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# VERIFICATION AND CERTIFICATION REPORT

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**Triveni Engineering and Industries Ltd**

## **Bagasse based Co-generation Power Project at Khatauli**

**Monitoring Period 3: 01/06/2010 - 29/02/2012**

**UN PA 0826**

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**SGS Climate Change Programme**

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<b>Date of Issue:</b>	<b>Project Number:</b>
06/11/2012	CDM.VER0468 MP03
<b>Project Title:</b>	
Bagasse based Co-generation Power Project at Khatauli	
<b>Organisation:</b>	<b>Client:</b>
SGS United Kingdom Limited	Triveni Engineering and Industries Ltd
<b>Publication of Monitoring Report:</b>	
<b>Monitoring Period:</b>	01/06/2010 - 29/02/2012
First Monitoring Version and Date:	Version 1, 20/04/2012
Final Monitoring Version and Date:	Version 03, 24/07/2012
<b>Summary:</b>	
<p>SGS United Kingdom Ltd has performed the 3<sup>rd</sup> periodic verification of the CDM project Bagasse based Co-generation Power Project at Khatauli, UNFCCC reference number 0826. The verification includes confirming the implementation of the monitoring plan of the registered PDD. UNFCCC reference number 0826 and the application of the monitoring methodology as per ACM0006 Version 03. A site visit was conducted to verify the data submitted in the monitoring report. SGS confirms the following has been reviewed:</p> <ul style="list-style-type: none"> <li>(a) The registered PDD and the corresponding validation report;</li> <li>(b) Monitoring report, previous verification reports, approved revised monitoring plan;</li> <li>(c) The applied monitoring methodology;</li> <li>(d) Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board;</li> <li>(e) All information and references relevant to the project activity's resulting in emission reductions</li> </ul> <p>The project activity is the installation of a 23 MW Co-generation power plant to full-fill the steam and power demand of the TEIL sugar unit at Khatauli, Uttar Pradesh, India and to export surplus electricity to the Uttar Pradesh Power Corporation Limited (UPPCL). Under this project activity a 120 TPH nominal capacity high pressure boiler with outlet steam pressure of 87 kg/cm<sup>2</sup>, temperature 515 DegC and an extraction cum condensing turbo generator of 23 MW capacity are installed at the plant site. The steam produced is supplied to the sugar manufacturing unit, whereas the electricity generated in the project plant is partially utilised to fulfil the in-house power requirements and the surplus electricity is exported to the state grid.</p> <p>SGS confirms that the project is implemented in accordance with the validated and registered Project Design Document and the revised monitoring plan approved on 05/10/2011. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in <b>28,312 tCO<sub>2</sub>e</b> emission reductions during the current monitoring period</p>	
<b>Subject:</b>	
CDM Verification	
<b>Verification Team:</b>	
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Date: 23/11/2012 Name: Ravi Kant Soni	<input type="checkbox"/> Limited Distribution
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## Abbreviations

ACM	Approved Consolidated Methodology
AGM	Additional General Manager
ACE	Assistant Chief Executive
DGM	Deputy General Manager
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CL	Clarification Request
CO <sub>2</sub>	Carbon Dioxide
COP	Conference of Parties
DCS	Distributed Control System
DOE	Designated Operational Entity
EB	Executive Board
ERs	Emission Reduction (s)
FAR	Forward Action Request
GHGs	Green House Gas(es)
IPCC	Intergovernmental Panel on Climate Change
Kg	Kilo gram
kWh	Kilo Watt Hour
MCR	Maximum Continuous Rating
MOP	Meeting of Parties
MR	Monitoring Report
MT	Metric Tones
MW	Mega Watt
MWh	Mega Watt Hour
NABL	National Accreditation Board for Testing and Calibration Laboratories
NCV	Net Calorific value
PDD	Project Design Document
PE	Project Emissions
PP	Project Participant
QA	Quality Assurance
QC	Quality Control
RMP	Revised Monitoring Plan
SEB	State Electricity Board
tCaO	Tones of Calcium Oxide
tCO <sub>2e</sub>	Tones of Carbon Dioxide Equivalent
TEIL	Triveni Engineering and Industries Limited
TPH	Tones Per Hour
UNFCCC	United Nations Framework Convention for Climate Change
UPPCL	Uttar Pradesh Power Corporation Limited

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## 1. Introduction

### 1.1 Objective

SGS United Kingdom Ltd has been contracted by Triveni Engineering and Industries Ltd to perform an independent verification of its CDM project Bagasse based Co-generation Power Project at Khatauli. CDM projects must undergo periodic audits and verification of emission reductions as the basis for issuance of Certified Emission Reductions (CERs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The emissions report conforms with the requirements of the monitoring plan in the registered PDD and the approved methodology; and
- The data reported are complete and transparent.

### 1.2 Scope

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the project activity. The verification is based on the validated and registered project design document and the monitoring report. The project is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

SGS has, based on the recommendations in the Validation and Verification Manual, employed a risk-based approach in the verification, focusing on the identification of significant reporting risks and the reliability of project monitoring.

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

### 1.3 Project Activity and Period Covered

This engagement covers emissions and emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the following project and period.

Title of Project Activity:	Bagasse based Co-generation Power Project at Khatauli
UNFCCC Registration Number:	0826
Monitoring Period Covered in this Report	01/06/2010 - 29/02/2012
Project Participant (Host)	Triveni Engineering and Industries Ltd (India)
Location of the Project Activity:	Khatauli/District - Muzzafarnagar/State-Uttar Pradesh/Country-India Geographical Coordinates: Longitude: 77° 42' 0" E; Latitude: 29° 16' 0" N

The project activity involves the installation of a boiler with a nominal steam generation rate of 120 TPH and a double extraction cum condensing turbo generator with a rated capacity of 23 MW. The steam is generated at 87 kg/cm<sup>2</sup> and 515 degrees Celsius pressure and temperature conditions respectively. The purpose of project activity is to utilize the bagasse generated in the sugar mill to produce steam and electricity to fulfil the process steam and in-house power requirements and to export surplus electricity generated to the state grid under Uttar Pradesh Power Corporation Limited (UPPCL). Prior to the initiation of the project activity, TEIL sugar unit's steam and power requirement was met by operating a series of low pressure boilers and turbo generators. The emission reductions occurs due to the partial replacement of the grid electricity with the electricity generated from the renewable source i.e. bagasse, after taking into account the project emissions. Hence with the implementation of the bagasse based Co-generation power plant, the project reduces GHG emission that otherwise would have continued to occur in the absence of the project activity.

## 2. Methodology

### 2.1 General Approach

SGS' approach to the verification is a two-stage process.

In the first stage, SGS completed a strategic review and risk assessment of the projects activities and processes in order to gain a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

At the end of this stage, SGS produced a Periodic Verification Checklist which, based on the risk assessment of the parameters and data collection and handling processes for each of those parameters, describes the verification approach and the sampling plan.

Using the Periodic Verification Checklist, SGS verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved a site visit and a desk review of the monitoring report. This verification report describes the findings of this assessment.

### 2.2 Verification Team for this Assessment

Assessment Team	
Name	Role
Sandeep Kumar Kurmi	Lead Assessor/Team Leader/Local Assessor/Sectoral Scope Expert (TA 1.1)
Vishnu Patidar	Assessor

Technical Review Team	
Name	Role
Ravi Kant Soni	Technical reviewer
Nitin Babber	Sectoral Scope Expert (TA 1.1) to Technical Reviewer

### 2.3 Means of Verification

#### 2.3.1 Review of Documentation

The validated PDD, the monitoring report submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is attached in section 8 of this report.

### 2.3.2 Site Visits

As part of the verification, the following on-site inspections have been performed by the Lead Assessor/Team Leader/Local Assessor/Sectoral Scope Expert (TA 1.1).

<b>Location:</b> Khatauli/Dist-Muzzafarnagar/Uttar Pradesh/India	
<b>Date:</b> 15/05/2012 and 16/05/2012	
<b>Coverage:</b>	<b>Source of Information / Persons Interviewed</b>
Assessment of Project Boundary	Physical Verification
Plant Operations	Mr. Ashish Awasthi – G.M. (TEIL) Mr. Vikas Agrawal – D.G.M. Mech (TEIL) Mr. Vipin Jindal – Sr. Manager (TEIL)
Monitoring and measuring system <ul style="list-style-type: none"> <li>Collection of measurements</li> <li>Observations of established practices</li> <li>Data Verification of monitoring parameters</li> </ul>	Mr. Ashish Awasthi – G.M. (TEIL) Mr. Sanjay Kumar – D.G.M Electrical (TEIL) Mr. Vikas Agrawal – DGM Mech (TEIL) Mr. Shashank – Consultant
CDM monitoring & reporting documentation	Mr. Ashish Aawasthi – G.M. (TEIL) Mr. Atul Porwal – A.C.E (TEIL) Mr. Shashank – Consultant Mr. Vipin Jindal – Sr. Manager (TEIL)
Quality Assurance – Management and operating system	Mr. Ashish Awasthi – G.M. (TEIL) Mr. Vipin Jindal – Sr. Manager (TEIL) Mr. Shashank – Consultant

### 2.4 Reporting of Findings

As an outcome of the verification process, the team can raise different types of findings

In general, where insufficient or inaccurate information is available and clarification or new information is required the team shall raise a Clarification Request (CL) specifying what additional information is required.

Where a non-conformance arises the team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

- I. Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- II. Mistakes have been made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions;
- III. Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

The verification process may be halted until this information has been made available to comply with the requirements of the CDM Executive Board. Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

A clarification request (CL) will be raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. All CARs and CLs raised during verification shall be resolved prior to submitting a request for issuance.



Corrective Action Requests and Clarification requests are raised in the Periodic Verification Checklist. The Project Developer is given the opportunity to “close” outstanding CARs and respond to CLs and Observations.

Forward Action Requests (FARs) may be raised during verification for actions where the monitoring and reporting require attention and/or adjustment for the next verification period. Observations may be raised which are for the benefit of future projects and future verification actors. These have no impact upon the completion of the verification activity.

All CARs, CLs and FARs for this verification period are included in this report.

## **2.5 Internal Quality Control**

Following the completion of the assessment process and a recommendation by the Assessment Team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

### 3. Verification Findings

#### 3.1 Project Implementation - General

The project activity was registered with the UNFCCC on 19<sup>th</sup> March 2007. The project implementation is in compliance with the registered PDD<sup>/1/</sup>. This is the 3<sup>rd</sup> periodic verification for the project activity for the current monitoring period. The parameters and the monitoring approach are discussed in the final MR. The project is registered against the approved methodologies ACM0006, Version 03 dated 19/05/2006<sup>/3.1/</sup> and the project is in compliance with the monitoring methodologies and approved revised monitoring plan<sup>/4/</sup>. The project boundary is in compliance with the registered PDD<sup>/1/</sup>.

The project activity was commissioned on 18/10/2005; the assessment team has conducted the verification site visit, and it was confirmed that all physical features of the proposed CDM project activity are implemented in accordance with the registered PDD<sup>/1/</sup> and that the project participants have operated the CDM project activity as per the registered PDD<sup>/1/</sup>. There are no changes in project activity from previous verifications.

The revision in the monitoring plan was submitted to the UNFCCC and the same was approved on 05/10/2011. During the site visit, the assessment team verified that the implementation and operation of the monitoring plan is in accordance with the accepted revised monitoring plan. The temporary shutdown of the plant due to various reasons has been mentioned in the monitoring report version 03. The details of the down time of the plant were verified from the plant records and found to be satisfactory. Based on this site visit, the assessment team has confirmed that the monitoring of reduction of GHG emissions resulting from the project activity has been implemented in accordance with the revised monitoring plan<sup>/4/</sup>.

The monitoring procedure for all parameters (for project emissions, baseline emission and leakage) stated in the revised monitoring plan have been verified during the verification site visit and found to be consistent with the monitoring methodologies and actual practices being followed by project proponent.

The operation, data transfer and reporting procedures are incorporated into the CDM operating Manual. The same is in line with the revised monitoring plan approved by CDM EB on 05/10/2011<sup>/4/</sup>.

Based on the data verified as contained in the final MR<sup>/7.2/</sup> and corresponding ER spreadsheet<sup>/8.1/</sup>, the reported emission reductions during the current monitoring period (28,312tCO<sub>2</sub>e) are lower than those estimated in the registered PDD<sup>/1/</sup> (158,058 tCO<sub>2</sub>e) for the same period. There are mainly two reasons for this important difference: 1<sup>st</sup> the monitoring period in question is the least crushing season and operation of co-gen plant is therefore less, as mentioned in the monitoring report; and 2<sup>nd</sup>, the PP had considered higher electricity generation in the baseline, however the baseline plants have been operated less for the current monitoring period which results in lower increased electricity generation. The details of the down time of the plants were verified from the plant records and found to corroborate the client statement. In conclusion, the actual ERs are below the estimated ERs and are not likely to surpass the estimates (in the registered PDD<sup>/1/</sup>) under the current scenario.

CAR#06 was raised because of the following reason;

ERs for current monitoring period were significantly lower than estimated in the PDD (pro-rata basis).

In response to CAR#06, the PP clarified that operation of Co-gen plant was less due to less availability of biomass. The reason for less biomass availability is the reduced activity in the crushing season in the current monitoring period. The response from the PP was verified from the plant record during the site visit. The response was found ok, thus CAR#06 was closed.

#### 3.2 Remaining Issues, CAR's, FAR's from Previous Validation or Verification

There are no pending issues from the 2<sup>nd</sup> verification and from the validation. However, pending issues from 1<sup>st</sup> verification has been successfully closed during 2<sup>nd</sup> verification.

### 3.3 Compliance of the monitoring plan with the monitoring methodology.

The revised monitoring plan of the registered project is in accordance with the applied methodologies. The final monitoring report<sup>/7.2/</sup> is consistent with the methodologies ACM0006 Version 03<sup>/3.1/</sup> the projects was registered against and ACM0002 version 06<sup>/3.2/</sup>. The revised monitoring plan was submitted to UNFCCC and same was approved on 05/10/2011, which further ensures the compliance of revised monitoring plan with the methodologies ACM0006 Version 03<sup>/3.1/</sup> and ACM0002 version 06<sup>/3.2/</sup>. The details of the monitoring parameters are mentioned in the section 3.4 of the verification report.

### 3.4 Completeness of Monitoring

Monitoring of reductions in GHG emissions resulting from the registered project have been implemented in accordance with the revised monitoring plan<sup>/4/</sup> which was approved on 05/10/2011. The monitoring system was effective and reliable.

The following monitoring parameters have been verified as per the revised monitoring plan approved on 05/10/2011<sup>/4/</sup>:

#### 1. Project Emission Parameters:

##### 1.1.QB<sub>y</sub> [Quantity of Biomass transported, {MT}]

The biomass is collected from the nearby sources and is transported by trucks to the project site. Each truck laden with biomass is weighed on the electronic weighbridge and the corresponding readings are noted in the plant log books<sup>/10.1 & 10.2/</sup>. For the current monitoring period no biomass was collected from outside, thus for this monitoring period, the value of this parameter is zero. The reported values of the quantity of biomass transported have been verified against the plant records<sup>/10.1 & 10.2/</sup> and found to be correct.

##### CAR#01 was raised because of the following reasons;

- (i). It was found during the site visit that the weighbridge with a capacity 25000kg was modified to one with a capacity of 45000 kg. The PP was requested to provide a date for the modification, the reason for the modification and impact on quality of the monitoring plan due to modification.
  - (ii). It was also found that there was a delay in calibration of the weighbridge of capacity 45000kg, due date of calibration was 10/10/2011; however it was calibrated on 14/10/2011.
- In response to CAR#01, the PP has clarified that weighbridge with a capacity of 45000 kg was installed on 28/08/2011; it has similar accuracy (+/-10 Kg) in comparison to old one. The weighbridge with a capacity of 25000 was found to be wrecked, therefore the PP decided to replace the weighbridge. Since the accuracy of the new weighbridge is the same as earlier one, there is no adverse impact in the revised monitoring plan. Regarding the delay in calibration, the PP clarified that there was no bagasse transported from/out of the site during the current monitoring period thus project emission due to bagasse transportation is zero for the current monitoring period. There was no transportation carried out physically. This has been checked from the plant record<sup>10.9</sup> as bagasse generation was more than the bagasse consumption. Thus EB52 annex 60 (guideline for applying delay in calibration) is not applicable for this monitoring period. The response from the PP was found accepted, thus CAR#01 was closed.

##### 1.2.AVD<sub>y</sub> [Average return trip distance between biomass fuel supply site and project site,{km}]

The average return trip distance between the biomass fuel supply site and the project site (km) was verified from the records provided by the contracted transporters on the mean distance travelled by a truck between the biomass fuel supply site and project site and is being recorded in the plant log book<sup>/10.1 & 10.2/</sup>. For the current monitoring period, no biomass was collected from outside, thus for this monitoring period value of this parameter is zero. The values were verified from the chalang (token) and plant log books<sup>/10.1 & 10.2/</sup> and found to be correct.

##### 1.3.N<sub>y</sub> [Number of truck trips for biomass transportation,{Number}]

The Number of truck trips between the biomass fuel supply site and the project site for biomass transportation was verified from the records<sup>/10.1 & 10.2/</sup> provided by the contracted transporters. For

the current monitoring period, no biomass was collected from outside, thus for this monitoring period value of this parameter is zero. The values were cross verified from the plant log books<sup>/10.1/</sup> & <sup>/10.2/</sup> and found to be correct.

#### **1.4.EF<sub>km,CO2</sub> [Average CO2 emission factor for transportation of biomass with trucks,{tCO2/km}]**

The average truck mileage has been referred from the World Bank report for the Indian trucks (Annex 1 on page 58 of report - World Bank Report titled "Road Transport Service Efficiency Study" (India)). The CO2 emission factor for diesel, density of diesel and NCV of diesel is referred from the CEA Baseline Carbon Dioxide Emission Data-base Version 7.0<sup>/11/</sup>. These figures have been verified against the sources referred. The values and the calculation of the emission factor are found to be correct.

## **2. Baseline Emission Parameters:**

### **2.1.EG<sub>project plant ,y</sub> [Net quantity of electricity generated in the project plant during the year,{MWh}]**

The net quantity of electricity generated is calculated by subtracting the auxiliary consumption of the project plant from gross generation of the project plant. The energy meters to monitor the auxiliary consumption and gross generation are calibrated as per frequency defined in RMP by an accredited third party<sup>/14.1/</sup>. The calibration certificates<sup>/14.1/</sup> of the energy meters were checked and verified by the assessment team and found to be correct. The data for the net quantity of electricity generated in the project plant has been verified from shift wise records maintained in plants log book and also with the ER spread sheet<sup>/8.1/</sup> was found to be correct.

The net quantity of electricity generated in the project plant is compared with the sale records and it was noted that the sold quantity is relatively less as sugar industry also uses a portion of power generated from the project activity.

### **2.2.EG<sub>Gross project plant ,y</sub> [Gross quantity of electricity generated in the project plant during the year y,{MWh}]**

The Gross electricity generated in the project plant is monitored by an energy meter. The meters placed online to record the readings automatically and these values are recorded in different shift in hard copies<sup>/10.3/</sup>. This data is also registered in DCS installed in the plant. The plant records<sup>/10.3/</sup> for gross quantity of electricity generated in the project plant have been verified, the values quoted in the monitoring report and ER spread sheet<sup>/8.1/</sup> were found to be correct.

CAR#02 was raised because of the following reason;

It was found during the site visit that the meter (serial no. D7351248) which was used to monitor EG<sub>Gross project plant,y</sub> has been replaced by a meter with a serial no UPP30121 on 21/03/2011. The PP was requested to justify the change. In response to CAR#02, the PP clarified that the meter was replaced due to the requirement of providing day ahead scheduling (Projection of power to be exported on the next day) to UPPCL (Uttar Pradesh Power Corporation Limited) thus as a proactive measure and to have better monitoring and archiving arrangement, the PP has replaced the meter. The new meter is equipped with the facility of archiving the data on an interval of 15 min.

It has been verified from the meter detail that the meter has an accuracy level of 0.2s which is the same as the accuracy of the old meters. Therefore, the same is in line with the revised monitoring plan of the project activity. The PP also provided the calibration of the new meter, it has been verified from the calibration certificate that the new meters are duly calibrated and the calibration was also in date for the previous meter. Since there is no impact on the effectiveness of the revised monitoring plan and the PP had to replace the meter due to UPPCL requirement, CAR#02 was closed.

### **2.2.1 EG<sub>Gross, baseline plant,</sub> [Gross quantity of electricity generated in the baseline plant during the year, y]**

Gross electricity generation is being measured continuously by energy meters. The meter readings are recorded in the plant log books on shift wise basis. Energy meters have been calibrated as per standard procedures by third party agencies which are also according to the RMP. The same has been verified from the calibration certificated provided during the site visit.

**2.3.EG<sub>Aux project plant, y</sub> [Auxiliary electricity consumption in the project plant during the year y, {MWh}]**

The auxiliary electricity consumption in the project plant is monitored by energy meter. Auxiliary consumption is being measured continuously by energy meters. The meter readings are recorded in log books on shift basis<sup>/10.4/</sup>. This data is also registered in DCS installed in the plant. Data represented under the ER spread sheet<sup>/8.1/</sup> have been cross checked from records<sup>/10.4/</sup> and the reported values were consistent with the verified values and no variation was observed and found to be correct.

CAR#03 was raised because of the following reason;

It was found during the site visit that the meter (serial no. 67272/75-0705 and 67274/79-0705) which was used to monitor EG<sub>Aux project plant, y</sub> had been replaced by a meter with serial no UPP30122 and UPP30123 respectively on 21/03/2011. The PP was requested to justify the change; In response to CAR #03, the PP clarified that the meter was replaced due to the requirement of providing one day ahead scheduling (Projection of power to be exported on the next day) to UPPCL (Uttar Pradesh Power Corporation Limited) thus as a proactive measure and to have better monitoring and archiving arrangement, PP has replaced the meter. The new meter is equipped with the facility of archiving the data on an interval of 15 min.

It has been verified from the meter detail that the meter has an accuracy level of 0.2s which is the same as the accuracy of the old meters. Therefore, the same is in line with the revised monitoring plan of the project activity. The PP also provided calibration of the new meter, it has been verified from the calibration certificate that the new meters are duly calibrated and the calibration was also in date for the previous meter. Since there is no impact on effectiveness of monitoring plan and the PP had to replace the meter due to UPPCL requirement, CAR#03 was closed.

**2.3.1 EGAux, baseline plant [Auxiliary electricity consumption in the baseline plant during the year y]**

Auxiliary electricity consumption is being measured continuously by energy meters. The meter readings have been recorded in the plant log books on shift wise basis. Energy meters are calibrated by third party agencies and as per the frequency defined in RMP.

**2.4.EG<sub>total, y</sub> [Total net quantity of electricity generated at the project site (Including the project plant and any other plant at site existing at the start of the project activity),{ MWh}]**

The total net quantity of electricity generated at the project site is calculated by subtracting the auxiliary consumption from the gross generation of the units existing at the start of the project activity.

The data represented in the ER spread sheet<sup>/8.1/</sup> have been cross checked from records<sup>/10.5/</sup> and the reported values were consistent with the verified values and no variation was observed; therefore found to be correct.

The total net electricity generated in all the power units (including project power plant) when compared with the quantity of electricity sold to the grid is not comparable directly as the existing power units at the project site basically produce power to meet processing requirement. Only the incremental power that is generated in the project power plant can be sold to the grid after consuming some portion for in-house process requirements.

**2.5.EG<sub>Gross, total, y</sub> [Gross quantity of electricity generated at the project site (Including the project plant and any other plant site existing at the start of the project activity),{MWh}]**

This parameter is calculated. The gross electricity generation by the existing units and units installed under the Co-generation plant is monitored by the electronic energy meters at the project site. The meter readings are recorded in a daily plant log book<sup>/10.3 to 10.5/</sup>. This data is also registered in DCS installed in the plant. Data represented in the ER spreadsheet<sup>/8.1/</sup> have been cross checked from plant records.

**2.6.  $E_{Aux, total, y}$  [Total auxiliary consumption at the project site (Including the project plant and any other plant site existing at the start of the project activity), {MWh}]**

This parameter is being calculated shift wise. The total auxiliary consumption at the project site is obtained by the summation of the monitored parameters auxiliary electricity consumption in the project plant and in the baseline units. Monitoring procedure for Auxiliary consumption in project plant and base line plant has been already discussed above.

**2.7.  $Q_{project\ plant}$  [Net quantity of heat generated from firing biomass in the project plant, {MWh}]**

The net heat generated from the project plant is determined as a difference between the steam energy (based on measured steam flow, temperature and pressure) and feed water energy (based on feed water flow, temperature). The outlet steam conditions, pressure and temperature, are continuously monitored using pressure transmitter and temperature sensor respectively. The steam flow rate is monitored on a continuous basis using the steam flow meter. At the boiler outlet, steam pressure and temperature condition, the enthalpy is obtained from the standard steam table. The multiplication of the enthalpy of steam with the steam flow rate, gives the total heat content of the outlet steam from the boiler. Similarly, the enthalpy of feed water has also been monitored and reported and the same was considered to obtain the final  $Q_{project\ plant}$  which reflects the actual net quantity of heat generation from the project plant boiler. The readings recorded from the flow meter are converted to MWh, which has been found correct. Monthly data<sup>/10.8/</sup> represented under the ER spread sheet<sup>/8.1/</sup> have been cross checked from records and the reported values were consistent with verified values and no variation was observed and found to be correct.

The net heat generation from the project activity boiler was compared with the previous years and was found comparable on the net heat generation basis.

**2.8.  $BF_{i, y}$  [Quantity of Biomass of Type i combusted in the project plan during year y, {Tons}]**

The quantity of biomass type (on "as received" basis) combusted in the project plant is measured on conveyor belt by load cells. Load cells are calibrated on an annual basis according to the standard procedure and RMP. Calibration certificates of load cells have been checked on site. Calibration of load cell had been done by Prima Calibration Services which is accredited by NABL (National Accreditation Board for Testing and Calibration Laboratories). The amount of biomass combusted in the process was verified from the plant log books<sup>/10.9/</sup>. This was found to be correct. Data represented under the ER spread sheet<sup>/8.1/</sup> have been cross checked from records and the reported values were consistent with verified values and no variation was observed and found to be correct. Biomass combusted have been cross checked with energy balance. There was a variation of 0.97% between monitored value and value drive from energy balance. The variation is less than 1% thus accepted. It is worth mentioning here that this parameter is not being used in the ER calculation.

**2.9.  $NCV_i$  [Net calorific value of biomass, { MWh/ton }]**

The Net calorific value of the bagasse ("as received" basis) is measured monthly in the internal plant lab and annually by the third party in an accredited lab. The NCV values specified in the monitoring report have been verified against the internal plant records and third party reports dated 11/01/2011 and 31/01/2012<sup>/10.11/</sup>. The NCV values reported in monitoring report were found to be appropriate.

The verified value of  $NCV_i$  is noted to fall in range as per IPCC 2006 Guidelines (1,409,191 to 5,493,456 kCal/Ton) and therefore accepted.

**2.10.  $\epsilon_{boiler}$  [Thermal energy efficiency, { %}]**

The thermal efficiency is obtained by dividing the energy output of steam from the project plant boilers by the total energy content of the biomass input in the boilers. The energy output of steam from the project plant has been calculated by subtracting feed water enthalpy from enthalpy of steam generated. The calculation for evaluating thermal efficiency has been verified from the ER



spread sheet<sup>8.1/</sup>. The information mentioned was checked and verified by the assessment team and was found to be correct.

The average thermal efficiency of the boiler for the current monitoring period is 70.5% is found comparable to the rated efficiency as per the manufacturer (71.2%). In the opinion of the technical expert these variation can occur and are reasonable.

CL#04 was raised because of the following reason;

For the month of Sep-11 efficiency of boiler was 58.8%, which was significant low as compared to other months.

In response to CL#04 the PP clarify that co-gen was started for a trial run in Sep-11 for one day. The response from the PP was verified from the plant record, since efficiency of boiler in Sep-11 is only for one day, hence variation is not realistic. Response from the PP was found satisfactory, thus CL#04 was closed.

#### 2.11. $T_{\text{project plant}}$ [Steam temperature, ° C]

A temperature transmitter is used to measure the temperature of the steam produced. The temperature of the steam is monitored on a continuous basis and recorded daily. A daily average value of temperature is recoded in to the plant log book taken from DCS. The recorded daily values of the temperature of steam were verified from the plant log books<sup>10.8/</sup> and found to be correct. The temperature transmitter is calibrated as per frequency given in the revised monitoring plan.

#### 2.12. $P_{\text{project PI}}$ [Steam pressure { Kg/cm<sup>2</sup>}]

A Pressure transmitter is used to measure the pressure of the steam produced. The pressure of the steam generated is monitored on a continuous basis and recorded daily. The daily average value is taken from DCS and the same is recorded in to log books. The daily values of the pressure of steam recorded were verified from the plant log books<sup>10.8/</sup> and found to be correct. Pressure transmitter is calibrated as per frequency given in revised monitoring plan.

#### 2.13. $S_{\text{project plant}}$ [Total steam generated, { MT }]

The steam flow meter is installed to measure the steam generated from the project boiler. The total quantity of the steam generated for the current monitoring period was verified from the plant records<sup>10.8/</sup> and was found to be correct. Steam flow meters are calibrated as per frequency given in revised monitoring plan.

#### 2.14. $E_{\text{steam}}$ [Enthalpy of steam, { MJ/Tonne }]

The enthalpy of steam is obtained from the steam table by using pressure and temperature condition (temperature and pressure as being monitored above) of the steam generated from the project boiler. The data reported in the monitoring report and the ER spread sheet<sup>8.1/</sup> was checked and verified by the assessment team and was found to be correct.

#### 2.15 $E_{\text{feed water}}$ [Enthalpy of feed water]

The enthalpy of feed water is obtained from the steam table at the temperature condition of the feed water supplied to the project boiler. The daily average temperature of feed water is taken form DCS. The data reported in the monitoring report and the ER spread sheet<sup>8.1/</sup> was checked and verified by the assessment team and was found to be correct.

#### 2.16 $I_{\text{Electricity}}$ [Import from banked electricity]

Quantity of electricity imported from the grid is being measured continuously by energy meters. The readings are reported on shift wise in log books, monthly value are also verified as per the RMP from log books. Electricity imported from grid has also been cross checked from invoices. Energy meters have been calibrated as per standard procedures by third party agencies and as per defined frequency in RMP.

CAR#05 was raised because of the following reason;

Monitoring and recording frequency of parameter  $I_{\text{Electricity}}$  was mentioned as monthly in MR version 01, however it is mentioned as continuous in RMP, please clarify how it is complying RMP.

In response to CAR#05, the PP corrected the MR and mentioned monitoring and recording frequency in line to RMP. PP had already provided the shift wise data in excel sheet however PP corrected the section D.2 of MR version 03 to comply the requirement of RMP. The revised MR version 03 has been checked and found ok, thus CAR#05 was closed.

CAR#07 was raised because of the following reasons;

1. Description of few parameters are not correctly mentioned in ER sheet, e.g.  $EG_{\text{Gross, baseline plant, y}}$ ,  $EG_{\text{Auxiliary, baseline plant, y}}$
2. Values of few parameters after decimal place are not reported correctly in monitoring report as it is monitored in ER sheet, e.g.  $EG_{\text{Gross, baseline plant, y}}$
3. Reported frequency of few calculated parameters are mentioned not as per RMP, e.g.  $EG_{\text{project plant, y}}$ . However parameter was reported in line to the RMP, it is just wording mentioned in monitoring report.

In response to CAR#07 the PP correctly mentioned the description of parameters in the ER sheet as per the RMP. The PP provided the revised ER sheet which has been checked and found correct. The PP also corrected the values of the parameters after the decimal place as per the excel sheet. The PP provided the revised MR version 03, it has been checked and found correct. The PP also mentioned the reporting frequency of the calculated parameters inline to RMP, however the PP was actually reporting the parameters as per the frequency in line to RMP in the excel sheet. The revised MR version 03 was checked and found ok. The response from the PP was found ok thus CAR#07 was closed.

### 3. Leakage Parameters:

No Leakage Parameters. The same was re-confirmed by assessment team during site visit.

The reported and verified values for the parameters are included in the section 4 of this report and additional QA/QC measures (calibration details) are included in the section 3.5 of this report.

## 3.5 Accuracy of Equipment

The monitoring results for the parameters listed in the Revised Monitoring Plan, approved on 05/10/2011<sup>/4/</sup> are recorded as per the frequency defined therein for each parameter. The monitoring frequency for these monitored parameters meets the minimum level of the frequency specified by the applied methodologies. These results were verified during the site visit and the revised MR Version 03 dated 24/07/2012<sup>/7.2/</sup> contains only the verified and consistent values as per the plant logs<sup>/10/</sup> and DCS records<sup>/10/</sup>. Furthermore, these monitored values of each parameter are also transferred into the spreadsheets before finally utilizing them in the ER spreadsheet<sup>/8.1/</sup>. The additional spreadsheets are also provided, as annexure to the monitoring report, in order to ensure compliance towards EB48 Annex68 para10 (a).

All the relevant meters are duly calibrated in continuity and therefore the calibration requirement for the energy meters pertaining to the project activity is maintained in line to the QA/QC procedures defined in the RMP, approved on dated 05/10/2011<sup>/4/</sup>. The assessment team retained the calibration certificate copies for its own records and the following table confirms that all the relevant meters were calibrated and functioning properly as envisaged in the registered PDD<sup>/1/</sup> and RMP.

Serial Number	Monitoring Parameter	Instrument/Meter details	Calibration Details	
			Date of Calibration/Result	Validity
1.	$BF_{i,y}$ [Quantity of Biomass]	Weighbridge <sup>/14.4/</sup> Capacity – 25,000 Kg	21/10/2009/Ok	1 year



	transported, {MT}}	Weighbridge <sup>/14.4/</sup> Capacity – 45,000 Kg (Weigh bridge capacity is expanded from 25 MT to 45 MT. It is worth mentioning that biomass transported from outside is nil in the monitoring period thus this weighbridge is not used in this monitoring period for this parameter. Least count of this weighbridge was verified +/-10Kg from the certificates	11/10/2010/Ok and 14/10/2011/Ok	1 year
2.	EG Gross project plant ,y [Gross quantity of electricity generated in the project plant during the year y ,{MWh}]	Serial number: D7351248 Model number: PQMII-T20-CA Accuracy Class - 0.2S (meter replaced on 21/03/2011)	04/03/2010/Ok and 07/03/2011/Ok	1 year
		New meter verified on site Serial no- UPP30121 Make – secure meters limited Accuracy class- 0.2s	11/03/2011/Ok	1 year
3.	EG Aux project plant, y [Auxiliary electricity consumption in the project plant during the year y ,{MWh}] <sup>/14.1/</sup>	Auxiliary Consumption Meter 23 MW Serial number: 67272/75-0705 Model number: EM3480, Accuracy Class - 0.2S This was replaced by the below one on 21/03/2011	03/03/2010/Ok and 07/03/2011/Ok	1 year
		Serial no - UPP30122 Make – Secure Meter Limited Accuracy class – 0.2S	11/03/2011/Ok	
		And Serial number: 67274/79-0705 Model number: EM3480, Accuracy Class - 0.2S This was replaced by the below one on 21/03/2011	03/03/2010/Ok and 07/03/2011/Ok	1 year
		Serial no - UPP30123 Make – Secure Meter Limited Accuracy class – 0.2S	11/03/2011/Ok	
4.	EG Gross ,baseline ,y [Gross quantity of electricity generated in the baseline plant	Serial No.- 7112989, Accuracy class – 0.2	05/03/2010/Ok And 02/03/2011/Ok	1 year
		Serial No.- 32355068 , Accuracy class – 0.2	05/03/2010/Ok And 02/03/2011/Ok	1 year

	during the year, y]	Serial No.- 4882543, Accuracy class – 0.2	05/03/2010/Ok And 02/03/2011/Ok	1 year
		Serial No.- 4883585 , Accuracy class – 0.2	05/03/2010/Ok And 02/03/2011/Ok	1 year
		Serial No.- 32355069 , Accuracy class – 0.2	05/03/2010/Ok And 02/03/2011/Ok	1 year
5.	EG <sup>Aux,baseline,y</sup> [Auxiliary electricity consumption in the baseline plant during the year, y,{MWh}]	Serial No. - 4725437, Make - Sycom, Accuracy – 0.2,	05/03/2010/Ok And 02/03/2011/Ok	1 year
		Serial No. - 4727966, Make - Sycom, Accuracy – 0.2,	05/03/2010/Ok And 02/03/2011/Ok	1 year
		Serial No. - 4721354, Make - Sycom, Accuracy – 0.2,	05/03/2010/Ok And 02/03/2011/Ok	1 year
		Serial No. - 4728967, Make - Sycom, Accuracy – 0.2,	05/03/2010/Ok And 02/03/2011/Ok	1 year
		Serial No. - 4727321, Make - Sycom, Accuracy – 0.2,	05/03/2010/Ok And 02/03/2011/Ok	1 year
6.	T <sub>project plant</sub> [Steam temperature, °C]	Serial no. - 225016, Make - Rosemount,	03/03/2010/Ok, 03/03/2011/Ok and 06/02/2012/Ok	1 year
	P <sub>project plant</sub> [Steam pressure { Kg/cm <sup>2</sup> }]	Serial no. - S0226501, Make - Rosemount,	03/03/2010/Ok, 03/03/2011/Ok and 06/02/2012/Ok	1 year
	S <sub>project plant</sub> [Total steam generated, { MT }]	Serial no. - S 0226515, Make - Rosemount, Accuracy Class: + 1.5 % FSD	09/02/2010/Ok, 09/02/2011/Ok and 06/02/2012/Ok	1 year

7.	BF <sub>i,y</sub> [Quantity of Biomass of Type I combusted in the project plan during year y,{Tons}] Onwards 7/09/2008	Belt conveyor-2 (BC) Model no. - IS-BLW-11, Serial no. 072/06 - 4 Load Cells for BC-2 Model no. - 65023-3600, Serial 319444,319437,319432 319443	no. and	03/03/ 2010/Ok And 03/03/2011/Ok	1 year
		Belt conveyor-3 (BC) Model no. - IS-BLW-11, Serial no. - 073/06 4 Load Cells for BC-3 Model no. - 65023-3600, Serial no. -319447, 319434, 319435 and 319446		03/03/ 2010/Ok And 03/03/ 2011/Ok	1 year
8.	I Electricity [Import from electricity] [Import banked electricity]	Serial no - TNU 01629 Make - Secure meters Ltd Accuracy Class- 0.2S		04/03/2010/Ok, 07/03/2011/Ok and 28/2/2012/Ok	1 year

It is observed that calibration of meters used for measurement of parameters EG<sub>gross, project plant,y</sub> and EG<sub>Aux, project plant,y</sub> was delayed. The detail of the same is provided in below table:

Meter S.No-	Parameter measured	Date of calibration	Calibration frequency	Delay in calibration
D7351248	EG <sub>gross, project plant,y</sub>	04/03/2010 and 07/03/2011	Yearly	4 days delay as calibration was due on 03/03/2011
67272/75-0705 and 67274/79-0705	EG <sub>Aux, project plant,y</sub>	03/03/2010 and 07/03/2011	Yearly	5 days delay as calibration was due on 02/03/2011

It is verified through the latest calibration certificates (for the meters mentioned in above table) that the meters were working satisfactorily and the error was smaller than the maximum permissible error. The maximum permissible error was verified from the meter manuals<sup>16/</sup>.

In line with paragraph 4(a) of EB 52 annex 60, the PP has applied maximum permissible error of the meters to the measured values in a conservative manner i.e. adjusted measured values of Gross quantity of electricity generated in the project plant and Auxiliary electricity consumption in the project plant resulting lower baseline emissions and higher project emissions.

The assessment team has checked the ER calculation sheet<sup>/8/</sup> and the monitoring report<sup>/7.2/</sup> and able to confirm that delayed calibration error has been correctly applied for concerned measured parameters in line with EB 52 annex 60 para 4(a).

### **3.6 Accuracy of Emission Reduction Calculations**

The calculation of emission reduction is found to be correct in the revised MR Version 03 dated 24/07/2012<sup>/7.2/</sup>. The details of the reported and the verified values for all parameters are listed in section 4, 'Calculation of Emission Reductions'.

The complete data set for each monitored parameter as required by the revised monitoring plan of the registered PDD<sup>/1/</sup> was available at the plant site in the log books<sup>/10/</sup> and in the DCS and external records. In section 3.4 of this report the procedures governing the monitoring, recording and archiving of monitored data are included against each parameter.

The monitored data is recorded in the plant log books and DCS records for the electricity generated and auxiliary power consumption, biomass consumption etc. The NCV results of the biomass are received from third party supplier. The plant log books<sup>/10/</sup>, DCS records<sup>/10/</sup> and NCV reports<sup>/10.11/</sup> were reviewed and found to be consistent with the values reported in the revised MR Version 03 dated 24/07/2012<sup>/7.2/</sup>. In section 3.4 of this report the procedures governing the monitoring, recording and archiving of monitored data are included against each parameter and sources against which it was verified.

The empirical expressions to determine the baseline, project and leakage emissions, as defined in the applied version of the methodology, are incorporated in the registered PDD<sup>/1/</sup> and consistently followed in the corresponding ER spreadsheet<sup>/8.1/</sup> of the revised MR version 03 dated 24/07/2012<sup>/7.2/</sup>.

The external parameters, separately included in section 3.9 of this report, have been sourced from the registered PDD<sup>/1/</sup> or IPCC default values (please refer section 3.9 for details) as appropriate. These values are found to be consistent with their respective sources and duly justified.

### **3.7 Quality of Evidence to Determine Emission Reductions**

All parameters used for the determination of the Emission Reductions are discussed in section 3.4 above. All the data recorded is in compliance with the monitoring report.

### **3.8 Management System and Quality Assurance**

The project participant has provided the CDM manual<sup>/9/</sup>. The assessment team has checked the same to verify the information on standard operating procedures, GHG performance procedures and the monitoring procedures as defined in the registered PDD<sup>/1/</sup>. The information was found to be in compliance with the registered PDD<sup>/1/</sup>; also the defined procedures are followed at the plant site as well. This was verified during the site visit.

Therefore, the assessment team can confirm that the management system for the CDM project is in place; with the responsibilities properly identified and in place.

In order to verify data quality, the PP involved in the project works in accordance with a quality assurance procedure (Procedure for Monitoring Plan Implementation), which establishes the operational and management structure implemented.

### **3.9 Data from External Sources**

The value of baseline emission factor  $EF_{grid, y}$  used is 0.75087 tCO<sub>2</sub>/MWh; this is as per registered PDD<sup>/1/</sup>.

The diesel emission factor is referred from the CEA Database Version 07.

Average CO<sub>2</sub> emission factor for transportation of biomass with Trucks ( $EF_{km, CO_2}$ ) is calculated as  $(EF_{Diesel} \times NCV \times Density) / \text{Mileage}$

Description	Value	References
<b>Density of Diesel (t/klitre)</b>	0.83	Baseline Carbon Dioxide Emission Database Version 7.0 ( <a href="http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm">http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</a> )
<b>Mileage (Km/litre)</b>	4.00	Annex 1 on page 58 of report 'World Bank Report titled "Road Transport Service Efficiency Study" (India) available at <a href="http://siteresources.worldbank.org/EXTTRANSPORT/Resources/337115-1214499672078/5154009-1215830515903/5205342-1217256600926/rd-trans-final-11-05.pdf">http://siteresources.worldbank.org/EXTTRANSPORT/Resources/337115-1214499672078/5154009-1215830515903/5205342-1217256600926/rd-trans-final-11-05.pdf</a>
<b>NCV of Diesel (GJ /t)</b>	43	Baseline Carbon Dioxide Emission Database Version 7.0 ( <a href="http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm">http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</a> )  Calculated from (GCV-NCV)/GCV = 5% GCV value =10,500
<b>EF<sub>Diesel</sub> (tCO<sub>2</sub>/GJ)</b>	0.0726	Baseline Carbon Dioxide Emission Database Version 7.0 <a href="http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm">http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</a>
<b>EF<sub>Km, CO2</sub> (tCO<sub>2</sub>/ Km)</b>	0.000647	Calculated

#### 4. Calculation of Emission Reductions

<b>Parameter</b>	<b>Reported Value (For the entire monitoring period) (MR version 1 dated 20/04/2012)</b>	<b>Verified Value (For the entire monitoring period) (MR version 03 dated 24/07/2012)</b>	
QB <sub>y</sub> [Quantity of Biomass transported, {MT}]	Nil	Nil	
AVD <sub>y</sub> [Average return trip distance between biomass fuel supply site and project site,{km}]	Nil	Nil	
N <sub>y</sub> [Number of truck trips for biomass transportation,{Number}]	Nil	Nil	
EF <sub>km,CO2</sub> [Average CO2 emission factor for transportation of biomass with trucks,{tCO2/km}]	0.000623	0.000647	
EG <sub>project plant, y</sub> [Net quantity of electricity generated in the project plant during the year,{MWh}]	105,417.79*	105,417.79*	
EG <sub>Gross project plant, y</sub> [Gross quantity of electricity generated in the project plant during the year y,{MWh}]	118,783.06*	118,783.06*	
EG <sub>Aux project plant, y</sub> [Auxiliary electricity consumption in the project plant during the year y, {MWh}]	12,533.6*	12,533.595*	
EG <sub>Gross baseline plant, y</sub> [Gross quantity of electricity generated in the baseline plant during the year y]	9,812.92*	9,812.92*	
EG <sub>Aux baseline plant, y</sub> [Auxiliary electricity consumption in the baseline plant during the year]	1,306.48*	1,306.48*	
EG <sub>,total, y</sub> [Total Net quantity of electricity generated at the project site (Including the project plant and any other plant site existing at the start of the project activity),{MWh}]	113,924.23*	113,924.237*	
EG <sub>Gross,total,y</sub> [Gross quantity of electricity generated at the project site (Including the project plant and any other plant site existing at the start of the project activity)]	128,595.98*	128,595.984*	
EG <sub>Aux,total,y</sub> [Total auxiliary consumption at the project site (Including the project plant and any other plant site existing at the start of the project activity),{MWh}]	13,840.07*	13,840.07*	
Q <sub>project plant</sub> [Net quantity of heat generated from firing biomass in the project plant, {MWh}]	Month	MWh	MWh
	June' 10	3299.45	3299.45
	July' 10	0.00	0.00
	Aug' 10	0.00	0.00
	Sep' 10	0.00	0.00
	Oct' 10	0.00	0.00

	Nov' 10	11434.81	11434.81
	Dec'10	59705.86	59705.86
	Jan' 11	39959.67	39959.67
	Feb' 11	51252.96	51252.96
	Mar' 11	50176.88	50176.88
	Apr' 11	19896.30	19896.30
	May' 11	0.00	0.00
	June' 11	0.00	0.00
	July' 11	0.00	0.00
	Aug' 11	0.00	0.00
	Sep' 11	629.29	629.29
	Oct' 11	0.00	0.00
	Nov' 11	23133.49	23133.49
	Dec'11	62224.38	62224.38
	Jan' 12	56818.69	56818.69
	Feb' 12	54970.02	54970.02
BF <sub>i,y</sub> [Quantity of Biomass of Type I combusted in the project plan during year y, {Tons}]	238,436*	238,436*	
NCV <sub>i</sub> [Net calorific value of biomass, { MWh/ton }]	2.56 for 2010-11	2.56 for 2010-11	
	2.60 for 2011-12	2.60 for 2011-12	
ε <sub>boiler</sub> [Thermal energy efficiency, { %}]	June' 10	70.5	70.5
	July' 10	0.0	0.0
	Aug' 10	0.0	0.0
	Sep' 10	0.0	0.0
	Oct' 10	0.0	0.0
	Nov' 10	66.3	66.3
	Dec'10	70.6	70.6
	Jan' 11	70.6	70.6
	Feb' 11	70.9	70.9
	Mar' 11	71.0	71.0
	Apr' 11	69.6	69.6
	May' 11	0.0	0.0
	June' 11	0.0	0.0
	July' 11	0.0	0.0
	Aug' 11	0.0	0.0
	Sep' 11	58.8	58.8
	Oct' 11	0.0	0.0
	Nov' 11	69.9	69.9
	Dec'11	70.4	70.4
	Jan' 12	70.7	70.7
	Feb' 12	71.0	71.0
T <sub>project plant</sub> [Steam temperature, ° C]	June' 10	488.97	488.97
	July' 10	0.0	0.0
	Aug' 10	0.0	0.0
	Sep' 10	0.0	0.0
	Oct' 10	0.0	0.0
	Nov' 10	491.90	491.90

	Dec'10	502.25	502.25
	Jan' 11	500.14	500.14
	Feb' 11	502.62	502.62
	Mar' 11	500.11	500.11
	Apr' 11	495.81	495.81
	May' 11	0.0	0.0
	June' 11	0.0	0.0
	July' 11	0.0	0.0
	Aug' 11	0.0	0.0
	Sep' 11	480.30	480.30
	Oct' 11	0.0	0.0
	Nov' 11	503.37	503.37
	Dec'11	504.70	504.70
	Jan' 12	505.68	505.68
	Feb' 12	506.68	506.68
P <sub>project plant</sub> [Steam pressure { Kg/cm <sup>2</sup> }]	June' 10	81.23	81.23
	July' 10	0.0	0.0
	Aug' 10	0.0	0.0
	Sep' 10	0.0	0.0
	Oct' 10	0.0	0.0
	Nov' 10	82.57	82.57
	Dec'10	84.91	84.91
	Jan' 11	84.62	84.62
	Feb' 11	84.68	84.68
	Mar' 11	84.82	84.82
	Apr' 11	83.39	83.39
	May' 11	0.0	0.0
	June' 11	0.0	0.0
	July' 11	0.0	0.0
	Aug' 11	0.0	0.0
	Sep' 11	75.50	75.50
	Oct' 11	0.0	0.0
	Nov' 11	83.87	83.87
	Dec'11	84.78	84.78
	Jan' 12	85.19	85.19
	Feb' 12	85.68	85.68
S <sub>project plant</sub> [Total steam generated, { MT }]	June' 10	4391	4391
	July' 10	0	0
	Aug' 10	0	0
	Sep' 10	0	0
	Oct' 10	0	0
	Nov' 10	15172	15172
	Dec'10	78818	78818
	Jan' 11	52952	52952
	Feb' 11	67900	67900
	Mar' 11	66581	66581
	Apr' 11	26448	26448
	May' 11	0	0
	June' 11	0	0
	July' 11	0	0
	Aug' 11	0	0
	Sep' 11	824	824
	Oct' 11	0	0



	Nov' 11	30573	30573
	Dec'11	82332	82332
	Jan' 12	74856	74856
	Feb' 12	72452	72452
E <sub>steam</sub> [Enthalpy of steam, { MJ/Tonne }]	June' 10	3370.54	3370.54
	July' 10	0.00	0.00
	Aug' 10	0.00	0.00
	Sep' 10	0.00	0.00
	Oct' 10	0.00	0.00
	Nov' 10	3376.19	3376.19
	Dec'10	3399.20	3399.20
	Jan' 11	3394.28	3394.28
	Feb' 11	3400.40	3400.40
	Mar' 11	3393.96	3393.96
	Apr' 11	3384.95	3384.95
	May' 11	0.00	0.00
	June' 11	0.00	0.00
	July' 11	0.00	0.00
	Aug' 11	0.00	0.00
	Sep' 11	3356.26	3356.26
	Oct' 11	0.00	0.00
	Nov' 11	3403.24	3403.24
	Dec'11	3405.47	3405.47
	Jan' 12	3407.53	3407.53
	Feb' 12	3409.35	3409.35
I <sub>electricity</sub> [Quantity of electricity imported from the grid.], MWh	Month	(MWh)	(MWh)
	June' 10	79.987	79.987
	July' 10	41.430	41.430
	Aug' 10	42.310	42.310
	Sep' 10	41.220	41.220
	Oct' 10	69.245	69.245
	Nov' 10	72.046	72.046
	Dec'10	--	--
	Jan' 11	--	--
	Feb' 11	--	--
	Mar' 11	--	--
	Apr' 11	32.680	32.680
	May' 11	51.760	51.760
	June' 11	41.300	41.300
	July' 11	36.560	36.560
	Aug' 11	53.980	53.980
	Sep' 11	76.700	76.700
	Oct' 11	61.400	61.400
	Nov' 11	131.060	131.060
	Dec'11	--	--
	Jan' 12	--	--
	Feb' 12	--	--

Enthalpy of feed water for the project plant boiler $E_{\text{feedwater}}$	Month	(MJ/Tonne)	(MJ/Tonne)
	June' 10	665.46	665.46
	July' 10	0.00	0.00
	Aug' 10	0.00	0.00
	Sep' 10	0.00	0.00
	Oct' 10	0.00	0.00
	Nov' 10	662.95	662.95
	Dec'10	672.14	672.14
	Jan' 11	677.58	677.58
	Feb' 11	683.01	683.01
	Mar' 11	680.92	680.92
	Apr' 11	676.74	676.74
	May' 11	0.00	0.00
	June' 11	0.00	0.00
	July' 11	0.00	0.00
	Aug' 11	0.00	0.00
	Sep' 11	606.94	606.94
	Oct' 11	0.00	0.00
	Nov' 11	679.25	679.25
	Dec'11	684.68	684.68
	Jan' 12	674.99	674.99
	Feb' 12	678.00	678.00
$EF_{\text{electricity},y}$ (tCO <sub>2</sub> /MWh)	0.75087 <sup>£</sup>	0.75087 <sup>£</sup>	

\*Values are after summation for the period from 01/06/2010 – 31/03/2011 and 01/04/2011 – 29/02/2012. In the MR version 1 and in final MR, the PP reported value for both the period separately. PP did it according to financial year.

<sup>£</sup> = Conversion factor applied as 1MWh = 1 million kWh

Therefore, based on the above input values, the total emission reductions achieved by this project activity during the current monitoring period are 28,312 tCO<sub>2</sub>e. The calculations were carried out as mentioned below:

#### Baseline emissions:

$$ER_{\text{electricity},y} = EG_y \times EF_{\text{electricity},y}$$

$ER_{\text{electricity},y}$  - are the baseline emissions due to displacement of electricity during the year y in tons of CO<sub>2</sub>

$$EG_y = \text{Min} \{ (EG_{\text{project plant}, y}), (EG_{\text{total}, y} - (EG_{\text{historic}, 3 \text{ yr}})/3) \}$$

#### Project emissions:

$$PET_y = AVD_y \times N_y \times EF_{\text{km, CO}_2} \text{ (tCO}_2\text{/ Km)}$$

No leakages

### Net Emission Reductions

Net emission reductions = Baseline emissions – Project emissions

### Emission Reductions Calculation:

Period	Project emissions (ton of CO <sub>2</sub> )	Baseline emissions (ton of CO <sub>2</sub> )	Leakage emissions (ton of CO <sub>2</sub> )	Emission reductions (ton of CO <sub>2</sub> )
01/06/2010 – 31/03/2011	0	15601	0	15601
01/04/2011- 29/02/2012	0	12711	0	12711
Total Emission reductions (for current monitoring period)				28,312 (rundown total)



## **5. Recommendations for Changes in the Monitoring Plan**

No change is recommended.

## 6. Overview of Results

### Assessment Against the Provisions of Decision 17/CP.7:

Is the project documentation in accordance with the requirements of the registered PDD<sup>1/</sup> and relevant provision of decision 17/CP.7, EB decisions and guidance and the COP/MOP?

*Yes. The results of the compliance assessment are recorded in the verification checklist which is used as an internal report only.*

Have on-site inspections been performed that may comprise, inter alia, a review of performance records, interviews with project participants and local stakeholders, collection of measurements, observations of established practices and testing of the accuracy of monitoring equipment?

*Yes. the Lead Assessor/Team Leader/Local Assessor/Sectoral Scope Expert (TA 1.1) visited the site and undertook interviews, collected data, audited the implementation of procedures, checked calibration certificates and checked data, inter alia.*

*The results of the site visit are recorded in the verification checklist which is used as an internal report only.*

*The evidence has been checked and collected. The revised monitoring report is attached with this verification report.*

Has data from additional sources been used? If yes, please detail the source and significance.

*The value of baseline emission factor has been referred from the section E.4 on page 43 of registered PDD<sup>1/</sup>, UNFCCC reference number 0826.*

*The value of emission factor for diesel has been referred from the Central Electricity Authority (CEA) published data; version 07, the link is mentioned for reference ([http://www.cea.nic.in/reports/planning/cdm\\_co2/cdm\\_co2.htm](http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm))*

*All other values are reported in the section 3.9 of this report.*

Please review the monitoring results and verify that the monitoring methodologies for the estimation of reductions in anthropogenic emissions by sources have been applied correctly and their documentation is complete and transparent.

*Yes. The monitoring methodologies have been correctly applied and the monitoring report and supporting references are complete and transparent.*

Have any recommendations for changes to the monitoring methodology for any future crediting period been issued to the project participant?

*No*

Determine the reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CDM project activity, based on the data and information using calculation procedures consistent with those contained in the registered project design document and the monitoring plan.

*The data used in anthropogenic emission reduction calculation is consistent with those contained in the registered PDD<sup>1/</sup> and monitoring plan. The emission reduction was 158,058tCO<sub>2</sub> for the period 01/06/2010 - 29/02/2012 as per the estimation made in the registered PDD (on pro rata basis). The actual emission reduction is verified as 28,312tCO<sub>2</sub> for the same period.*

Identify and inform the project participants of any concerns related to the conformity of the actual project activity and its operation with the registered project design document. Project participants shall address the concerns and supply relevant additional information.

*No such non conformity of the actual project activity and its operation with the registered project design document has been observed.*

Post monitoring report on UNFCCC website

*Yes, the monitoring report is available at ref. 0826 on UNFCCC website*

<http://cdm.unfccc.int/Projects/DB/TUEV-SUED1166781266.9/iProcess/SGS-UKL1210596950.55/view>

## 7. Verification and Certification Statement

SGS United Kingdom Ltd has been contracted by Triveni Engineering and Industries Ltd to perform the verification of the emission reductions reported for the CDM project Bagasse based Co-generation Power Project at Khatauli, UNFCCC Reference Number 0826 in the current monitoring period .

The verification is based on the validated and registered project design document and the monitoring report for this project. Verification is performed in accordance with section I of Decision 3/CMP.1, and relevant decisions of the CDM EB and COP/MOP. The scope of this engagement covers the verification and certification of greenhouse gas emission reductions generated by the above project during the above mentioned period, as reported in the MR version 03 dated 24/07/2012<sup>7.2/</sup>.

The management of Triveni Engineering and Industries Ltd is responsible for the preparation, calculation and determination of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Monitoring Report MR version 03 dated 24/07/2012<sup>7.2/</sup>. The development and maintenance of records and reporting procedures are in accordance with the monitoring report.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the current monitoring period based on the reported emission reductions in the Monitoring Report version 03 dated 24/07/2012<sup>7.2/</sup> for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, SGS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

SGS confirms that the project is implemented as described in the validated and registered project design documents. Based on the information we have seen and evaluated, we confirm the following:

Project Title:	Bagasse based Co-generation Power Project at Khatauli
UNFCCC Reference Number:	0826
Registered PDD and Revised Monitoring Plan used for Verification:	PDD version 4 dated 04/12/2006 RMP Approved on 05/10/2011
Methodology Used for Verification:	ACM0006 Version 03, dated 19/05/2006 ACM0002 Version 06, dated 19/05/2006
Applicable Period:	01/06/2010 - 29/02/2012
Total GHG Emission Reductions Verified:	28,312tCO <sub>2</sub> e

**Signed on behalf of the Verification Body by Authorized Signatory**

Signature:



Name: Siddharth Yadav

Date: 27 November 2012

## 8. Document References

/1/	Registered PDD: <a href="http://cdm.unfccc.int/Projects/DB/TUEV-SUED1166781266.9/iProcess/SGS-UKL1210596950.55/view">http://cdm.unfccc.int/Projects/DB/TUEV-SUED1166781266.9/iProcess/SGS-UKL1210596950.55/view</a>
/2/	Validation Report: <a href="http://cdm.unfccc.int/Projects/DB/TUEV-SUED1166781266.9/iProcess/SGS-UKL1210596950.55/view">http://cdm.unfccc.int/Projects/DB/TUEV-SUED1166781266.9/iProcess/SGS-UKL1210596950.55/view</a>
/3/	CDM Methodology : 3.1 ACM0006, Version 03 dated 19/05/2006 3.2 ACM0002, version 06 dated 19/05/2006
/4/	Revised Monitoring Plan: Approved on 05/10/2011
/5/	Validation Report for RMP, Approved on 05/10/2011
/6/	Previous Verification and Certification Reports: 6.1 1 <sup>st</sup> Monitoring period <a href="http://cdm.unfccc.int/Projects/DB/TUEV-SUED1166781266.9/iProcess/SGS-UKL1210596950.55/view">http://cdm.unfccc.int/Projects/DB/TUEV-SUED1166781266.9/iProcess/SGS-UKL1210596950.55/view</a> 6.2 Previous Monitoring report 1 <sup>st</sup> monitoring period <a href="http://cdm.unfccc.int/Projects/DB/TUEV-SUED1166781266.9/iProcess/SGS-UKL1210596950.55/view">http://cdm.unfccc.int/Projects/DB/TUEV-SUED1166781266.9/iProcess/SGS-UKL1210596950.55/view</a>
/7/	Monitoring Report : 7.1 MR version 01 dated 20/04/2012 (Published) 7.1.1 MR version 02 dated 27/06/2012 7.2 MR version 03 dated 24/07/2012
/8/	Emission Reduction Spread Sheet : 8.1 ER spread sheet version 01 dated 20/04/2012 (corresponding to published MR) 8.2 ER spread sheet dated 24/07/2012 (corresponding to final MR)
/9/	CDM Operating Manual
/10/	Plant Records (from 01/06/2010 - 29/02/2012): 10.1 Log books and purchase receipts for quantity of biomass transported 10.2 Receipts provided by the truck contractor for the distance travelled by a truck and plant log books. 10.3 Gross energy generation data 10.4 Auxiliary energy consumption by the project plant data 10.5 total net energy generation at the project site data 10.6 the Gross energy meters for the existing baseline units data 10.7 gross energy generation at the project site data 10.8 steam flow, pressure and temperature data. 10.9 The biomass consumption was checked from stock inventory and cross verified against the plant records and purchase receipts. 10.10 Electricity Bills/ records 10.11 NCV values reports
/11/	CEA Baseline Carbon Dioxide Emission Data-base Version 7.0 (Source : <a href="http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm">http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</a> <a href="http://www.cea.nic.in/planning/c and e/Government of India website.htm">http://www.cea.nic.in/planning/c and e/Government of India website.htm</a>
/12/	Historical Data: Plant historical data for electricity generation
/13/	Photographic evidence for verification site visit: TEIL 1. Gross Generation Meter 23 MW TEIL 2. Auxiliary Consumption Meter 23 MW TEIL 3. Gross electricity generation (baseline unit) TEIL 4. Auxiliary electricity generation meter (baseline units) TEIL 5. Steam Flow, Pressure & Temperature Meter:



	TEIL 6. Belt Weighing System Conveyor TEIL 7. CDM Verification team on site
/14/	Calibration Test Certificates : 14.1 Energy Meters : (1) Gross energy meters for the existing baseline units (2) Auxiliary energy meters for the project plant (3) Gross energy meters for the project plant 14.2 Weigh feeders 14.3 Steam flow, temperature and pressure gauge/meters. 14.4 Electronic weighbridge
/15/	Meter with serial no. UPP30121, UPP30122 and UPP30123 installation certificate
/16/	Manuals of meters D7351248, 67272/75-0705 and 67274/79-0705.
/17/	45000 kg weighbridge purchase order and installation certificate.
/18/	VVM version 1.2

MR Version	Date of Revision	Main changes reason for Revision
01	20/04/2012	Original version published in the UNFCCC website
02	27/06/2012	CAE data 07 used, date of installation of new weighbridge provided in section D.2
03	24/07/2012	Corrected Values of few parameters after decimal place it is monitored in ER sheet, e.g. $EG_{Gross, baseline plant,y}$ , Reported frequency of few calculated parameters are mentioned as per RMP, e.g. $EG_{project plant,y}$ in section D.2

## 9. Findings Overview

### Findings Overview Summary

	CARs	CLs	FARs
Total Number raised	6	1	00

Date:	16/05/2012	Raised by:	Assessment team		
Type:	CAR	Number:	01	Reference:	Verification protocol
Lead Assessor Comment:				Date: 16/05/2012	
<div>1. It has been found during site visit the weighbridge with capacity 25000kg was modified to capacity 45000 kg. PP is requested to provide date of modification, reason of modification and impact on quality of monitoring plan due medication.</div> <div>2. It was also found that there is a delay in calibration of weighbridge of capacity 45000kg, due date of calibration was 10/10/2011 however it was calibrated on 14/10/2011, please clarify.</div>					
Project Participant Response:				Date: 22/06/2012	
<div>1. During periodic assessment, the weighbridge was found to be wrecked. Instead of getting it repaired the management decided to bring in a new weighbridge. At the same time the management decided to enhance the capacity of weighbridge to vehicles having capacity higher than 25 MT.</div> <div>2. The season for the monitoring period started on 21/11/2011. Therefore, the weighbridge calibration was carried out before the start of the season, i.e. on 14/10/2011.</div>					
Documentation Provided as Evidence by Project Participant:					
Weigh bridge installation report, calibration certificate of weighbridge.					
Information Verified by Lead Assessor:					
Weigh bridge installation report, calibration certificate of weighbridge.					
Reasoning for not Acceptance or Acceptance and Close Out:					
<div>1. PP need to provide date of installation of new weighbridge in MR. PP also needs to provide justification the monitoring plan is effective after the new weighbridge installed. Open</div> <div>2. Since there was no bagasse purchase during the period of delay in calibration, zero adjustment is applied in the monitored value according the EB 52 annex 60 para 4.a. this parameter is being used to calculate project emission. Since there is no transportation of bagasse during that period, there is no project emission due to transportation. Thus the response from PP was accepted, closed</div> <div>3. In MR version 01 CEA data base issue 06 is used however in ER sheet issue 07 is used. Please clarify.</div>					
Acceptance and Close out by Lead Assessor: Open				Date: 23/06/2012	
Project Participant Response:				Date: 27/06/2012	
<div>1. The monitoring plan requires to measure the amount of bagasse transported from outside as and when it happens. Since, the capacity of weighbridge does not have any effect on the net quantity of the bagasse being measured and the accuracy of the weighbridge is the same, the monitoring plan is effective even after the installation of new weighbridge with enhanced capacity.</div> <div>2. The CEA database (issue 7) is now used both in the MR and the ER sheet, the MR has been revised accordingly.</div>					
Documentation Provided as Evidence by Project Participant:					
MR version 02 date 27/06/2012					
Information Verified by Lead Assessor:					
PP used CEA database version 07.					
Reasoning for not Acceptance or Acceptance and Close Out:					

1. The accuracy of new weighbridge has been verified from weighbridge certificate. Its accuracy is also similar to the earlier one, therefore there will no adverse impact on quality of monitoring plan. Closed
2. PP has used CEA data base version 07 in revised MR version 02. The same has been check from MR version 02 provided by PP. it is also consistent with excel sheet provided by PP, closed

**Acceptance and Close out by Lead Assessor: closed**      **Date: 27/06/2012**

Date:	16/05/2012	Raised by:	Assessment team		
Type:	CAR	Number:	02	Reference:	Verification protocol
<b>Lead Assessor Comment:</b>				<b>Date:</b> 16/05/2012	
It was found during site visit that the meter (serial no. D7351248) which was used to monitor EG <sub>Gross project plant,y</sub> was been replace by meter with serial no UPP30121 on 21/03/2011. PP is requested to provide impact on effectiveness on monitoring plan due to change in meter					
<b>Project Participant Response:</b>				<b>Date:</b> 22/06/2012	
The change in the meters is not expected to have impact in effectiveness of monitoring plan. The PP was aware about the requirement of providing day ahead scheduling (Projection of power to be exported on the next day) to UPPCL (Uttar Pradesh Power Corporation Limited) from next season 2011-12 (The same was officially communicated to PP by UPPCL and PP is providing the day ahead scheduling in the on-going season). As a proactive measure and to have better monitoring and archiving arrangement, the PP replaced the meter at the project site in the month of March 2011 as the new meter is equipped with the facility of archiving the data on an interval of 15 min. The new meter has an accuracy level of 0.2s which is same as an accuracy of 0.2 with the only difference that the meter with 0.2s accuracy has a facility of archiving data. Therefore, the same is in line with the monitoring plan of the project activity.					
<b>Documentation Provided as Evidence by Project Participant:</b>					
Meter installation report, meter technical detail sheet,					
<b>Information Verified by Lead Assessor:</b>					
Meter with serial no D7351248 was replaced on 21/03/2011, new meter UPP30121 also has same accuracy class as previous one.					
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>					
Since the new meter also has the same accuracy class as previous one thus there will be no adverse impact on quality of monitoring plan due to new meter. The accuracy of meter was verified from name plate of meter and technical detail provided by supplier. PP has installed meter UPP30121 to improve archiving capability. PP has provided meter detail and its calibration detail in MR version 01, closed					
<b>Acceptance and Close out by Lead Assessor: closed</b>				<b>Date:</b> 27/06/2012	

Date:	16/05/2012	Raised by:	Assessment team		
Type:	CAR	Number:	03	Reference:	Verification protocol
<b>Lead Assessor Comment:</b>				<b>Date:</b> 16/05/2012	
It was found during site visit that the meter (serial no. 67272/75-0705 and 67274/79-0705) which was used to monitor EG <sub>Aux project palnt,y</sub> was been replace by meter with serial no UPP30122 and UPP30123 respectively on 21/03/2011. PP is requested to provide impact on effectiveness on monitoring plan due to change in meter					
<b>Project Participant Response:</b>				<b>Date:</b> 22/06/2012	
The change in the meters is not expected to have impact in effectiveness of monitoring plan. The PP was aware about the requirement of providing day ahead scheduling (Projection of power to be exported on the next day) to UPPCL (Uttar Pradesh Power Corporation Limited) from next season 2011-12 (The same was officially communicated to PP by UPPCL and PP is providing the day ahead scheduling in the on-going season). As a proactive measure and to have better monitoring and archiving arrangement, the PP replaced the meter at the project site in the month of March 2011 as the new meter is equipped with the facility of archiving the data on an interval of 15 min. The new meter has an accuracy level of 0.2s which is same as an accuracy of 0.2 with the only difference that the meter with 0.2s accuracy has a facility of archiving data. Therefore, the same is in line with the monitoring plan of the project activity.					
<b>Documentation Provided as Evidence by Project Participant:</b>					
Meter technical data sheet, meter installation report.					
<b>Information Verified by Lead Assessor:</b>					
Meters with serial no serial no. 67272/75-0705 and 67274/79-0705 were replaced on 21/03/2011, new meters UPP30122 and UPP30123 also have same accuracy class as previous one.					

<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	
Since the new meters also have the same accuracy class as previous one thus there will be no adverse impact on quality of monitoring plan due to new meters. The accuracy of meters were verified from name plate of meters and technical details provided by supplier. PP has installed new meters UPP30122 and UPP30123 to improve archiving capability. PP has provided meter details and their calibration details in MR version 01. closed	
<b>Acceptance and Close out by Lead Assessor: closed</b>	<b>Date: 27/06/2012</b>

Date:	16/05/2012		Raised by:	Assessment team		
Type:	CL	Number:	04	Reference:	Verification protocol	
<b>Lead Assessor Comment:</b>				<b>Date:</b> 16/05/2012		
For the month of Sep-11 efficiency of boiler was 58.8%, which is significant low as compared to other months, please clarify						
<b>Project Participant Response:</b>				<b>Date:</b> 22/06/2012		
The crushing season and steam generation during the year 2011-12 started from 19 <sup>th</sup> Nov 2011 onwards. The plant was operated only for one day during the month of September 2011 as trial before the season. Therefore the efficiency of the boiler is low as compared to other months.						
<b>Documentation Provided as Evidence by Project Participant:</b>						
Plant log book						
<b>Information Verified by Lead Assessor:</b>						
Plant was operated only for trial run in September 2011.						
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>						
Operation of co- gen plant in September-2011 was verified from plant record. Since the plant was not in continues operation thus variation in efficiency is technically accepted. closed						
<b>Acceptance and Close out by Lead Assessor: closed</b>				<b>Date:</b> 27/06/2012		

Date:	16/05/2012		Raised by:	Assessment team		
Type:	CAR	Number:	05	Reference:	Verification protocol	
Lead Assessor Comment:				Date: 16/05/2012		
Monitoring and recording frequency of parameter I <sub>Electricity</sub> is mentioned as monthly in MR version 01, however it is mentioned as continuous in RMP, please clarify how it is complying RMP.						
Project Participant Response:				Date: 22/06/2012		
The parameter I <sub>electricity</sub> is monitored shift wise on daily basis. The shift wise data is provided in the ER calculation sheet. However, the same is consolidated and reported on monthly basis in the MR.						
Documentation Provided as Evidence by Project Participant:						
ER sheet, Monitoring report version 02						
Information Verified by Lead Assessor:						
Sift wise data of I <sub>electricity</sub> .						
Reasoning for not Acceptance or Acceptance and Close Out:						
PP has provided shift wise data of this parameter. PP has corrected MR version 02 and mentioned measuring and recording frequency continuous in line to the RMP. MR has been checked and found ok. Closed.						
Acceptance and Close out by Lead Assessor: closed				Date:		

Date:	16/05/2012		Raised by:	Assessment team		
Type:	CAR	Number:	06	Reference:	Verification protocol	
<b>Lead Assessor Comment:</b>				<b>Date:</b> 16/05/2012		
ERs for current monitoring period is significantly lower than estimated in PDD prorate basis, please clarify						
<b>Project Participant Response:</b>				<b>Date:</b> 22/06/2012		
The crushing season duration was short due to low availability of sugar cane in the area. Due to lower crushing, availability of bagasse for the operation of the project plant was also significantly reduced. This has led to a lower generation of electricity in the monitoring period. As a result the emission reductions in the monitoring period are significantly lower than estimated in PDD.						
<b>Documentation Provided as Evidence by Project Participant:</b>						
ER sheet, plant operation log record.						
<b>Information Verified by Lead Assessor:</b>						

The plant was operational for the months Nov 10 – March 11, April 11 and Oct 11 – Feb 12 during the monitoring period.	
<b>Reasoning for not Acceptance or Acceptance and Close Out:</b>	
ERs are lower due to the less operation of co –gen plant due to less availability of bagasse of for the operation. The same has been verified during site visit and operation hours of co gen plant. Response from PP was found accepted, closed	
<b>Acceptance and Close out by Lead Assessor: closed</b>	<b>Date: 27/06/2012</b>

Date:	20/07/2012	Raised by:	Assessment team (Technical Review Stage)		
Type:	CAR	Number:	07	Reference:	Verification protocol
Lead Assessor Comment:				Date: 20/07/2012	
PP is requested to further clarify;					
1. Description of few parameters are not correctly mentioned in ER sheet, e.g. EG <sub>Gross,baseline plant,y</sub> , EG <sub>Auxiliary, baseline plant, y</sub>					
2. Values of few parameters after decimal place are not reported correctly in monitoring report as it is monitored in ER sheet, e.g. EG <sub>Gross, baseline plant,y</sub>					
3. Reported frequency of few calculated parameters are mentioned not as per RMP, e.g. EG <sub>project plant,y</sub>					
Project Participant Response:				Date: 23/06/2012	
1. The description of the parameters is now modified in the ER sheet					
2. The values of the parameter are corrected in MR to the decimal point to make it in line with the ER sheet					
3. The frequency of reporting and recording is now modified in the MR.					
Documentation Provided as Evidence by Project Participant:					
Revised MR version 03 dated 24/07/2012 and excel sheet dated 24/07/2012					
Information Verified by Lead Assessor:					
Revised MR version 03 and Emission reduction sheet					
Reasoning for not Acceptance or Acceptance and Close Out:					
1. PP has corrected the description of all parameters in accordance to RMP. The same has been checked from revised MR sent by PP and found ok, closed					
2. PP has reported value of all parameters exactly after decimal place as per excel sheet, the same has been checked from revised MR and found ok, closed					
3. PP corrected the reporting frequency of all parameters as RMP in revised MR, the same has been check from revised MR and found ok, closed					
Acceptance and Close out by Lead Assessor: closed				Date: 24/07/2012	

## 10. Statement of Competence

### Statement of Competence

Name: Sandeep Kurmi

#### Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	x

#### Scopes of Expertise

##### 1. Energy Industries (renewable / non-renewable)

x

Technical Area(s): TA 1.1 Thermal energy generation from fossil fuels and biomass including thermal electricity from solar.

##### 2. Energy Distribution

Technical Area(s):

##### 3. Energy Demand

x

Technical Area(s): TA 3.1 Energy Demand

##### 4. Manufacturing

x

Technical Area(s): TA 4.n Other

##### 5. Chemical Industry

Technical Area(s):

##### 6. Construction

Technical Area(s):

##### 7. Transport

Technical Area(s):

##### 8. Mining/Mineral Production

Technical Area(s):

##### 9. Metal Production

Technical Area(s):

##### 10. Fugitive Emissions from Fuels (solid, oil and gas)

Technical Area(s):

##### 11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride

Technical Area(s):

##### 12. Solvent Use

Technical Area(s):

##### 13. Waste Handling and Disposal

Technical Area(s):

##### 14. Afforestation and Reforestation

Technical Area(s):

##### 15. Agriculture

Technical Area(s):

Approved Member of Staff by:

Siddharth Yadav

Date:

21/09/2012

## Statement of Competence

Name: Vishnu Patidar

### Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	

### Scopes of Expertise

<b>1. Energy Industries (renewable / non-renewable)</b>	<b>x</b>
Technical Area(s): TA 1.2 Energy generation from renewable energy sources	
<b>2. Energy Distribution</b>	
Technical Area(s):	
<b>3. Energy Demand</b>	
Technical Area(s):	
<b>4. Manufacturing</b>	
Technical Area(s):	
<b>5. Chemical Industry</b>	
Technical Area(s):	
<b>6. Construction</b>	
Technical Area(s):	
<b>7. Transport</b>	
Technical Area(s):	
<b>8. Mining/Mineral Production</b>	
Technical Area(s):	
<b>9. Metal Production</b>	
Technical Area(s):	
<b>10. Fugitive Emissions from Fuels (solid, oil and gas)</b>	
Technical Area(s):	
<b>11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride</b>	
Technical Area(s):	
<b>12. Solvent Use</b>	
Technical Area(s):	
<b>13. Waste Handling and Disposal</b>	
Technical Area(s):	
<b>14. Afforestation and Reforestation</b>	
Technical Area(s):	
<b>15. Agriculture</b>	
Technical Area(s):	

Approved Member of Staff by:

Siddharth  
Yadav

Date:

15/02/2012

## Statement of Competence

Name: Nitin Babber

### Status

- Lead Assessor	<input checked="" type="checkbox"/>	- Expert	<input checked="" type="checkbox"/>
- Assessor	<input checked="" type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	India	- Technical Reviewer	<input type="checkbox"/>

### Scopes of Expertise

<b>1. Energy Industries (renewable / non-renewable)</b>	<input checked="" type="checkbox"/>
Technical Area(s): TA 1.1 Thermal energy generation from fossil fuels and biomass including thermal electricity from solar.	
<b>2. Energy Distribution</b>	<input type="checkbox"/>
Technical Area(s):	
<b>3. Energy Demand</b>	<input checked="" type="checkbox"/>
Technical Area(s): TA 3.1 Energy Demand	
<b>4. Manufacturing</b>	<input checked="" type="checkbox"/>
Technical Area(s): TA 4.4 Refinery (oil and gas) TA 4.n Other	
<b>5. Chemical Industry</b>	<input type="checkbox"/>
Technical Area(s):	
<b>6. Construction</b>	<input type="checkbox"/>
Technical Area(s):	
<b>7. Transport</b>	<input type="checkbox"/>
Technical Area(s):	
<b>8. Mining/Mineral Production</b>	<input type="checkbox"/>
Technical Area(s):	
<b>9. Metal Production</b>	<input type="checkbox"/>
Technical Area(s):	
<b>10. Fugitive Emissions from Fuels (solid, oil and gas)</b>	<input checked="" type="checkbox"/>
Technical Area(s): TA 10.2 Oil and Gas industry, coal mine methane recovery and use	
<b>11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride</b>	<input type="checkbox"/>
Technical Area(s):	
<b>12. Solvent Use</b>	<input type="checkbox"/>
Technical Area(s):	
<b>13. Waste Handling and Disposal</b>	<input type="checkbox"/>
Technical Area(s):	
<b>14. Afforestation and Reforestation</b>	<input type="checkbox"/>
Technical Area(s):	
<b>15. Agriculture</b>	<input type="checkbox"/>
Technical Area(s):	

Approved Member of Staff by: Siddharth Yadav Date: 22/02/2012



## Statement of Competence

Name: Ravikant Soni

### Status

- Lead Assessor	x	- Expert	x
- Assessor	x	- Financial Expert	
- Local Assessor	India	- Technical Reviewer	x

### Scopes of Expertise

#### 1. Energy Industries (renewable / non-renewable)

x

Technical Area(s): TA 1.2 Energy generation from renewable energy sources

#### 2. Energy Distribution

Technical Area(s):

#### 3. Energy Demand

Technical Area(s):

#### 4. Manufacturing

Technical Area(s):

#### 5. Chemical Industry

Technical Area(s):

#### 6. Construction

Technical Area(s):

#### 7. Transport

Technical Area(s):

#### 8. Mining/Mineral Production

Technical Area(s):

#### 9. Metal Production

Technical Area(s):

#### 10. Fugitive Emissions from Fuels (solid, oil and gas)

Technical Area(s):

#### 11. Fugitive Emissions from Production and

Consumption of Halocarbons and Sulphur Hexafluoride

Technical Area(s):

#### 12. Solvent Use

Technical Area(s):

#### 13. Waste Handling and Disposal

Technical Area(s):

#### 14. Afforestation and Reforestation

Technical Area(s):

#### 15. Agriculture

Technical Area(s):

Approved Member of Staff by:

Siddharth Yadav

Date:

05/04/2012

## 11. Photographic Evidence

Unique reference number: TEIL 01

Name of equipment: Gross Generation Meter 23 MW

Parameter:  $EG_{Gross\ project\ plant, y}$  [Gross quantity of electricity generated in the project plant during the year y, {MWh}]

Date: 15/05/2012



Unique reference number: TEIL 02

Name of equipment: Auxiliary Consumption Meter 23 MW

Parameter:  $EG_{Aux\ project\ plant, y}$  [Auxiliary electricity consumption in the project plant during the year y, {MWh}]

Date: 15/05/2012

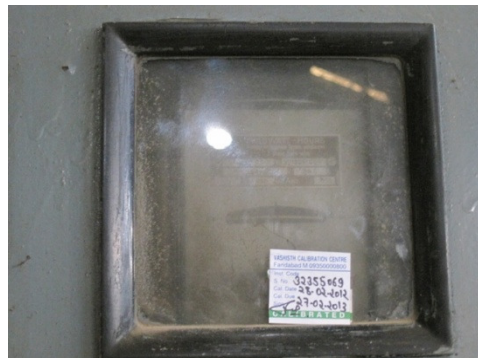


Unique reference number: TEIL 03

Name of equipment: Gross electricity generation (baseline unit)

Parameter:  $EG_{Gross\ baseline, y}$  [Gross quantity of electricity generated by base line power plants, {MWh}]

Date: 15/05/2012



Unique reference number: TEIL 04

Name of equipment: Auxiliary electricity generation meter (base-line units)

Parameter:  $EG_{Aux, total, y}$  [Total auxiliary consumption at the project site (Including the project plant and any other plant site existing at the start of the project activity), {MWh}]



Date:15/05/2012

Unique reference number: TEIL 05

Name of equipment: Steam Flow Meter, Steam Pressure meter, Steam Temperature Meter

Parameter:  $Q_{\text{project plant}}$  [Net quantity of heat generated from firing biomass in the project plant, {MWh}]

Date:15/05/2012



Unique reference number: TEIL 06

Name of equipment: Belt Weighing System:

Conveyor No. BC-2, BC-3

Parameter:  $BF_{i,y}$  [Quantity of Biomass of Type I combusted in the project plan during year y,{Tons}]

Date:15/05/2012



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