invoices obtained from the fuel supplier and found to match
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Weighbridge	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable)	NA
Period of operating time		01/06/2012 to 31/08/2012	NA
Instrument type		Weighbridge	NA
Manufacturer, model and serial number		1) Avery India Ltd. EBO5S121 2) TEF Systems - B110325	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type mustard husk available at the end date of each monitored period measured at the Project site “<math>Q_{in, \text{mustard husk}}</math>” (Tonnes)</b>	<b>Quantity of biomass fuel type k (rice husk) husk consumed during the monitoring period for boiler “<math>Q_{c, \text{rice husk}, B}</math>” = “<math>FC_{\text{biomass, rice husk}, B, y}</math>” (Tonnes)</b>
Specific location	At project site	NA
Calibration dates	20/12/2011 (valid till 19/12/2012)	NA
Company performing the calibration	Weights and Measure Department, Govt. of India	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The weighbridges were functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of biomass fuel type k (rice husk) husk consumed during the monitoring period for heater “<math>Q_{c, \text{rice husk}, H}</math>” = “<math>FC_{\text{biomass, rice husk}, H, y}</math>” (Tonnes)</b>	<b>Quantity of biomass fuel type k (mustard husk) husk consumed during the monitoring period for boiler “<math>Q_{c, \text{mustard husk}, B}</math>” = “<math>FC_{\text{biomass, mustard husk}, y}</math>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	196
Measuring / Monitoring frequency	Calculated at the end of the monitoring period	Calculated at the end of monitoring period
Reporting frequency	Once during the monitoring period	Once during the monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of biomass fuel type k (rice husk) husk consumed during the monitoring period for heater "<math>Q_{c, \text{rice husk}, H} = FC_{\text{biomass, rice husk}, H, y}</math>" (Tonnes)</b>	<b>Quantity of biomass fuel type k (mustard husk) husk consumed during the monitoring period for boiler "<math>Q_{c, \text{mustard husk}, B} = FC_{\text{biomass, mustard husk}, y}</math>" (Tonnes)</b>
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	Calculated value	Calculated value
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of biomass fuel type k (rice husk) husk consumed during the monitoring period for heater "<math>Q_{c, \text{rice husk}, H} = FC_{\text{biomass, rice husk}, H, y}</math>" (Tonnes)</b>	<b>Quantity of biomass fuel type k (mustard husk) husk consumed during the monitoring period for boiler "<math>Q_{c, \text{mustard husk}, B} = FC_{\text{biomass, mustard husk}, y}</math>" (Tonnes)</b>
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site "<math>Q_{ob, i}</math>" (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i "<math>Q_{np, i}</math>" (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	0
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q<sub>ob,i</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i “Q<sub>np,i</sub>” (Tonnes)</b>
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site “Q<sub>in,i</sub>” (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period “Q<sub>c,i</sub>” = “FC<sub>i,PJ,y</sub>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	0
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA
Population Size	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site "<math>Q_{in,i}</math>" (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period "<math>Q_{c,i}</math>" = "<math>FC_{i,PJ,y}</math>" (Tonnes)</b>
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA



Data / Parameter (as in the MP)		Quantity of fossil fuel type i consumed during the monitoring period for boiler " $Q_{c,i,B}$ " = " $FC_{j,PJ,y,B}$ " (Tonnes)	Quantity of fossil fuel type i consumed during the monitoring period for heater " $Q_{c,i,H}$ " = " $FC_{j,PJ,y,H}$ " (Tonnes)
Value	Ex-ante	-	0
	Ex-post	0	0
Measuring / Monitoring frequency		Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA
Company performing the calibration		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period for boiler “<math>Q_{c,i,B}</math>” = “<math>FC_{j,PJ,y,B}</math>” (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period for heater “<math>Q_{c,i,H}</math>” = “<math>FC_{j,PJ,y,H}</math>” (Tonnes)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “<math>NCV_{rice\ husk}</math>” (GJ/tonne)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “<math>NCV_{mustard\ husk}</math>” (GJ/tonne)</b>
Value	Ex-ante	11.85
	Ex-post	13.40
Measuring / Monitoring frequency	Annually once	13.81
Reporting frequency	Annually	14.09
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Annually once
Does monitoring of the parameter involve sampling? (yes / no)	No	Annually
Population Size	NA	Yes
Sample Size	NA	No
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The NCV analysis is carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL	The NCV analysis is carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL

<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “NCV<sub>rice husk</sub>” (GJ/tonne)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “NCV<sub>mustard husk</sub>” (GJ/tonne)</b>
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Hydrogen in rice husk “Hydrogen<sub>rice husk</sub>” (%)</b>	<b>Percentage of Hydrogen in rice husk “Hydrogen<sub>mustard husk</sub>” (%)</b>
Value	Ex-ante	-
	Ex-post	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency	Annually once	Annually once

Data / Parameter (as in the MP)	Percentage of Hydrogen in rice husk “Hydrogen <sub>rice husk</sub> ” (%)	Percentage of Hydrogen in rice husk “Hydrogen <sub>mustard husk</sub> ” (%)
Reporting frequency	Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA

Data / Parameter (as in the MP)	Percentage of Hydrogen in rice husk “Hydrogen <sub>rice husk</sub> ” (%)	Percentage of Hydrogen in rice husk “Hydrogen <sub>mustard husk</sub> ” (%)
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Percentage of Oxygen in biomass fuel rice husk “Oxygen <sub>rice husk</sub> ” (%)	Percentage of Oxygen in biomass fuel mustard husk “Oxygen <sub>mustard husk</sub> ” (%)
Value	Ex-ante	-	-
	Ex-post	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency		Annually once	Annually once
Reporting frequency		Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel rice husk “Oxygen<sub>rice husk</sub>” (%)</b>	<b>Percentage of Oxygen in biomass fuel mustard husk “Oxygen<sub>mustard husk</sub>” (%)</b>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Percentage of moisture in biomass fuel rice husk “Moisture <sub>rice husk</sub> ” (%)	Percentage of moisture in biomass fuel mustard husk “Moisture <sub>mustard husk</sub> ” (%)
Value	Ex-ante	-	-
	Ex-post	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency		Annually once	Annually once
Reporting frequency		Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of moisture in biomass fuel rice husk “Moisture<sub>rice husk</sub>” (%)</b>	<b>Percentage of moisture in biomass fuel mustard husk “Moisture<sub>mustard husk</sub>” (%)</b>
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/Gg)</b>
Value	Ex-ante
	Ex-post
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA
Population Size	NA
Sample Size	NA
Confidence level	NA
Margin of error	NA
Recording (Manually / electronically / ...)	NA



<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/Gg)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA
Period of operating time	NA
Instrument type	NA
Manufacturer, model and serial number	NA
Specific location	NA
Calibration dates	NA
Company performing the calibration	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA
Is calibration valid for the whole reporting period?	NA
Maintenance	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA
Key reporting risks	NA

Data / Parameter (as in the MP)		Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC <sub>PJ,j,y</sub> ” (MWh)	Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC <sub>EL,j,y</sub> ” (MWh)
Value	Ex-ante	-	0
	Ex-post	2.27	0.22
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Monthly	Monthly However, CAR 02 was raised as the recording frequency of the monitoring parameter “EC <sub>EL,j,y</sub> ” has not been stated in the MR. CAR was closed after revision in the MR.
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		The auxiliary electricity is measured by a calibrated energy meter	The auxiliary electricity is measured by a calibrated energy meter
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		Energy Meters; Boiler: Sr. No. - 10895723 Heater: Sr. No. - 10895170	Energy Meters; Boiler: Sr. No. - 10895723 Heater: Sr. No. - 10895170
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		Class 1 (which is better than Class 2 stated in the CA-DD)	Class 1 (which is better than Class 2 stated in the CA-DD)
Period of operating time		01/06/2012 to 31/08/2012	01/06/2012 to 31/08/2012
Instrument type		Energy Meter	Energy Meter

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,i,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,i,y</sub>” (MWh)</b>
Manufacturer, model and serial number	Boiler : Larsen & Toubro; Sr. No. 10895723 Heater : Larsen & Toubro; Sr. No. 10895170	Boiler : Larsen & Toubro ; Sr. No. 10895723 Heater : Larsen & Toubro; Sr. No. 10895170
Specific location	Project site	Project site
Calibration dates	For Boiler – 14/02/2012 (valid till 13/02/2013) For Heater - 23/02/2012 (valid till 22/02/2013)	For Boiler – 14/02/2012 (valid till 13/02/2013) For Heater - 23/02/2012 (valid till 22/02/2013)
Company performing the calibration	L & T (NABL accredited).	L & T (NABL accredited).
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The energy meters were functional throughout the monitoring period.	The energy meters were functional throughout the monitoring period.
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average return trip distance (from and to) between the source of the biomass (rice husk) and the site of the Project plant during the year y “ $AVD_{y, \text{rice husk}}$ ” (km)	Number of truck trips for rice husk during the year y “ $N_{y, \text{rice husk}}$ ”
Value	Ex-ante	-	-
	Ex-post	63.18	200
Measuring / Monitoring frequency		Continuous at each trip	Continuous at each trip
Reporting frequency		Calculated at the end of the monitoring period	Calculated at the end of monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the invoices and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass (rice husk) and the site of the Project plant during the year y “AVD<sub>y, rice husk</sub>” (km)</b>	<b>Number of truck trips for rice husk during the year y “N<sub>y, rice husk</sub>”</b>
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass (mustard husk) and the site of the Project plant during the year y “AVD<sub>y, mustard husk</sub>” (km)</b>	<b>Number of truck trips for mustard husk during the year y “N<sub>y, mustard husk</sub>”</b>
Value	Ex-ante	-
	Ex-post	63
Measuring / Monitoring frequency	Continuous at each trip	Continuous at each trip
Reporting frequency	Calculated at the end of the monitoring period	Calculated at the end of monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass (mustard husk) and the site of the Project plant during the year y “AVD<sub>y, mustard husk</sub>” (km)</b>	<b>Number of truck trips for mustard husk during the year y “N<sub>y, mustard husk</sub>”</b>
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the invoices and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

	Verified situation	Conclusion
<b>SECTION 4. Compliance with the calibration frequency requirements for measuring instruments</b>		
The “Monitoring Parameters and Calibration Checklist” in section 3 above shall be checked to determine if the calibration frequency specified in the applied monitoring methodology and/or monitoring plan is followed in the monitoring report and in the monitoring activities. Where a failure to comply with the required frequency is detected, or no frequency is mentioned in the monitoring report, please follow the checklist below:		
<p>4-1. If the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (that is, the results of delayed calibration are available), confirm that the following conservative approach has been adopted in the calculation of emission reductions:</p> <ul style="list-style-type: none"> <li>- If the delayed calibration did not show any errors in the measuring equipment, or the error was smaller than the maximum permissible error, have the PPs applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> <li>- If the delayed calibration identified an error greater than the maximum permissible error, have the PPs applied the error identified in the delayed calibration test to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> </ul> <p>Confirm that the error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer emission reductions being claimed;</p>	No delayed calibration was noted during this monitoring period. Hence this is not applicable.	NA

	Verified situation	Conclusion
<p>4-2. If the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification:</p> <p>(a) Request the PPs to conduct the required calibration;</p> <p>(b) On receipt of the calibration results, determine whether the PPs have calculated the emission reductions conservatively using the approach mentioned in section 4.1 above.</p>	Not Applicable.	NA
<p>4-3. If it is not possible for the PPs to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of the PPs, check if the PPs have prepared a temporary deviation or a 'Permanent changes from the monitoring plan and/or monitoring methodology application'.</p> <p>Follow the requirements for post registration changes in sections 3.10 to 3.19 above.</p>	Not Applicable.	NA
<p>4-4. If neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipment, determine whether the equipment is calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification. If neither local/national standards nor the manufacturer's specification are available, international standards may be used.</p>	Not Applicable.	NA



	Verified situation	Conclusion
<b>SECTION 5. Assessment of data and calculation of emission reductions</b>		
<p>5-1. Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in line with the formulae and methods described in the monitoring plan and the applied methodology document?</p> <p>Check consistency in the ERs spreadsheet.</p>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and the applicable methodological tools for the project activity are as follows:</p> <p><b><u>Baseline emissions:</u></b></p> <p><b><u>For boiler:</u></b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity = 1862.48 tCO<sub>2</sub> – Calculation shown below</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity = 20.81 TJ – Calculation shown below</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant as per the included CPA-DD = 89.5 tCO<sub>2</sub>/TJ</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity as per the included CPA-DD = 100%</p> <p><math>EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}</math></p> <p>where</p> <p><math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{steam}</math> = Quantity of steam supplied in Tonnes = 8354.35 Tonnes</p>	<p>CAR-04 CL-08 CL-02 OK</p>

	Verified situation	Conclusion
	<p> <math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet  = 665.68 kCal/kg  <math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg) = 70.62 kCal/kg    <math>EG_{thermal} = 8354.35 * (665.68 - 70.62) * 4.186 \times 10^{-6}</math>  = 20.81 TJ    Note: Steam enthalpy is calculated at the weighted average steam pressure during the monitoring period from standard steam table for saturated steam. Similarly the enthalpy of the boiler feed water is determined at the weighted average feed water temperature during the monitoring period. The verification team independently calculated the steam enthalpy at the average steam pressure of 12.45 kg/cm<sup>2</sup> g using the web site - <a href="http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp">http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp</a> ; and found the steam enthalpy as 665.98 kCal/kg. Hence the enthalpy used by the CME is conservative.    Therefore,  <math>BE_{thermal,CO2,y} = (20.81 / 100 \%) * 89.5</math>  = 1,862.48 tCO<sub>2</sub>    <b><u>For Heater:</u></b>    <math>EG_{thermal} = Q_{flow} * Cp_{out} * \delta_{out} * (T_{out} - T_{in}) * 4.186 \times 10^{-6}</math>    <math>Q_{flow}</math> Flow of heat transfer fluid at the heater outlet (m<sup>3</sup>).  <math>Cp_{out}</math> The specific heat of heat transfer fluid at <math>T_{out}</math> temperature (kCal/kg°C).  <math>\delta_{out}</math> Density of heat transfer fluid at <math>T_{out}</math> temperature of the heater (kg/m<sup>3</sup>) at the outlet of the heater (kg/m<sup>3</sup>)  <math>T_{out}</math> Temperature of the heat transfer fluid at the outlet of the heater (°C).  <math>T_{in}</math> Temperature of the heat transfer fluid at the inlet of the heater (°C).    <math>EG_{thermal} = 1.22</math> TJ (<math>EG_{thermal}</math> for heater has been calculated every 15 minutes and the data is captured through SCADA and reported. These 15 minutes enthalpy data is </p>	

	Verified situation	Conclusion
	<p>aggregated for the monitoring period to arrive at the total value of the heat generated by the heater. For the periods where data was not captured every 15 minutes, CERs are not being claimed. This is conservative and hence accepted. For details of the calculation and data, please refer to the ER spreadsheet).</p> <p>CAR 03 (2) was raised in this respect and closed after revision of the ER calculation in a conservative manner by not considering the heat output from the heater for the period when the 15 minutes data is not available.</p> <p><math>BE_{thermal,CO_2,y} = 1.22 * 89.5 / 100\%</math></p> <p><math>BE_{thermal,CO_2,y} = 109.05.</math></p> <p>Thus total <math>BE_{thermal,CO_2,y}</math> for the project activity = <math>1,862.48 + 109.05 = 1971.53 \text{ tCO}_2</math></p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p><math>PE_{EC,y} = EC_{PJ,j,y} * EF_{grid,CM,y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})</math></p> <p><math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid = 2.27 MWh</p> <p><math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) = 0.22 MWh</p> <p><math>EF_{grid,CM,y}</math> = Ex-ante Grid Emission Factor = 0.80 tCO<sub>2</sub>/MWh</p> <p><math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l) = 1.3 tCO<sub>2</sub>/MWh</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j as per the included CPA-DD = 20%</p> <p><math>PE_{EC,y} = 2.27 * 0.80 * (1 + 20\%) + 0.22 * 1.30 * (1 + 20\%)</math>  <math>= 2.52 \text{ tCO}_2</math></p>	

	Verified situation	Conclusion
	<p><u>Project emissions from fossil fuel combustion</u></p> $PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}$ <p>where  <math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p><math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr) = 0 Tonnes  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)</p> <p><math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math>  Where  <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)</p> <p>The boiler of this project is Huskpac type which means there is no possibility of firing fossil fuel (coal) in this boiler. Hence no Project emissions due to fossil fuel combustions are there for this CPA.</p> <p><math>PE_{FC,j,y} = 0</math></p> <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math>  = 2.52 + 0 = 2.52 tCO<sub>2</sub></p> <p><u>Leakage:</u></p> $LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}$ $= EC_{LE,i,y} * EF_{EL,i,y} * (1+TDL_{i,y}) + N_{c,y} * AVDC_{i,y} * EF_{km,CO2} + N_{i,y} * AVD_{i,y} * EF_{km,CO2}$	

	Verified situation	Conclusion
	<p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p><math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p>This CPA does not involves usage of any processed biomass (rice husk is the biomass residue used in the project boiler). Hence leakage emission due to processing biomass is not applicable.</p> <p>Again the biomass used in the project is not transported from beyond 200 km of the project site. Hence leakage emission due to transportation of biomass is neglected.</p> <p>Thus <math>LE_y = 0</math></p> <p>Emission reductions are calculated as follows:</p> $ER_y = BE_y - PE_y - LE_y$ $= 1971.53 - 2.52 - 0 = 1969 \text{ tCO}_2 \text{ (rounded down value)}$ <p>However, the following CAR/CLs were raised:</p> <p>CAR 04#1 was raised as non consideration of leakage due to processing and transportation (where availability of surplus biomass is more than 25%) for the CPA is not justified in the MR. The finding was successfully closed after appropriate revision in the MR / ER spreadsheet.</p> <p>CL 08 was raised as the ER calculation spreadsheet provided for the CPA had not included daily monitored data for steam quantity, temperature, pressure and feed water temperature to calculate the average of these parameters. ER calculation spreadsheet was adequately revised and the CL was closed.</p> <p>CL 02#2 was raised as, for the parameter "<math>TD_{Li,y} = TD_{Lj,y}</math>", it was stated in the MR that it is used for Leakage emission calculation. But this parameter is also used for the calculation of project emission. CL was closed after appropriate revision in the MR.</p>	

	Verified situation	Conclusion
<p>5-2. Has the calculation tool been correctly documented? Check its consistency and formulae.</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	The Monitoring Report is supported by Micro Soft excel based spreadsheet for the calculation of emission reductions. The consistency and formula were verified and found to be accurate.	OK
<p>5-3. Is a complete set of data available during the specified monitoring period? If only partial data is available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan proceed as follows:</p> <ol style="list-style-type: none"> <li>a. Check if sections 3.11 and/or 3.12 above are applicable and raise a CAR for the PPs to comply with these requirements.</li> <li>b. If sections 3.11 and 3.12 are not applicable or the answer to this question remains NO, a request for deviation is necessary.</li> </ol> <p>Conduct an assessment of the potential impacts of these changes in accordance to the procedures for Post Registration Changes.</p>	Yes, the complete data set was available during the specified monitoring period.	OK
<p>5-4. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?</p> <p>Please describe how LRQA has cross-checked reported data.</p>	All the information provided in the Monitoring Report were cross-checked with the Plant log book records, purchase records (for biomass and fossil fuel), site visit and interview of the CPA implementer/CME.	OK
5-5. Have any assumptions used in emission calculations been justified?	All assumptions in the emission reduction calculation are consistent with assumptions taken in the registered monitoring plan and have reference to the applied methodology.	OK

	Verified situation	Conclusion
5-6. Have appropriate emission factors, IPCC default values, and other reference values been correctly applied?	<p>The CME has applied the appropriate ex-ante fixed factors as stated in the included CPA-DD like:</p> <ul style="list-style-type: none"> <li>• The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity (<math>\eta_{BL,thermal}</math>)</li> <li>• CO<sub>2</sub> Emission Factor of the fossil fuel that would have been used in the baseline plant (<math>EF_{FF,CO_2}</math>)</li> <li>• Surplus availability of Biomass within identified region (<math>SA_k</math>)</li> <li>• Ex-ante Grid Emission Factor in a year y.</li> <li>• Emission Factor for fossil fuel based electricity generation for source j and/or l in year y (<math>EF_{EL,j,y} = EF_{EL,l,y}</math>)</li> <li>• Auxiliary Electricity Consumption for biomass processing, outside Project boundary. (<math>EC_{LE,l,y}</math>)</li> <li>• Average CO<sub>2</sub> emission factor for the trucks measured during the year y (<math>EF_{km,CO_2}</math>)</li> <li>• Average technical transmission and distribution losses for providing electricity to source l and/or j in year y (<math>TDL_{l,y} = TDL_{j,y}</math>)</li> <li>• Specific energy consumption of fuel type j of the Project activity in year y (<math>SEC_{PJ,j,y,measured}</math>)</li> </ul> <p>CL 02#3 was raised for the CME to clarify the appropriateness of the “Source of data” and “Additional comment” as stated in the MR for the parameters in section D.1, which are fixed ex-ante at the time of validation of the CPA.</p> <p>The MR was suitably revised against the raised findings and hence the CAR/CL were closed. For details please refer to the Annex D of this report.</p>	CL-02 OK

## 7.11 Appendix C9: Verification Protocol for CPA 4041-0012

	Verified situation	Conclusion
<b>SECTION 1. Project implementation in accordance with the registered PoA-DD &amp; CPA-DD</b>		
<b>General description of the project</b>		
1.1. Does the MR provide general information of the CPA and is it as per the CPA-DD included by CDM-EB or by a DOE <sup>94</sup> ?	Yes, the Monitoring Report <sup>95</sup> provides the general information of the CPA. Details such as Title of the CPA, UNFCCC registration reference number, version number of the Monitoring Report, monitoring period, project participants, sectoral scope and estimated amount of GHG emission reductions. All the above details can be confirmed from the included CPA-DD through link in UNFCCC site: <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=0ZOF2EL3H6WCNAT5BVYSXD4KI9P7UG">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=0ZOF2EL3H6WCNAT5BVYSXD4KI9P7UG</a> Title of the CPA is “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 012)” and it was included in the PoA on 29/06/2012 applying the baseline and monitoring methodology AMS-I.C, version 16 “Thermal energy production with or without electricity” as verified from the project page of the CPA. The project activity applies AMS-I.C, version 16. The project activity is installation and operation of a 4 TPH biomass briquette fired boiler to meet the captive requirement of steam in the manufacturer of API (Active Pharmaceutical Ingredient). The project is located in Additional MIDC Industrial Area, Village - Birwadi, Taluka – Mahad, District - Raigad, Maharashtra. The project is implemented by KOPRAN LIMITED.	OK
1.2. Is the general information provided in the MR in line with the PoA-DD registered by CDM-EB?	Yes, the Monitoring Report is as per the PoA-DD registered by CDM-EB confirmed from the registered PoA-DD through link on UNFCCC site: <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=0ZOF2EL3H6WCNAT5BVYSXD4KI9P7UG">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=0ZOF2EL3H6WCNAT5BVYSXD4KI9P7UG</a>	OK
1.3. Is the Monitoring Report as per the standardised format (F-CDM-MR)? (EB 66 )	Yes, the Monitoring Report is as per the latest standardised format (F-CDM-MR) version 02.0 (EB66, Annex 20).	OK
1.4. Is the Monitoring Report filled as per the "Guidelines for	Yes, the MR is filled up as per the latest “Guidelines for completing the Monitoring Report form” EB 66, Annex 20.	<del>CAR08</del> OK

<sup>94</sup> The first CPA is included by the CDM-EB along with registered PoA-DD and subsequent CPAs are included by DOEs.

<sup>95</sup> Monitoring Report for this CPA (CPA 4041-0012) refers to the Appendix-9 of the consolidated MR Version 4.0



	Verified situation		Conclusion		
completing the Monitoring Report form" (EB 66, Annex 20).	CAR 08 was raised as project page of the PoA on UNFCCC web site, the "Other Parties involved" is stated as "United Kingdom of Great Britain and Northern Ireland" and "Germany". But in the MR "Germany" is missing. CAR was closed as the MR was suitably revised.				
1.5. Is there any open issue in the validation / previous verification including FARs? (CDM VVS para. 213)	No No FAR was raised in the Validation report during the CPA inclusion by TUV Rheinland, the DOE for validation of the CPA. Further this being the first periodic verification, no open issues exists from earlier verification.		OK		
Implementation status of the CPA					
1.6. Is the CPA location indicated same as that in the included CPA-DD? Confirm geographical coordinates	Yes, the project location is same as stated in the CPA-DD and this was verified during the on-site visit. The geographical coordinates of the project site are 18.1081 <sup>0</sup> North; 73.5189 <sup>0</sup> East. This was cross-checked from the Google Earth web site.		OK		
1.7. Is the project boundary described in the same way as the included CPA-DD and registered PoA-DD? Please confirm each component based on the applied methodology.	Yes, the project boundary is described in the same way as in the included CPA-DD and registered PoA-DD. During the on-site assessment it was also confirmed the project boundary is in line with the applied methodology. The project boundary for this CPA includes the biomass storage area and feeding system, boiler house and the facility which is consuming the heat generated by the project.		OK		
1.8. Has on-site fossil fuel consumption, if any, been monitored? Is any emission source missed? Check the site lay-out and confirm through site tour.	Fossil fuel consumption is required to be monitored in this project. It has been confirmed during the on-site visit and document review that no fossil fuel has been consumed at the CPA site by the project during the monitoring period. The verification team did not find any emission source attributable to the project activity which has been missed out and the same was confirmed during the on-site visit and review of the site lay-out diagram.		OK		
1.9. Confirm contractors for equipment and installation works	It is confirmed that the project equipment i.e., 4 TPH boiler for the project is supplied by Thermax Limited and this was confirmed during the on-site visit interview with the project implementer and from the purchase order copy of the boiler issued by the project implementer dated 27/05/2010.		OK		
1.10. Confirm conformance with baseline and monitoring methodology - Applicability conditions. Please refer to the	Conformance to the applicable methodology conditions for the CPA are as follows: <table><tr><td>Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)</td><td>Means of Verification and Results</td></tr></table>		Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)	Means of Verification and Results	OK
Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)	Means of Verification and Results				

	Verified situation			Conclusion
applicability conditions and confirm that the CPA meets all the requirements.	<i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>	The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.		
	<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>	The total installed / rated capacity of the project equipment is 2.51 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .		
	<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>	The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.		
	<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>	The project does not use any charcoal.		
	<p>The verification team confirms that the CPA conforms to all applicable condition of the applied methodology.</p> <p>Apart from the baseline and monitoring methodology applicability criteria as stated above, the verification team also verified the eligibility criteria stated in section B.2 of the included CPA-DD under "Monitoring Criteria" for the point numbers 1, 3.3, 3.4, 3.5, 16, 17 and 18 and found these to be</p>			

	Verified situation	Conclusion
	vallidfor the project activity during the monitoring period. A declaration letter dated 11/12/2012 in this respect has also been submitted by the CME.	
1.11. Confirm use or no use of public funding and determine if there is no diversion of ODA to the CPA.	There is no use of public funding for the CPA. The same was confirmed during the interview with the CME and also a declaration in this respect has been provided by the CPA implementer.	OK
1.12. Check data in the MR and in the CPA-DD. Describe data and variables that are different from that stated in the included CPA-DD and cause an increase in emission reductions estimations.	<p>Data in the MR and CPA-DD fixed at validation stage are found to be consistent.</p> <p>The ex-ante estimated emission reductions during this monitoring period of 62 days are 893 tCO<sub>2</sub> (5260/365*62) and the actual emission reductions during this monitoring period are 491 tCO<sub>2</sub>. Hence the actual emission reductions during this monitoring are less than the estimated values as per the CPA-DD.</p> <p>However, the following findings were raised and successfully closed during the verification;</p> <ol style="list-style-type: none"> <li>1) CL 02 was raised for the parameters like “CAP<sub>boiler</sub>” and “SEC<sub>PJ,y,measured</sub>”, it was stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation.</li> <li>2) CL 05 was raised, as the NCV is taken directly taken from the laboratory report, values of parameters like hydrogen, oxygen and moisture content in the biomass are still reported in the MR, which is not required as per the included CPA-DD.</li> </ol> <p>The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p>	<p>CL02 CL05 OK</p>
1.13. By means of an on-site visit: Is the general information of the project provided in the Monitoring report and is it as per the CPA-DD included by CDM-EB or by a DOE?	<p>Yes.</p> <p>The on-site visit for the CPA was conducted on 05/11/2012.</p> <p>The project activity comprises of the installation and operation of a 4 TPH biomass briquette fired boiler to meet the captive requirement of steam at the project site.</p>	<p>CAR 01 CAR 03 OK</p>

	Verified situation	Conclusion
<p>List each technical component and equipment and check design parameters and actual status of installation and / or operation.</p> <p>Please check to ensure that all physical features of the proposed CPA in the registered/included CPA-DD are in place and the PP has operated the proposed CPA as per the included CPA-DD.</p> <p>It may include but not limited to:</p> <ul style="list-style-type: none"> <li>the actual capacity and output</li> <li>plant load factor</li> <li>type of feedstock</li> <li>operation of other components / units within the project boundary which could affect functioning of the project plant.</li> </ul> <p>In cases where there are a large number of components and equipment items and the check of all of them is not an available option, then a random sampling check shall be performed. Justify here the sample chosen and describe the results.<sup>96</sup></p>	<p>During the verification, by the observation of equipment, interviews with relevant staff and the checking of technical specifications of main components, it was confirmed that the project activity has been implemented as described in the included CPA-DD.</p> <p>The project is operational. The project was commissioned on 09/12/2010 and the same was verified from the commissioning certificate issued by Thermax Limited.</p> <p>No change from the included CPA-DD of physical features which may impact the emission reduction of the project activity has been identified.</p> <ul style="list-style-type: none"> <li>Steam generation unit : 4 TPH boiler</li> <li>Net enthalpy supply by project activity : The ex-ante estimated annual enthalpy output from the project boiler is 75.87 TJ as per the included CPA-DD (which corresponds to 12.89 TJ for 62 days of this monitoring period) whereas actual enthalpy supplied by the boiler during this monitoring period was 7.81 TJ which is less than the ex-ante estimated value.</li> <li>Type of biomass fired in the boiler : As per the included CPA-DD, renewable biomass briquette made from groundnut shells, maize cobs (corn cobs), cane crush, bagasse, saw dust and tur stems is to be fired in the boiler and it was noted that there was no deviation in the biomass firing during the monitoring period.</li> <li>As per the included CPA-DD, the project may fire fossil fuel (Coal) in the boiler. During this monitoring period, no fossil fuel has been fired in the project boiler as confirmed by the project implementer during the site visit.</li> </ul> <p>100% data is monitored for the CPA and hence no sampling plan is applicable.</p> <p>However, CAR 01 was raised as in section B.1 of the MR, the downtime time of the project boiler was not provided. Details are provided in the revised MR and the CAR was closed.</p> <p>Further, CAR 03 was raised as PP has considered a simple average of steam pressure, temperature and boiler feed water enthalpy, which are used for the calculation of net enthalpy supplied by the project boiler, which is not correct. The calculation approach was revised and a weighted average</p>	

<sup>96</sup> The sampling shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified situation	Conclusion
	was considered for emission reduction. The CAR 03 was successfully closed.	
1.14. Have responsibilities for monitoring been described and specified?	<p>The responsibilities of monitoring have been provided and described in the Monitoring Report. The Monitoring Report and CDM documents clearly describe the responsibilities for monitoring.</p> <p>The project owner has identified the CDM team, the structure of which is given in Monitoring Report. During the verification, responsibilities for operational personnel, technical and support team have been verified and confirmed.</p> <p>The CDM team has been assigned the responsibility for measuring, recording and storage of the measured data. Data is kept in electronic format and paper format.</p>	OK
1.15. Are the responsibilities and authorities for monitoring and reporting in line with those stated in the monitoring plan of the included CPA-DD?	Yes, responsibilities and authorities for monitoring and reporting are in accordance with included CPA-DD.	OK
1.16. Check QA/QC, management systems. Are procedures described and specified in the MR? Are they consistently applied as described in the MP? a. documented instructions, management manual b. documentation c. data archiving d. monitoring report e. cross-checking f. energy balance analysis (as relevant) g. internal audits / verification and management review	<p>QA/QC procedures include staff training, instrument calibration, cross-checking and data/documents archiving. They are consistent with the monitoring plan.</p> <p>The Monitoring Report describes the monitoring system, monitoring procedures, data collection and reporting, responsibilities of relevant staff/departments, calibrations that were implemented and QA/QC procedures including data cross-checking.</p> <p>By means of document review, onsite assessment and interviews, the verification team has confirmed that all the QA/QC measures, data archiving, monitoring report and internal audits are as per the registered monitoring plan of the registered PoA-DD and the included CPA-DD.</p> <p>However, CL 03 was raised as the “QA/QC procedure” &amp; “Purpose of data” for the quantity of biomass in MR was mentioned as “NA” and the same is not consistent with the monitoring plan of the included CPA-DD. Monitoring and recording frequency of these parameters were not mentioned in the MR. Also the values for these parameters as stated in the MR was incorrect as verified during the on-site visit and also with the documents provided.</p> <p>The MR was suitably revised to close the finding.</p>	CL-03 OK

	Verified situation	Conclusion
1.17. Have the procedures for emergency and abnormal situations been established?	<p>As stated in section C of the MR, the procedure for non-conformance and corrective actions is in place for the project activity to mitigate any emergency and abnormal situations in monitoring as per the included CPA-DD.</p> <p>During the monitoring period, no emergency situation in monitoring has occurred.</p> <p>However, CAR 07 was raised as the CME needed to clarify why the details of the backup monitoring instruments (for steam pressure and temperature and feed water temperature) were not provided in the MR. Adequate justification was provided by the CME and the CAR was closed</p>	<p><del>CAR 07</del></p> <p>OK</p>
1.18. Has the system for qualification and training been established as relevant for the monitoring and management activities?	<p>The training and qualification of the project personnel has also been confirmed during interview of the operational personnel during the on-site visit. It is confirmed that they have sufficient knowledge, experience and competency to implement and maintain the plant operation including data monitoring and recording in line with boiler operation and maintenance manual provided by the boiler supplier, and with CDM requirements.</p> <p>This is further verified by the evidence for training of the project personnel and the boiler attendants' certificates issued by Directorate of Steam Boilers (Government agency) for the boiler operators.</p>	OK
1.19. Check the environmental report, license, permit and compliance to the local environmental legislation (if relevant).	The verification team has confirmed that the project meets the relevant local environmental legislation. The same was confirmed from the copy of the consent to operate issued by Maharashtra Pollution Control Board valid from 26/07/2010 to 31/05/2014. Also a copy of certificate for the use of the boiler for the period from 25/04/2012 to 24/04/2013 issued by Directorate of Steam Boilers Department has been submitted.	OK
1.20. Check contribution to sustainable development, comparing those expected in the included CPA-DD and the actual status.	<p>With the provision of employment opportunities by the project activity, there has been a contribution for the social and economic well-being of some local people.. The project utilises renewable biomass to produce steam (thereby avoiding the fossil fuel usage) and this leads to environment well being by reduced environmental impact from fossil fuel use. Also the project uses renewable biomass technology which is deemed as a clean (as it displaces fossil fuel usage) and safe technology.</p> <p>Even though the sustainable development measures were not registered in the CPA-DD as a monitoring parameter, it was confirmed during the site visit that the CPA contributes to the sustainable development of the host country.</p>	OK
1.21. Check issues with local stakeholders, claims, complaints, etc.	It was confirmed by on-site interviews that there had been no claims and complaints from local stakeholders prior to the verification visit.	OK

	Verified situation	Conclusion	
1.22. If from the above assessment the conclusion is that the implementation or operation of the CPA does not conform with the description contained in the included CPA-DD and/or corrections have been made to project information or parameters fixed at validation/inclusion, determine if these changes and/or corrections do not require prior approval by the board: <ul style="list-style-type: none"><li>- A request of approval is required if the boundary of a registered CDM PoA is changed to include an additional host party, in accordance with the project cycle procedure.</li><li>- A request for approval is required if the CME of a registered CDM PoA changes after the registration of the PoA.</li><li>- Any corrections to project information of an included CPA that do not affect the design of the project activity do not require prior approval by the Board.</li><li>- A request for approval is required if any of the three issues below is adversely impacted by the identified changes to the project design.</li></ul>			
1.23. The applicability and application of the applied methodology under which the CPA has been included:  Check if the project boundary has changed and if any of the parameters to assess the applicability conditions have changed.	No change in applicability and application of the applied methodology AMS-I.C. version 16, including the project boundary, is observed.	YES	NO
			X
1.24. Compliance of the included CPA to eligibility criteria as defined in the registered PoA-DD.  Check if any of the parameters to assess the PoA eligibility criteria have changed.	No change in the eligibility criteria of the registered CPA, as defined in the registered PoA-DD, is observed.	YES	NO
			X
1.25. The additionality of the project activity:  Check if any of the input parameters to the investment analysis have changed. For barrier analysis, check if any information or data used in the	There is no change in the project design parameters as the project is implemented as per the included CPA-DD. Hence this is not applicable.	YES	NO
			X

	Verified situation	Conclusion	
barrier analysis has changed.			
1.26. The scale of the project activity. Check if the project is still small scale or large scale after the implementation of the changes.	Small scale, as per the eligibility criteria for CPA inclusion and is in accordance with the methodology AMS-I C, version 16.	YES	NO
			X
If the answer to any of the above items is YES, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
1.27. If, from the above assessment, the conclusion is that the changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	



	Verified Situation	Conclusion
<b>SECTION 2. Compliance of the Monitoring Plan with the Monitoring Methodology including applicable Tool(s)</b>		
2.1. Is the monitoring plan of the included CPA-DD in accordance with the applied methodology?	Yes, it is confirmed that monitoring plan of the included CPA-DD is in accordance with the applied methodology, AMS-I.C, version 16.	OK
2.2. If the methodology provides different options (for example, use of default values or on-site measurements), has the Monitoring Report specified which option is used?	<p>Yes,</p> <p>The ex-ante parameters which are fixed for the crediting period at the time of CPA inclusion in the PoA as per the methodological tools are:</p> <ul style="list-style-type: none"> <li>• <math>CAP_{\text{boiler}}</math> (Rated capacity (thermal output) of the boiler of the Project activity)</li> <li>• <math>\eta_{\text{BL,thermal}}</math> (The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity)</li> <li>• <math>EF_{\text{FF,CO}_2}</math> (<math>\text{CO}_2</math> Emission Factor of the fossil fuel that would have been used in the baseline plant)</li> <li>• <math>SA_k</math> (Surplus availability of Biomass within 50 km radial distance)</li> <li>• <math>EF_{\text{grid,CM,y}}</math> (Ex-ante Grid Emission Factor in a year y)</li> <li>• <math>EF_{\text{EL,j,y}} = EF_{\text{EL,l,y}}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)</li> <li>• <math>EC_{\text{LE,l,y}}</math> (Auxiliary Electricity Consumption for biomass processing, outside Project boundary)</li> <li>• <math>EF_{\text{km,CO}_2}</math> (Average <math>\text{CO}_2</math> emission factor for the trucks measured during the year y)</li> <li>• <math>TDL_{\text{i,y}} = TDL_{\text{j,y}}</math> (Average technical transmission and distribution losses for providing electricity to source l and/or j in year y)</li> <li>• <math>SEC_{\text{PJ,j,y,measured}}</math> (Specific energy consumption of fuel type j of the Project activity in year y)</li> </ul> <p>Further, the verification team confirms that there is no deviation in the values of the ex-ante fixed parameters between the included CPA-DD and the MR.</p> <p>The parameters being monitored ex-post as per the monitoring methodology and the CPA-DD are:</p> <ul style="list-style-type: none"> <li>• Quantity of steam supplied in year y (<math>Q_{\text{steam}}</math>)</li> </ul>	<p>GL-05</p> <p>OK</p>

	Verified Situation	Conclusion
	<ul style="list-style-type: none"> <li>• Average Steam Temperature at MSSV (Main steam stop valve) outlet during year (<math>T_{\text{steam}}</math>)</li> <li>• Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year (<math>P_{\text{steam}}</math>)</li> <li>• Average Feed Water Temperature at inlet of boiler (<math>T_{\text{FWB}}</math>)</li> <li>• Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob},k}</math>)</li> <li>• Quantity of subsequent delivery of fuel type k biomass at the Project site (<math>Q_{\text{np},k}</math>)</li> <li>• Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in},k}</math>)</li> <li>• Quantity of biomass fuel type k consumed during the monitoring period (<math>Q_{\text{c},k} = FC_{\text{biomass},k,y}</math>)</li> <li>• Quantity of stored fuel type fossil (Coal) i on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob},i}</math>) *</li> <li>• Quantity of subsequent delivery of fuel type fossil fuel (Coal) i (<math>Q_{\text{np},i}</math>) *</li> <li>• Quantity of remaining fossil fuel type (Coal) i available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in},i}</math>) *</li> <li>• Quantity of fossil fuel type i (Coal) consumed during the monitoring period (<math>Q_{\text{c},i} = FC_{\text{fossil},i,y}</math>) *</li> <li>• Net calorific value of biomass fuel k used in the Project activity.( <math>NCV_k</math>)</li> <li>• Percentage of hydrogen in biomass fuel (Hydrogen) **</li> <li>• Percentage oxygen in Biomass fuel (Oxygen) **</li> <li>• Moisture content of the biomass residues (Moisture) **</li> <li>• Weighted average net calorific value of the fuel (coal) type i in year y (<math>NCV_{i,y}</math>) *</li> <li>• Auxiliary Electricity Consumption of the Project activity from the Grid in year y (<math>EC_{\text{PJ},j,y}</math>)</li> <li>• Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) in a year y (<math>EC_{\text{EL},j,y}</math>) ***</li> <li>• Average return trip distance (from and to) between the source of the</li> </ul>	

	Verified Situation	Conclusion
	<p>biomass and the site of the Project plant during the year y (<math>AVD_{i,y}</math>)</p> <ul style="list-style-type: none"> <li>• Number of truck trips during the year y (<math>N_{i,y}</math>)</li> <li>• Average round trip distance (from and to) between the biomass fuel supply sites and the site of biomass processing in year y (<math>AVD_{c,y}</math>)</li> <li>• Number of truck trips during the transportation of biomass to the biomass processing site in year y (<math>N_{c,y}</math>)</li> <li>• Weighted average CO<sub>2</sub> emission factor of fuel type i in year y (<math>EF_{CO2,i,y}</math>)</li> </ul> <p>These parameters are based on on-site measurement and have been verified during this verification.</p> <p>* No fossil fuel has been fired in the project boiler during this monitoring period</p> <p>** The laboratory report has directly provided the value of NCV. Hence Hydrogen, Oxygen and moisture are not required (which would be required in case NCV was not provided to be calculate NCV from GCV and the above three parameters)</p> <p>*** Auxiliary electricity for the boiler has been sourced from grid and no off grid (DG power) was used during the monitoring period.</p> <p>However, CL 05 was raised, since the NCV was taken directly from the laboratory report, yet the values of parameters like hydrogen, oxygen and moisture content in the biomass were reported in the MR, which is not required as per the included CPA-DD.</p> <p>CL was closed after appropriate revision in the MR.</p>	
2.3. Is all data collected and archived according to the tables in the applied Monitoring Methodology and is this included in the Monitoring Plan?	Yes, all the data is collected and archived in accordance to methodology and included in the monitoring plan. All the data will be archived until 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.	OK
2.4. Check the calculation of emission reductions following the applied methodology: <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> </ul>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and applied for the project activity are as follows:</p> <p><b><u>Baseline emissions:</u></b></p>	<p><del>CL01</del></p> <p>OK</p>

	Verified Situation	Conclusion
<ul style="list-style-type: none"> <li>leakage</li> <li>emission reductions of the project.</li> </ul>	<p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity during the year y (tCO<sub>2</sub>)</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity during the year y (TJ)</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant; tCO<sub>2</sub> / TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity</p> $EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}$ <p>where</p> <p><math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{steam}</math> = Quantity of steam supplied in Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet (kCal/kg)</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg)</p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> $PE_{EC,y} = EC_{PJ,i,y} * EF_{grid,CM,y} * (1 + TDL_{i,y}) + EC_{EL,i,y} * EF_{EL,i,y} * (1 + TDL_{i,y})$	

	Verified Situation	Conclusion
	<p> <math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid in year y  <math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set)  <math>EF_{grid,CM,y}</math> (Ex-ante Grid Emission Factor in a year y)  <math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j in year y </p> <p><u>Project emissions from fossil fuel combustion</u></p> <p> <math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math> </p> <p>where  <math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p> <math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit) </p> <p> <math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math>  Where  <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ) </p> <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math></p>	

	Verified Situation	Conclusion
	<p><b>Leakage:</b></p> $LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}$ $= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVDc_y * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km,CO2}$ <p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption in year y (tCO<sub>2</sub>/yr)</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p><math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p><math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source l in year y as a result of leakage (MWh/yr)</p> <p><math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source l in year y (tCO<sub>2</sub>/MWh)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l in year y</p> <p><math>N_{c,y}</math> = Number of truck trips for collecting loose biomass during the year y</p> <p><math>AVDc_y</math> = Average round trip distance between the biomass fuel supply sites and biomass collection site during the year y</p> <p><math>EF_{km,CO2}</math> = Average CO<sub>2</sub> emission factor for the trucks measured during year y</p> <p><math>N_{y,y}</math> = Number of truck trips during the year y</p> <p><math>AVD_{y,y}</math> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant during year y (km)</p> <p>Emission reductions are calculated as follows:</p> $ER_y = BE_y - PE_y - LE_y$ <p>However, CL 01 was raised as in section E.5 of the MR, the calculation of the ex-ante emission reductions was not transparently presented. The CL was closed as the revised MR describes the ER calculation approach providing</p>	

	Verified Situation	Conclusion
	relevant equations in line with the included CPA-DD.	
<p>2.5. List any monitoring aspect that is not specified in the methodology and check its compliance with the Monitoring Plan, for example:</p> <ul style="list-style-type: none"> <li>• additional monitoring parameters</li> <li>• monitoring frequency</li> <li>• calibration frequency.</li> </ul>	<p>No additional monitoring parameter is identified that is not specified in the approved methodology and the included CPA-DD available in the project page on UNFCCC website.</p> <p>The monitoring frequency and the calibration frequency specified are not less than the requirements of the approved methodology and the Monitoring plan in the included CPA-DD.</p>	OK

	Verified Situation	Conclusion
<b>SECTION 3. Compliance of Monitoring activities with the Monitoring Plan of the included CPA-DD</b>		
<p>3-1. Is the Monitored Data included in the Monitoring Report as per the Monitoring Plan or any accepted revised MP?</p> <p>3-2. Has the data been generated at the frequency required by the Monitoring Plan or any accepted revised MP?</p>	<p>Yes</p> <p>The monitored data included in section D.2 of the MR is as per the monitoring plan of the included CPA-DD.</p> <p>The values are indicated in the section D.2 of the Monitoring Report. At the site visit it was verified that data was generated at the required frequency as per the monitoring plan in the included CPA-DD.</p>	OK
<p>3-3. Has the monitoring been implemented in accordance with the monitoring plan contained in the included CPA-DD or any accepted revised MP?</p> <p>Confirm that the monitoring and reporting procedures have been implemented as documented and follow by PPs.</p>	<p>Yes, by means of document review, on-site assessment and interviews with the plant personnel, it was confirmed that the monitoring has been implemented in accordance with the monitoring plan contained in the included CPA-DD.</p> <p>It was also established that monitoring and reporting procedures have been implemented as documented by the CME and the CPA operator.</p>	OK
<p>3-4. Have types of measurement instrumentation used been described and specified?</p>	<p>Yes the MR specifies and describes the use of different measurement instruments (Steam flow meter, RTD / Temperature gauge, Pressure transmitter / Pressure gauge, energy meter and weighbridge). The details of the measuring equipment are provided in the "Annex-1_4041-0012: Instrument Details" of the MR. The provided details have been verified during the on-site visit.</p>	OK



<p>3-5. Is the accuracy of equipment used for monitoring sufficient and regularly controlled and calibrated in line with the registered monitoring plan or any accepted revised MP?</p> <p>Check relevance of maintenance and calibration included in the monitoring plan.</p> <p>Check relevance of laboratory analysis if included in the monitoring plan.</p>	<p>Yes, the verification team confirmed through the on-site assessment and the review of evidence that the installation of the measuring devices has been completed and the equipment has been operated and maintained in normal operating conditions.</p> <p>The accuracy classes of all the monitoring equipment are found as per the monitoring plan of the included CPA-DD, or of higher accuracy as detailed in "Annex-1_4041-0012: Instrument Details" of the MR.</p> <p>It was confirmed that the information of the meters was consistent with that described in the Monitoring Report.</p> <p>The CME has provided the calibration certificates of all the monitoring equipment and the verification team confirms the certificates to be appropriate and relevant.</p> <p>For further details of the calibration of the monitoring equipment please refer to section 3.19 of this report below.</p> <p>Nevertheless, CL 07 was raised as The CME hasnot provided the credentials of the calibrating agencies and the laboratories, which have carried out the NCV analysis. Adequate information was provided by the CME and the CL was closed. For details please refer to Appendix D of this report.</p>	<p>CL-07 OK</p>
<p>3-6. If the monitoring plan of the CPA-DD refers to a sampling plan and monitoring is carried out for the chosen samples, ensure that the sampling is carried out as per the sampling plan<sup>97</sup>.</p>	<p>The monitoring plan of the CPA-DD does not refers to a sampling plan and the monitoring is carried out for 100% data for all the monitoring parameters.</p>	<p>NA</p>

<sup>97</sup> The sampling plan shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

<p>3-7. Check that responsibilities and authorities for monitoring and reporting are in line with the monitoring plan.</p> <p>Are the monitoring results consistently recorded, reviewed and approved as stated in the CPA-DD or any accepted revised MP?</p>	<p>Yes</p> <p>During the site visit, monitoring and reporting procedures were confirmed by the verification team through interview with the relevant plant personnel, CME and by document review.</p> <p>However following CAR/CLs were raised and successfully closed;</p> <ul style="list-style-type: none"> <li>CAR 02 was raised as the opening readings of the parameter "<math>Q_{\text{steam}}</math>" and closing readings of the parameters "<math>EC_{PJ,y}</math>" and "<math>EC_{EL,j,y}</math>" have not been presented to the verification team.</li> <li>CL 02 was raised as for the parameters like "<math>CAP_{\text{boiler}}</math>" and "<math>SEC_{PJ,y,\text{measured}}</math>" CME had stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation.</li> <li>CL05 was raised, since the NCV was taken directly taken from the laboratory report, however the values of parameters like hydrogen, oxygen and moisture content in the biomass were reported in the MR, which is not required as per the included CPA-DD.</li> </ul> <p>The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p>	<p>CAR-02 CL-02 CL-05 OK</p>
<p>3-8. Reporting period: Defined?</p> <p>If a monitoring period of a parameter more / less than a year is applied, check if the monitoring is in a complete and consistent manner?</p> <p>Is the monitoring period within the crediting period of the CPA and length of the registered PoA?</p>	<p>The monitoring period for the PoA is from 12/01/2011 to 31/08/2012. But for the CPA, the emission reduction starts from 01/07/2012 (i.e., the date of start of crediting period of the CPA) till 31/08/2012. Hence the monitoring period for the CPA is for 62 days which is less than a year. However, monitoring of all the parameters is complete, as there is no specific requirement in the methodology for annual reporting of any data. The verification team therefore confirms the monitoring to be complete and consistent and clearly defined in the MR.</p> <p>The monitoring period is within the crediting period of the CPA and also the length of the registered PoA.</p> <p>Nevertheless, CL 09 was raised as the monitoring period of the CPA is not consistent with that of the PoA in the webhosted MR. The issue has been addressed and the finding was successfully closed.</p>	<p>CL-09 OK</p>

3-9. If the monitoring plan includes the determination of environmental and / or social indicators, have the sustainable development indicators been monitored in accordance with the monitoring plan of the included CPA-DD?	Not applicable	NA
3-10. Check monitoring of Environmental and Social indicators (if relevant) <ul style="list-style-type: none"> <li>• implementation of measures</li> <li>• monitoring equipment</li> <li>• quality assurance procedures</li> <li>• external data.</li> </ul>	Not applicable	NA

	Verified Situation	Conclusion	
SECTION 2 and 3: Post Registration Changes			
3-11. If, from the above assessment in SECTIONS 2 and 3, the conclusion is that there are temporary deviations or permanent changes from the registered Monitoring Plan or Monitoring Methodology, determine if these deviations or changes require prior approval by the EB by answering the questions below. All the answers to the applicable questions below shall be explained and the reasons for each conclusion given in the “Verified situation” column.			
Temporary deviations from the registered monitoring plan or applied methodology: Prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES.			
3-12. Have the PPs reported as zero any parameter related to baseline GHG emissions that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?	No temporary deviation is sought during this monitoring period	YES	NO
		-	-
3-13. Have the PPs estimated (assuming that the source of the project GHG emissions operated at maximum capacity for the full period of the missing data) any parameter that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?  For project GHG emissions related to the consumption of electricity, the estimate shall include an addition of 10% to account for transmission and distribution losses.	No temporary deviation is sought during this monitoring period	YES	NO
		-	-
Permanent changes from the registered monitoring plan or applied methodology			
If the monitoring equipment actually installed has a lower accuracy level than the accuracy stipulated in the applied methodology and/or in the registered monitoring plan, and the monitoring equipment is under the control of the project participants, prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES:			
3-14. Have the PPs deducted from the measured	No permanent change in the monitoring plan is observed during this monitoring	YES	NO

	Verified Situation	Conclusion	
value, for any parameter used for calculating baseline GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	period	-	-
3-15. Have the PPs added to the measured value, for any parameter used for calculating project GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES	NO
		-	-
Changes to the monitoring of the included CPA of a type listed below do not require approval by the EB. Confirm in the conclusion column that the change is of the type in the table below and explain the reasons.			
3-16. Change of calibration frequency or practice for monitoring equipment not within the control of project participants	Not Applicable	NA	
3-17. Change of accuracy / type / model of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
3-18. Change of location of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
If the answer to any of the above items has been that approval from the EB is required, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
3-19. If, from the above assessment, the conclusion is that the temporary deviations or permanent changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	

### 3.19 Monitoring Parameters and Calibration Checklist:

Complete the following table for each parameter:

Data / Parameter (as in the MP)		Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Value	Ex-ante	30015.8 per annum	185.14
	Ex-post	3164.78	171.15 <sup>98</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		<p>As per the monitoring plan of the included CPA-DD, the quantity of steam delivered by the project is measured by duly calibrated steam flow meter and the calibration certificate has been verified.</p> <p>Further, the verification team cross-checked the quantity of steam delivered by the project activity during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.</p>	<p>As per the monitoring plan of the included CPA-DD, the steam temperature is measured by duly calibrated RTD and the calibration certificate has been verified.</p> <p>Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.</p>

<sup>98</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised and successfully closed by the CME

Data / Parameter (as in the MP)	Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Steam flow meter Sr. No.: E80120220000	RTD Sr. No.: E80120220000 <sup>99</sup>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	± 2.3% Maximum (which is better than that stated in the CPA-DD of ±3%)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	01/07/2012 to 31/08/2012	01/07/2012 to 31/08/2012
Instrument type	Steam flow meter cum RTD	Steam flow meter cum RTD
Manufacturer, model and serial number	Make: Endress + Hauser; Sr. No.: E80120220000	Make: Endress + Hauser; Sr. No.: E80120220000
Specific location	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler
Calibration dates	23/09/2011 (valid till 22/09/2014)	23/09/2011 (valid till 22/09/2014)
Company performing the calibration	Manufacturer Endress + Hauser (NABL accredited)	Manufacturer Endress + Hauser (NABL accredited)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes

<sup>99</sup> A consolidated monitoring equipment is used by the CPA operator, which has inbuilt feature for measuring the both steam flow and the steam temperature. This was confirmed during the on-site visit and verification of the technical specification of the measuring equipment.

Data / Parameter (as in the MP)	Quantity of steam supplied in year y " $Q_{\text{steam}}$ " (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet " $T_{\text{steam}}$ " ( $^{\circ}\text{C}$ )
Maintenance	The Steam flow meter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year " $P_{\text{steam}}$ " ( $\text{kg}/\text{cm}^2 \text{ g}$ )	Average Feed Water Temperature at inlet of boiler " $T_{\text{FWB}}$ " ( $^{\circ}\text{C}$ )
Value	Ex-ante	10.54	60
	Ex-post	7.41 <sup>100</sup>	71.81 <sup>101</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically

<sup>100</sup> The value is the weighted average of the daily recorded pressure readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised and successfully closed by the CME

<sup>101</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised and successfully closed by the CME



<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “<math>P_{\text{steam}}</math>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “<math>T_{\text{FWB}}</math>” (°C)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the steam pressure is measured by duly calibrated pressure transmitter and the calibration certificate has been verified. Further, the verification team cross-checked the steam pressure during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the feed water temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Pressure transmitter Sr. No. E8004121129	RTD Sr. No. E8007D142EA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	± 2% (which is same as stated in the CPA-DD)	Class B (which is same as stated in the CPA-DD)
Period of operating time	01/07/2012 to 31/08/2012	01/07/2012 to 31/08/2012
Instrument type	Pressure transmitter	RTD
Manufacturer, model and serial number	Endress + Hauser; Sr. No. E8004121129	Endress + Hauser; Sr. No. E8007D142EA
Specific location	Project site, at the Main Steam Stop Valve (MSSV)	Project site, after the boiler feed water tank at the inlet of the boiler
Calibration dates	15/05/2012 (valid till 14/05/2013)	15/05/2012 (valid till 14/05/2013)
Company performing the calibration	Qualitek Instrument (Calibration done with a master equipment which is traceable to national standard and hence deemed acceptable)	Qualitek Instrument (Calibration done with a master equipment which is traceable to national standard and hence deemed acceptable)

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “<math>P_{\text{steam}}</math>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “<math>T_{\text{FWB}}</math>” (°C)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The pressure transmitter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “<math>Q_{\text{ob},k}</math>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “<math>Q_{\text{np},k}</math>” (Tonnes)</b>
Value	Ex-ante	NA
	Ex-post	108.33
Measuring / Monitoring frequency	At the start of the monitoring period	756.84
Reporting frequency	Once during the monitoring period	Data is monitored and recorded for each truck delivery
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Each truck trip
		Yes

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The opening balance of the biomass is measured by a calibrated weighbridge	Biomass procured is measured for each truck entering the plant premises by a calibrated weighbridge
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge; Sr. No. SB9831	Weighbridge; Sr. No. SB9831
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III <sup>94</sup>	Class III <sup>102</sup>
Period of operating time	01/07/2012 to 31/08/2012	01/07/2012 to 31/08/2012
Instrument type	Weighbridge	Weighbridge
Manufacturer, model and serial number	Deligant; Sr. No. SB9831	Deligant; Sr. No. SB9831
Specific location	Adjacent to project site	Adjacent to project site
Calibration dates	05/01/2012 (valid till 04/01/2013)	05/01/2012 (valid till 04/01/2013)
Company performing the calibration	Weights and Measure Department, Govt. of India	Weights and Measure Department, Govt. of India
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.

<sup>102</sup> In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable.

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The weighbridge was functional throughout the monitoring period	The weighbridge was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Value	Ex-ante	NA
	Ex-post	1087.44 <sup>103</sup>
Measuring / Monitoring frequency	Measured at the end of the monitoring period	746.61
Reporting frequency	Once during the monitoring period	Calculated from the opening, received and closing balance of the biomass during the monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	At the end of the monitoring period
Does monitoring of the parameter involve sampling? (yes / no)	No	Yes
Population Size	NA	No
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically

<sup>103</sup> Calculated for the monitoring period of 62 days from the ex-ante estimated value of 6401.89 tonnes for one year as per the included CPA-DD

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>”  (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>”  (Tonnes)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	The closing balance of the biomass is measured by a calibrated weighbridge	The quantity of biomass consumed is cross-checked with the invoices obtained from the fuel supplier and found to match
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge; Sr. No. SB9831	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III (In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable.	NA
Period of operating time	01/07/2012 to 31/08/2012	NA
Instrument type	Weighbridge	NA
Manufacturer, model and serial number	Deligant; Sr. No. SB9831	NA
Specific location	Adjacent to project site	NA
Calibration dates	05/01/2012 (valid till 04/01/2013)	NA
Company performing the calibration	Weights and Measure Department, Govt. of India	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The weighbridge was functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low Risk as this data is not used for emission reduction calculation.

Data / Parameter (as in the MP)		Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q <sub>ob,i</sub> ” (Tonnes)	Quantity of subsequent delivery of fuel type fossil fuel i “Q <sub>np,i</sub> ” (Tonnes)
Value	Ex-ante	-	-
	Ex-post	0	0
Measuring / Monitoring frequency		Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q<sub>ob,i</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i “Q<sub>np,i</sub>” (Tonnes)</b>
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site “Q<sub>in,i</sub>” (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period “Q<sub>c,i</sub>” = “FC<sub>i,PJ,y</sub>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	0
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site “<math>Q_{in,i}</math>”  (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period “<math>Q_{c,i}</math>” = “<math>FC_{i,PJ,y}</math>”  (Tonnes)</b>
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA



Data / Parameter (as in the MP)		Net calorific value of biomass fuel k used in the Project activity "NCV <sub>k</sub> "  (TJ/Gg)	Percentage of hydrogen in biomass fuel "Hydrogen"  (%)
Value	Ex-ante	14.33	3.99
	Ex-post	15.99	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency		Annually once	Annually once
Reporting frequency		Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		The NCV analysis is carried out by third party laboratory NIKHIL Analytical & Research Laboratory which is accredited by NABL	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “NCV<sub>k</sub>”  (TJ/Gg)</b>	<b>Percentage of hydrogen in biomass fuel “Hydrogen”  (%)</b>
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	NA
Key reporting risks	Low risk	NA

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen”  (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Value	Ex-ante	38.32
	Ex-post	- (This parameter is not applicable during the monitoring period, as the NCV is directly provided in the laboratory analysis report)
Measuring / Monitoring frequency	Annually once	Annually once
Reporting frequency	Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel "Oxygen"  (%)</b>	<b>Moisture content of the biomass residues "Moisture"</b>
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Weighted average net calorific value of the fuel type i in year y “NCV <sub>i,y</sub> ” (TJ/Gg)	Weighted average CO2 emission factor of fuel type i in year y “EF <sub>CO2,i,y</sub> ” (tCO <sub>2</sub> /GJ)
Value	Ex-ante	-	-
	Ex-post	- Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	- Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Measuring / Monitoring frequency		NA	NA
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA
Company performing the calibration		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/Gg)</b>	<b>Weighted average CO2 emission factor of fuel type i in year y “EF<sub>CO2,i,y</sub>” (tCO<sub>2</sub>/GJ)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>” (MWh)</b>
Value	Ex-ante	197.4 per annum
	Ex-post	32.05
Measuring / Monitoring frequency	Continuous	No captive fossil fuel (Diesel Generator) power has been consumed by the project during the monitoring period
Reporting frequency	Monthly	Monthly
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	NA
Does monitoring of the parameter involve sampling? (yes / no)	No	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	CAR 02 was raised as the recording frequency of the monitoring parameter “EC <sub>EL,j,y</sub> ” has not been stated in the MR.

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>” (MWh)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	The auxiliary electricity is measured by a calibrated energy meter	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Energy Meter; Sr. No. 203352/18509-2610	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class 1 (which is better than Class 2 stated in the CPA-DD)	NA
Period of operating time	01/07/2012 to 31/08/2012	NA
Instrument type	Energy Meter	NA
Manufacturer, model and serial number	Schneider Electric; Sr. No. 203352/18509-2610	NA
Specific location	Project site	NA
Calibration dates	22/02/2012 (valid till 21/02/2013)	NA
Company performing the calibration	Manufacturer Schneider Electric (NABL accredited).	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The energy meter was functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	NA
Key reporting risks	Low risk	NA

Data / Parameter (as in the MP)		Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD <sub>y</sub> ”  (km)	Number of truck trips during the year y “N <sub>y</sub> ”
Value	Ex-ante	-	-
	Ex-post	517.69	65
Measuring / Monitoring frequency		Continuous at each trip	Continuous at each trip
Reporting frequency		Calculated at the end of the monitoring period	Calculated at the end of monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the invoices and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>”  (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Average round trip distance (from and to) between the biomass fuel supply sites and the site of biomass processing in year y “AVD<sub>C,y</sub>”  (km)</b>	<b>Number of truck trips during the transportation of biomass to the biomass  processing site in year y “N<sub>C,y</sub>”</b>
Value	Ex-ante	-
	Ex-post	76.23
Measuring / Monitoring frequency	Continuous at each trip	Continuous at each trip
Reporting frequency	Calculated at the end of monitoring period	Calculated at the end of monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA



<b>Data / Parameter (as in the MP)</b>	<b>Average round trip distance (from and to) between the biomass fuel supply sites and the site of biomass processing in year y “AVD<sub>C,y</sub>”  (km)</b>	<b>Number of truck trips during the transportation of biomass to the biomass  processing site in year y “N<sub>C,y</sub>”</b>
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the quantity of biomass combusted and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

	Verified situation	Conclusion
<b>SECTION 4. Compliance with the calibration frequency requirements for measuring instruments</b>		
The “Monitoring Parameters and Calibration Checklist” in section 3 above shall be checked to determine if the calibration frequency specified in the applied monitoring methodology and/or monitoring plan is followed in the monitoring report and in the monitoring activities. Where a failure to comply with the required frequency is detected, or no frequency is mentioned in the monitoring report, please follow the checklist below:		
<p>4-1. If the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (that is, the results of delayed calibration are available), confirm that the following conservative approach has been adopted in the calculation of emission reductions:</p> <ul style="list-style-type: none"> <li>- If the delayed calibration did not show any errors in the measuring equipment, or the error was smaller than the maximum permissible error, have the PPs applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> <li>- If the delayed calibration identified an error greater than the maximum permissible error, have the PPs applied the error identified in the delayed calibration test to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> </ul> <p>Confirm that the error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer emission reductions being claimed;</p>	No delayed calibration was noted during this monitoring period. Hence this is not applicable.	NA

	Verified situation	Conclusion
<p>4-2. If the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification:</p> <ul style="list-style-type: none"> <li>k. Request the PPs to conduct the required calibration;</li> <li>l. On receipt of the calibration results, determine whether the PPs have calculated the emission reductions conservatively using the approach mentioned in section 4.1 above.</li> </ul>	Not Applicable.	NA
<p>4-3. If it is not possible for the PPs to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of the PPs, check if the PPs have prepared a temporary deviation or a 'Permanent changes from the monitoring plan and/or monitoring methodology application'.</p> <p>Follow the requirements for post registration changes in sections 3.10 to 3.19 above.</p>	Not Applicable.	NA
<p>4-4. If neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipment, determine whether the equipment is calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification. If neither local/national standards nor the manufacturer's specification are available, international standards may be used.</p>	Not Applicable.	NA

	Verified situation	Conclusion
<b>SECTION 5. Assessment of data and calculation of emission reductions</b>		
<p>5-1. Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in line with the formulae and methods described in the monitoring plan and the applied methodology document?</p> <p>Check consistency in the ERs spreadsheet.</p>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and the applicable methodological tools for the project activity are as follows:</p> <p><b>Baseline emissions:</b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity = 589.61 tCO<sub>2</sub> – Calculation shown below</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity = 7.81 TJ – Calculation shown below</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant as per the included CPA-DD = 75.5 tCO<sub>2</sub>/TJ</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity as per the included CPA-DD = 100%</p> $EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}$ <p>where</p> <p><math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{steam}</math> = Quantity of steam supplied in Tonnes = 3164.78 Tonnes</p>	<p>CAR-04 CL-08 CL02 OK</p>

<sup>104</sup> This value is obtained from the ex-ante fixed value electricity consumption for processing of biomass as 288.09 MWh per annum for 8,000 operating hours. Accordingly for this monitoring period, the project operated for 1,290 hours and hence this parameter is calculated on pro rata basis as 288.09 / 8000 \* 1290 = 44.24 MWh for this monitoring period

	Verified situation	Conclusion
	<p> <math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet = 661.3 kCal/kg  <math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg) = 71.81 kCal/kg  <math>EG_{thermal} = 3164.78 * (661.3 - 71.81) * 4.186 * 10^{-6}</math>  <math>= 7.81 \text{ TJ}</math> </p> <p>Note: Steam enthalpy is calculated at the weighted average steam pressure during the monitoring period from standard steam table for saturated steam. Similarly the enthalpy of the boiler feed water is determined at the weighted average feed water temperature during the monitoring period. The verification team independently calculated the steam enthalpy at the average steam pressure of 7.41 kg/cm<sup>2</sup> g using the web site - <a href="http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp">http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp</a> ; and found the steam enthalpy as 661.92 kCal/kg. Hence the enthalpy used by the CME is conservative.</p> <p>Therefore,  <math>BE_{thermal,CO2,y} = 7.81 / 100 * 75.5</math>  <math>= 589.61 \text{ tCO}_2</math> </p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> $PE_{EC,y} = EC_{PJ,j,y} * EF_{grid,CM,y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})$ <p> <math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid = 32.05 MWh  <math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid </p>	

	Verified situation	Conclusion
	<p>Captive Power Plant (Diesel Generator set) = 0 MWh</p> <p><math>EF_{grid,CM,y} = \text{Ex-ante Grid Emission Factor} = 0.80 \text{ tCO}_2/\text{MWh}</math></p> <p><math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l) = <math>1.3 \text{ tCO}_2/\text{MWh}</math></p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j as per the included CPA-DD = 20%</p> <p><math>PE_{EC,y} = 32.05 * 0.80 * (1+20\%) + 0 * 1.30 * (1+20\%)</math>  <math>= 30.77 \text{ tCO}_2</math></p> <p><u>Project emissions from fossil fuel combustion</u></p> <p><math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math></p> <p>where</p> <p><math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p><math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr) = 0 Tonnes</p> <p><math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)</p> <p><math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math></p> <p>Where</p> <p><math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)</p> <p><math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)</p> <p>As there is fossil fuel consumption during the monitoring period,</p> <p><math>PE_{FC,j,y} = 0</math></p> <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math>  <math>= 30.77 + 0 = 30.77 \text{ tCO}_2</math></p>	

	Verified situation	Conclusion
	<p><b><u>Leakage:</u></b></p> $LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}$ $= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVDC_y * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km,CO2}$ <p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p><math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p><math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source as a result of leakage = 44.24 MWh<sup>104</sup></p> <p><math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source as per included CPA-DD = 0.80 (tCO<sub>2</sub>/MWh)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity as per included CPA-DD = 20%</p> <p><math>N_{c,y}</math> = Number of truck trips for collecting loose biomass = 199</p> <p><math>AVDC_y</math> = Average round trip distance between the biomass fuel supply sites and biomass collection site = 76.23 km</p> <p><math>EF_{km,CO2}</math> = Average CO<sub>2</sub> emission factor for the trucks as per the included CPA-DD = 0.0005152 tCO<sub>2</sub>/km</p> <p><math>N_{y,y}</math> = Number of truck trips for supplying the biomass briquette to the project site = 65</p> <p><math>AVD_{y,y}</math> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant = 517.69 km</p> $LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}$ $= 44.24 * 0.8 (1 + 20\%) + 199 * 76.23 * 0.0005152 + 65 * 517.69 * 0.0005152$ $= 42.47 + 7.82 + 17.34 = 67.62 \text{ tCO}_2$	

	Verified situation	Conclusion
	<p>Emission reductions are calculated as follows:  <math>ER_y = BE_y - PE_y - LE_y</math>  <math>= 589.61 - 30.77 - 67.62 = 491 \text{ tCO}_2</math> (rounded down value)</p> <p>CAR 04#1 was raised as non consideration of leakage due to processing and transportation (where availability of surplus biomass is more than 25%) for the CPA is not justified in the MR. The finding was successfully closed after appropriate revision in the MR / ER spreadsheet.</p> <p>CAR 04#2 was raised as the value of the parameter "<math>EC_{LE,i,y}</math>" is not consistent with the CPA-DD. CAR was closed after appropriate revision in the MR / ER spreadsheet.</p> <p>CL 08 was raised as the ER calculation spreadsheet provided for the CPA had not included daily monitored data for steam quantity, temperature, pressure and feed water temperature to calculate the average of these parameters. ER calculation spreadsheet was adequately revised and the CL was closed.</p> <p>CL 02#2 was raised as, for the parameter "<math>TD_{Li,y} = TD_{Lj,y}</math>", it was stated in the MR that it is used for Leakage emission calculation. But this parameter is also used for the calculation of project emission. CL was closed after appropriate revision in the MR.</p>	
<p>5-2. Has the calculation tool been correctly documented? Check its consistency and formulae.</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The Monitoring Report is supported by Micro Soft excel based spreadsheet for the calculation of emission reductions. The consistency and formula were verified and found to be accurate.</p>	OK



	Verified situation	Conclusion
<p>5-3. Is a complete set of data available during the specified monitoring period? If only partial data is available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan proceed as follows:</p> <p>a. Check if sections 3.11 and/or 3.12 above are applicable and raise a CAR for the PPs to comply with these requirements.</p> <p>b. If sections 3.11 and 3.12 are not applicable or the answer to this question remains NO, a request for deviation is necessary.</p> <p>Conduct an assessment of the potential impacts of these changes in accordance to the procedures for Post Registration Changes.</p>	<p>Yes, the complete data set was available during the specified monitoring period.</p>	<p>OK</p>
<p>5-4. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?</p> <p>Please describe how LRQA has cross-checked reported data.</p>	<p>All the information provided in the Monitoring Report was cross-checked with the Plant log book records, purchase records (for biomass and fossil fuel), site visit and interview of the CPA implementer/CME.</p>	<p>OK</p>
<p>5-5. Have any assumptions used in emission calculations been justified?</p>	<p>All assumptions in the emission reduction calculation are consistent with assumptions taken in the registered monitoring plan and have reference to the applied methodology.</p>	<p>OK</p>

	Verified situation	Conclusion
5-6. Have appropriate emission factors, IPCC default values, and other reference values been correctly applied?	<p>The CME has applied the appropriate ex-ante fixed factors as stated in the included CPA-DD like:</p> <ul style="list-style-type: none"> <li>• The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity (<math>\eta_{BL,thermal}</math>)</li> <li>• CO2 Emission Factor of the fossil fuel that would have been used in the baseline plant (<math>EF_{FF,CO2}</math>)</li> <li>• Surplus availability of Biomass within identified region (<math>SA_k</math>)</li> <li>• Ex-ante Grid Emission Factor in a year y.</li> <li>• Emission Factor for fossil fuel based electricity generation for source j and/or l in year y (<math>EF_{EL,j,y} = EF_{EL,l,y}</math>)</li> <li>• Auxiliary Electricity Consumption for biomass processing, outside Project boundary. (<math>EC_{LE,l,y}</math>)</li> <li>• Average CO<sub>2</sub> emission factor for the trucks measured during the year y (<math>EF_{km,CO2}</math>)</li> <li>• Average technical transmission and distribution losses for providing electricity to source l and/or j in year y (<math>TDL_{l,y} = TDL_{j,y}</math>)</li> <li>• Specific energy consumption of fuel type j of the Project activity in year y (<math>SEC_{PJ,j,y,measured}</math>)</li> </ul> <p>CAR 04 #2 was raised as the value of the parameter "<math>EC_{LE,l,y}</math>" reported in the published MR was not consistent with the CPA-DD and it was closed after appropriate revision in the MR.</p> <p>CL 02#3 was raised for the CME to clarify the appropriateness for the "Source of data" and "Additional comment" as stated in the MR for the parameters in section D.1, which are fixed ex-ante at the time of validation of the CPA.</p> <p>The MR was suitably revised against the raised findings and hence the CAR/CL were closed. For details please refer to the Annex D of this report.</p>	<p><del>CAR 04</del> <del>CL 02</del> OK</p>

## 7.12 Appendix C10: Verification Protocol for CPA 4041-0013

	Verified situation	Conclusion
<b>SECTION 1. Project implementation in accordance with the registered PoA-DD &amp; CPA-DD</b>		
<b>General description of the project</b>		
1.1. Does the MR provide general information of the CPA and is it as per the CPA-DD included by CDM-EB or by a DOE <sup>105</sup> ?	<p>Yes, the Monitoring Report provides the general information of the CPA. Details such as Title of the CPA, UNFCCC registration reference number, version number of the Monitoring Report, monitoring period, project participants, sectoral scope and estimated amount of GHG emission reductions. All the above details can be confirmed from the included CPA-DD through link in UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=LSPUMIGECTXQ0N8F3JH9V7RO652AWB">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=LSPUMIGECTXQ0N8F3JH9V7RO652AWB</a></p> <p>Title of the CPA is “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 013)” and it was included in the PoA on 29/06/2012 applying the baseline and monitoring methodology AMS-I.C, version 16 “Thermal energy production with or without electricity” as verified from the project page of the CPA. The project activity applies AMS-I.C, version 16. The project activity is installation and operation of a 12 TPH biomass (rice husk) fired boiler to meet the captive requirement of steam in the of Production of Oil &amp; De Oiled Cake (DOC) through solvent extraction process from rice bran, Sal seed, Soya bean, Cotton seed etc. The project is located in Additional MIDC Industrial Area, Village - Arasnara, District-Durg, Chhattisgarh. The project is implemented by SHREE SITA EDIBLES PRIVATE LIMITED.</p>	OK
1.2. Is the general information provided in the MR in line with the PoA-DD registered by CDM-EB?	<p>Yes, the Monitoring Report<sup>106</sup> is as per the PoA-DD registered by CDM-EB confirmed from the registered PoA-DD through link on UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=LSPUMIGECTXQ0N8F3JH9V7RO652AWB">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=LSPUMIGECTXQ0N8F3JH9V7RO652AWB</a></p>	OK
1.3. Is the Monitoring report as per the standardised format (F-CDM-MR)? (EB 66)	Yes, the Monitoring Report is as per the latest standardised format (F-CDM-MR) version 02.0 (EB66, Annex 20).	OK
1.4. Is the monitoring report filled as per the "Guidelines for completing the monitoring report	<p>Yes, the MR is filled up as per the latest “Guidelines for completing the monitoring report form” EB 66, Annex 20.</p> <p>CAR 08 was raised as project page of the PoA on UNFCCC web site, the “Other Parties involved” is</p>	<del>CAR 08</del> OK

<sup>105</sup> The first CPA is included by the CDM-EB along with registered PoA-DD and subsequent CPAs are included by DOEs.

<sup>106</sup> Monitoring Report for this CPA (CPA 4041-0013) refers to the Appendix-10 of the consolidated MR Version 4.0

	Verified situation	Conclusion				
form" (EB 66, Annex 20).	stated as “United Kingdom of Great Britain and Northern Ireland” and “Germany”. But in the MR “Germany” is missing. CAR was closed as the MR was suitably revised.					
1.5. Is there any open issue in the validation / previous verification including FARs? (CDM VVS para. 213)	No No FAR was raised in the Validation report during the CPA inclusion by TUV Rheinland, the DOE for validation of the CPA. Further this being the first periodic verification, no open issues exists from earlier verification.	OK				
Implementation status of the CPA						
1.6. Is the CPA location indicated same as that in the included CPA-DD? Confirm geographical coordinates	Yes, the project location is same as stated in the CPA-DD and this was verified during the on-site visit. The geographical coordinates of the project site are 21.3016 <sup>0</sup> North, 81.3305 <sup>0</sup> East. This was cross-checked from the Google Earth web site.	OK				
1.7. Is the project boundary described in the same way as the included CPA-DD and registered PoA-DD? Please confirm each component based on the applied methodology.	Yes, the project boundary is described in the same way as in the included CPA-DD and registered PoA-DD. During the on-site assessment it was also confirmed the project boundary is in line with the applied methodology. The project boundary for this CPA includes the biomass storage area and feeding system, boiler house and the facility which is consuming the heat generated by the project.	OK				
1.8. Has on-site fossil fuel consumption, if any, been monitored? Is any emission source missed? Check the site lay-out and confirm through site tour.	Fossil fuel consumption is required to be monitored in this project. It has been confirmed during the on-site visit and document review that no fossil fuel has been consumed at the CPA site by the project. The verification team did not find any emission source attributable to the project activity which has been missed out and the same was confirmed during the on-site visit and review of the site lay-out diagram.	OK				
1.9. Confirm contractors for equipment and installation works	It is confirmed that the project equipment i.e., 12 TPH boiler for the project is supplied by Thermax Limited and this was confirmed during the on-site visit interview with the project implementer and from the purchase order copy of the boiler issued by the project implementer dated 22/02/2011.	OK				
1.10. Confirm conformance with baseline and monitoring methodology - Applicability conditions. Please refer to the complete description of the applicability conditions and	Conformance to the applicable methodology conditions for the CPA are as follows: <table><tr><th>Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)</th><th>Means of Verification and Results</th></tr><tr><td><i>This category comprises renewable energy technologies that supply users</i></td><td>The project activity comprises renewable biomass fired boiler that</td></tr></table>	Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)	Means of Verification and Results	<i>This category comprises renewable energy technologies that supply users</i>	The project activity comprises renewable biomass fired boiler that	OK
Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)	Means of Verification and Results					
<i>This category comprises renewable energy technologies that supply users</i>	The project activity comprises renewable biomass fired boiler that					

	Verified situation			Conclusion
confirm that the CPA meets all the requirements.	<i>with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>	supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.		
	<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>	The total installed / rated capacity of the project equipment is 7.53 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .		
	<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>	The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.		
	<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>	The project does not use any charcoal.		
	The verification team confirms that the CPA conforms to all applicable condition of the applied methodology.			
	Apart from the baseline and monitoring methodology applicability criteria as stated above, the verification team also verified the eligibility criteria stated in section B.2 of the included CPA-DD under “Monitoring Criteria” for the point numbers 1, 3.3, 3.4, 3.5, 16, 17 and 18 and found these to be valid for the project activity during the monitoring period. A declaration letter dated 11/12/2012 in this respect has also been submitted by the CME.			

	Verified situation	Conclusion
1.11. Confirm use or no use of public funding and determine if there is no diversion of ODA to the CPA.	There is no use of public funding for the CPA. The same was confirmed during the interview with the CME and also a declaration in this respect has been provided by the CPA implementer.	OK
1.12. Check data in the MR and in the CPA-DD. Describe data and variables that are different from that stated in the included CPA-DD and cause an increase in emission reductions estimations.	<p>Data in the MR and CPA-DD fixed at validation stage are found to be consistent.</p> <p>The ex-ante estimated emission reductions during this monitoring period of 62 days are 2,797 tCO<sub>2</sub> (16468/365*62) and the actual emission reductions during this monitoring period are 77 tCO<sub>2</sub>. Hence the actual emission reductions during this monitoring are less than the estimated values as per the CPA-DD.</p> <p>However, CL 02 was raised for the parameters like "CAP<sub>boiler</sub>" and "SEC<sub>PJ,y,measured</sub>", it was stated in the MR that they are being used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation. The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p>	CL 02 OK
<p>1.13. By means of an on-site visit:</p> <p>Is the general information of the project provided in the Monitoring Report and is it as per the CPA-DD included by CDM-EB or by a DOE?</p> <p>List each technical component and equipment and check design parameters and actual status of installation and / or operation.</p> <p>Please check to ensure that all physical features of the proposed CPA in the registered/included CPA-DD are in place and the PP has operated the proposed CPA as</p>	<p>Yes.</p> <p>The on-site visit for the CPA was conducted on 09/11/2012.</p> <p>The project activity comprises of the installation and operation of a 12 TPH biomass (rice husk) fired boiler to meet the captive requirement of steam at the project site.</p> <p>During the verification, by the observation of equipment, interviews with relevant staff and the checking of technical specifications of main components, it was confirmed that the project activity has been implemented as described in the included CPA-DD.</p> <p>The project is operational. The project was commissioned on 19/03/2012 and the same was verified from the commissioning certificate issued by Thermax Limited.</p> <p>No change from the included CPA-DD of physical features which may impact the emission reduction of the project activity has been identified.</p> <ul style="list-style-type: none"> <li>• Steam generation unit : 12 TPH boiler</li> <li>• Net enthalpy supply by project : The ex-ante estimated annual enthalpy output from the project</li> </ul>	CAR 01 CAR 03 OK

<sup>107</sup> The sampling shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified situation	Conclusion
<p>per the included CPA-DD.</p> <p>It may include but not limited to:</p> <ul style="list-style-type: none"> <li>the actual capacity and output</li> <li>plant load factor</li> <li>type of feedstock</li> <li>operation of other components / units within the project boundary which could affect functioning of the project plant.</li> </ul> <p>In cases where there are a large number of components and equipment items and the check of all of them is not an available option, then a random sampling check shall be performed. Justify here the sample chosen and describe the results.<sup>107</sup></p>	<p>boiler is 195.085 TJ as per the included CPA-DD (which corresponds to 33.137TJ for 62 days of this monitoring period) whereas actual enthalpy supplied by the boiler during this monitoring period was 1.125 TJ which is less than the ex-ante estimated value.</p> <ul style="list-style-type: none"> <li>Type of biomass fired in the boiler : As per the included CPA-DD, renewable biomass residue (rice husk) is to be fired in the boiler and it was noted that there was no deviation in the biomass firing during the monitoring period.</li> <li>As per the included CPA-DD, the project may fire fossil fuel (Coal) in the boiler. During this monitoring period, no fossil fuel has been fired in the project boiler as confirmed by the project implementer during the site visit.</li> </ul> <p>100% data is monitored for the CPA and hence no sampling plan is applicable.</p> <p>However, CAR 01 was raised as in section B.1 of the MR, the downtime time of the project boilers is not provided. Details are provided in the revised MR and the CAR was closed.</p> <p>Further, CAR 03 was raised as PP has considered a simple average of steam pressure, temperature and boiler feed water enthalpy, which are used for the calculation of net enthalpy supplied by the project boiler, which is not correct. The calculation approach was revised and a weighted average was considered for emission reduction. The CAR 03 was successfully closed.</p>	
1.14. Have responsibilities for monitoring been described and specified?	<p>The responsibilities of monitoring have been provided and described in the Monitoring Report. The Monitoring Report and CDM documents clearly describe the responsibilities for monitoring.</p> <p>The project owner has identified the CDM team, the structure of which is given in Monitoring Report. During the verification, responsibilities for operational personnel, technical and support team have been verified and confirmed.</p> <p>The CDM team has been assigned the responsibility for measuring, recording and storage of the measured data. Data is kept in electronic format and paper format.</p>	OK
1.15. Are the responsibilities and authorities for monitoring and reporting in line with those stated in the monitoring plan of the included CPA-DD?	Yes, responsibilities and authorities for monitoring and reporting are in accordance with included CPA-DD.	OK
1.16. Check QA/QC, management systems. Are procedures described and specified in the	QA/QC procedures include staff training, instrument calibration, cross-checking and data/documents archiving. They are consistent with the monitoring plan.	<del>GL-03</del> OK

	Verified situation	Conclusion
<p>MR? Are they consistently applied as described in the MP?</p> <ol style="list-style-type: none"> <li>documented instructions, management manual</li> <li>documentation</li> <li>data archiving</li> <li>monitoring report</li> <li>cross-checking</li> <li>energy balance analysis (as relevant)</li> <li>internal audits / verification and management review</li> </ol>	<p>The Monitoring Report describes the monitoring system, monitoring procedures, data collection and reporting, responsibilities of relevant staff/departments, calibrations that were implemented and QA/QC procedures including data cross-checking.</p> <p>By means of document review, onsite assessment and interviews, the verification team has confirmed that all the QA/QC measures, data archiving, monitoring report and internal audits are as per the registered monitoring plan of the registered PoA-DD and the included CPA-DD.</p> <p>However, CL 03 was raised as the “QA/QC procedure” &amp; “Purpose of data” for the quantity of biomass in MR was mentioned as “NA” and the same is not consistent with the monitoring plan of the included CPA-DD. Monitoring and recording frequency of these parameters were not mentioned in the MR. Also the values for these parameters as stated in the MR was incorrect as verified during the on-site visit and also with the documents provided.</p> <p>The MR was suitably revised to close the finding.</p>	
<p>1.17. Have the procedures for emergency and abnormal situations been established?</p>	<p>As stated in section C of the MR, the procedure for non-conformance and corrective actions is in place for the project activity to mitigate any emergency and abnormal situations in monitoring as per the included CPA-DD.</p> <p>During the monitoring period, no emergency situation in monitoring has occurred.</p> <p>However, CAR 07 was raised as the CME needed to clarify why the details of the backup monitoring instruments (for steam pressure and temperature and feed water temperature) were not being provided in the MR. Adequate justification was provided by the CME and the CAR was closed.</p>	<p><del>CAR 07</del> OK</p>
<p>1.18. Has the system for qualification and training been established as relevant for the monitoring and management activities?</p>	<p>The training and qualification of the project personnel has also been confirmed during interview of the operational personnel during the on-site visit. It is confirmed that they have sufficient knowledge, experience and competency to implement and maintain the plant operation including data monitoring and recording in line with boiler operation and maintenance manual provided by the boiler supplier, and with CDM requirements.</p> <p>This is further verified by the evidence for training of the project personnel and the boiler attendants' certificates issued by Directorate of Steam Boilers (Government agency) for the boiler operators.</p>	<p>OK</p>
<p>1.19. Check the environmental report, license, permit and compliance to the local environmental legislation (if</p>	<p>The verification team has confirmed that the project meets the relevant local environmental legislation. The same was confirmed from the copy of the consent to operate issued by Chattisgarh Environment Conservation Board dated 08/06/2012 valid for one year. Also copy of boiler certificate 01/03/2012 to 28/02/2013 issued by Directorate of Steam Boilers Department has been submitted for</p>	<p>OK</p>



	Verified situation	Conclusion	
relevant).	the operation of the boiler.		
1.20. Check contribution to sustainable development, comparing those expected in the included CPA-DD and the actual status.	With the provision of employment opportunities by the project activity, there has been a contribution for the social and economic well-being of some local people.. The project utilises renewable biomass to produce steam (thereby avoiding the fossil fuel usage) and this leads to environment well being by reduced environmental impact from fossil fuel use. Also the project uses renewable biomass technology which is deemed as a clean (as it displaces fossil fuel usage) and safe technology. Even though the sustainable development measures were not registered in the CPA-DD as a monitoring parameter, it was confirmed during the site visit that the CPA contributes to the sustainable development of the host country.	OK	
1.21. Check issues with local stakeholders, claims, complaints, etc.	It was confirmed by on-site interviews that there had been no claims and complaints from local stakeholders prior to the verification visit.	OK	
1.22. If from the above assessment the conclusion is that the implementation or operation of the CPA does not conform with the description contained in the included CPA-DD and/or corrections have been made to project information or parameters fixed at validation/inclusion, determine if these changes and/or corrections do not require prior approval by the board: <ul style="list-style-type: none"><li>- A request of approval is required if the boundary of a registered CDM PoA is changed to include an additional host party, in accordance with the project cycle procedure.</li><li>- A request for approval is required if the CME of a registered CDM PoA changes after the registration of the PoA.</li><li>- Any corrections to project information of an included CPA that do not affect the design of the project activity do not require prior approval by the Board.</li><li>- A request for approval is required if any of the three issues below is adversely impacted by the identified changes to the project design.</li></ul>			
1.23. The applicability and application of the applied methodology under which the CPA has been included:  Check if the project boundary has changed and if any of the parameters to assess the applicability conditions have changed.	No change in applicability and application of the applied methodology AMS-I.C. version 16, including the project boundary, is observed.	YES	NO
			X

	Verified situation	Conclusion	
1.24. Compliance of the included CPA to eligibility criteria as defined in the registered PoA-DD.  Check if any of the parameters to assess the PoA eligibility criteria have changed.	No change in the eligibility criteria of the registered CPA, as defined in the registered PoA-DD, is observed.	YES	NO
			X
1.25. The additionality of the project activity:  Check if any of the input parameters to the investment analysis have changed. For barrier analysis, check if any information or data used in the barrier analysis has changed.	There is no change in the project design parameters as the project is implemented as per the included CPA-DD. Hence this is not applicable.	YES	NO
			X
1.26. The scale of the project activity.  Check if the project is still small scale or large scale after the implementation of the changes.	Small scale, as per the eligibility criteria for CPA inclusion and is in accordance with the methodology AMS-I C, version 16.	YES	NO
			X
If the answer to any of the above items is YES, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
1.27. If, from the above assessment, the conclusion is that the changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	

	Verified Situation	Conclusion
<b>SECTION 2. Compliance of the Monitoring Plan with the Monitoring Methodology including applicable Tool(s)</b>		
2.1. Is the monitoring plan of the included CPA-DD in accordance with the applied methodology?	Yes, it is confirmed that monitoring plan of the included CPA-DD is in accordance with the applied methodology, AMS-I.C, version 16.	OK
2.2. If the methodology provides different options (for example, use of default values or on-site measurements), has the Monitoring Report specified which option is used?	<p>Yes,</p> <p>The ex-ante parameters which are fixed for the crediting period at the time of CPA inclusion in the PoA as per the methodological tools are:</p> <ul style="list-style-type: none"> <li>• <math>CAP_{\text{boiler}}</math> (Rated capacity (thermal output) of the boiler of the Project activity)</li> <li>• <math>\eta_{\text{BL,thermal}}</math> (The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity)</li> <li>• <math>EF_{\text{FF,CO}_2}</math> (<math>\text{CO}_2</math> Emission Factor of the fossil fuel (Indian Coal) that would have been used in the baseline plant)</li> <li>• <math>SA_k</math> (Surplus availability of Biomass within approx. 95 km radial distance)</li> <li>• <math>EF_{\text{grid,CM,y}}</math> (Ex-ante Grid Emission Factor in a year y)</li> <li>• <math>EF_{\text{EL,j,y}}</math> (Emission Factor for fossil fuel based electricity generation for source j in year y)</li> <li>• <math>EF_{\text{km,CO}_2}</math> (Average <math>\text{CO}_2</math> emission factor for the trucks measured during the year y)</li> <li>• <math>TDL_{i,y}</math> (Average technical transmission and distribution losses for providing electricity to source j in year y)</li> <li>• <math>SEC_{\text{PJ,j,y,measured}}</math> (Specific energy consumption of fuel type j of the Project activity in year y)</li> </ul> <p>Further, the verification team confirms that there is no deviation in the values of the ex-ante fixed parameters between the included CPA-DD and the MR.</p> <p>The parameters being monitored ex-post as per the monitoring methodology and the CPA-DD are:</p> <ul style="list-style-type: none"> <li>• Quantity of steam supplied in year y (<math>Q_{\text{steam}}</math>)</li> <li>• Average Steam Temperature at MSSV (Main steam stop valve) outlet during year (<math>T_{\text{steam}}</math>)</li> <li>• Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet</li> </ul>	OK

		Verified Situation	Conclusion
		<p>during year (<math>P_{\text{steam}}</math>)</p> <ul style="list-style-type: none"> <li>• Average Feed Water Temperature at inlet of boiler (<math>T_{\text{FWB}}</math>)</li> <li>• Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob},k}</math>)</li> <li>• Quantity of subsequent delivery of fuel type k biomass at the Project site (<math>Q_{\text{np},k}</math>)</li> <li>• Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in},k}</math>)</li> <li>• Quantity of biomass fuel type k consumed during the monitoring period (<math>Q_{\text{c},k} = FC_{\text{biomass},k,y}</math>)</li> <li>• Quantity of stored fuel type fossil (Coal) i on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob},i}</math>)<sup>*</sup></li> <li>• Quantity of subsequent delivery of fuel type fossil fuel (Coal) i (<math>Q_{\text{np},i}</math>)<sup>*</sup></li> <li>• Quantity of remaining fossil fuel type (Coal) i available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in},i}</math>)<sup>*</sup></li> <li>• Quantity of fossil fuel type i (Coal) consumed during the monitoring period (<math>Q_{\text{c},i} = FC_{\text{fossil},i,y}</math>)<sup>*</sup></li> <li>• Net calorific value of biomass fuel k used in the Project activity. (<math>NCV_k</math>)</li> <li>• Percentage of hydrogen in biomass fuel (Hydrogen)</li> <li>• Percentage oxygen in Biomass fuel (Oxygen)</li> <li>• Moisture content of the biomass residues (Moisture)</li> <li>• Weighted average net calorific value of the fuel (coal) type i in year y (<math>NCV_{i,y}</math>)</li> <li>• Auxiliary Electricity Consumption of the Project activity from the Grid in year y (<math>EC_{\text{PJ},j,y}</math>)</li> <li>• Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) in a year y (<math>EC_{\text{EL},j,y}</math>)<sup>**</sup></li> <li>• Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y (<math>AVD_{,y}</math>)</li> <li>• Number of truck trips during the year y (<math>N_{,y}</math>)</li> <li>• Weighted average CO<sub>2</sub> emission factor of fuel type i in year y (<math>EF_{\text{CO2},i,y}</math>)</li> </ul> <p>These parameters are based on on-site measurement and have been verified during</p>	

	Verified Situation	Conclusion
	<p>this verification.</p> <p>* No fossil fuel has been fired in the project boiler during this monitoring period</p> <p>** Auxiliary electricity for the boiler has been sourced from grid and no off grid (DG power) power was used during the monitoring period.</p>	
2.3. Is all data collected and archived according to the tables in the applied Monitoring Methodology and is this included in the Monitoring Plan?	Yes, all the data is collected and archived in accordance to methodology and included in the monitoring plan. All the data will be archived until 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.	OK
<p>2.4. Check the calculation of emission reductions following the applied methodology:</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and applied for the project activity are as follows:</p> <p><b>Baseline emissions:</b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity during the year y (tCO<sub>2</sub>)</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity during the year y (TJ)</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant; tCO<sub>2</sub> / TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity</p>	<p>CL-01</p> <p>OK</p>

	Verified Situation	Conclusion
	<p> <math>EG_{\text{thermal}} = Q_{\text{steam}} * (H_s - H_w) * 4.186 \times 10^{-6}</math> </p> <p>where</p> <p> <math>EG_{\text{thermal}}</math> = Net quantity of heat supplied by the Project activity (TJ)  <math>Q_{\text{steam}}</math> = Quantity of steam supplied in Tonnes  <math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet (kCal/kg)  <math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg) </p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p> <math>PE_{EC,y} = EC_{PJ,j,y} * EF_{\text{grid},CM,y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})</math> </p> <p> <math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid in year y  <math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set)  <math>EF_{\text{grid},CM,y}</math> (Ex-ante Grid Emission Factor in a year y)  <math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j in year y </p> <p><u>Project emissions from fossil fuel combustion</u></p> <p> <math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math> </p> <p>where</p>	

	Verified Situation	Conclusion
	<p> <math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)  <math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)  <math>COEF_{i,y} = NCV_{i,y} \times EF_{CO_2,i,y}</math>  Where  <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO_2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)  Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math> </p> <p><b><u>Leakage:</u></b></p> <p> <math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math> </p> <p> <math>= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVDC_{y} * EF_{km,CO_2} + N_{y} * AVD_{y} * EF_{km,CO_2}</math> </p> <p>where</p> <p> <math>LE_y</math> = Leakage emissions  <math>LE_{EC,y}</math> = Leakage emissions from electricity consumption in year y (tCO<sub>2</sub>/yr)  <math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site  <math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site  <math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source l in year y as a result of leakage (MWh/yr)  <math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source l in year y (tCO<sub>2</sub>/MWh)  <math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing </p>	

	Verified Situation	Conclusion
	<p>electricity to source / in year <math>y</math></p> <p><math>N_{c,y}</math> = Number of truck trips for collecting loose biomass during the year <math>y</math></p> <p><math>AVD_{c,y}</math> = Average round trip distance between the biomass fuel supply sites and biomass collection site during the year <math>y</math></p> <p><math>EF_{km,CO_2}</math> = Average <math>CO_2</math> emission factor for the trucks measured during year <math>y</math></p> <p><math>N_{,y}</math> = Number of truck trips during the year <math>y</math></p> <p><math>AVD_{,y}</math> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant during year <math>y</math> (km)</p> <p>Emission reductions are calculated as follows:</p> $ER_y = BE_y - PE_y - LE_y$ <p>However, CL 01 was raised as in section E.5 of the MR, the calculation of the ex-ante emission reductions was not transparently presented. The revised MR clearly and transparently describes the ER calculation approach providing relevant equations in line with the included CPA-DD.</p>	
<p>2.5. List any monitoring aspect that is not specified in the methodology and check its compliance with the Monitoring Plan, for example:</p> <ul style="list-style-type: none"> <li>• additional monitoring parameters</li> <li>• monitoring frequency</li> <li>• calibration frequency.</li> </ul>	<p>No additional monitoring parameter is identified that is not specified in the approved methodology and the included CPA-DD available in the project page on UNFCCC website.</p> <p>The monitoring frequency and the calibration frequency specified are not less than the requirements of the approved methodology and the Monitoring plan in the included CPA-DD.</p>	OK



		Verified Situation	Conclusion
<b>SECTION 3. Compliance of Monitoring activities with the Monitoring Plan of the included CPA-DD</b>			
3-1. Is the Monitored Data included in the Monitoring Report as per the Monitoring Plan or any accepted revised MP?	Yes	The monitored data included in section D.2 of the MR is as per the monitoring plan of the included CPA-DD.  The values are indicated in the section D.2 of the Monitoring Report. At the site visit it was verified that data was generated at the required frequency as per the monitoring plan in the included CPA-DD.	OK
3-2. Has the data been generated at the frequency required by the Monitoring Plan or any accepted revised MP?			
3-3. Has the monitoring been implemented in accordance with the monitoring plan contained in the included CPA-DD or any accepted revised MP?  Confirm that the monitoring and reporting procedures have been implemented as documented and follow by PPs.	Yes, by means of document review, on-site assessment and interviews with the plant personnel, it was confirmed that the monitoring has been implemented in accordance with the monitoring plan contained in the included CPA-DD.  It was also established that monitoring and reporting procedures have been implemented as documented by the CME and the CPA operator		OK
3-4. Have types of measurement instrumentation used been described and specified?	Yes the MR specifies and describes the use of different measurement instruments (Steam flow meter, RTD / Temperature gauge, Pressure transmitter / Pressure gauge, energy meter and weighbridge). The details of the measuring equipment are provided in the "Annex-1_4041-0013: Instrument Details" of the MR. The provided details have been verified during the on-site visit.		OK

	Verified Situation	Conclusion
<p>3-5. Is the accuracy of equipment used for monitoring sufficient and regularly controlled and calibrated in line with the registered monitoring plan or any accepted revised MP?</p> <p>Check relevance of maintenance and calibration included in the monitoring plan.</p> <p>Check relevance of laboratory analysis if included in the monitoring plan.</p>	<p>Yes, the verification team confirmed through the on-site assessment and the review of evidence that the installation of the measuring devices has been completed and the equipment has been operated and maintained in normal operating conditions.</p> <p>The accuracy classes of all the monitoring equipment are found as per the monitoring plan of the included CPA-DD, or of higher accuracy as detailed in "Annex-1_4041-0013: Instrument Details" of the MR.</p> <p>It was confirmed that the information of the meters was consistent with that described in the Monitoring Report.</p> <p>The CME has provided the calibration certificates of all the monitoring equipment and the verification team confirms the certificates to be appropriate and relevant.</p> <p>For further details of the calibration of the monitoring equipment please refer to section 3.19 of this report below.</p> <p>CL 07 was raised as the CME has not provided the credentials of the calibrating agencies and the laboratories, which have carried out the NCV analysis. Adequate information was provided by the CME and the CL was closed. For details please refer to Appendix D of this report.</p>	<p>GL-07 OK</p>
<p>3-6. If the monitoring plan of the CPA-DD refers to a sampling plan and monitoring is carried out for the chosen samples, ensure that the sampling is carried out as per the sampling plan<sup>108</sup>.</p>	<p>The monitoring plan of the CPA-DD does not refer to a sampling plan and the monitoring is carried out for 100% data for all the monitoring parameters.</p>	<p>NA</p>

<sup>108</sup> The sampling plan shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified Situation	Conclusion
<p>3-7. Check that responsibilities and authorities for monitoring and reporting are in line with the monitoring plan.</p> <p>Are the monitoring results consistently recorded, reviewed and approved as stated in the CPA-DD or any accepted revised MP?</p>	<p>Yes</p> <p>During the site visit, monitoring and reporting procedures were confirmed by the verification team through interview with the relevant plant personnel, CME and by document review.</p> <p>However following CAR/CL were raised and successfully closed;</p> <ul style="list-style-type: none"> <li>CAR 02 was raised as the opening readings of the parameter "<math>Q_{\text{steam}}</math>" and closing readings of the parameters "<math>EC_{PJ,y}</math>" and "<math>EC_{EL,j,y}</math>" have not been presented to the verification team.</li> <li>CL 02 was raised as, for the parameters like "<math>CAP_{\text{boiler}}</math>" and "<math>SEC_{PJ,y,\text{measured}}</math>", it was stated in the MR that they were used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not used for baseline emission calculation.</li> </ul> <p>The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p>	<p><del>CAR 02</del></p> <p><del>CL 02</del></p> <p>OK</p>
<p>3-8. Reporting period: Defined?</p> <p>If a monitoring period of a parameter more / less than a year is applied, check if the monitoring is in a complete and consistent manner?</p> <p>Is the monitoring period within the crediting period of the CPA and length of the registered PoA?</p>	<p>The monitoring period for the PoA is from 12/01/2011 to 31/08/2012. But for the CPA, the emission reduction starts from 01/07/2012 (i.e., the date of start of crediting period of the CPA) till 31/08/2012. Hence the monitoring period for the CPA is for 62 days which is less than a year. However, monitoring of all the parameters is complete, as there is no specific requirement in the methodology for annual reporting of any data. The verification team therefore, confirms the monitoring to be complete and consistent and clearly defined in the MR.</p> <p>The monitoring period is within the crediting period of the CPA and also the length of the registered PoA.</p> <p>Nevertheless, CL 09 was raised as the monitoring period of the CPA is not consistent with that of the PoA in the webhosted MR. The issue has been addressed and the finding was successfully closed.</p>	<p><del>CL 09</del></p> <p>OK</p>

	Verified Situation	Conclusion
3-9. If the monitoring plan includes the determination of environmental and / or social indicators, have the sustainable development indicators been monitored in accordance with the monitoring plan of the included CPA-DD?	Not applicable	NA
3-10. Check monitoring of Environmental and Social indicators (if relevant) <ul style="list-style-type: none"> <li>• implementation of measures</li> <li>• monitoring equipment</li> <li>• quality assurance procedures</li> <li>• external data.</li> </ul>	Not applicable	NA

		Verified Situation	Conclusion	
<b>SECTION 2 and 3: Post Registration Changes</b>				
<p>3-11. If, from the above assessment in SECTIONS 2 and 3, the conclusion is that there are temporary deviations or permanent changes from the registered Monitoring Plan or Monitoring Methodology, determine if these deviations or changes require prior approval by the EB by answering the questions below.</p> <p>All the answers to the applicable questions below shall be explained and the reasons for each conclusion given in the “Verified situation” column.</p> <p><b>Temporary deviations from the registered monitoring plan or applied methodology:</b> Prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES.</p>				
3-12. Have the PPs reported as zero any parameter related to baseline GHG emissions that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?	No temporary deviation is sought during this monitoring period	YES	NO	
		-	-	
3-13. Have the PPs estimated (assuming that the source of the project GHG emissions operated at maximum capacity for the full period of the missing data) any parameter that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?  For project GHG emissions related to the consumption of electricity, the estimate shall include an addition of 10% to account for transmission and distribution losses.	No temporary deviation is sought during this monitoring period	YES	NO	
		-	-	
<b>Permanent changes from the registered monitoring plan or applied methodology</b>				
If the monitoring equipment actually installed has a lower accuracy level than the accuracy stipulated in the applied methodology and/or in the registered monitoring plan, and the monitoring equipment is under the control of the project participants, prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES:				
3-14. Have the PPs deducted from the measured value,	No permanent change in the monitoring plan is observed during this	YES	NO	

	Verified Situation	Conclusion	
for any parameter used for calculating baseline GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	monitoring period	-	-
3-15. Have the PPs added to the measured value, for any parameter used for calculating project GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES	NO
		-	-
Changes to the monitoring of the included CPA of a type listed below do not require approval by the EB. Confirm in the conclusion column that the change is of the type in the table below and explain the reasons.			
3-16. Change of calibration frequency or practice for monitoring equipment not within the control of project participants	Not Applicable	NA	
3-17. Change of accuracy / type / model of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
3-18. Change of location of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
If the answer to any of the above items has been that approval from the EB is required, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
3-19. If, from the above assessment, the conclusion is that the temporary deviations or permanent changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	

### 3.19 Monitoring Parameters and Calibration Checklist:

Complete the following table for each parameter:

Data / Parameter (as in the MP)		Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Value	Ex-ante	79,252 per annum	207.47
	Ex-post	425.30	190.02 <sup>109</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		As per the monitoring plan of the included CPA-DD, the quantity of steam delivered by the project is measured by duly calibrated steam flow meter and the calibration certificate has been verified. Further, the verification team cross-checked the quantity of steam delivered by the project activity during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the steam temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.

<sup>109</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

Data / Parameter (as in the MP)	Quantity of steam supplied in year y " $Q_{\text{steam}}$ " (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet " $T_{\text{steam}}$ " ( $^{\circ}\text{C}$ )
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Steam flow meter Sr. No.: ECO29320000	RTD Sr. No.: ECO29320000 <sup>110</sup>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+/- 2.3% Maximum (which is better than that stated in the CPA-DD of +/-3%)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	01/07/2012 to 31/08/2012	01/07/2012 to 31/08/2012
Instrument type	Steam flow meter cum RTD	Steam flow meter cum RTD
Manufacturer, model and serial number	Make: Endress + Hauser; Sr. No.: ECO29320000	Make: Endress + Hauser; Sr. No.: ECO29320000
Specific location	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler
Calibration dates	07/02/2012 (valid till 06/02/2015)	07/02/2012 (valid till 06/02/2015)
Company performing the calibration	Manufacturer Endress + Hauser (NABL accredited)	Manufacturer Endress + Hauser (NABL accredited)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes

<sup>110</sup> A consolidated monitoring equipment is used by the CPA operator, which has inbuilt feature for measuring the both steam flow and the steam temperature. This was confirmed during the on-site visit and verification of the technical specification of the measuring equipment.



Data / Parameter (as in the MP)	Quantity of steam supplied in year y " $Q_{\text{steam}}$ " (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet " $T_{\text{steam}}$ " ( $^{\circ}\text{C}$ )
Maintenance	The Steam flow meter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year " $P_{\text{steam}}$ " ( $\text{kg}/\text{cm}^2 \text{ g}$ )	Average Feed Water Temperature at inlet of boiler " $T_{\text{FWB}}$ " ( $^{\circ}\text{C}$ )
Value	Ex-ante	17.5	80
	Ex-post	12.89 <sup>111</sup>	34.21 <sup>112</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA

<sup>111</sup> The value is the weighted average of the daily recorded pressure readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily pressure readings was reported in the published MR which is incorrect. The CAR was closed after the pressure was revised as the weighted average of the daily readings during the monitoring period

<sup>112</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “<math>P_{\text{steam}}</math>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “<math>T_{\text{FWB}}</math>” (°C)</b>
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the steam pressure is measured by duly calibrated pressure transmitter and the calibration certificate has been verified. Further, the verification team cross-checked the steam pressure during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the feed water temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Pressure transmitter Sr. No. EC172101052	RTD RTD-01
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	+/- 1% (which is better than 2% as stated in the CPA-DD)	Class B (which is same as stated in the CPA-DD)
Period of operating time	01/07/2012 to 31/08/2012	01/07/2012 to 31/08/2012
Instrument type	Pressure transmitter	RTD
Manufacturer, model and serial number	Endress + Hauser; Sr. No. EC172101052	Bellofram; Sr. No. RTD-01
Specific location	Project site, at the Main Steam Stop Valve (MSSV)	Project site, after the boiler feed water tank at the inlet of the boiler
Calibration dates	15/06/2012 (valid till 14/06/2013)	15/06/2012 (valid till 14/06/2013)
Company performing the calibration	Bhilai calibration laboratory (NABL accredited)	Bhilai calibration laboratory (NABL accredited)

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “<math>P_{\text{steam}}</math>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “<math>T_{\text{FWB}}</math>” (°C)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The pressure transmitter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “<math>Q_{\text{ob,k}}</math>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “<math>Q_{\text{np,k}}</math>” (Tonnes)</b>
Value	Ex-ante	NA
	Ex-post	65.00
Measuring / Monitoring frequency	At the start of the monitoring period	84.19
Reporting frequency	Once during the monitoring period	Data is monitored and recorded for each truck delivery
		Each truck trip

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The opening balance of the biomass is measured by a calibrated weighbridge	Biomass procured is measured for each truck entering the plant premises by a calibrated weighbridge
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge; Sr. No. 950041998	Weighbridge; Sr. No. 950041998
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III <sup>113</sup>	Class III <sup>106</sup>
Period of operating time	01/07/2012 to 31/08/2012	01/07/2012 to 31/08/2012
Instrument type	Weighbridge	Weighbridge
Manufacturer, model and serial number	Essae- toraika; Sr. No. 950041998	Essae- toraika; Sr. No. 950041998
Specific location	At project site	At project site
Calibration dates	24/09/2011 (valid till 23/09/2012)	24/09/2011 (valid till 23/09/2012)
Company performing the calibration	Weights and Measure Department, Govt. of India	Weights and Measure Department, Govt. of India

<sup>113</sup> In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department , Govt. of India. Hence the accuracy class is deemed acceptable

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The weighbridge was functional throughout the monitoring period	The weighbridge was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	18.91
Measuring / Monitoring frequency	Measured at the end of the monitoring period	6401.89 per annum
Reporting frequency	Once during the monitoring period	130.28
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Calculated from the opening, received and closing balance of the biomass during the monitoring period
Does monitoring of the parameter involve sampling? (yes / no)	No	At the end of the monitoring period
Population Size	NA	No
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The closing balance of the biomass is measured by a calibrated weighbridge	The quantity of biomass consumed is cross-checked with the invoices obtained from the fuel supplier and found to match
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge; Sr. No. 950041998	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III <sup>114</sup>	NA
Period of operating time	01/07/2012 to 31/08/2012	NA
Instrument type	Weighbridge	NA
Manufacturer, model and serial number	Essae- toraika; Sr. No. 950041998	NA
Specific location	At project site	NA
Calibration dates	24/09/2011 (valid till 23/09/2012)	NA
Company performing the calibration	Weights and Measure Department, Govt. of India	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The weighbridge was functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Yes. But this data is not used for emission reduction calculation.

<sup>114</sup> In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department, Govt. of India. Hence the accuracy class is deemed acceptable

Data / Parameter (as in the MP)		Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q <sub>ob,i</sub> ” (Tonnes)	Quantity of subsequent delivery of fuel type fossil fuel i “Q <sub>np,i</sub> ” (Tonnes)
Value	Ex-ante	-	-
	Ex-post	0	0
Measuring / Monitoring frequency		Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q<sub>ob,i</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i “Q<sub>np,i</sub>” (Tonnes)</b>
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site “Q<sub>in,i</sub>” (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period “Q<sub>c,i</sub>” = “FC<sub>i,PJ,y</sub>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	0
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA



<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site "<math>Q_{in,i}</math>" (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period "<math>Q_{c,i}</math>" = "<math>FC_{i,PJ,y}</math>" (Tonnes)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Net calorific value of biomass fuel k used in the Project activity “NCV <sub>k</sub> ” (TJ/Gg)	Percentage of hydrogen in biomass fuel “Hydrogen” (%)
Value	Ex-ante	12.11	4.03
	Ex-post	13.30 <sup>115</sup>	4.03
Measuring / Monitoring frequency		Annually once	Annually once
Reporting frequency		Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		The NCV is calculated from the values of the GCV, Hydrogen, Oxygen and Moisture provided in the analysis report carried out by third party laboratory Quality Services and Solutions which is accredited by NABL	Provided in the analysis report carried out by third party laboratory Quality Services and Solutions which is accredited by NABL
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA

<sup>115</sup> Calculated from the laboratory analysis report providing the values of GCV as 3177.56 kCal/kg, Hydrogen as 4.03%, Oxygen as 31.49% and moisture as 9.90% using the formulae provided in the CPA-DD

<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “NCV<sub>k</sub>” (TJ/Gg)</b>	<b>Percentage of hydrogen in biomass fuel “Hydrogen” (%)</b>
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen” (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Value	Ex-ante	31.49
	Ex-post	31.49
Measuring / Monitoring frequency	Annually once	Annually once
Reporting frequency	Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen” (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	Provided in the analysis report carried out by third party laboratory Quality Services and Solutions which is accredited by NABL	Provided in the analysis report carried out by third party laboratory Quality Services and Solutions which is accredited by NABL
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Weighted average net calorific value of the fuel type i in year y “NCV <sub>i,y</sub> ” (TJ/Gg)	Weighted average CO2 emission factor of fuel type i in year y “EF <sub>CO2,i,y</sub> ” (tCO <sub>2</sub> /GJ)
Value	Ex-ante	-	-
	Ex-post	- Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	- Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Measuring / Monitoring frequency		NA	NA
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA
Company performing the calibration		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/Gg)</b>	<b>Weighted average CO2 emission factor of fuel type i in year y “EF<sub>CO2,i,y</sub>” (tCO<sub>2</sub>/GJ)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>” (MWh)</b>
Value	Ex-ante	1033.5 per annum
	Ex-post	24.13
Measuring / Monitoring frequency	Continuous	No captive fossil fuel (Diesel Generator) power has been consumed by the project during the monitoring period
Reporting frequency	Monthly	Monthly However, CAR 02 was raised as the recording frequency of the monitoring parameter “EC <sub>EL,j,y</sub> ” has not been stated in the MR. CAR was closed after revision in the MR.
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	NA
Does monitoring of the parameter involve sampling? (yes / no)	No	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>” (MWh)</b>
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	The auxiliary electricity is measured by a calibrated energy meter	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Energy Meter; Sr. No. 203352/18502-2610	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class 1.0 (which is better than Class 2 stated in the CPA-DD)	NA
Period of operating time	01/07/2012 to 31/08/2012	NA
Instrument type	Energy Meter	NA
Manufacturer, model and serial number	Schneider Electric; Sr. No. 203352/18509-2610 However, CAR 07 was raised as the Sr. No. of the energy meter provided in the MR was incorrect. The CAR was closed after appropriate revision of the MR.	NA
Specific location	Project site	NA
Calibration dates	13/06/2012 (valid till 12/06/2013)	NA
Company performing the calibration	Manufacturer Schneider Electric (NABL accredited)	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.	NA
Is calibration valid for the whole reporting period?	Yes	NA

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>” (MWh)</b>
Maintenance	The energy meter was functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	NA
Key reporting risks	Low risk	NA

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Value	Ex-ante	-
	Ex-post	14
Measuring / Monitoring frequency	Continuous at each trip	Continuous at each trip
Reporting frequency	Calculated at the end of the monitoring period	Calculated at the end of monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the invoices and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA



<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

	Verified situation	Conclusion
<b>SECTION 4. Compliance with the calibration frequency requirements for measuring instruments</b>		
The “Monitoring Parameters and Calibration Checklist” in section 3 above shall be checked to determine if the calibration frequency specified in the applied monitoring methodology and/or monitoring plan is followed in the monitoring report and in the monitoring activities. Where a failure to comply with the required frequency is detected, or no frequency is mentioned in the monitoring report, please follow the checklist below:		
<p>4-1. If the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (that is, the results of delayed calibration are available), confirm that the following conservative approach has been adopted in the calculation of emission reductions:</p> <ul style="list-style-type: none"> <li>- If the delayed calibration did not show any errors in the measuring equipment, or the error was smaller than the maximum permissible error, have the PPs applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> <li>- If the delayed calibration identified an error greater than the maximum permissible error, have the PPs applied the error identified in the delayed calibration test to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> </ul> <p>Confirm that the error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer emission reductions being claimed;</p>	No delayed calibration was noted during this monitoring period. Hence this is not applicable.	NA

	Verified situation	Conclusion
<p>4-2. If the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification:</p> <ul style="list-style-type: none"> <li>m. Request the PPs to conduct the required calibration;</li> <li>n. On receipt of the calibration results, determine whether the PPs have calculated the emission reductions conservatively using the approach mentioned in section 4.1 above.</li> </ul>	Not Applicable.	NA
<p>4-3. If it is not possible for the PPs to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of the PPs, check if the PPs have prepared a temporary deviation or a 'Permanent changes from the monitoring plan and/or monitoring methodology application'.</p> <p>Follow the requirements for post registration changes in sections 3.10 to 3.19 above.</p>	Not Applicable.	NA
<p>4-4. If neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipment, determine whether the equipment is calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification. If neither local/national standards nor the manufacturer's specification are available, international standards may be used.</p>	Not Applicable.	NA

	Verified situation	Conclusion
<b>SECTION 5. Assessment of data and calculation of emission reductions</b>		
<p>5-1. Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in line with the formulae and methods described in the monitoring plan and the applied methodology document?</p> <p>Check consistency in the ERs spreadsheet.</p>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and the applicable methodological tools for the project activity are as follows:</p> <p><b>Baseline emissions:</b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity = 100.66 tCO<sub>2</sub> – Calculation shown below</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity = 1.125 TJ – Calculation shown below</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant as per the included CPA-DD = 89.5 tCO<sub>2</sub>/TJ</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity as per the included CPA-DD = 100%</p> $EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}$ <p>where</p> <p><math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{steam}</math> = Quantity of steam supplied in Tonnes = 425.30 Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet = 665.94 kCal/kg</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg) = 34.21 kCal/kg</p>	<p>CAR-04 CL-08 CL-02 OK</p>

	Verified situation	Conclusion
	<p> <math>EG_{\text{thermal}} = 425.30 * (665.94 - 34.21) * 4.186 * 10^{-6}</math>  <math>= 1.125 \text{ TJ}</math> </p> <p>           Note: Steam enthalpy is calculated at the weighted average steam pressure during the monitoring period from standard steam table for saturated steam. Similarly the enthalpy of the boiler feed water is determined at the weighted average feed water temperature during the monitoring period. The verification team independently calculated the steam enthalpy at the average steam pressure of 12.89 kg/cm<sup>2</sup> g using the web site - <a href="http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp">http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp</a> ; and found the steam enthalpy as 666.18 kCal/kg. Hence the enthalpy used by the CME is conservative.         </p> <p>           Therefore,  <math>BE_{\text{thermal,CO2,y}} = 1.125 / 100 * 89.5</math>  <math>= 100.66 \text{ tCO}_2</math> </p> <p> <b><u>Project emissions:</u></b> </p> <p> <u>Project emissions due to electricity consumption:</u> </p> <p> <math>PE_{\text{EC,y}} = EC_{\text{PJ,j,y}} * EF_{\text{grid,CM,y}} * (1 + \text{TDL}_{\text{j,y}}) + EC_{\text{EL,j,y}} * EF_{\text{EL,j,y}} * (1 + \text{TDL}_{\text{j,y}})</math> </p> <p> <math>EC_{\text{PJ,j,y}} = \text{Auxiliary Electricity Consumption of the Project activity from the Grid} = 24.13 \text{ MWh}</math> </p> <p> <math>EC_{\text{EL,j,y}} = \text{Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set)} = 0 \text{ MWh}</math> </p> <p> <math>EF_{\text{grid,CM,y}} = \text{Ex-ante Grid Emission Factor} = 0.80 \text{ tCO}_2/\text{MWh}</math> </p> <p> <math>EF_{\text{EL,j,y}} = EF_{\text{EL,l,y}}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l) = 1.3 tCO<sub>2</sub>/MWh         </p>	

	Verified situation	Conclusion
	<p><math>TDL_{i,y}</math> = Average technical transmission and distribution losses for providing electricity to source i and/or j as per the included CPA-DD = 20%</p> <p><math>PE_{EC,y} = 24.13 * 0.80 * (1+20\%) + 0 * 1.30 * (1+20\%)</math>  <math>= 23.16 \text{ tCO}_2</math></p> <p><u>Project emissions from fossil fuel combustion</u></p> <p><math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math></p> <p>where  <math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p><math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr) = 0 Tonnes  <math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)</p> <p><math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math>  Where  <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)</p> <p>As there is fossil fuel consumption during the monitoring period,</p> <p><math>PE_{FC,j,y} = 0</math></p> <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math>  <math>= 23.16 + 0 = 23.16 \text{ tCO}_2</math></p> <p><u>Leakage:</u></p> <p><math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math></p>	

	Verified situation	Conclusion
	<p> <math display="block">= EC_{LE,l,y} * EF_{EL,l,y} * (1+TDL_{l,y}) + N_{c,y} * AVD_{c,y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km, CO2}</math> </p> <p>where</p> <p>LE<sub>y</sub> = Leakage emissions</p> <p>LE<sub>EC,y</sub> = Leakage emissions from electricity consumption</p> <p>LE<sub>collection,y</sub> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p>LE<sub>transportation, y</sub> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p>This CPA does not involves usage of any processed biomass (rice husk is the biomass residue used in the project boiler). Hence leakage emission due to processing biomass is not applicable.</p> <p>Again the biomass used in the project is not transported from beyond 200 km of the project site (biomass transported from within a distance of 14 km). Hence leakage emission due to transportation of biomass is neglected.</p> <p>Thus LE<sub>y</sub> = 0</p> <p>Emission reductions are calculated as follows:</p> <p> <math display="block">ER_y = BE_y - PE_y - LE_y</math> <math display="block">= 100.66 - 23.16 - 0 = 77 \text{ tCO}_2 \text{ (rounded down value)}</math> </p> <p>However, the following CAR/CLs were raised:</p> <p>CAR 04#1 was raised as non consideration of leakage due to processing and transportation (where availability of surplus biomass is more than 25%) for the CPA is not justified in the MR. The finding was successfully closed after appropriate revision in the MR / ER spreadsheet.</p> <p>.</p> <p>CL 08 was raised as the ER calculation spreadsheet provided for the CPA had not included daily monitored data for steam quantity, temperature, pressure and feed water temperature to calculate the average of these parameters. ER calculation spreadsheet was adequately revised and the CL was closedd.</p>	

	Verified situation	Conclusion
	CL 02#2 was raised as, for the parameter " $TD_{Li,y} = TD_{Lj,y}$ ", it was stated in the MR that it is used for Leakage emission calculation. But this parameter is also used for the calculation of project emission. CL was closed after appropriate revision in the MR.	
<p>5-2. Has the calculation tool been correctly documented? Check its consistency and formulae.</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	The Monitoring Report is supported by Micro Soft excel based spreadsheet for the calculation of emission reductions. The consistency and formula were verified and found to be accurate.	OK
<p>5-3. Is a complete set of data available during the specified monitoring period? If only partial data is available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan proceed as follows:</p> <ol style="list-style-type: none"> <li>Check if sections 3.11 and/or 3.12 above are applicable and raise a CAR for the PPs to comply with these requirements.</li> <li>If sections 3.11 and 3.12 are not applicable or the answer to this question remains NO, a request for deviation is necessary.</li> </ol> <p>Conduct an assessment of the potential impacts of these changes in accordance to the procedures for Post Registration Changes.</p>	Yes, the complete data set was available during the specified monitoring period.	OK



	Verified situation	Conclusion
<p>5-4. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?</p> <p>Please describe how LRQA has cross-checked reported data.</p>	<p>All the information provided in the Monitoring Report were cross-checked with the Plant log book records, purchase records (for biomass and fossil fuel), site visit and interview of the CPA implementer/CME.</p>	OK
<p>5-5. Have any assumptions used in emission calculations been justified?</p>	<p>All assumptions in the emission reduction calculation are consistent with assumptions taken in the registered monitoring plan and have reference to the applied methodology.</p>	OK
<p>5-6. Have appropriate emission factors, IPCC default values, and other reference values been correctly applied?</p>	<p>The CME has applied the appropriate ex-ante fixed factors as stated in the included CPA-DD like:</p> <ul style="list-style-type: none"> <li>• The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity(<math>\eta_{BL,thermal}</math>)</li> <li>• CO2 Emission Factor of the fossil fuel that would have been used in the baseline plant (<math>EF_{FF,CO2}</math>)</li> <li>• Surplus availability of Biomass within identified region (<math>SA_k</math>)</li> <li>• Ex-ante Grid Emission Factor in a year y.</li> <li>• Emission Factor for fossil fuel based electricity generation for source j and/or l in year y (<math>EF_{EL,j,y} = EF_{EL,l,y}</math>)</li> <li>• Auxiliary Electricity Consumption for biomass processing, outside Project boundary. (<math>EC_{LE,l,y}</math>)</li> <li>• Average CO<sub>2</sub> emission factor for the trucks measured during the year y(<math>EF_{km,CO2}</math>)</li> <li>• Average technical transmission and distribution losses for providing electricity to source l and/or j in year y(<math>TDL_{l,y} = TDL_{j,y}</math>)</li> <li>• Specific energy consumption of fuel type j of the Project activity in year y(<math>SEC_{PJ,j,y,measured}</math>)</li> </ul> <p>However, CL 02#3 was raised for the CME to clarify the appropriateness of the “Source of data” and “Additional comment” as stated in the MR for the parameters in section D.1, which are fixed ex-ante at the time of validation of the CPA.</p> <p>The MR was suitably revised against the raised findings and hence the CAR/CL were closed. For details please refer to the Annex D of this report.</p>	<p>CL 02 OK</p>

## 7.13 Appendix C11: Verification Protocol for CPA 4041-0015

	Verified situation	Conclusion
<b>SECTION 1. Project implementation in accordance with the registered PoA-DD &amp; CPA-DD</b>		
<b>General description of the project</b>		
1.1. Does the MR provide general information of the CPA and is it as per the CPA-DD included by CDM-EB or by a DOE <sup>116</sup> ?	<p>Yes, the Monitoring Report<sup>117</sup> provides the general information of the CPA. Details such as Title of the CPA, UNFCCC registration reference number, version number of the Monitoring Report, monitoring period, project participants, sectoral scope and estimated amount of GHG emission reductions. All the above details can be confirmed from the included CPA-DD through link in UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=S7B6NRHPY5UCTFEWL1MAZIQ28JDGX0">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=S7B6NRHPY5UCTFEWL1MAZIQ28JDGX0</a></p> <p>Title of the CPA is “Promotion of Biomass Based Heat Generation Systems in India” (CPA Number 015)” and it was included in the PoA on 29/06/2012 applying the baseline and monitoring methodology AMS-I.C, version 16 “Thermal energy production with or without electricity” as verified from the project page of the CPA. The project activity applies AMS-I.C, version 16. The project activity is installation and operation of a 12 TPH biomass briquette fired boiler to meet the captive requirement of steam in the production of beer and PET bottles used in different processes like pasteurization, sterilization, wort boiling and Clean In Place (CIP). The project is located in MIDC Area, Waluj, Aurangabad, Maharashtra. The project is implemented by SKOL BREWERIES LIMITED.</p>	OK
1.2. Is the general information provided in the MR in line with the PoA-DD registered by CDM-EB?	<p>Yes, the Monitoring Report is as per the PoA-DD registered by CDM-EB confirmed from the registered PoA-DD through link on UNFCCC site:  <a href="http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=S7B6NRHPY5UCTFEWL1MAZIQ28JDGX0">http://cdm.unfccc.int/ProgrammeOfActivities/gotoCPA?id=S7B6NRHPY5UCTFEWL1MAZIQ28JDGX0</a></p>	OK

<sup>116</sup> The first CPA is included by the CDM-EB along with registered PoA-DD and subsequent CPAs are included by DOEs.

<sup>117</sup> Monitoring Report for this CPA (CPA 4041-0015) refers to the Appendix-11 of the consolidated MR Version 4.0

	Verified situation	Conclusion
1.3. Is the Monitoring report as per the standardised format (F-CDM-MR)? (EB 66 )	Yes, the Monitoring Report is as per the latest standardised format (F-CDM-MR) version 02.0 (EB66, Annex 20).	OK
1.4. Is the monitoring report filled as per the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).	Yes, the MR is filled up as per the latest "Guidelines for completing the Monitoring Report form" EB 66, Annex 20.  CAR 08 was raised as project page of the PoA on UNFCCC web site, the "Other Parties involved" is stated as "United Kingdom of Great Britain and Northern Ireland" and "Germany". But in the MR "Germany" is missing. CAR was closed as the MR was suitably revised.	<del>CAR08</del> OK
1.5. Is there any open issue in the validation / previous verification including FARs? (CDM VVS para. 213)	No No FAR was raised in the Validation report during the CPA inclusion by TUV Rheinland, the DOE for validation of the CPA. Further this being the first periodic verification, no open issues exists from earlier verification.	OK
<b>Implementation status of the CPA</b>		
1.6. Is the CPA location indicated same as that in the included CPA-DD? Confirm geographical coordinates	Yes, the project location is same as stated in the CPA-DD and this was verified during the on-site visit. The geographical coordinates of the project site are 19.8444 <sup>0</sup> North, 75.2000 <sup>0</sup> East. This was cross-checked from the Google Earth web site.	OK
1.7. Is the project boundary described in the same way as the included CPA-DD and registered PoA-DD? Please confirm each component based on the applied methodology.	Yes, the project boundary is described in the same way as in the included CPA-DD and registered PoA-DD. During the on-site assessment it was also confirmed the project boundary is in line with the applied methodology. The project boundary for this CPA includes the biomass storage area and feeding system, boiler house and the facility which is consuming the heat generated by the project.	OK
1.8. Has on-site fossil fuel consumption, if any, been monitored? Is any emission source missed? Check the site lay-out and confirm through site tour.	Fossil fuel consumption is required to be monitored in this project. It has been confirmed during the on-site visit and document review that no fossil fuel has been consumed at the CPA site by the project. The verification team did not find any emission source attributable to the project activity which has been missed out and the same was confirmed during the on-site visit and review of the site lay-out diagram.	OK
1.9. Confirm contractors for	It is confirmed that the project equipment i.e., 12TPH boiler for the project is supplied by Thermax	OK

	Verified situation	Conclusion										
equipment and installation works	Limited and this was confirmed during the on-site visit interview with the project implementer and from the purchase order copy of the boiler issued by the project implementer dated 18/07/2011.											
1.10. Confirm conformance with baseline and monitoring methodology - Applicability conditions. Please refer to the complete description of the applicability conditions and confirm that the CPA meets all the requirements.	<div>Conformance to the applicable methodology conditions for the CPA are as follows:</div> <table><tr><th>Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)</th><th>Means of Verification and Results</th></tr><tr><td><i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i></td><td>The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.</td></tr><tr><td><i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i></td><td>The total installed / rated capacity of the project equipment is 7.53 MW<sub>thermal</sub> which is less than 45 MW<sub>thermal</sub>.</td></tr><tr><td><i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i></td><td>The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.</td></tr><tr><td><i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i></td><td>The project does not use any charcoal.</td></tr></table>	Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)	Means of Verification and Results	<i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>	The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.	<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>	The total installed / rated capacity of the project equipment is 7.53 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .	<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>	The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.	<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>	The project does not use any charcoal.	OK
Applicability Criteria as per the baseline monitoring methodology of (AMS-I.C, version 16)	Means of Verification and Results											
<i>This category comprises renewable energy technologies that supply users with thermal energy that displaces fossil fuel use. These units include technologies such as solar thermal water heaters and dryers, solar cookers, energy derived from renewable biomass and other technologies that provide thermal energy that displaces fossil fuel.</i>	The project activity comprises renewable biomass fired boiler that supplies thermal energy to the industrial facility at the project site and displaces fossil fuel use.											
<i>The total installed/rated thermal energy generation capacity of the project equipment is equal to or less than 45 MW<sub>thermal</sub>.</i>	The total installed / rated capacity of the project equipment is 7.53 MW <sub>thermal</sub> which is less than 45 MW <sub>thermal</sub> .											
<i>In case electricity and/or steam/heat produced by the project activity is delivered to another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered into specifying that only the facility generating the energy can claim emission reductions from the energy displaced.</i>	The steam produced in the project is used for captive consumption and hence this is not applicable for the CPA.											
<i>Charcoal based biomass energy generation project activities are eligible to apply the methodology only if the charcoal is produced from renewable biomass sources</i>	The project does not use any charcoal.											

	Verified situation	Conclusion
	<p>The verification team confirms that the CPA conforms to all applicable condition of the applied methodology.</p> <p>Apart from the baseline and monitoring methodology applicability criteria as stated above, the verification team also verified the eligibility criteria stated in section B.2 of the included CPA-DD under "Monitoring Criteria" for the point numbers 1, 3.3, 3.4, 3.5, 16, 17 and 18 and found these to be valid for the project activity during the monitoring period. A declaration letter dated 11/12/2012 in this respect has also been submitted by the CME.</p>	
1.11. Confirm use or no use of public funding and determine if there is no diversion of ODA to the CPA.	There is no use of public funding for the CPA. The same was confirmed during the interview with the CME and also a declaration in this respect has been provided by the CPA implementer.	OK
1.12. Check data in the MR and in the CPA-DD. Describe data and variables that are different from that stated in the included CPA-DD and cause an increase in emission reductions estimations.	<p>Data in the MR and CPA-DD fixed at validation stage are found to be consistent.</p> <p>The ex-ante estimated emission reductions during this monitoring period of 31 days are 1,079 tCO<sub>2</sub> (12,706/365*31) and the actual emission reductions during this monitoring period are 18 tCO<sub>2</sub>. Hence the actual emission reductions during this monitoring are less than the estimated values as per the CPA-DD.</p> <p>However, the following findings were raised and successfully closed during the verification;</p> <ol style="list-style-type: none"> <li>1) CL 02 was raised as for the parameters like "CAP<sub>boiler</sub>" and "SEC<sub>PJ,y,measured</sub>", it was stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation.</li> <li>2) CL 05 was raised, since the NCV is taken directly taken from the laboratory report, values of parameters like hydrogen, oxygen and moisture content in the biomass are still reported in the MR, which is not required as per the included CPA-DD.</li> </ol> <p>The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p>	<p>CL02 CL05 OK</p>
1.13. By means of an on-site visit: Is the general information of the project provided in the	<p>Yes.</p> <p>The on-site visit for the CPA was conducted on 21/11/2012.</p>	<p>CAR 01 CAR 03 OK</p>

	Verified situation	Conclusion
<p>Monitoring report and is it as per the CPA-DD included by CDM-EB or by a DOE?</p> <p>List each technical component and equipment and check design parameters and actual status of installation and / or operation.</p> <p>Please check to ensure that all physical features of the proposed CPA in the registered/included CPA-DD are in place and the PP has operated the proposed CPA as per the included CPA-DD.</p> <p>It may include but not limited to:</p> <ul style="list-style-type: none"> <li>the actual capacity and output</li> <li>plant load factor</li> <li>type of feedstock</li> <li>operation of other components / units within the project boundary which could affect functioning of the project plant.</li> </ul> <p>In cases where there are a large number of components and equipment items and the check of all of them is not an available option, then a random sampling check shall be performed. Justify here the sample chosen and describe the results.<sup>118</sup></p>	<p>The project activity comprises of the installation and operation of a 12 TPH biomass briquette fired boiler to meet the captive requirement of steam at the project site.</p> <p>During the verification, by the observation of equipment, interviews with relevant staff and the checking of technical specifications of main components, it was confirmed that the project activity has been implemented as described in the included CPA-DD.</p> <p>The project is operational. The project was commissioned on 25/07/2012 and the same was verified from the commissioning certificate issued by Thermax Limited.</p> <p>No change from the included CPA-DD of physical features which may impact the emission reduction of the project activity has been identified.</p> <ul style="list-style-type: none"> <li>Steam generation unit : 12 TPH boiler</li> <li>Net enthalpy supply by project : The ex-ante estimated annual enthalpy output from the project boiler is 195.085 TJ as per the included CPA-DD (which corresponds to 16.569 TJ for 31 days of this monitoring period) whereas actual enthalpy supplied by the boiler during this monitoring period was 0.664 TJ which is less than the ex-ante estimated value.</li> <li>Type of biomass fired in the boiler : As per the included CPA-DD, renewable biomass briquette made mainly from Tur stems, Groundnut shells, Maize cobs, Cotton stems, Bagasse, Soya husk, etc. is to be fired in the boiler and it was noted that there was no deviation in the biomass firing during the monitoring period.</li> <li>As per the included CPA-DD, the project may fire fossil fuel (Coal) in the boiler. During this monitoring period, no fossil fuel has been fired in the project boiler as confirmed by the project implementer during the site visit.</li> </ul> <p>100% data is monitored for the CPA and hence no sampling plan is applicable.</p> <p>However, CAR 01 was raised as in section B.1 of the MR, the downtime time of the project boiler is not provided. Details are provided in the revised MR and the CAR was closed.</p> <p>Further, CAR 03 was raised as PP has considered a simple average of steam pressure, temperature and boiler feed water enthalpy, which are used for the calculation of net enthalpy supplied by the project boiler, which is not correct. The calculation approach was revised and a weighted average was considered for emission reduction. The CAR 03 was successfully closed.</p>	

<sup>118</sup> The sampling shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified situation	Conclusion
1.14. Have responsibilities for monitoring been described and specified?	<p>The responsibilities of monitoring have been provided and described in the Monitoring Report. The Monitoring Report and CDM documents clearly describe the responsibilities for monitoring.</p> <p>The project owner has identified the CDM team, the structure of which is given in Monitoring Report. During the verification, responsibilities for operational personnel, technical and support team have been verified and confirmed.</p> <p>The CDM team has been assigned the responsibility for measuring, recording and storage of the measured data. Data is kept in electronic format and paper format.</p>	OK
1.15. Are the responsibilities and authorities for monitoring and reporting in line with those stated in the monitoring plan of the included CPA-DD?	Yes, responsibilities and authorities for monitoring and reporting are in accordance with included CPA-DD.	OK
<p>1.16. Check QA/QC, management systems. Are procedures described and specified in the MR? Are they consistently applied as described in the MP?</p> <p>a. documented instructions, management manual</p> <p>b. documentation</p> <p>c. data archiving</p> <p>d. monitoring report</p> <p>e. cross-checking</p> <p>f. energy balance analysis (as relevant)</p> <p>g. internal audits / verification and management review</p>	<p>QA/QC procedures include staff training, instrument calibration, cross-checking and data/documents archiving. They are consistent with the monitoring plan.</p> <p>The Monitoring Report describes the monitoring system, monitoring procedures, data collection and reporting, responsibilities of relevant staff/departments, calibrations that were implemented and QA/QC procedures including data cross-checking.</p> <p>By means of document review, onsite assessment and interviews, the verification team has confirmed that all the QA/QC measures, data archiving, monitoring report and internal audits are as per the registered monitoring plan of the registered PoA-DD and the included CPA-DD.</p> <p>However, CL 03 was raised as the “QA/QC procedure” &amp; “Purpose of data” for the quantity of biomass in MR was mentioned as “NA” and the same is not consistent with the monitoring plan of the included CPA-DD. Monitoring and recording frequency of these parameters were not mentioned in the MR. Also the values for these parameters as stated in the MR was incorrect as verified during the on-site visit and also with the documents provided.</p> <p>The MR was suitably revised to close the finding.</p>	<p><del>CL-03</del></p> <p>OK</p>
1.17. Have the procedures for emergency and abnormal situations been established?	<p>As stated in section C of the MR, the procedure for non-conformance and corrective actions is in place for the project activity to mitigate any emergency and abnormal situations in monitoring as per the included CPA-DD.</p> <p>During the monitoring period, no emergency situation in monitoring has occurred.</p>	<p><del>CAR-07</del></p> <p>OK</p>

	Verified situation	Conclusion
	However, CAR 07 was raised as the CME needed to clarify why the details of the backup monitoring instruments (for steam pressure and temperature and feed water temperature) were not provided in the MR. Adequate justification was provided by the CME and the CAR was closed.	
1.18. Has the system for qualification and training been established as relevant for the monitoring and management activities?	<p>The training and qualification of the project personnel has also been confirmed during interview of the operational personnel during the on-site visit. It is confirmed that they have sufficient knowledge, experience and competency to implement and maintain the plant operation including data monitoring and recording in line with the boiler operation and maintenance manual provided by the boiler supplier, and with CDM requirements.</p> <p>This is further verified by the evidence for training of the project personnel and the boiler attendants' certificates issued by Directorate of Steam Boilers (Government agency) for the boiler operators.</p>	OK
1.19. Check the environmental report, license, permit and compliance to the local environmental legislation (if relevant).	The verification team has confirmed that the project meets the relevant local environmental legislation. The same was confirmed from the copy of the consent to operate issued by Maharashtra Pollution Control Board valid from 20/01/2011 to 31/03/2015. Also a copy of certificate for the use of the boiler for the period from 27/03/2012 to 26/09/2012 issued by Directorate of Steam Boilers Department on 28/06/2012 has been submitted.	OK
1.20. Check contribution to sustainable development, comparing those expected in the included CPA-DD and the actual status.	<p>With the provision of employment opportunities by the project activity, there has been a contribution for the social and economic well-being of some local people.. The project utilises renewable biomass to produce steam (thereby avoiding the fossil fuel usage) and this leads to environment well being by reduced environmental impact from fossil fuel use. Also the project uses renewable biomass technology which is deemed as a clean (as it displaces fossil fuel usage) and safe technology.</p> <p>Even though the sustainable development measures were not registered in the CPA-DD as a monitoring parameter, it was confirmed during the site visit that the CPA contributes to the sustainable development of the host country.</p>	OK
1.21. Check issues with local stakeholders, claims, complaints, etc.	It was confirmed by on-site interviews that there had been no claims and complaints from local stakeholders prior to the verification visit.	OK



	Verified situation	Conclusion	
1.22. If from the above assessment the conclusion is that the implementation or operation of the CPA does not conform with the description contained in the included CPA-DD and/or corrections have been made to project information or parameters fixed at validation/inclusion, determine if these changes and/or corrections do not require prior approval by the board: <ul style="list-style-type: none"><li>- A request of approval is required if the boundary of a registered CDM PoA is changed to include an additional host party, in accordance with the project cycle procedure.</li><li>- A request for approval is required if the CME of a registered CDM PoA changes after the registration of the PoA.</li><li>- Any corrections to project information of an included CPA that do not affect the design of the project activity do not require prior approval by the Board.</li><li>- A request for approval is required if any of the three issues below is adversely impacted by the identified changes to the project design.</li></ul>			
1.23. The applicability and application of the applied methodology under which the CPA has been included:  Check if the project boundary has changed and if any of the parameters to assess the applicability conditions have changed.	No change in applicability and application of the applied methodology AMS-I.C. version 16, including the project boundary, is observed.	YES	NO
			X
1.24. Compliance of the included CPA to eligibility criteria as defined in the registered PoA-DD.  Check if any of the parameters to assess the PoA eligibility criteria have changed.	No change in the eligibility criteria of the registered CPA, as defined in the registered PoA-DD, is observed.	YES	NO
			X
1.25. The additionality of the project activity:  Check if any of the input parameters to the investment analysis have changed. For barrier analysis, check if any information or data used in the barrier analysis has changed.	There is no change in the project design parameters as the project is implemented as per the included CPA-DD. Hence this is not applicable.	YES	NO
			X

	Verified situation	Conclusion	
1.26. The scale of the project activity.  Check if the project is still small scale or large scale after the implementation of the changes.	Small scale, as per the eligibility criteria for CPA inclusion and is in accordance with the methodology AMS-I C, version 16.	YES	NO
			X
If the answer to any of the above items is YES, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			
1.27. If, from the above assessment, the conclusion is that the changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA	

	Verified Situation	Conclusion
<b>SECTION 2. Compliance of the Monitoring Plan with the Monitoring Methodology including applicable Tool(s)</b>		
2.1. Is the monitoring plan of the included CPA-DD in accordance with the applied methodology?	Yes, it is confirmed that monitoring plan of the included CPA-DD is in accordance with the applied methodology, AMS-I.C, version 16.	OK
2.2. If the methodology provides different options (for example, use of default values or on-site measurements), has the Monitoring Report specified which option is used?	<p>Yes,</p> <p>The ex-ante parameters which are fixed for the crediting period at the time of CPA inclusion in the PoA as per the methodological tools are:</p> <ul style="list-style-type: none"> <li>• <math>CAP_{\text{boiler}}</math> (Rated capacity (thermal output) of the boiler of the Project activity)</li> <li>• <math>\eta_{\text{BL,thermal}}</math> (The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity)</li> <li>• <math>EF_{\text{FF,CO}_2}</math> (<math>\text{CO}_2</math> Emission Factor of the fossil fuel (Furnace Oil) that would have been used in the baseline plant)</li> <li>• <math>SA_k</math> (Surplus availability of Biomass within identified region)</li> <li>• <math>EF_{\text{grid,CM,y}}</math> (ex-ante Grid Emission Factor in a year y)</li> <li>• <math>EF_{\text{EL,j,y}} = EF_{\text{EL,l,y}}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)</li> <li>• <math>EC_{\text{LE,l,y}}</math> (Auxiliary Electricity Consumption for biomass processing, outside Project boundary)</li> <li>• <math>EF_{\text{km,CO}_2}</math> (Average <math>\text{CO}_2</math> emission factor for the trucks measured during the year y)</li> <li>• <math>TDL_{i,y} = TDL_{j,y}</math> (Average technical transmission and distribution losses for providing electricity to source l and/or j in year y)</li> <li>• <math>SEC_{\text{PJ,j,y,measured}}</math> (Specific energy consumption of fuel type j of the Project activity in year y)</li> </ul> <p>Further, the verification team confirms that there is no deviation in the values of the ex-ante fixed parameters between the included CPA-DD and the MR.</p> <p>The parameters being monitored ex-post as per the monitoring methodology and the CPA-DD are:</p> <ul style="list-style-type: none"> <li>• Quantity of steam supplied in year y (<math>Q_{\text{steam}}</math>)</li> </ul>	<p>CL-05</p> <p>OK</p>

	Verified Situation	Conclusion
	<ul style="list-style-type: none"> <li>• Average Steam Temperature at MSSV (Main steam stop valve) outlet during year (<math>T_{\text{steam}}</math>)</li> <li>• Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year (<math>P_{\text{steam}}</math>)</li> <li>• Average Feed Water Temperature at inlet of boiler (<math>T_{\text{FWB}}</math>)</li> <li>• Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob},k}</math>)</li> <li>• Quantity of subsequent delivery of fuel type k biomass at the Project site (<math>Q_{\text{np},k}</math>)</li> <li>• Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in},k}</math>)</li> <li>• Quantity of biomass fuel type k consumed during the monitoring period (<math>Q_{\text{c},k} = FC_{\text{biomass},k,y}</math>)</li> <li>• Quantity of stored fuel type fossil (Coal) i on the starting date of each monitoring period measured at the Project site (<math>Q_{\text{ob},i}</math>) *</li> <li>• Quantity of subsequent delivery of fuel type fossil fuel (Coal) i (<math>Q_{\text{np},i}</math>) *</li> <li>• Quantity of remaining fossil fuel type (Coal) i available at the end date of each monitored period measured at the Project site (<math>Q_{\text{in},i}</math>) *</li> <li>• Quantity of fossil fuel type i (Coal) consumed during the monitoring period (<math>Q_{\text{c},i} = FC_{\text{fossil},i,y}</math>) *</li> <li>• Net calorific value of biomass fuel k used in the Project activity. (<math>NCV_k</math>)</li> <li>• Percentage of hydrogen in biomass fuel (Hydrogen)</li> <li>• Percentage oxygen in Biomass fuel (Oxygen)</li> <li>• Moisture content of the biomass residues (Moisture)</li> <li>• Weighted average net calorific value of the fuel (coal) type i in year y (<math>NCV_{i,y}</math>)</li> <li>• Auxiliary Electricity Consumption of the Project activity from the Grid in year y (<math>EC_{\text{PJ},j,y}</math>)</li> <li>• Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) in a year y (<math>EC_{\text{EL},j,y}</math>) **</li> <li>• Average return trip distance (from and to) between the source of the biomass</li> </ul>	

	Verified Situation	Conclusion
	<p>and the site of the Project plant during the year y (<math>AVD_{c,y}</math>)</p> <ul style="list-style-type: none"> <li>• Number of truck trips during the year y (<math>N_{c,y}</math>)</li> <li>• Average round trip distance (from and to) between the biomass fuel supply sites and the site of biomass processing in year y (<math>AVD_{c,y}</math>)</li> <li>• Number of truck trips during the transportation of biomass to the biomass processing site in year y (<math>N_{c,y}</math>)</li> <li>• Weighted average <math>CO_2</math> emission factor of fuel type i in year y (<math>EF_{CO_2,i,y}</math>)</li> </ul> <p>These parameters are based on on-site measurement and have been verified during this verification.</p> <p>* No fossil fuel has been fired in the project boiler during this monitoring period</p> <p>** The auxiliary electricity the boiler has been sourced from grid no off grid (DG power) was used during the monitoring period.</p> <p>However, CL0 5 was raised, since the NCV was taken directly from the laboratory report, yet the values of parameters like hydrogen, oxygen and moisture content in the biomass were reported in the MR, which is not required as per the included CPA-DD. MR was suitably revised and the finding was closed.</p>	
2.3. Is all data collected and archived according to the tables in the applied Monitoring Methodology and is this included in the Monitoring Plan?	Yes, all the data is collected and archived in accordance to methodology and included in the monitoring plan. All the data will be archived until 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.	OK
2.4. Check the calculation of emission reductions following the applied methodology: <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and applied for the project activity are as follows:</p> <p><b><u>Baseline emissions:</u></b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$	<p>CL01</p> <p>OK</p>

	Verified Situation	Conclusion
	<p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity during the year y (tCO<sub>2</sub>)</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity during the year y (TJ)</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant; tCO<sub>2</sub> / TJ, obtained from reliable local or national data if available, otherwise, IPCC default emission factors are used</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity</p> <p><math>EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}</math></p> <p>where</p> <p><math>EG_{thermal}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{steam}</math> = Quantity of steam supplied in Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet (kCal/kg)</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg)</p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p><math>PE_{EC,y} = EC_{PJ,j,y} * EF_{grid,CM,y} * (1 + TDL_{j,y}) + EC_{EL,j,y} * EF_{EL,j,y} * (1 + TDL_{j,y})</math></p> <p><math>EC_{PJ,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid in year</p>	

	Verified Situation	Conclusion
	<p>y</p> <p><math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set)</p> <p><math>EF_{grid,CM,y}</math> (Ex-ante Grid Emission Factor in a year y)</p> <p><math>EF_{EL,j,y} = EF_{EL,l,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or l in year y)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source l and/or j in year y</p> <p><u>Project emissions from fossil fuel combustion</u></p> <p><math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math></p> <p>where</p> <p><math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p><math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)</p> <p><math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)</p> <p><math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math></p> <p>where</p> <p><math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)</p> <p><math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)</p> <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math></p>	

	Verified Situation	Conclusion
	<p><b>Leakage:</b></p> $LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}$ $= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVD_{c,y} * EF_{km,CO_2} + N_{y,y} * AVD_{y,y} * EF_{km,CO_2}$ <p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption in year <math>y</math> (tCO<sub>2</sub>/yr)</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p><math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p><math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source <math>l</math> in year <math>y</math> as a result of leakage (MWh/yr)</p> <p><math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source <math>l</math> in year <math>y</math> (tCO<sub>2</sub>/MWh)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity to source <math>l</math> in year <math>y</math></p> <p><math>N_{c,y}</math> = Number of truck trips for collecting loose biomass during the year <math>y</math></p> <p><math>AVD_{c,y}</math> = Average round trip distance between the biomass fuel supply sites and biomass collection site during the year <math>y</math></p> <p><math>EF_{km,CO_2}</math> = Average CO<sub>2</sub> emission factor for the trucks measured during year <math>y</math></p> <p><math>N_{y,y}</math> = Number of truck trips during the year <math>y</math></p> <p><math>AVD_{y,y}</math> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant during year <math>y</math> (km)</p> <p>Emission reductions are calculated as follows:</p> $ER_y = BE_y - PE_y - LE_y$ <p>However, CL 01 was raised as, in section E.5 of the MR, the calculation of the ex-ante emission reductions is not transparently presented. The revised MR clearly and transparently describes the ER calculation approach providing relevant equations in</p>	



	Verified Situation	Conclusion
	line with the included CPA-DD.	
<p>2.5. List any monitoring aspect that is not specified in the methodology and check its compliance with the Monitoring Plan, for example:</p> <ul style="list-style-type: none"> <li>• additional monitoring parameters</li> <li>• monitoring frequency</li> <li>• calibration frequency.</li> </ul>	<p>No additional monitoring parameter is identified that is not specified in the approved methodology and the included CPA-DD available in the project page on UNFCCC website.</p> <p>The monitoring frequency and the calibration frequency specified are not less than the requirements of the approved methodology and the Monitoring plan in the included CPA-DD.</p>	OK

		Verified Situation	Conclusion
<b>SECTION 3. Compliance of Monitoring activities with the Monitoring Plan of the included CPA-DD</b>			
<p>3-1. Is the Monitored Data included in the Monitoring Report as per the Monitoring Plan or any accepted revised MP?</p> <p>3-2. Has the data been generated at the frequency required by the Monitoring Plan or any accepted revised MP?</p>	<p>Yes</p> <p>The monitored data included in section D.2 of the MR is as per the monitoring plan of the included CPA-DD.</p> <p>The values are indicated in the section D.2 of the Monitoring Report. At the site visit it was verified that data was generated at the required frequency as per the monitoring plan in the included CPA-DD.</p>		OK
<p>3-3. Has the monitoring been implemented in accordance with the monitoring plan contained in the included CPA-DD or any accepted revised MP?</p> <p>Confirm that the monitoring and reporting procedures have been implemented as documented and follow by PPs.</p>	<p>Yes, by means of document review, on-site assessment and interviews with the plant personnel, it was confirmed that the monitoring has been implemented in accordance with the monitoring plan contained in the included CPA-DD.</p> <p>It was also established that monitoring and reporting procedures have been implemented as documented by the CME and the CPA operator.</p>		OK
<p>3-4. Have types of measurement instrumentation used been described and specified?</p>	<p>Yes the MR specifies and describes the use of different measurement instruments (Steam flow meter, RTD / Temperature gauge, Pressure transmitter / Pressure gauge, energy meter and weighbridge). The details of the measuring equipment are provided in the "Annex-1_4041-0015: Instrument Details" of the MR. The provided details have been verified during the on-site visit.</p>		OK

	Verified Situation	Conclusion
<p>3-5. Is the accuracy of equipment used for monitoring sufficient and regularly controlled and calibrated in line with the registered monitoring plan or any accepted revised MP?</p> <p>Check relevance of maintenance and calibration included in the monitoring plan.</p> <p>Check relevance of laboratory analysis if included in the monitoring plan.</p>	<p>Yes, the verification team confirmed through the on-site assessment and the review of evidence that the installation of the measuring devices has been completed and the equipment has been operated and maintained in normal operating conditions.</p> <p>The accuracy classes of all the monitoring equipment are found as per the monitoring plan of the included CPA-DD, or of higher accuracy as detailed in "Annex-1_4041-0015: Instrument Details" of the MR.</p> <p>It was confirmed that the information of the meters was consistent with that described in the Monitoring Report.</p> <p>The CME has provided the calibration certificates of all the monitoring equipment and the verification team confirms the certificates to be appropriate and relevant.</p> <p>For further details of the calibration of the monitoring equipment please refer to section 3.19 of this report below.</p> <p>CL 07 was raised as the CME has not provided the credentials of the calibrating agencies and the laboratories, which have carried out the NCV analysis. Adequate information was provided by the CME and the CL was closed. For details please refer to Appendix D of this report.</p>	<p>CL-07 OK</p>
<p>3-6. If the monitoring plan of the CPA-DD refers to a sampling plan and monitoring is carried out for the chosen samples, ensure that the sampling is carried out as per the sampling plan<sup>119</sup>.</p>	<p>The monitoring plan of the CPA-DD does not refers to a sampling plan and the monitoring is carried out for 100% data for all the monitoring parameters.</p>	<p>NA</p>

<sup>119</sup> The sampling plan shall be in line with the "Standard for sampling and surveys for CDM project activities and programme of activities"

	Verified Situation	Conclusion
<p>3-7. Check that responsibilities and authorities for monitoring and reporting are in line with the monitoring plan.</p> <p>Are the monitoring results consistently recorded, reviewed and approved as stated in the CPA-DD or any accepted revised MP?</p>	<p>Yes</p> <p>During the site visit, monitoring and reporting procedures were confirmed by the verification team through interview with the relevant plant personnel, CME and by document review.</p> <p>However, the following CAR/CLs were raised and successfully closed;</p> <ul style="list-style-type: none"> <li>CAR 02 was raised as the opening readings of the parameter "<math>Q_{\text{steam}}</math>" and closing readings of the parameters "<math>EC_{PJ,j,y}</math>" and "<math>EC_{EL,j,y}</math>" have not been presented to the verification team.</li> <li>CL 02 was raised as for the parameters like "<math>CAP_{\text{boiler}}</math>" and "<math>SEC_{PJ,y,\text{measured}}</math>", CME had stated in the MR that they are used for baseline emission calculation, whereas, as per the CPA-DD, these parameters are not to be used for baseline emission calculation.</li> </ul> <p>The MR was suitably revised and the revised MR was found to be in line with the included CPA-DD.</p>	<p><del>CAR-02</del> <del>CL-02</del> OK</p>
<p>3-8. Reporting period: Defined?</p> <p>If a monitoring period of a parameter more / less than a year is applied, check if the monitoring is in a complete and consistent manner?</p> <p>Is the monitoring period within the crediting period of the CPA and length of the registered PoA?</p>	<p>The monitoring period for the PoA is from 12/01/2011 to 31/08/2012. But for the CPA, the emission reduction starts from 01/08/2012 (i.e., the date of start of crediting period of the CPA) till 31/08/2012. Hence the monitoring period for the CPA is for 31 days which is less than a year. However, monitoring of all the parameters is complete, as there is no specific requirement in the methodology for annual reporting of any data. The verification team therefore, confirms the monitoring to be complete and consistent and clearly defined in the MR.</p> <p>The monitoring period is within the crediting period of the CPA and also the length of the registered PoA.</p> <p>CL 09 was raised as the monitoring period of the CPA is not consistent with that of the PoA in the webhosted MR. The issue has been addressed and the finding was successfully closed.</p>	<p><del>CL-09</del> OK</p>

	Verified Situation	Conclusion
3-9. If the monitoring plan includes the determination of environmental and / or social indicators, have the sustainable development indicators been monitored in accordance with the monitoring plan of the included CPA-DD?	Not applicable	NA
3-10. Check monitoring of Environmental and Social indicators (if relevant) <ul style="list-style-type: none"> <li>• implementation of measures</li> <li>• monitoring equipment</li> <li>• quality assurance procedures</li> <li>• external data.</li> </ul>	Not applicable	NA

Verified Situation		Conclusion	
<b>SECTION 2 and 3: Post Registration Changes</b>			
<p>3-11. If, from the above assessment in SECTIONS 2 and 3, the conclusion is that there are temporary deviations or permanent changes from the registered Monitoring Plan or Monitoring Methodology, determine if these deviations or changes require prior approval by the EB by answering the questions below.</p> <p>All the answers to the applicable questions below shall be explained and the reasons for each conclusion given in the “Verified situation” column.</p> <p><b>Temporary deviations from the registered monitoring plan or applied methodology:</b>  Prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES.</p>			
3-12. Have the PPs reported as zero any parameter related to baseline GHG emissions that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?	No temporary deviation is sought during this monitoring period	YES	NO
		-	-
3-13. Have the PPs estimated (assuming that the source of the project GHG emissions operated at maximum capacity for the full period of the missing data) any parameter that they have temporarily failed to monitor or for which they are unable to produce evidence related to such monitoring?  For project GHG emissions related to the consumption of electricity, the estimate shall include an addition of 10% to account for transmission and distribution losses.	No temporary deviation is sought during this monitoring period	YES	NO
		-	-
<b>Permanent changes from the registered monitoring plan or applied methodology</b>			

Verified Situation		Conclusion	
If the monitoring equipment actually installed has a lower accuracy level than the accuracy stipulated in the applied methodology and/or in the registered monitoring plan, and the monitoring equipment is under the control of the project participants, prior approval by the EB is <u>not</u> required if the answer to the applicable questions below is YES:			
3-14. Have the PPs deducted from the measured value, for any parameter used for calculating baseline GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES	NO
		-	-
3-15. Have the PPs added to the measured value, for any parameter used for calculating project GHG emissions, the difference between the accuracy level of the installed monitoring equipment and the accuracy prescribed by the applied methodology and/or the registered monitoring plan?	No permanent change in the monitoring plan is observed during this monitoring period	YES	NO
		-	-
Changes to the monitoring of the included CPA of a type listed below do not require approval by the EB. Confirm in the conclusion column that the change is of the type in the table below and explain the reasons.			
3-16. Change of calibration frequency or practice for monitoring equipment not within the control of project participants	Not Applicable	NA	
3-17. Change of accuracy / type / model of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
3-18. Change of location of meter(s) as per a power purchase agreement (PPA)	Not Applicable	NA	
If the answer to any of the above items has been that approval from the EB is required, please conduct an assessment of the potential impacts of these changes following the Procedures for Post Registration Changes.			

	Verified Situation	Conclusion
3-19. If, from the above assessment, the conclusion is that the temporary deviations or permanent changes require prior approval by the EB in accordance with the PS, please check any approvals of the necessary request for approval of changes.	Not Applicable	NA



### 3.19 Monitoring Parameters and Calibration Checklist:

Complete the following table for each parameter:

Data / Parameter (as in the MP)		Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Value	Ex-ante	81,219 per annum	171.15
	Ex-post	275.48	162.01 <sup>120</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	Daily
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)		As per the monitoring plan of the included CPA-DD, the quantity of steam delivered by the project is measured by duly calibrated steam flow meter and the calibration certificate has been verified. Further, the verification team cross-checked the quantity of steam delivered by the project activity during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the steam temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the steam temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.

<sup>120</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period

Data / Parameter (as in the MP)	Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Steam flow meter Sr. No.: EC002520000	RTD Sr. No.: EC002520000 <sup>121</sup>
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	±2.3% Maximum (which is better than that stated in the CPA-DD of ±3%)	Class A (which is better than Class B as stated in the CPA-DD)
Period of operating time	01/08/2012 to 31/08/2012	01/08/2012 to 31/08/2012
Instrument type	Steam flow meter cum RTD	Steam flow meter cum RTD
Manufacturer, model and serial number	Make: Endress + Hauser; Sr. No.: EC002520000	Make: Endress + Hauser; Sr. No.: EC002520000
Specific location	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler	Project site, at the Main Steam Stop Valve (MSSV) outlet of the boiler
Calibration dates	16/01/2012 (valid till 15/01/2015)	16/01/2012 (valid till 15/01/2015)
Company performing the calibration	Manufacturer Endress + Hauser (NABL accredited)	Manufacturer Endress + Hauser (NABL accredited)
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the once in three years frequency of calibration as implemented by the CPA is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes

<sup>121</sup> A consolidated monitoring equipment is used by the CPA operator, which has inbuilt feature for measuring the both steam flow and the steam temperature. This was confirmed during the on-site visit and verification of the technical specification of the measuring equipment.

Data / Parameter (as in the MP)	Quantity of steam supplied in year y “Q <sub>steam</sub> ” (Tonnes)	Average Steam Temperature at MSSV (Main steam stop valve) outlet “T <sub>steam</sub> ” (°C)
Maintenance	The Steam flow meter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P <sub>steam</sub> ” (kg/cm <sup>2</sup> g)	Average Feed Water Temperature at inlet of boiler “T <sub>FWB</sub> ” (°C)
Value	Ex-ante	10.54	90
	Ex-post	6.79 <sup>122</sup>	84.50 <sup>123</sup>
Measuring / Monitoring frequency		Continuous	Continuous
Reporting frequency		Daily	
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA

<sup>122</sup> The value is the weighted average of the daily recorded pressure readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily pressure readings was reported in the published MR which is incorrect. The CAR was closed after the pressure was revised as the weighted average of the daily readings during the monitoring period

<sup>123</sup> The value is the weighted average of the daily recorded temperature readings as reported in the ER spreadsheet. The daily readings are again obtained as weighted average of the recorded hourly readings which was verified by the verification team. CAR 03 was raised in this respect as the simple average of the daily temperature readings was reported in the published MR which is incorrect. The CAR was closed after the temperature was revised as the weighted average of the daily readings during the monitoring period)

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P<sub>steam</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “T<sub>FWB</sub>” (°C)</b>
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	As per the monitoring plan of the included CPA-DD, the steam pressure is measured by duly calibrated pressure transmitter and the calibration certificate has been verified. Further, the verification team cross-checked the steam pressure during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.	As per the monitoring plan of the included CPA-DD, the feed water temperature is measured by duly calibrated RTD and the calibration certificate has been verified. Further, the verification team cross-checked the feed water temperature during the site visit with the plant log books and the data transferred to the CME server through internet connectivity and found the values to be correct.
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Pressure transmitter Sr. No. EC004321128	RTD Sr. No. F201AB14150
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	± 2.3% (which is same as stated in the CPA-DD)	Class B (which is same as stated in the CPA-DD)
Period of operating time	01/08/2012 to 31/08/2012	01/08/2012 to 31/08/2012
Instrument type	Pressure transmitter	RTD
Manufacturer, model and serial number	Endress + Hauser; Sr. No. EC004321128	Endress + Hauser; Sr. No. F201AB14150
Specific location	Project site, at the Main Steam Stop Valve (MSSV)	Project site, after the boiler feed water tank at the inlet of the boiler
Calibration dates	02/04/2012 (valid till 01/04/2013)	02/03/2012 (valid till 01/03/2013)
Company performing the calibration	TechnoVision Instru. Solutions Pvt. Ltd. (Calibration is traceable to national standard and hence deemed acceptable)	TechnoVision Instru. Solutions Pvt. Ltd. (Calibration is traceable to national standard and hence deemed acceptable)

<b>Data / Parameter (as in the MP)</b>	<b>Average Steam Pressure (gauge) at MSSV (Main steam stop valve) outlet during year “P<sub>steam</sub>” (kg/cm<sup>2</sup> g)</b>	<b>Average Feed Water Temperature at inlet of boiler “T<sub>FWB</sub>” (°C)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.	Yes. As per the included CPA-DD, the calibration to be conducted at least once in three years taking account of the manufacturers specification and local, national or international standard. It was confirmed from the manufacturer's specification that it does not specify any requirements pertaining to calibration frequency. Any specific local or national or international standard related to calibration frequency of such equipment is not available. Therefore, it was confirmed that the annual frequency of calibration as implemented by the CPA represents good monitoring practice and is in line with the specified frequency of once in three years as per the registered monitoring plan.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The pressure transmitter was functional throughout the monitoring period	The RTD was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>		<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Value	Ex-ante	NA	NA
	Ex-post	61.04	401.63
Measuring / Monitoring frequency		At the start of the monitoring period	Data is monitored and recorded for each truck delivery
Reporting frequency		Once during the monitoring period	Each truck trip

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The opening balance of the biomass is measured by a calibrated weighbridge	Biomass procured is measured for each truck entering the plant premises by a calibrated weighbridge
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge; Sr. No. 950052904	Weighbridge; Sr. No. 950052904
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III <sup>124</sup>	Class III <sup>119</sup>
Period of operating time	01/08/2012 to 31/08/2012	01/08/2012 to 31/08/2012
Instrument type	Weighbridge	Weighbridge
Manufacturer, model and serial number	Essae Teroka: Sr. No. 950052904	Essae Teroka: Sr. No. 950052904
Specific location	At project site	At project site
Calibration dates	27/04/2012 (valid till 26/04/2013)	27/04/2012 (valid till 26/04/2013)
Company performing the calibration	Weights and Measure Department, Govt. of India	Weights and Measure Department, Govt. of India

<sup>124</sup> In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department , Govt. of India. Hence the accuracy class is deemed acceptable.

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type biomass k on the starting date of each monitoring period measured at the Project site “Q<sub>ob,k</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type k biomass at the Project site “Q<sub>np,k</sub>” (Tonnes)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.
Is calibration valid for the whole reporting period?	Yes	Yes
Maintenance	The weighbridge was functional throughout the monitoring period	The weighbridge was functional throughout the monitoring period
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Value	Ex-ante	NA
	Ex-post	209.17
Measuring / Monitoring frequency	Measured at the end of the monitoring period	16,671 per annum
Reporting frequency	Once during the monitoring period	Calculated from the opening, received and closing balance of the biomass during the monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	At the end of the monitoring period
Does monitoring of the parameter involve sampling? (yes / no)	No	Yes
Population Size	NA	No
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The closing balance of the biomass is measured by a calibrated weighbridge	The quantity of biomass consumed is cross-checked with the invoices obtained from the fuel supplier and found to match
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Weighbridge; Sr. No. 950052904	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class III <sup>125</sup>	NA
Period of operating time	01/08/2012 to 31/08/2012	NA
Instrument type	Weighbridge	NA
Manufacturer, model and serial number	Essae Teroka: Sr. No. 950052904	NA
Specific location	At project site	NA
Calibration dates	27/04/2012 (valid till 26/04/2013)	NA
Company performing the calibration	Weights and Measure Department, Govt. of India	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	Once in a year. The calibration of the weighbridge in India is done annually once by Weights and Measurement Department which is a Government agency. Hence annual calibration frequency is deemed acceptable and represents good monitoring practices.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The weighbridge was functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.

<sup>125</sup> In the CPA-DD accuracy class is not stated. But the weighbridges in India are monitored and calibrated by Weights and Measure Department , Govt. of India. Hence the accuracy class is deemed acceptable.



<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining biomass fuel type k available at the end date of each monitored period measured at the Project site “Q<sub>in,k</sub>” (Tonnes)</b>	<b>Quantity of biomass fuel type k consumed during the monitoring period “Q<sub>c,k</sub>” = “FC<sub>biomass,k,y</sub>” (Tonnes)</b>
Key reporting risks	Low risk	Yes. But this data is not used for emission reduction calculation.

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q<sub>ob,i</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i “Q<sub>np,i</sub>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	0
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of stored fuel type fossil i on the starting date of each monitoring period measured at the Project site “Q<sub>ob,i</sub>” (Tonnes)</b>	<b>Quantity of subsequent delivery of fuel type fossil fuel i “Q<sub>np,i</sub>” (Tonnes)</b>
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site “Q<sub>in,i</sub>” (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period “Q<sub>c,i</sub>” = “FC<sub>j,PJ,y</sub>” (Tonnes)</b>
Value	Ex-ante	-
	Ex-post	0
Measuring / Monitoring frequency	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.	Fossil fuel has not been fired during the monitoring period. Hence this is not applicable.
Reporting frequency	NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	NA	NA
Does monitoring of the parameter involve sampling? (yes / no)	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Quantity of remaining fossil fuel type i available at the end date of each monitored period measured at the Project site “Q<sub>in,i</sub>” (Tonnes)</b>	<b>Quantity of fossil fuel type i consumed during the monitoring period “Q<sub>c,i</sub>” = “FC<sub>j,PJ,y</sub>” (Tonnes)</b>
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)	NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

Data / Parameter (as in the MP)		Net calorific value of biomass fuel k used in the Project activity "NCV <sub>k</sub> " (TJ/Gg)	Percentage of hydrogen in biomass fuel "Hydrogen" (%)
Value	Ex-ante	13.61	3.99
	Ex-post	13.58 <sup>126</sup>	3.7
Measuring / Monitoring frequency		Annually once	Annually once
Reporting frequency		Annually	Annually
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		The NCV is calculated from the laboratory analysis report (carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL) providing the values of GCV, Hydrogen, Oxygen and moisture content of the biomass	Carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA

<sup>126</sup> Calculated from the laboratory analysis report providing the values of GCV as 3245.56 kCal/kg, Hydrogen as 3.7%, Oxygen as 32.59% and moisture as 7.54% using the formulae provided in the CPA-DD

<b>Data / Parameter (as in the MP)</b>	<b>Net calorific value of biomass fuel k used in the Project activity “NCV<sub>k</sub>” (TJ/Gg)</b>	<b>Percentage of hydrogen in biomass fuel “Hydrogen” (%)</b>
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen” (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Value	Ex-ante	38.22
	Ex-post	32.59
Measuring / Monitoring frequency	Annually once	10.3
Reporting frequency	Annually	7.64
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Annually once
Does monitoring of the parameter involve sampling? (yes / no)	No	Annually
Population Size	NA	Yes
		No
		NA

<b>Data / Parameter (as in the MP)</b>	<b>Percentage of Oxygen in biomass fuel “Oxygen” (%)</b>	<b>Moisture content of the biomass residues “Moisture”</b>
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	Carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL	Carried out by third party laboratory Food Hygiene and Health Laboratory which is accredited by NABL
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes. But this data is not used for emission reduction calculation.	Yes. But this data is not used for emission reduction calculation.
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Weighted average net calorific value of the fuel type i in year y “NCV <sub>i,y</sub> ” (TJ/Gg)	Weighted average CO2 emission factor of fuel type i in year y “EF <sub>CO2,i,y</sub> ” (tCO <sub>2</sub> /GJ)
Value	Ex-ante	-	-
	Ex-post	No fossil fuel has been fired during the monitoring period. Hence this is not applicable.	No fossil fuel has been fired during the monitoring period. Hence this is not applicable.
Measuring / Monitoring frequency		NA	NA
Reporting frequency		NA	NA
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		NA	NA
Does monitoring of the parameter involve sampling? (yes / no)		NA	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		NA	NA
QA/QC How are values verified? (Cross-checked, double-checked,...)		NA	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA
Company performing the calibration		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Weighted average net calorific value of the fuel type i in year y “NCV<sub>i,y</sub>” (TJ/Gg)</b>	<b>Weighted average CO2 emission factor of fuel type i in year y “EF<sub>CO2,i,y</sub>” (tCO<sub>2</sub>/GJ)</b>
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	NA	NA
Key reporting risks	NA	NA

<b>Data / Parameter (as in the MP)</b>		<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,i,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,i,y</sub>” (MWh)</b>
Value	Ex-ante	901.2 per annum	0
	Ex-post	15.63	0
Measuring / Monitoring frequency		Continuous	No captive fossil fuel (Diesel Generator) power has been consumed by the project during the monitoring period
Reporting frequency		Monthly	Monthly
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	NA
Does monitoring of the parameter involve sampling? (yes / no)		No	NA
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	NA



<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>” (MWh)</b>
QA/QC How are values verified? (Cross-checked, double-checked,...)	The auxiliary electricity is measured by a calibrated energy meter	NA
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	Energy Meter; Sr. No. 80348	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	Class 1 (which is better than Class 2 stated in the CPA-DD)	NA
Period of operating time	01/08/2012 to 31/08/2012	NA
Instrument type	Energy Meter	NA
Manufacturer, model and serial number	Manaco Energy Solutions Private - Krykard; Sr. No. 80348	NA
Specific location	Project site	NA
Calibration dates	20/04/2012 (valid till 19/04/2013)	NA
Company performing the calibration	Manufacturer : Manaco Energy Solutions Private Ltd. (Calibration is traceable to national standard and hence deemed acceptable).	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	As per the CPA-DD, calibration frequency should be as per manufacturer's specification / local national / international standard but at least once in three years. Manufacturer has not specified the calibration frequency and as per national standard, electricity meters are to be calibrated once in five years. The CPA operator has opted for annual calibration frequency which is deemed acceptable as it is better than once in three years.	NA
Is calibration valid for the whole reporting period?	Yes	NA
Maintenance	The energy meter was functional throughout the monitoring period	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	NA

<b>Data / Parameter (as in the MP)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the Grid in year y “EC<sub>PJ,j,y</sub>” (MWh)</b>	<b>Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set or Fossil fuel based power source) in a year y “EC<sub>EL,j,y</sub>” (MWh)</b>
Key reporting risks	Low risk	NA

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Value	Ex-ante	-
	Ex-post	158.0
Measuring / Monitoring frequency	Continuous at each trip	Continuous at each trip
Reporting frequency	Calculated at the end of the monitoring period	Calculated at the end of monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?	Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)	No	No
Population Size	NA	NA
Sample Size	NA	NA
Confidence level	NA	NA
Margin of error	NA	NA
Recording (Manually / electronically / ...)	Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double-checked,...)	The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the invoices and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD	NA	NA
Is accuracy of the monitoring equipment as stated in the CPA-DD? If not stated in the CPA-DD, does it represent good monitoring practices?	NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Average return trip distance (from and to) between the source of the biomass and the site of the Project plant during the year y “AVD<sub>y</sub>” (km)</b>	<b>Number of truck trips during the year y “N<sub>y</sub>”</b>
Period of operating time	NA	NA
Instrument type	NA	NA
Manufacturer, model and serial number	NA	NA
Specific location	NA	NA
Calibration dates	NA	NA
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

Data / Parameter (as in the MP)		Average round trip distance (from and to) between the biomass fuel supply sites and the site of biomass processing in year y “AVD <sub>C,y</sub> ” (km)	Number of truck trips during the transportation of biomass to the biomass processing site in year y “N <sub>C,y</sub> ”
Value	Ex-ante	-	-
	Ex-post	70.52	97
Measuring / Monitoring frequency		Continuous at each trip	Continuous at each trip
Reporting frequency		Calculated at the end of monitoring period	Calculated at the end of monitoring period
Is the measuring and reporting frequency in line with the MP and the Monitoring Methodology?		Yes	Yes
Does monitoring of the parameter involve sampling? (yes / no)		No	No
Population Size		NA	NA
Sample Size		NA	NA
Confidence level		NA	NA
Margin of error		NA	NA
Recording (Manually / electronically / ...)		Manually and electronically	Manually and electronically
QA/QC How are values verified? (Cross-checked, double- checked,...)		The distance is cross-checked with Google map and found to be correct	The number of trips are cross-checked with the quantity of biomass combusted and found to be correct
Type of Monitoring Equipment and Identification number or Reference in the CPA-DD		NA	NA
Is accuracy of the monitoring equipment as stated in the CPA- DD? If not stated in the CPA-DD, does it represent good monitoring practices?		NA	NA
Period of operating time		NA	NA
Instrument type		NA	NA
Manufacturer, model and serial number		NA	NA
Specific location		NA	NA
Calibration dates		NA	NA

<b>Data / Parameter (as in the MP)</b>	<b>Average round trip distance (from and to) between the biomass fuel supply sites and the site of biomass processing in year y “AVD<sub>c,y</sub>” (km)</b>	<b>Number of truck trips during the transportation of biomass to the biomass processing site in year y “N<sub>c,y</sub>”</b>
Company performing the calibration	NA	NA
Required calibration frequency: Is it in line with the MP? Or represent good monitoring practices?	NA	NA
Is calibration valid for the whole reporting period?	NA	NA
Maintenance	NA	NA
Does the data management (from monitoring equipment to emission reductions calculation) ensure correct transfer of data and reporting of emission reductions?	Yes	Yes
Key reporting risks	Low risk	Low risk

		Verified situation	Conclusion
<b>SECTION 4. Compliance with the calibration frequency requirements for measuring instruments</b>			
The “Monitoring Parameters and Calibration Checklist” in section 3 above shall be checked to determine if the calibration frequency specified in the applied monitoring methodology and/or monitoring plan is followed in the monitoring report and in the monitoring activities. Where a failure to comply with the required frequency is detected, or no frequency is mentioned in the monitoring report, please follow the checklist below:			
4-1.	<p>If the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (that is, the results of delayed calibration are available), confirm that the following conservative approach has been adopted in the calculation of emission reductions:</p> <ul style="list-style-type: none"> <li>- If the delayed calibration did not show any errors in the measuring equipment, or the error was smaller than the maximum permissible error, have the PPs applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> <li>- If the delayed calibration identified an error greater than the maximum permissible error, have the PPs applied the error identified in the delayed calibration test to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration?</li> </ul> <p>Confirm that the error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer emission reductions being claimed;</p>	No delayed calibration was noted during this monitoring period. Hence this is not applicable.	NA

	Verified situation	Conclusion
<p>4-2. If the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification:</p> <ul style="list-style-type: none"> <li>- Request the PPs to conduct the required calibration;</li> <li>- On receipt of the calibration results, determine whether the PPs have calculated the emission reductions conservatively using the approach mentioned in section 4.1 above.</li> </ul>	Not Applicable.	NA
<p>4-3. If it is not possible for the PPs to conduct the calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of the PPs, check if the PPs have prepared a temporary deviation or a 'Permanent changes from the monitoring plan and/or monitoring methodology application'.</p> <p>Follow the requirements for post registration changes in sections 3.10 to 3.19 above.</p>	Not Applicable.	NA
<p>4-4. If neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipment, determine whether the equipment is calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification. If neither local/national standards nor the manufacturer's specification are available, international standards may be used.</p>	Not Applicable.	NA

	Verified situation	Conclusion
<b>SECTION 5. Assessment of data and calculation of emission reductions</b>		
<p>5-1. Have calculations of baseline emissions, proposed CDM project activity emissions and leakage, as appropriate, been carried out in line with the formulae and methods described in the monitoring plan and the applied methodology document?</p> <p>Check consistency in the ERs spreadsheet.</p>	<p>The calculation of the emission reductions as per the applied methodology, AMS-I.C, version 16 and the applicable methodological tools for the project activity are as follows:</p> <p><b>Baseline emissions:</b></p> <p>The baseline emissions are calculated by the below stated formulae:</p> $BE_{thermal,CO_2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO_2}$ <p>where</p> <p><math>BE_{thermal,CO_2,y}</math> = The baseline emissions from steam/heat displaced by the Project activity = 50.15 tCO<sub>2</sub> – Calculation shown below</p> <p><math>EG_{thermal,y}</math> = The net quantity of steam/heat supplied by the Project activity = 0.664 TJ – Calculation shown below</p> <p><math>EF_{FF,CO_2}</math> = The CO<sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant as per the included CPA-DD = 75.5 tCO<sub>2</sub>/TJ</p> <p><math>\eta_{BL,thermal}</math> = The efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity as per the included CPA-DD = 100%</p> <p><math>EG_{thermal} = Q_{steam} * (H_s - H_w) * 4.186 \times 10^{-6}</math></p>	<p>CL-08 CL-02 OK</p>

<sup>127</sup> This value is obtained from the ex-ante fixed value electricity consumption for processing of biomass as 750.195 MWh per annum for 7,200 operating hours. Accordingly for this monitoring period, the project operated for 259 hours and hence this parameter is calculated on pro rata basis as 750.195 / 7200 \* 259 = 26.99 MWh for this monitoring period

<sup>128</sup> Although out of the three suppliers of biomass briquette for the project, the distance is beyond 200 km for only one of the supplier. But the CME has considered leakage for all the biomass transported which is conservative and hence accepted.



	Verified situation	Conclusion
	<p>where</p> <p><math>EG_{\text{thermal}}</math> = Net quantity of heat supplied by the Project activity (TJ)</p> <p><math>Q_{\text{steam}}</math> = Quantity of steam supplied in Tonnes = 275.48 Tonnes</p> <p><math>H_s</math> = Specific enthalpy of steam at corresponding absolute pressure at the outlet = 660.56 kCal/kg</p> <p><math>H_w</math> = Specific Enthalpy of feed water at corresponding temperature at the Boiler inlet (kCal/kg) = 84.50 kCal/kg</p> <p><math>EG_{\text{thermal}} = 275.48 * (660.56 - 84.50) * 4.186 * 10^{-6}</math></p> <p>= 0.664 TJ</p> <p>Note: Steam enthalpy is calculated at the weighted average steam pressure during the monitoring period from standard steam table for saturated steam. Similarly the enthalpy of the boiler feed water is determined at the weighted average feed water temperature during the monitoring period. The verification team independently calculated the steam enthalpy at the average steam pressure of 6.79 kg/cm<sup>2</sup> g using the web site - <a href="http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp">http://www.spiraxsarco.com/resources/steam-tables/saturated-steam.asp</a> ; and found the steam enthalpy as 661.06 kCal/kg. Hence the enthalpy used by the CME is conservative.</p> <p>Therefore,</p> <p><math>BE_{\text{thermal,CO2,y}} = 0.664 / 100\% * 75.5</math>  <math>= 50.15 \text{ tCO}_2</math></p> <p><b><u>Project emissions:</u></b></p> <p><u>Project emissions due to electricity consumption:</u></p> <p><math>PE_{\text{EC,y}} = EC_{\text{PJ,j,y}} * EF_{\text{grid,CM,y}} * (1 + \text{TDL}_{\text{j,y}}) + EC_{\text{EL,j,y}} * EF_{\text{EL,j,y}} * (1 + \text{TDL}_{\text{j,y}})</math></p>	

	Verified situation	Conclusion
	<p><math>EC_{PJ,y}</math> = Auxiliary Electricity Consumption of the Project activity from the Grid = 15.63 MWh</p> <p><math>EC_{EL,j,y}</math> = Auxiliary Electricity Consumption of the Project activity from the off grid Captive Power Plant (Diesel Generator set) = 0 MWh</p> <p><math>EF_{grid,CM,y}</math> = Ex-ante Grid Emission Factor = 0.80 tCO<sub>2</sub>/MWh</p> <p><math>EF_{EL,j,y} = EF_{EL,i,y}</math> (Emission Factor for fossil fuel based electricity generation for source j and/or I) = 1.3 tCO<sub>2</sub>/MWh</p> <p><math>TDL_{i,y}</math> = Average technical transmission and distribution losses for providing electricity to source I and/or j as per the included CPA-DD = 20%</p> <p><math>PE_{EC,y} = 15.63 * 0.80 * (1+20\%) + 0 * 1.30 * (1+20\%)</math>  <math>= 15.01 \text{ tCO}_2</math></p> <p><u>Project emissions from fossil fuel combustion</u></p> <p><math>PE_{FC,j,y} = \sum FC_{i,j,y} * COEF_{i,y}</math></p> <p>where  <math>PE_{FC,j,y}</math> = CO<sub>2</sub> emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p><math>FC_{i,j,y}</math> = Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr) = 0 Tonnes</p> <p><math>COEF_{i,y}</math> = The CO<sub>2</sub> emission coefficient of fuel type i in year y (tCO<sub>2</sub> / mass or volume unit)</p> <p><math>COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}</math>  Where  <math>NCV_{i,y}</math> = Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)  <math>EF_{CO2,i,y}</math> = weighted average CO<sub>2</sub> emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)</p>	

	Verified situation	Conclusion
	<p>As there is fossil fuel consumption during the monitoring period,</p> $PE_{FC,j,y} = 0$ <p>Hence <math>PE_y</math> (Total Project emissions) = <math>PE_{EC,y} + PE_{FC,j,y}</math>  <math>= 15.01 + 0 = 15.01 \text{ tCO}_2</math></p> <p><b><u>Leakage:</u></b></p> $LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}$ $= EC_{LE,l,y} * EF_{EL,l,y} * (1 + TDL_{l,y}) + N_{c,y} * AVDC_{y,y} * EF_{km,CO2} + N_{y,y} * AVD_{y,y} * EF_{km,CO2}$ <p>where</p> <p><math>LE_y</math> = Leakage emissions</p> <p><math>LE_{EC,y}</math> = Leakage emissions from electricity consumption</p> <p><math>LE_{collection,y}</math> = Leakage Emissions due to transportation of collection of biomass to biomass processing site</p> <p><math>LE_{transportation,y}</math> = Leakage Emissions due to transportation of processed biomass to Project site</p> <p><math>EC_{LE,l,y}</math> = Net increase in electricity consumption of source as a result of leakage = 26.99 MWh<sup>127</sup></p> <p><math>EF_{EL,l,y}</math> = Emission factor for electricity generation for source as per included CPA-DD = 0.80 (tCO<sub>2</sub>/MWh)</p> <p><math>TDL_{l,y}</math> = Average technical transmission and distribution losses for providing electricity as per included CPA-DD = 20%</p> <p><math>N_{c,y}</math> = Number of truck trips for collecting loose biomass = 97</p> <p><math>AVDC_{y,y}</math> = Average round trip distance between the biomass fuel supply sites and biomass collection site = 70.52 km</p> <p><math>EF_{km,CO2}</math> = Average CO<sub>2</sub> emission factor for the trucks as per the included CPA-DD = 0.0005152 tCO<sub>2</sub>/km</p> <p><math>N_{y,y}</math> = Number of truck trips for supplying the biomass briquette to the project site = 30</p> <p><math>AVD_{y,y}</math> = Average round trip distance (from and to) between the biomass fuel supply sites and the site of the Project plant = 158 km<sup>128</sup></p>	

	Verified situation	Conclusion
	<p> <math>LE_y = LE_{EC,y} + LE_{collection,y} + LE_{transportation,y}</math>  <math>= 26.99 * 0.8 (1+20\%) + 97 * 70.52 * 0.0005152 + 30 * 158 * 0.0005152</math>  <math>= 25.91 + 3.52 + 2.44 = 31.87 \text{ tCO}_2</math> </p> <p>Emission reductions are calculated as follows:  <math>ER_y = BE_y - PE_y - LE_y</math>  <math>= 50.15 - 15.01 - 31.87 = 3 \text{ tCO}_2</math> (rounded down value)</p> <p>CL 08 was raised as the ER calculation spreadsheet provided for the CPA had not included daily monitored data for steam quantity, temperature, pressure and feed water temperature to calculate the average of these parameters. ER calculation spreadsheet was adequately revised and the CL was closed.</p> <p>CL 02#2 was raised as, for the parameter "<math>TD_{Lj,y} = TD_{Lj,y}</math>", it was stated in the MR that it is used for Leakage emission calculation. But this parameter is also used for the calculation of project emission. CL was closed after appropriate revision in the MR.</p>	
<p>5-2. Has the calculation tool been correctly documented? Check its consistency and formulae.</p> <ul style="list-style-type: none"> <li>• baseline emissions</li> <li>• project emissions</li> <li>• leakage</li> <li>• emission reductions of the project.</li> </ul>	<p>The Monitoring Report is supported by Micro Soft excel based spreadsheet for the calculation of emission reductions. The consistency and formula were verified and found to be accurate.</p>	OK

	Verified situation	Conclusion
<p>5-3. Is a complete set of data available during the specified monitoring period? If only partial data is available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan proceed as follows:</p> <ul style="list-style-type: none"> <li>a. Check if sections 3.11 and/or 3.12 above are applicable and raise a CAR for the PPs to comply with these requirements.</li> <li>b. If sections 3.11 and 3.12 are not applicable or the answer to this question remains NO, a request for deviation is necessary.</li> </ul> <p>Conduct an assessment of the potential impacts of these changes in accordance to the procedures for Post Registration Changes.</p>	Yes, the complete data set was available during the specified monitoring period.	OK
<p>5-4. Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?</p> <p>Please describe how LRQA has cross-checked reported data.</p>	All the information provided in the Monitoring Report were cross-checked with the Plant log book records, purchase records (for biomass and fossil fuel), site visit and interview of the CPA implementer/CME.	OK
5-5. Have any assumptions used in emission calculations been justified?	All assumptions in the emission reduction calculation are consistent with assumptions taken in the registered monitoring plan and have reference to the applied methodology.	OK

	Verified situation	Conclusion
5-6. Have appropriate emission factors, IPCC default values, and other reference values been correctly applied?	<p>The CME has applied the appropriate ex-ante fixed factors as stated in the included CPA-DD like:</p> <ul style="list-style-type: none"> <li>• The Efficiency of the plant using fossil fuel that would have been used in the absence of the Project activity(<math>\eta_{BL,thermal}</math>)</li> <li>• CO<sub>2</sub> Emission Factor of the fossil fuel that would have been used in the baseline plant (<math>EF_{FF,CO_2}</math>)</li> <li>• Surplus availability of Biomass within identified region (<math>SA_k</math>)</li> <li>• Ex-ante Grid Emission Factor in a year y.</li> <li>• Emission Factor for fossil fuel based electricity generation for source j and/or l in year y (<math>EF_{EL,j,y} = EF_{EL,l,y}</math>)</li> <li>• Auxiliary Electricity Consumption for biomass processing, outside Project boundary. (<math>EC_{LE,l,y}</math>)</li> <li>• Average CO<sub>2</sub> emission factor for the trucks measured during the year y(<math>EF_{km,CO_2}</math>)</li> <li>• Average technical transmission and distribution losses for providing electricity to source l and/or j in year y(<math>TDL_{l,y} = TDL_{j,y}</math>)</li> <li>• Specific energy consumption of fuel type j of the Project activity in year y(<math>SEC_{PJ,j,y,measured}</math>)</li> </ul> <p>However, CL 02#3 was raised for the CME to clarify the appropriateness of the “Source of data” and “Additional comment” as stated in the MR for the parameters in section D.1, which are fixed ex-ante at the time of validation of the CPA.</p> <p>The MR was suitably revised against the raised finding and hence the CL were closed. For details please refer to the Annex D of this report.</p>	OK

## 7.14 Appendix D: Consolidated Verification Findings<sup>129</sup>

<b>1. Grade / Ref:</b>	CAR 01	<b>2. Date:</b>	<del>27/11/2012</del> 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Guideline for completing the Monitoring Report, Version 2.0 and paragraph 228 (b) of Validation and Verification Standard Version 2.0				
<b>5. Nature of the Issue Raised:</b>	In section B.1 of the MR, the downtime of the respective project boilers / heaters is not provided for all the CPAs. CME is requested to justify for not providing the downtime details during this monitoring period.				
<b>6. Nature of responses provided by the project participants:</b>	Details of the downtime for each CPA have been included in section B.1 of the MR. Reason for the same is due to raw material unavailability and regular maintenance for the boilers installed and the seasonal operation of some of the CPA sites. Evidence for the downtime in the form of declaration from client is been submitted herewith.				
<b>7. Assessment of such responses:</b>	The MR has been revised stating the downtime. Evidence for the downtime has also been submitted to the verification team. Hence the CAR is closed.				
<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	Section B.1 of the MR.				

<sup>129</sup> Explanation of the Findings Log structure:

1. Grading and Sequential Number of the finding2. Date of Original Finding 3. New, Open, Closed 4. Requirement (VVS, CPA-DD, PoA-DD, etc.) 5. Reference to Workbook  
6. Details of PP's response 7. Evaluation from the Verification team 8. List of changes made as a result of the finding

<b>1. Grade / Ref:</b>	CAR 02	<b>2. Date:</b>	27/11/2012 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 215, 216, 219, 244 & 245 of Validation and Verification Standard Version 2.0				
<b>5. Nature of the Issue Raised:</b>	<ol style="list-style-type: none"> <li>1) The opening readings of the parameter “Q<sub>steam</sub>” and closing readings of the parameters “EC<sub>PJ,j,y</sub>” and “EC<sub>EL,j,y</sub>” have not been presented to the verification team for all the CPAs. CME is to provide the complete data for the whole monitoring period for the verification and consider them for emission reduction calculation.</li> <li>2) For the CPA 0009, auxiliary electricity consumption for the 8 TPH boiler and the RO plant have not been considered for project emission calculation.</li> <li>3) For the CPA 0006, energy meter for measuring the parameter “EC<sub>PJ,j,y</sub>” (auxiliary grid electricity consumption) was not in place from 01/05/2012 to 10/05/2012. This has not been reported in the MR. CME needs to clarify how project emissions due to electricity consumption during this period is considered.</li> <li>4) Recording frequency of the monitoring parameter “EC<sub>EL,j,y</sub>” has not been stated in the MR for all the CPAs.</li> </ol>				
<b>6. Nature of responses provided by the project participants:</b>	<ol style="list-style-type: none"> <li>1) The opening readings of the parameter “Q<sub>steam</sub>” and closing readings of the parameters “EC<sub>PJ,j,y</sub>” and “EC<sub>EL,j,y</sub>” have now been presented and submitted to the verification team for all the CPAs. The CME has provided complete data for whole monitoring period for the verification and has considered them for emission reduction calculation. The revised emission reduction sheets for all CPAs are submitted herewith to the verification team.</li> <li>2) For the CPA 0009, auxiliary electricity consumption for the 8 TPH boiler was already included in the project emission calculation. However it was missed for the RO plant. Accordingly the emission reduction calculation has been revised by including the auxiliary electricity consumption for the RO plant. A copy of energy meter log book and the revised emission reduction calculation is attached herewith to verification team</li> <li>3) For the CPA 0006, the dual source energy meter for monitoring auxiliary electricity consumption was installed only on 11/05/2012. Hence for the period 01/05/2012 to 10/05/2012, this source of emission has been calculated based on the emergency preparedness plan as indicated in the included CPA-DD. It states that, the energy (kWh) consumed in the absence of meter will be calculated considering failure hours and the auxiliary electrical connected load of the boiler i. e. Failure hours*Electrical connected load*Grid emission factor. Failure hours are 109 hrs which is the actual running hours of the boiler. Electrical connected load is 30.20 kW as per the included CPA-DD and grid emission factor is 0.86 tCO<sub>2</sub>e/MWh which is fixed ex-ante at the time of validation. Emission reduction calculation sheet has been revised accordingly and is submitted herewith for the verification team.</li> <li>4) Recording frequency of the monitoring parameter “EC<sub>EL,j,y</sub>” has now been stated as monthly in all the MRs.</li> </ol>				
<b>7. Assessment of such responses:</b>					



- 1) The opening readings for “Q<sub>steam</sub>” and closing readings of the parameters “EC<sub>PJ,j,y</sub>” and “EC<sub>EL,j,y</sub>” have been provided now and also considered for ER calculation in the revised MR and ER spreadsheets.
- 2) In the revised MR and Spreadsheet for CPA 0009, auxiliary electricity for the 8 TPH boiler and the RO plant have been considered for PE calculations.
- 3) For CPA 0006, in the revised MR and ER spreadsheet, the CME has correctly considered the auxiliary consumption based on the connected auxiliary load of the boiler in line with the included CPA-DD emergency plan for the period 01/05/2012 to 10/05/2012.
- 4) Recording frequency for “EC<sub>EL,j,y</sub>” has been stated in the revised MR.

As the MR / ER spreadsheets have been revised appropriately for all the above points, the CAR is closed.

<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	
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Section D.2 of the MR and ER spreadsheets
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<b>1. Grade / Ref:</b>	CAR 03	<b>2. Date:</b>	27/11/2012 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 220 (c) and 245 (c) of Validation and Verification Standard Version 2.0				
<b>5. Nature of the Issue Raised:</b>	<ol style="list-style-type: none"> <li>For all the CPAs, the enthalpy output of the boiler / heater is dependent on temperature. In this respect, the CME needs to justify the appropriateness of taking the simple average of the readings of the monitored parameters <math>P_{\text{steam}}</math>, <math>T_{\text{steam}}</math>, <math>T_{\text{fwb}}</math>, <math>T_{\text{in}}</math> and <math>T_{\text{out}}</math> to arrive at the corresponding reported values in section D.2 of the Monitoring Report.</li> <li>For CPA 0011, the heat out put of the heater has been calculated every 15 minutes by the SCADA system. It is noted that during the monitoring period, for many of the days, the data is not available for few hours in a day. But energy output has been calculated based on the latest readings of the inlet and outlet temperature readings of the thermic fluid. CME needs to justify the appropriateness of this in the calculation of emission reductions.</li> </ol>				
<b>6. Nature of responses provided by the project participants:</b>	<ol style="list-style-type: none"> <li>The CME has revised the ER calculations by calculating the weighted average of steam temperature, pressure and feed water temperature for the respective boilers of all the CPAs and also the weighted average inlet and outlet temperature of the thermic fluid heater for CPA 0011. The revised MR and ER spreadsheets are submitted to the verification team.</li> <li>For the period during which the 15 minutes readings are not available, CME is not considering the heat output from the heater for that period being conservative.</li> </ol>				
<b>7. Assessment of such responses:</b>	<p>ER spreadsheets and MR was revised for the calculation of the temperature and pressure of steam, feed water temperature for all the CPAs and the inlet and outlet temperature for the thermic fluid for heater for CPA 0011 to calculate the respective enthalpies by the weighted average approach based on the quantity of steam supplied rather than on the simple average approach. Hourly readings of temperature and pressure are recorded along with the quantity of steam / thermic fluid. Weighted average of these hourly temperature and pressure values are calculated on a daily basis and presented in the respective ER spreadsheets of the CPAs. Again, weighted average of the daily temperature and pressure values are calculated from these daily readings (based on the quantity of steam / thermic fluid flow) for the monitoring period of the respective CPAs to calculate the enthalpies of the steam / feed water / thermic fluid for heater.</p> <p>The calculation was checked by the verification team and the approach was deemed correct and hence acceptable.</p> <p>Also, for the period when the data is not available for every 15 minutes for the thermic fluid, the CME has not considered that period for ER calculation. This is deemed acceptable as it is conservative.</p> <p>The CAR is closed.</p>				
<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	Section D.2 of MR and ER spreadsheets				

<b>1. Grade / Ref:</b>	CAR 04	<b>2. Date:</b>	27/11/2012 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 234 of Validation and Verification Standard Version 2.0				
<b>5. Nature of the Issue Raised:</b>	<ol style="list-style-type: none"> <li>1) For the CPAs 0001, 0005, 0012 and 0015 (CPAs using biomass briquette), as per the “General Guidance on leakage in Biomass Project activities”, leakage due to competing use of biomass need not be considered if it is established ex-ante that the surplus availability of biomass in the defined region is more than 25%. Also as per footnote 11 of the applied methodology, AMS-I.C, version 16, “If biomass residues are transported over a distance of more than 200 kilometres due to the implementation of the project activity then this leakage source attributed to transportation shall be considered, otherwise it can be neglected”. In this context, CME needs to justify the non consideration of leakage due to processing and transportation of biomass for the project activity.</li> <li>2) The values of the parameter “<math>EC_{LE,I,y}</math>” for the CPAs 0001, 0005, 0012 and 0015 (CPAs using biomass briquette) are not consistent with the respective CPA-DDs.</li> <li>3) The CME needs to clarify the appropriateness of the calculation of the parameter “<math>AVD_{c,y}</math>” for the CPAs that use briquette as the biomass fuel considering that the briquette suppliers source the raw materials from different vendors having different locations and different number of trips involved</li> </ol>				
<b>6. Nature of responses provided by the project participants:</b>	<ol style="list-style-type: none"> <li>1. The CME has revised the ER sheets considering the leakage due to transportation/collection and processing if the distance is more than 200km for biomass transportation. Revised ER sheets are attached herewith.</li> <li>2. The CME has revised the values of the parameter “<math>EC_{LE,I,y}</math>” for the CPAs 0001, 0005, 0012 and 0015 (CPAs using biomass briquette) in accordance with the respective CPA-DDs.</li> <li>3. As the briquette suppliers source the raw materials from different vendors having different locations and different number of trips involved, the CME has calculated the parameter “<math>AVD_{c,y}</math>” by doing a weighted average against the number of trips. The declaration from the biomass briquette suppliers are received stating the distance and trips involved for sourcing of biomass to biomass processing site. The revised ER sheet along with the declaration letters are provided to the verification team.</li> </ol>				
<b>7. Assessment of such responses:</b>	<ol style="list-style-type: none"> <li>1) In the revised MR and ER spreadsheets, the CME has now considered the leakage due to collection / transportation of biomass for the cases where the distance is beyond 200 km and this is in accordance with the “General Guidance on leakage in Biomass Project activities”.</li> <li>2) The values of the parameter “<math>EC_{LE,I,y}</math>” for the CPAs 0001, 0005, 0012 and 0015 have been corrected in the revised MR and ER spreadsheets in accordance with the CPA-DDs.</li> <li>3) In the revised MR and ER spreadsheets submitted by CME, the calculation approach for the parameter “<math>AVD_{c,y}</math>” has been changed to weighted average rather than the simple average which is deemed correct.</li> </ol> <p>As all the above points have been addressed in the revised MR and ER spreadsheets of the respective CPAs, the CAR is closed.</p>				

<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	
Section D.2 of MR and ER spreadsheets	

<b>1. Grade / Ref:</b>	CAR 05	<b>2. Date:</b>	27/11/2012 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 220 (c) of Validation and Verification Standard Version 2.0				
<b>5. Nature of the Issue Raised:</b>	For CPA 0009, the CME has not considered the Maximum of “EG <sub>thermal, actual,y</sub> ” and “EG <sub>thermal, estimated,y</sub> ” to arrive at “EG <sub>thermal, old,y</sub> ” for the calculation of “EG <sub>thermal, add, y</sub> ” as per the included CPA-DD and the applied methodology AMS-I.C, version 16.				
<b>6. Nature of responses provided by the project participants:</b>	The CME has now considered the maximum of “EG <sub>thermal, actual,y</sub> ” and “EG <sub>thermal, estimated,y</sub> ” to arrive at “EG <sub>thermal, old,y</sub> ” for the calculation of “EG <sub>thermal, add, y</sub> ” as per the included CPA-DD and the applied methodology AMS-I.C, version 16 for the CPA 0009. The revised emission reduction sheet for the CPA 009 is submitted to verification team.				
<b>7. Assessment of such responses:</b>	The CME has corrected the calculation approach for the parameter “EG <sub>thermal, old,y</sub> ” for the calculation of “EG <sub>thermal, add, y</sub> ” in the revised ME and ER spreadsheet for the CPA 0009, which is in line with the included CPA-DD and applied methodology AMS-I.C, version 16. Hence the CAR is closed.				
<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	Section D.2 of MR and ER spreadsheets				

<b>1. Grade / Ref:</b>	CAR 06	<b>2. Date:</b>	27/11/2012 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 243 of Validation and Verification Standard Version 2.0				
<b>5. Nature of the Issue Raised:</b>	As per the CPA-DDs for the CPAs 0001, 0002, 0003, 0005, 0006, 0007, 0009 and 0011, "h <sub>y</sub> " (Boiler operating hours of the project activity in year y) is a monitoring parameter. But this parameter has not been provided in the MR for the above CPAs.				
<b>6. Nature of responses provided by the project participants:</b>	The CME has revised the MRs for all CPAs and is now consistent with the included CPA-DD.				
<b>7. Assessment of such responses:</b>	In the revised MR, the parameter "h <sub>y</sub> " has been included for the applicable CPAs. Hence the CAR is closed.				
<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	Section D.2 of MR				

<b>1. Grade / Ref:</b>	CAR 07	<b>2. Date:</b>	27/11/2012 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 230 of Validation and Verification Standard Version 2.0 and Guideline for completing the Monitoring Report, Version 2.0				
<b>5. Nature of the Issue Raised:</b>	<p><u>Regarding Calibration that is common to all CPAs</u></p> <p>Most of the accuracy class of the monitoring instruments as stated in the MR is incorrect for all the CPAs. Further, the CME needs to clarify why the details of the backup monitoring instruments (for steam pressure and temperature and feed water temperature) are not being provided for all the CPAs.</p> <p><u>Issues specific to CPA</u></p> <p>CPA 0001</p> <ol style="list-style-type: none"> <li>1) The auxiliary electricity consumption energy meter serial number is incorrect as stated in the MR (noted as DS-10-10-0029 during the on-site visit and document review).</li> <li>2) Weighbridge details have not been provided in the MR and also the calibration does not cover the whole monitoring period.</li> </ol> <p>CPA 0011</p> <ol style="list-style-type: none"> <li>1) Serial numbers of the weighbridges used for this CPA are either not stated or incorrectly stated.</li> </ol> <p>CPA 0007</p> <ol style="list-style-type: none"> <li>1) Feed water temperature measuring equipment details have not been provided in the MR.</li> <li>2) Make of the weighbridge is not stated in the MR.</li> </ol> <p>CPA 0015</p> <ol style="list-style-type: none"> <li>1) The make of the weighbridge, serial number, accuracy class and calibration date as stated in the MR is incorrect.</li> </ol> <p>CPA 0009</p> <ol style="list-style-type: none"> <li>1) Serial number of the energy meter as stated in the MR as IL262653 is incorrect as verified during the on-site visit and with document review..Also the details of the energy meter for the 8 TPH boiler and the RO plant energy meter are not stated in the MR.</li> </ol> <p>CPA 0006</p> <ol style="list-style-type: none"> <li>1) The calibration date of RTD for feed water temperature is stated wrongly as 18/10/2011 as verified during the on-site visit and with document review.</li> </ol> <p>CPA 0003</p>				

- 1) Calibration date for the RTD for feed water temperature and energy meter have not been stated in the MR.

CPA 0013

- 1) The serial number of the energy meter is found to be incorrect as stated in the MR.

CPA 0002

- 1) Serial number of the RTD for feed water temperature and the calibration dates for pressure gauge for steam and RTD for feed water in the MR is found to be incorrect.

#### **6. Nature of responses provided by the project participants:**

The accuracy class of the monitoring instruments as stated in the MR were based on the included CPA-DD. However it has been now corrected as per the technical specification of the respective monitoring instruments installed at site and it is also ensured that the accuracy class mentioned in the revised MR is in line or on higher accuracy than stated in the CPA-DDs. Furthermore, during the monitoring period, the backup meters are not used for reporting as the main meters installed were working without any fail (Except for the CPAs 0005 and 0006 for which the auxiliary energy meter were non functional/ not in place for some period during this monitoring period. Accordingly the emergency preparedness plan has been followed in line with the CPA-DD. This is transparently stated in the respective MRs). Hence the details of the back up monitoring instrument are not being provided in the MRs.

Issues specific to CPA

CPA 0001

- 1) The auxiliary electricity consumption energy meter serial number as mentioned in the web hosted MR is the model number and hence the serial number is corrected as DS-10-10-0029 in the revised MR.
- 2) Weigh machine details have been corrected. Further since the calibration is not valid from 17/06/2011 to 29/06/2011, error has been applied to the quantity of biomass procured during this period.

CPA 0011

- 1) Serial numbers of the weighbridges used for this CPA are corrected and included in the revised MR. The same is submitted to the verification team.

CPA 0007

- 1) Feed water temperature measuring equipment details have now been provided in the revised MR and is submitted to the verification team.
- 2) Make of the Weighbridge is now included in the revised MR and is submitted to the verification team.

CPA 0015

- 1) The correct details for the Weighbridge are provided as Make- Essae Teraoka, serial number- 950052904, accuracy class-Class III and calibration

date 27/04/2012 to 27/04/2013 is now provided in the revised MR.

CPA 0009

- 1) Serial number of the energy meter is now corrected in the MR. The details of the energy meter for 8TPH and the RO plant is also included in the revised MR.

CPA 0006

- 1) The calibration date of RTD for feed water temperature is now stated correctly as 13/10/2011. The calibration certificate is submitted to verification team.

CPA 0003

- 1) Calibration date for the RTD - 13/10/2011 for feed water temperature and energy meter- 19/02/2012 has been now been stated in the revised MR.

CPA 0013

- 1) The serial number for energy meter is corrected as 203352/18502-2610 in the revised MR.

CPA 0002

Serial number of the RTD for feed water temperature and the calibration date of RTD for feed water has been revised in the MR. details of the pressure gauge is not included with reference to the first response for this CAR.

**7. Assessment of such responses:**

During this monitoring period, all the monitoring equipment was operating normally without any failure (except for the cases as mentioned in the response by the CME above which is stated in the MR). The main monitoring equipment' readings were reported during this monitoring period and no back-up meter readings were required or reported. Hence the revision in the MR by removal of the stand-by monitoring equipment is found to be appropriate.

CPA 0001

MR is revised, stating the correct energy meter serial number and the weigh machine details. The CME has appropriately applied the error in line with the calibration guidelines in the calculation of biomass procured during the monitoring period.

CPA 0011

Serial number of the weighbridge are corrected in the revised MR.

CAP 0007

Feed water temperature measuring instrument details and the weighbridge details are provided in the revised MR.

CPA 0015



The weighbridge details are corrected in the revised MR.

CPA 0009

MR is revised stating the correct serial number of the energy meter and also details of the energy meter for 8 TPH boiler and RO plant have been stated in the revised MR.

CPA 0006

Calibration date of the RTD for feed water temperature has been corrected in the revised MR.

CPA 0003

In the revised MR, calibration dates of the RTD feed water temperature and the energy meter have been stated.

CPA 0013

Serial number of the energy meter has been corrected in the revised MR.

CPA 0002

In the revised MR serial number of the feed water temperature RTD and the calibration dates of the steam and feed water RTD have been correctly stated. The pressure gauge details are not required as the readings of this gauge are not used in this monitoring period.

As all the points of the CAR have been addressed appropriately, the CAR is closed.

<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	
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Section D.2 of MR
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<b>1. Grade / Ref:</b>	CAR 08	<b>2. Date:</b>	<del>30/11/2012</del> 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Section A.3 of Guideline for completing the Monitoring Report, Version 2.0				
<b>5. Nature of the Issue Raised:</b>	<p>On the project page website of UNFCCC for the PoA (4041), the “Other parties involved” are United Kingdom of Great Britain and Northern Ireland and Germany. But in the MR, only United Kingdom is stated.</p>				
<b>6. Nature of responses provided by the project participants:</b>	<p>The CME has revised the MR accordingly and is submitted to the verification team</p>				
<b>7. Assessment of such responses:</b>	<p>In the revised MR, both the Annex I parties have been stated in line with the project page of the registered PoA as visible on the UNFCCC web site. Hence the CAR is closed.</p>				
<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	<p>Section A.3 of MR</p>				

<b>1. Grade / Ref:</b>	CL 01	<b>2. Date:</b>	<del>27/11/2012</del> 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 244 and 245 of Validation and Verification Standard Version 2.0 and Guideline for completing the Monitoring Report, Version 2.0				
<b>5. Nature of the Issue Raised:</b>	<p>CME is requested to clarify the following for all the CPAs:</p> <ol style="list-style-type: none"> <li>1) In section E.5 of the MR, the calculation of the ex-ante emission reductions is not transparently presented. The ex-ante estimated GHG emission reductions as stated in the MR for the monitoring period are incorrect for the CPA 0006 and CPA 0005.</li> <li>2) NCV for CPA 0007 as stated in the MR is incorrect.</li> </ol>				
<b>6. Nature of responses provided by the project participants:</b>	<ol style="list-style-type: none"> <li>1) In section E.5 of the MR, the calculation of the ex-ante emission reductions is now transparently shown. The ex-ante estimated GHG emission reductions for the CPA 0006 and CPA 0005 are now corrected in the revised MR and is submitted to the verification team accordingly</li> <li>2) NCV for CPA 0007 is corrected in the revised MR and is submitted to the verification team accordingly.</li> </ol>				
<b>7. Assessment of such responses:</b>	<ol style="list-style-type: none"> <li>1) The ex-ante estimated GHG emission reductions have been revised correctly in the MR and the calculation shown transparently.</li> <li>2) NCV for CPA 0007 has been corrected in the revised MR.</li> </ol>				
<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	Sections D.2 and E.5 of MR				

<b>1. Grade / Ref:</b>	CL 02	<b>2. Date:</b>	<del>27/11/2012</del> 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 217 of Validation and Verification Standard Version 2.0 and Guideline for completing the Monitoring Report, Version 2.0				
<b>5. Nature of the Issue Raised:</b>	<p>For all the CPAs:</p> <ol style="list-style-type: none"> <li>1) In section D.1 of the MR, under the parameters like “CAP<sub>boiler</sub>” and “SEC<sub>PJ,y,measured</sub>” CME needs to clarify how these parameters are being used for Baseline Emission calculation. As per the CPA-DD, these parameters are not used for Baseline emission calculation.</li> <li>2) For the parameter “TD<sub>Li,y</sub> = TD<sub>Lj,y</sub>”, it is stated in the MR that it is used for Leakage emission calculation. But this parameter is also used for the calculation of project emission.</li> <li>3) The CME needs to clarify the appropriateness for the “Source of data” and “Additional comment” as stated in the MR for the parameters in section D.1 which are fixed ex-ante at the time of validation of the CPAs.</li> </ol>				
<b>6. Nature of responses provided by the project participants:</b>	<ol style="list-style-type: none"> <li>1) The CME has corrected the section D.1 of MR and is submitted to the verification team</li> <li>2) The CME has corrected the section D.1 of MR for the parameter “TD<sub>Li,y</sub> = TD<sub>Lj,y</sub>” and the revised MR is submitted to the verification team</li> <li>3) The CME has revised the section D.1 of the MR accordingly and is submitted to the verification team.</li> </ol>				
<b>7. Assessment of such responses:</b>	<ol style="list-style-type: none"> <li>1) MR has been revised appropriately as these parameters are not used for baseline emission calculation.</li> <li>2) MR has been revised appropriately stating these parameters are used for project and leakage emission calculation.</li> <li>3) Revision in the MR is found to be appropriate for the rows “Source of data” and “Additional comment” for the ex-ante parameters.</li> </ol> <p>CL is closed.</p>				
<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	Section D.1 of MR				

1. Grade / Ref:	CL 03	2. Date:	27/11/2012 03/12/2012	3. Status:	Closed
4. Requirement		Paragraph 217 of Validation and Verification Standard Version 2.0 and Guideline for completing the Monitoring Report, Version 2.0			
5. Nature of the Issue Raised:					
1) For all the CPAs, the monitoring parameters related quantity of biomass consumed (like “Q <sub>ob,k</sub> ”, “Q <sub>np,k</sub> ”, “Q <sub>in,k</sub> ”, “Q <sub>c,k</sub> ”) “Purpose of data” and “QA/QC procedures”, it is stated as “NA”. The CME needs to clarify why these rows are not applicable. The CME needs to clearly state the monitoring and recording frequency of these parameters in the MR.					
2) The values for these parameters as stated in the MR is incorrect as verified during the on-site visit and also with the documents provided.					
6. Nature of responses provided by the project participants:					
1) The CME has included the proper justification for “Purpose of data” and “QA/QC procedures”. Further the monitoring and recording frequency has been included in the revised MR and is submitted to the verification team.					
2) The CME has revised the MR by inserting correct values for the parameters related to biomass consumed. The revised MR has been submitted to verification team.					
7. Assessment of such responses:					
1) MR has been revised appropriately the rows “Purpose of data” and “QA/QC procedures” and also the monitoring and recording frequency of these parameters have been stated.					
2) Values of the biomass quantity parameters have been corrected in the revised MR.					
CL is closed.					
8. References to resulting changes in the Monitoring Report or supporting annexes:					
Section D.2 of MR					

<b>1. Grade / Ref:</b>	CL 04	<b>2. Date:</b>	<del>27/11/2012</del> 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 233 of Validation and Verification Standard Version 2.0				
<b>5. Nature of the Issue Raised:</b>	For the CPAs 0001, 0002, 0003, 0005, 0006, 0007, 0009 and 0011, for the quantity of biomass and the fossil fuel consumed by the project activity, under "QA/QC procedures" in the MRs it is stated "The quantity of biomass consumed can be cross-checked with payment receipt /invoice obtained from the fuel supplier" whereas in the included CPA-DDs it is stated "This can be verified with the help of steam generation and steam to fuel ratio". CME needs to clarify the same.				
<b>6. Nature of responses provided by the project participants:</b>	The CME has revised the QA/QC procedures in MR for the CPAs 0001, 0002, 0003, 0005, 0006, 0007, 0009 and 0011 consistent with the included CPA-DDs.				
<b>7. Assessment of such responses:</b>	MR has been revised stating the QA/QC procedure of the parameter biomass consumed by the project activity in line with the CPA-DD. Hence the CL is closed.				
<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	Section D.2 of MR				

<b>1. Grade / Ref:</b>	CL 05	<b>2. Date:</b>	<del>27/11/2012</del> 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 217 of Validation and Verification Standard Version 2.0				
<b>5. Nature of the Issue Raised:</b>	As per the included CPA-DDs, the values of the parameters Hydrogen, Oxygen and Moisture content in the biomass are required to be used only when the laboratory report refers to GCV of the biomass consumed. The CME to clarify why the values of Hydrogen, Oxygen & moisture are included even when the NCV is directly provided (except for CPAs 0013 and 0015). Also, the dates of the laboratory reports for this parameter are missing in the MRs.				
<b>6. Nature of responses provided by the project participants:</b>	As per the included CPA-DDs, the values of the parameters Hydrogen, Oxygen and Moisture content in the biomass are now mentioned only for the CPA ( where the laboratory report refers to GCV of the biomass consumed. The CME has removed the values of Hydrogen, Oxygen & moisture for other CPAs in which the NCV value is directly provided. Also the dates of the laboratory reports for this parameter are now mentioned in the revised MRs.				
<b>7. Assessment of such responses:</b>	In the revised MR, the values of the parameters Hydrogen, Oxygen and Moisture content of the biomass are stated only for the CPAs where NCV is provided directly by the laboratory. CL is closed.				
<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	Section D.2 of MR				

<b>1. Grade / Ref:</b>	CL 06	<b>2. Date:</b>	<del>27/11/2012</del> 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 217 of Validation and Verification Standard Version 2.0				
<b>5. Nature of the Issue Raised:</b>	For the CPA 0011 for the parameter " $Q_{c, \text{rice husk, B}}$ " and " $Q_{c, \text{rice husk, H}}$ ", the CME needs to clarify "Calculation method" which does not match with the CPA-DD. Also the value of " $Q_{c, \text{rice husk, H}}$ " as stated in the MR is incorrect.				
<b>6. Nature of responses provided by the project participants:</b>	PP has revised the MR accordingly and is submitted to the verification team				
<b>7. Assessment of such responses:</b>	For the CPA 0011, "Calculation method" has been corrected appropriately as rice husk is only used for Heater and not for boiler during this monitoring period.				
<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	Section D.2 of MR				

<b>1. Grade / Ref:</b>	CL 07	<b>2. Date:</b>	<del>27/11/2012</del> 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 217 of Validation and Verification Standard Version 2.0				
<b>5. Nature of the Issue Raised:</b>	As per the included CPA-DDs, the monitoring equipment is to be calibrated by third party accredited independent agency. The CME needs to provide the credentials of the calibrating agencies and the laboratories which have carried out the NCV analysis for all the CPAs.				
<b>6. Nature of responses provided by the project participants:</b>	The instruments are calibrated by credible agencies / master equipment traceable to national standards.				
<b>7. Assessment of such responses:</b>	The CME has provided the credentials of all the agencies which have carried out the monitoring instrument calibration and laboratory analysis for NCV of biomass. The calibrating agencies are either NABL accredited agencies or Government agencies or the master equipment used for calibration are traceable to national standards and hence deemed credible.				
<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	Section D.2 of MR				

<b>1. Grade / Ref:</b>	CL 08	<b>2. Date:</b>	<del>27/11/2012</del> 03/11/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 217 of Validation and Verification Standard Version 2.0				
<b>5. Nature of the Issue Raised:</b>	In the ER spreadsheets provided for all the CPAs, the CME has not provided the monitored data values as per the CPA-DDs for daily monitored data for steam quantity, temperature, pressure, feed water temperature and for CPA 11 inlet and outlet thermic fluid temperature and its flow rate, to calculate the average of these parameters.				
<b>6. Nature of responses provided by the project participants:</b>	The revised ER spreadsheets for all CPAs that has the monitored data values as per CPA-DD is submitted to the verification team.				
<b>7. Assessment of such responses:</b>	In the revised ER spreadsheets submitted for all the CPAs, the CME has now provided the daily data for steam temperature, pressure and quantity; feed water temperature; temperature (inlet and outlet) and flow rate for thermic fluid for CPA 0011. Also the calculation of the weighted average of the steam temperature and pressure, feed water temperature and the inlet and outlet temperature of the thermic fluid have been transparently provided in the ER spreadsheets. Hence the CL is closed.				
<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	Section D.2 of MR and ER spreadsheets				



<b>1. Grade / Ref:</b>	CL 09	<b>2. Date:</b>	<del>30/11/2012</del> 03/12/2012	<b>3. Status:</b>	Closed
<b>4. Requirement</b>	Paragraph 294 of Validation and Verification Standard Version 2.0				
<b>5. Nature of the Issue Raised:</b>	<p>Paragraph 294 of VVS, version 3.0 states "A DOE shall request issuance of CERs for a PoA in accordance with the Project cycle procedure. The request shall relate to all CPAs included in the PoA during the specified monitoring period".</p> <p>In this context, it is noted that this monitoring period is from 12/01/2011 to 31/08/2012 and MRs for 6 CPAs included till 31/08/2012 (i.e., CPA 0004, 0008, 0010, 0014, 0016 and 0017) have not been presented for verification. CME needs to provide clarification on this.</p>				
<b>6. Nature of responses provided by the project participants:</b>	<p>Monitoring Report for the CPA 0004, 0008, 0010, 0014, 0016 and 0017 are not submitted as CME is not claiming any CERs for these CPA's in the current monitoring period. For these CPA(s), CME will not be claiming any CERs for the monitoring period (12/01/2011 to 31/08/2012) in the subsequent verification(s). the declaration letter for the same is submitted to the verification team.</p>				
<b>7. Assessment of such responses:</b>	<p>Although 17 CPAs are included under the PoA 4041, as on last date of this monitoring period i.e. till 31/08/2012, the CME has opted to claim CERs only for 11 CPAs (CPA No.1, 2, 3, 5, 6, 7, 9, 11, 12, 13 and 15) for this monitoring period. During the verification, the CME has confirmed that the CME will not be claiming any CERs from the CPAs (4, 8 10, 14, 16 and 17) for this monitoring period, in subsequent periodic verifications i.e., no overlapping of the monitoring periods of any of the CPAs during the periodic verifications will take place.</p>				
<b>8. References to resulting changes in the Monitoring Report or supporting annexes:</b>	--				