MONITORING REPORT FORM (CDM-MR) *
Version 01 - in effect as of: 28/09/2010

CONTENTS

MONITORING REPORT
Version: 1
Date 26/03/2012
Deoband Bagasse based Co-generation Power Project
REFERENCE NUMBER 0578
5th Monitoring period (01/06/2011 - 29/02/2012) (first and last day included)

SECTION A. General description of the project activity

A.1. Brief description of the project activity:

The purpose of the project activity is to utilize the available sugar mill generated bagasse to generate steam and electricity for internal use and to export the surplus electricity to the Uttar Pradesh Power Corporation Limited (UPPCL) grid (part of erstwhile Northern regional grid). The project activity is 22.0 MW capacity cogeneration project at Triveni Engineering and Industries Ltd. (TEIL), Deoband plant, Uttar Pradesh. By displacing carbon intensive grid energy with a renewable, carbon neutral energy source, the project activity reduces carbon dioxide emissions over the project life. Replicable technology, environmental, and sustainable development benefits also result from the project activity. These include: introducing efficient high pressure cogeneration technology to the Indian sugar industry; reducing power shortages in the state of Uttar Pradesh (UP) India; and, fostering sustainable economic growth through promoting energy self sufficiency and resource conservation in India's sugarcane industry.

The bagasse based Co-generation Power Project has been successfully commissioned on 01/11/2004 by Triveni Engineering & Industries Limited (TEIL) at Deoband Village, Saharanpur District, Uttar Pradesh, and is operational since 6/12/2004. The major equipments deployed for the project activity are as follows:

Boiler Details

Description	**1 number of Water tube**
Steam generating capacity (tons per hour)	120
Steam pressure (kg/cm2)	87
Steam temperature (° C)	515

Turbine details:

Description	**1 number of extraction cum condensing turbine**
Power (kW)	22000
Steam inlet pressure (kg/cm2)	84

The turbine has been designed for a condition called valve wide open condition, wherein the flow in turbine can vary 3-5% more than MCR turbine flow, which may result in slightly higher power generation than the nominal capacity.

The technology for the boilers and turbines is well established and the project activity does not involve any transfer of technology. The technology being used is environmentally safe and sound.

This is the fifth monitoring report associated with TEIL project activity. The period covered in this monitoring report is from 01/06/2011 to 29/02/2012 (Both days included). This monitoring report does not cover any period of time which was part of the previous monitoring report. The CERs generated in the monitoring period are 25,611 CERs.

The fourth monitoring report covered the period from 01/06/2010 to 31/05/2011 (Both days included). Issuance of 34,385 CERs is awaited f for the monitoring period.

The third monitoring report covered the period from 01/04/2008 to 31/05/2010 (Both days included). 87,860 CERs were issued for this monitoring period.

The second monitoring report covered the period from 01/06/2007 to 31/03/2008 (Both days included). 82,917 CERs were issued for this monitoring period.

The first monitoring report covered the period from 01/11/2004 to 31/03/2007 (Both days included). 190,404 CERs were issued for this monitoring period.

A.2. Project Participants

Host Country: India
Authorized Participants: Triveni Engineering and Industries Ltd and;
Bunge Emissions Fund Limited (Switzerland).

A.3. Location of the project activity:

The TEIL sugar plant and the project activity are located in the complex at Deoband Village, Saharanpur District in Uttar Pradesh, India. The plant is located near Meerut & Saharanpur highway and is about 35 km from Saharanpur.

Longitude: 77^{o} 40' 6'' E
Latitude: 29^{o} 40' 30'' N

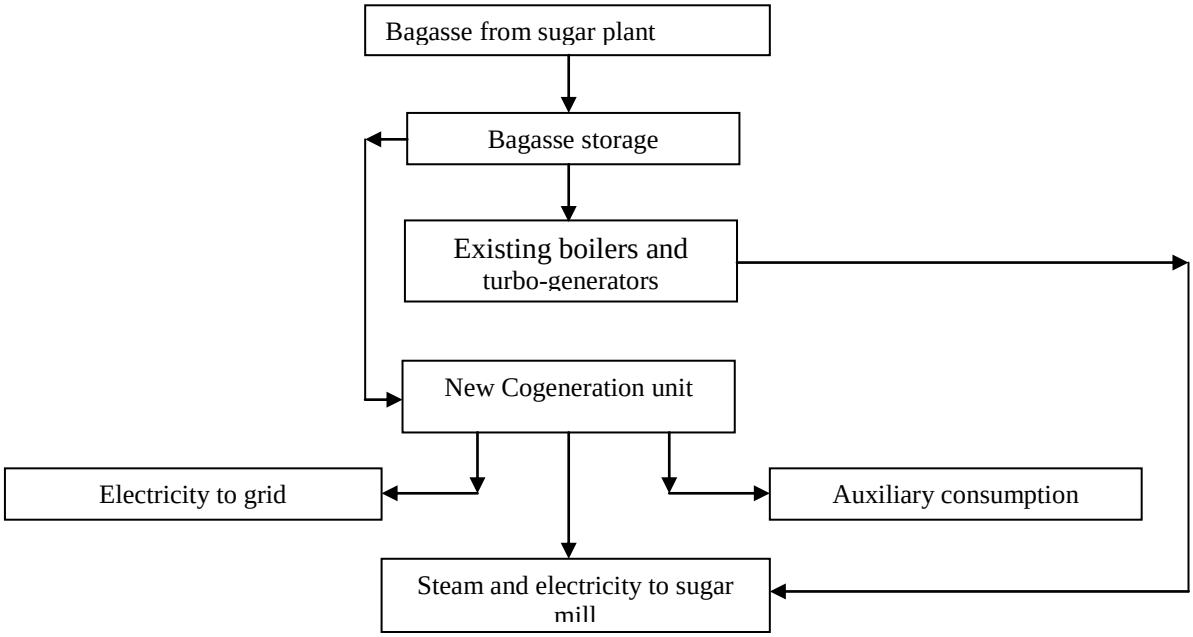
A.4. Technical description of the project

As discussed in the previous section A.1, the cogeneration project activity consists of the following main units:

- 1 number of bagasse fired boiler
- 1 number of extraction cum condensing turbine
- Appropriate electrical system for its successful operation and the related instrumentation and controls

The high pressure boiler and the turbine would ensure that maximum power output is obtained from the bagasse fired. The power is generated at 11 kV level. The internal consumption requirements for auxiliaries and equipment of the sugar plant and the co-generation plant are met by stepping down voltage level to 415V. The exportable power needs to be stepped upto 132 kV and paralleled with the erstwhile Northern grid at the sub-station in Deoband.

Project activity diagram (Flow chart) is as illustrated below:



A.5. Title, reference and version of the baseline and monitoring methodology applied to the project activity:

Title: Consolidated baseline methodology for grid-connected electricity generation from biomass residues

Reference: Approved consolidated baseline methodology ACM0006, Version 03, Sectoral Scope: 01, 19/05/2006 (as mentioned in methodology)
Approved consolidated methodology for grid-connected electricity generation from renewable sources ACM0002, version 6 dated 19/05/2006

A.6. Registration date of the project activity:

03/11/2006

A.7. Crediting period of the project activity and related information (start date and choice of crediting period):

A fixed crediting period of 10 years has been chosen and the start date of crediting period is 01/11/2004 – 31/10/2014

A.8. Name of responsible person(s)/entity(ies):

Mr. Sameer Sinha (Vice President - Power, Alcohol and Corporate Planning)
Address: 15-16, 16-A, 8th floor, Express trade towers, Noida, Uttar Pradesh – 201301
Tel: 0120 – 4308000
Fax: 0120 – 4311011
E-mail: ssinha@ho.trivenigroup.com

SECTION B. Implementation of the project activity

B.1. Implementation status of the project activity

The project activity by Triveni Engineering and Industries Limited utilizes the bagasse to generate steam and electricity which caters to the captive steam and power requirements. The surplus amount of

the power is exported to the electricity starved Uttar Pradesh Power Corporation Limited (UPPCL) grid (part of erstwhile Northern regional grid). The bagasse based Co-generation Power Project has been successfully commissioned by Triveni Engineering & Industries Limited (TEIL) at Deoband Village, Saharanpur District, Uttar Pradesh and is operational since 06/12/2004.

The plant was operational for the months Nov 11 – Feb 12 during the monitoring period. However, the operation was shutdown at certain instances and the details of these outages and the associated reasons are provided below:

Details of Outages

Date	Detail of reason	Time (from)	Time(to)	Hrs
14.11.2011	i) PCC DT incomer tripped, after this turbine tripped. After restoring the fault, turbine restarted by 11.21 am. Steam & Power to sugar was maintained uninterrupted during this period. ii) Turbine tripped manually at 12.53 am due to SC1 chain derailment and electric problem in continuation to this Turbine synchronized with grid at 2.49 pm.	10.51 am 12.53 am	11.21 am 06.00am	0.50 5.12
15.11.2011	SC-1 Break down Continued since yesterday Turbine synchronized with grid at 2.49 pm.	06.00 am	2.49 pm	8.81
17.11.2011	Turbine tripped manually at 09.35 am for attending 3 ata line SKODA supplied QCNRV stucked in closed position. After detailed consultation with Avant Garde and TBG, the valve problem was rectified and Turbine re-started & synchronized at 07.47 pm. Steam & Power supplied to sugar plant uninterruptedly.	09.35 am	07.47 pm	10.20
24.12.2011	Due to malfunction of DCS total plant got tripped. DCS fault was rectified after consultation with M/s YOKOGAWA and plant was restarted. M/s YOKOGOWA Engineer visited the site.	9.50 am	3.32 pm	5.70
05.01.2012	At 10.12 pm Turbine tripped on low temperature of boiler for attending Economizer tube leakage.	10.12 pm	06.00 am	7.80
06.01.2012	Economiser tube repair work continued	06.00am	02.50pm	8.83
27.01.2012	Turbine tripped at 02.51 pm due to heavy jerk in the grid	02.51 pm	04.20 pm	1.48

There has been no change of equipments in the current monitoring period for the project activity and no such event occurred during the monitoring period, which may impact the applicability of the methodology.

B.2. Revision of the monitoring plan

Revision was sought in the monitoring plan during the third monitoring period and the same was approved by UNFCCC on 23/05/2009
(http://cdm.unfccc.int/Projects/DB/TUEV-SUED1156433275.07/view)

B.3. Request for deviation applied to this monitoring period

No deviation was requested.

B.4. Notification or request of approval of changes

No notification or request of approval of changes has been made.

SECTION C. Description of the monitoring system

Measures to ensure the Results / uncertainty analysis

As per the Power Purchase Agreement (PPA), the energy exported to the UPPCL Grid is recorded from two independent meters viz., Main Meter and Check Meter and reading of main meter is used for billing. In the event of main meter not in operation / fails, the reading of the check meter shall be used for billing. Power Generation, Export & Auxiliary Consumption, fuel consumption are being recorded daily and the same is being verified and approved by Manager (O&M).

The Calibration of monitoring equipment has been carried out according to the specifications of the equipment (1st calibration in 2 years of installation and thereafter subsequent calibrations at an interval of 1 year). All the meters are tested for accuracy annually by an independent agency, which is accredited with National Accreditation Board for Testing & Calibration Laboratories (NABL), Department of Science & Technology, Government of India. If during the yearly test check, any meter is found to be beyond permissible limits of error, it would be calibrated immediately.

Emergency Procedure

Though, all the measures are taken to avoid erroneous recording of the monitoring parameters, there might be certain situations which may include failure of various metering devices. To minimize the risk of data discrepancy a set of spare for different meters are maintained at the plant site. Further, regular checking and maintenance of all metering devices is carried out by plant personals at TEIL to maintain highest level of accuracy.

The data collection and reporting procedures are mentioned in section D.2 of the monitoring report for each parameter. The line diagrams showing all relevant monitoring points are included at the end of the report as Annexure 4.

Roles and responsibilities

Shift Engineer (Co-Gen) is responsible for monitoring of daily data of the steam generated from bagasse based boiler, steam fed to turbine, parameters of steam and flow meter readings of the captive power plant. The report is then sent to the GM (Power Plant) for the review.

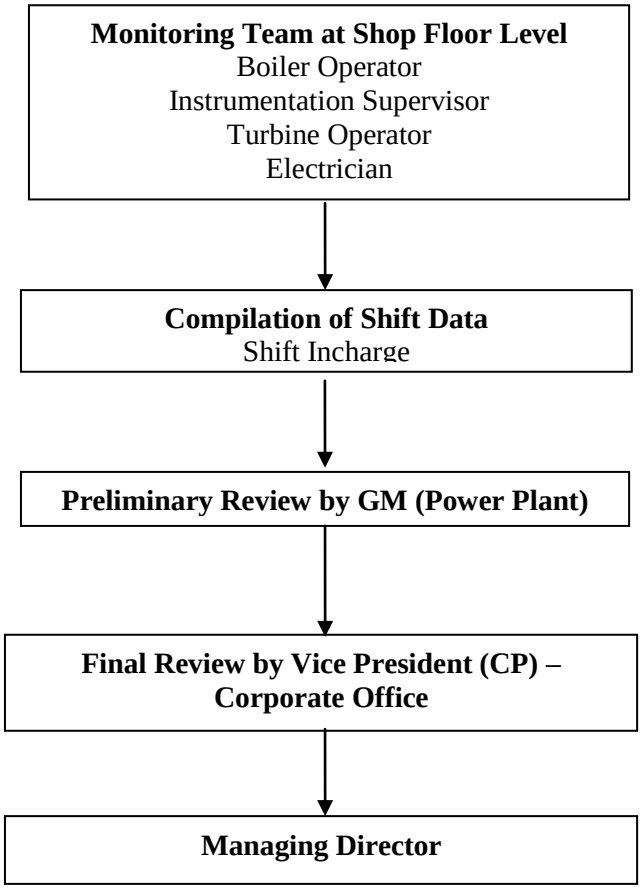
Shift Electrician (Electrical) is responsible for taking meter readings for electricity generation daily.

Shift Incharge is responsible for compilation of data which is then sent to GM (Power) for preliminary review.

The electricity generation details report is sent to the GM (Power Plant) through Shift Incharge with due verification for his review on a daily basis. In the absence of GM (Power Plant) this role is performed by the Dy. Chief Engineer.

GM (Power Plant) is responsible for reviewing the monitored parameters report on a daily basis and presenting a daily executive summary report, duly signed by himself, to the Vice President (CP) Corporate office which is finally reported to Managing Director (MD), TEIL.

Organization structure responsible for monitoring and reporting of parameters involved in CDM project activity has been presented in the following flow chart.


Monitoring Team at Shop Floor Level
Boiler Operator
Instrumentation Supervisor
Turbine Operator
Electrician
Compilation of Shift Data
Shift Incharge
Preliminary Review by GM (Power Plant)
Final Review by Vice President (CP) – Corporate Office
Managing Director

SECTION D. Data and parameters

D.1. Data and parameters determined at registration and not monitored during the monitoring period, including default values and factors

Data / Parameter:	EF_{grid}
Data unit:	tonnes of CO_2 / MWh
Description:	Emission factor for Northern Region Grid
Source of data used:	exante as fixed in registered PDD
Value(s) :	0.92354
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions
Additional comment:	-

Data / Parameter:	$EG_{historic}$
Data unit:	kWh
Description:	Net quantity of electricity generated during the most recent three years in all power plants at the project site
Source of data used:	Plant records
Value(s) :	2001 – 2002: 30189866 2002 – 2003: 30015620 2003 – 2004: 31732780
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions
Additional comment:	-

D.2. Data and parameters monitored

Data / Parameter:	$\mathbf{BF_{i,y}}$
Data unit:	MT
Description:	Quantity of Biomass transported
Measured /Calculated /Default:	Measured
Source of data:	Records of weighbridge data
Value(s) of monitored parameter:	11023.92
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	

Instrument	Capacity	Date of Calibration	Next Date of Calibration
Weighbridge	60000 Kg	01/11/2010	31/10/2011
		20/10/2011	19/10/2012

Least count +/- 10 Kg
Serial Number- JET 3747

Measuring/ Reading/ Recording frequency:	Measuring Frequency- Continuous, as and when the Bagasse is coming inside the plant premises on wet basis Recording Frequency- Continuous basis, added on daily basis in log books Reporting Frequency- Monthly basis in ER spread sheet
Calculation method (if applicable):	-
QA/QC procedures applied:	The details of the number of trucks carrying the bagasse, quantity of bagasse in each truck are recorded in a log book on a regular basis. Also, calibration is carried out of the weighbridge on annual basis.

Data / Parameter:	**AVD_y**
Data unit:	**Km**
Description:	Average return trip distance Between biomass fuel supply site and project site.
Measured /Calculated /Default:	Measured
Source of data:	The total number of trucks recorded for bringing in the bagasse and the total distance travelled by all these trucks
Value(s) of monitored parameter:	
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Distance meters fitted in the trucks
Measuring/ Reading/ Recording frequency:	Measuring Frequency- Continuous measurement for the trips Recording Frequency- Daily basis in log books Reporting Frequency- Monthly basis in ER spread sheet
Calculation method (if applicable):	The average distance is calculated by dividing the total distance travelled by the trucks by the number of trucks for a particular month. Then a monthly average is taken to arrive at the average trip distance for the monitoring period.
QA/QC procedures applied:	Regular recording of the distance of transportation of each truck is done in the log book.

Month	Average return trip distance
June 11	-
July 11	-
Aug 11	-
Sep 11	-
Oct 11	-
Nov 11	50.00
Dec 11	42.53
Jan 12	40.66
Feb 12	42.33

Data / Parameter:	**N_y**
Data unit:	**Number**
Description:	Number of truck trips for biomass transportation
Measured /Calculated /Default:	Measured
Source of data:	Data entry of the incoming trucks in the log books
Value(s) of monitored parameter:	<table><tr><th>Month</th><th>Number of truck trips for biomass transportation</th></tr><tr><td>June 11</td><td>-</td></tr><tr><td>July 11</td><td>-</td></tr><tr><td>Aug 11</td><td>-</td></tr><tr><td>Sep 11</td><td>-</td></tr><tr><td>Oct 11</td><td>-</td></tr><tr><td>Nov 11</td><td>20</td></tr><tr><td>Dec 11</td><td>241</td></tr><tr><td>Jan 12</td><td>302</td></tr><tr><td>Feb 12</td><td>279</td></tr></table>
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	-
Measuring/ Reading/ Recording frequency:	Measuring Frequency- Continuous for incoming trucks Recording Frequency- Daily basis in log books Reporting Frequency- Monthly basis in ER spread sheet
Calculation method (if applicable):	A total of the number of trucks bringing in the bagasse is taken for the entire monitoring period
QA/QC procedures applied:	Regular recording of the distance of transportation of each truck and the no of trips is done in the log book.

Data / Parameter:	**$EF_{km,co2}$**
Data unit:	**Tco_2/Km**
Description:	Average CO_2 emission factor for transportation of biomass with trucks (tCO_2/Km)
Measured /Calculated /Default:	Calculated
Source of data:	Baseline Carbon Dioxide Emission Database version 7.0 (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)
Value(s) of monitored parameter:	0.000629
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Project emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last	-

calibration, validity)	
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	-
QA/QC procedures applied:	National data is Chosen

Data / Parameter:	**$EG_{project\ plant,y}$**
Data unit:	**MWh**
Description:	Net quantity of electricity generated in the project plant during the year y
Measured /Calculated /Default:	Calculated
Source of data:	Metering Records
Value(s) of monitored parameter:	

Month	**MWh**
June 11	-31.28
July 11	-34.08
Aug 11	-34.08
Sep 11	-36.75
Oct 11	-35.69
Nov 11	7044.50
Dec 11	14600.13
Jan 12	13583.07
Feb 12	10107.32

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	The parameter is calculated by subtracting the auxiliary consumption (**$EG_{Aux\ project\ plant,\ y}$**) from gross generation (**$EG_{Gross\ project\ plant,\ y}$**) of the project plant. Both the parameters are discussed in the section.
Measuring/ Reading/ Recording frequency:	Not Applicable as the parameter is calculated
Calculation method (if applicable):	Net quantity of electricity generated is calculated by subtracting auxiliary consumption of the project plant from gross generation of the project plant. Separate energy meters are used for measurement of gross electricity generated and auxiliary consumption of the project plant. Energy meters (gross and auxiliary) were calibrated annually as per the standard procedures by accredited third party agencies.
QA/QC procedures applied:	Net quantity of electricity produced is been monitored by energy meters of accuracy class 0.2. The meters are calibrated on annual basis by third parties. The consistency of the metered net electricity generation is cross checked with receipts of electricity sold and the quantity of biomass fired (net electricity generated is divided by the quantity of biomass fired to compare the resultant efficiency with previous years). The power exported to UPPCL for the monitoring period is as follows:

Month	Electricity exported (MWh)
Nov 11	5351.28
Dec 11	11505.72
Jan 12	10529.64
Feb 12	7572.84

The net electricity generation from the project plant is compared with power exported and the net electricity generated was found to be more than the electricity exported due to the fact that sugar industry use certain portion of generated power to meet its captive power requirement and only the surplus power is exported. (Detailed calculation in emission reduction sheet).

The ratio of net electricity generation divided by the quantity of fuels fired (on energy basis) is in the range of 14.11 to 16.04 for period 01/06/2011 – 29/02/2012.

Data / Parameter:	**$EG_{Gross\ project\ plant,\ y}$**
Data unit:	**MWh**
Description:	Gross quantity of electricity generated in the project plant during the year y
Measured /Calculated /Default:	Measured
Source of data:	Metering records

Value(s) of monitored parameter:

Month	**MWh**
June 11	0.00
July 11	0.00
Aug 11	0.00
Sep 11	0.00
Oct 11	0.00
Nov 11	7862.10
Dec 11	16038.00
Jan 12	14977.20
Feb 12	11219.10

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations): Baseline emissions

Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)

Gross electricity generation meter:

Description	**Meter details**
S. No.	UPP30131
Make	Secure meters limted
Class	0.2s
Date of Calibration	11/03/2011
Due date of Calibration	10/03/2012

Measuring/ Reading/ Recording frequency:	Measuring Frequency- Continuous Recording Frequency- Daily basis in log books Reporting Frequency- Monthly basis in ER spread sheet
Calculation method (if applicable):	Gross quantity of electricity generated in the project plant was monitored by energy meters. Energy meters were calibrated annually as per the standard procedures by accredited third party agencies.
QA/QC procedures applied:	All Meters are calibrated by accredited external third party, as per standard procedures, on annual basis. The consistency of gross electricity generation has been cross checked with receipt of sales and the quantity of biomass fired. The ratio of gross electricity generation from project units when divided by the quantity of fuels fired (on energy basis) is in the range 15.75 – 17.69 for 01/06/2011 to 29/02/2012.

Data / Parameter:	**$EG_{Aux\ project\ plant,\ y}$**
Data unit:	
Description:	Auxiliary electricity consumption in the project plant during the year y
Measured /Calculated /Default:	Measured
Source of data:	Metering records
Value(s) of monitored parameter:	
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions

Month	**MWh**
June 11	0.00
July 11	0.00
Aug 11	0.00
Sep 11	0.00
Oct 11	0.00
Nov 11	797.03
Dec 11	1437.87
Jan 12	1394.13
Feb 12	1111.79

<table>
<tr><td>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</td><td><u>Auxiliary electricity consumption meter:</u>

<table>
<tr><th>Description</th><th>Meter details</th></tr>
<tr><td>S. No.</td><td>UPP30130</td></tr>
<tr><td>Make</td><td>Secure meters limted</td></tr>
<tr><td>Class</td><td>0.2s</td></tr>
<tr><td>Date of Calibration</td><td>11/03/2011</td></tr>
<tr><td>Due date of Calibration</td><td>10/03/2012</td></tr>
</table>

<table>
<tr><th>Description</th><th>Meter details</th></tr>
<tr><td>S. No.</td><td>UPP30132</td></tr>
<tr><td>Make</td><td>Secure meters limted</td></tr>
<tr><td>Class</td><td>0.2s</td></tr>
<tr><td>Date of Calibration</td><td>11/03/2011</td></tr>
<tr><td>Due date of Calibration</td><td>10/03/2012</td></tr>
</table>
</td></tr>
<tr><td>Measuring/ Reading/ Recording frequency:</td><td>Measuring Frequency- Continuous
Recording Frequency- Daily basis in log books
Reporting Frequency- Monthly basis in ER spread sheet</td></tr>
<tr><td>Calculation method (if applicable):</td><td>Not Applicable</td></tr>
<tr><td>QA/QC procedures applied:</td><td>Auxiliary electricity consumption in the project plant was monitored by energy meters. Energy meters were calibrated annually by accredited third party agencies.</td></tr>
</table>

<table>
<tr><td>Data / Parameter:</td><td>$EG_{total,y}$</td></tr>
<tr><td>Data unit:</td><td>MWh</td></tr>
<tr><td>Description:</td><td>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)</td></tr>
<tr><td>Measured /Calculated /Default:</td><td>Calculated</td></tr>
<tr><td>Source of data:</td><td>Metering records</td></tr>
<tr><td>Value(s) of monitored parameter:</td><td>
<table>
<tr><th>Month</th><th>MWh</th></tr>
<tr><td>June 11</td><td>-31.28</td></tr>
<tr><td>July 11</td><td>-34.08</td></tr>
<tr><td>Aug 11</td><td>-34.08</td></tr>
<tr><td>Sep 11</td><td>-36.75</td></tr>
<tr><td>Oct 11</td><td>-35.69</td></tr>
<tr><td>Nov 11</td><td>7946.92</td></tr>
<tr><td>Dec 11</td><td>16764.61</td></tr>
<tr><td>Jan 12</td><td>14840.29</td></tr>
<tr><td>Feb 12</td><td>11360.65</td></tr>
</table>
</td></tr>
<tr><td>Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)</td><td>Baseline emissions</td></tr>
<tr><td>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last</td><td>The energy meters for the project plant shall be same as delineated in the previous monitoring parameters.</td></tr>
</table>

calibration, validity)	
Measuring/ Reading/ Recording frequency:	Not Applicable as the parameter is calculated
Calculation method (if applicable):	Total net quantity of electricity generated was calculated by subtracting aggregated auxiliary consumption from the aggregated gross generation of all the power units at the plant site. Separate energy meters were used for measurement of gross generations and auxiliary consumptions of all units at the project site and thus subsequently aggregated respectively. Energy meters were calibrated annually as per standard procedures internally.
QA/QC procedures applied:	Total quantity of electricity produced has been monitored by energy meters of class- 0.2 which are calibrated on annual basis. The consistency of total net electricity generation has been cross checked with receipt of sales. The power exported to UPPCL for the monitoring period is as follows:

Month	Electricity exported
June 11	-
July 11	-
Aug 11	-
Sep 11	-
Oct 11	-
Nov 11	5351.28
Dec 11	11505.72
Jan 12	10529.64
Feb 12	7572.84

The total net electricity generation from the project plant is compared with power exported and the same was found to be more than the exported power due to the fact that sugar industry uses certain portion of generated power to meet its captive power requirement and only the surplus power is exported. (Detailed calculation in emission reduction sheet).

Data / Parameter:	**$EG_{Gross,total,y}$**
Data unit:	**MWh**
Description:	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)
Measured /Calculated /Default:	Measured
Source of data:	Metering records
Value(s) of monitored parameter:	

Month	**MWh**
June 11	0
July 11	0
Aug 11	0
Sep 11	0
Oct 11	0
Nov 11	8920.61
Dec 11	18536.55

Jan 12	16444.80
Feb 12	12644.37

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)

Baseline emissions

Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)

The energy meters for all the project plants shall be same as delineated in the previous monitoring parameters.

Gross electricity generation meter (Project activity):

Description	Meter details
S. No.	UPP30131
Make	Secure meters limted
Class	0.2s
Date of Calibration	11/03/2011
Due date of Calibration	10/03/2012

Gross electricity generation meter (baseline units);

Description	Gross electricity generation
S. No.	1659822
Accuracy	0.2s

Description	Gross electricity generation
S. No.	001259
Accuracy	0.2s

Description	Gross electricity generation
S. No.	2419728
Accuracy	0.2s

Description	Gross electricity generation
S. No.	7112634
Accuracy	0.2s

Description	Gross electricity generation
S. No.	710760
Accuracy	0.2s

Serial Number of the Meter	**Date of Calibration**	**Due Date of Calibration**	**Date of Calibration**	**Due Date of Calibration**
	2011		**2012**	
1659822	26/08/2010	25/08/2011	24/08/2011	23/08/2012
001259	26/08/2010	25/08/2011	24/08/2011	23/08/2012
2419728	26/08/2010	25/08/2011	24/08/2011	23/08/2012

	7112634 | 26/08/2010 | 25/08/2011 | 24/08/2011 | 23/08/2012 710760 | 26/08/2010 | 25/08/2011 | 24/08/2011 | 23/08/2012
Measuring/ Reading/ Recording frequency:	Measuring Frequency- Continuous Recording Frequency- Daily basis in log books Reporting Frequency- Monthly basis in ER spread sheet
Calculation method (if applicable):	For gross quantity of the electricity generated at the project site, the total was calculated by adding the gross generation of all power generating units. For each individual power generating unit gross quantity has been monitored by energy meters. Energy meters were calibrated annually as per standard procedures internally.
QA/QC procedures applied:	Total quantity of electricity produced has been monitored by energy meters of class- 0.2.

Data / Parameter:	**$EG_{Aux,total,y}$**
Data unit:	**MWh**
Description:	Total auxiliary consumption at the project site (Including the project plant and any other plant site existing at the start of the project activity)
Measured /Calculated /Default:	Measured
Source of data:	Metering records
Value(s) of monitored parameter:	**Month** | **MWh** June 11 | 0 July 11 | 0 Aug 11 | 0 Sep 11 | 0 Oct 11 | 0 Nov 11 | 953.11 Dec 11 | 1771.94 Jan 12 | 1604.51 Feb 12 | 1283.72
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions

Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)

The energy meters for all the project plants shall be same as delineated in the previous monitoring parameters.

Auxiliary electricity consumption meter (Project activity):

Description	Meter details
S. No.	UPP30130
Make	Secure meters limted
Class	0.2s
Date of Calibration	11/03/2011
Due date of Calibration	10/03/2012

Description	Meter details
S. No.	UPP30132
Make	Secure meters limted
Class	0.2s
Date of Calibration	11/03/2011
Due date of Calibration	10/03/2012

Please note that as per the RMP meters with accuracy class of 0.5s were required to be installed. However, the project proponent has installed meters with accuracy class of 0.2s, when the meters were required to be changed, which are more accurate than envisaged accuracy class of 0.5s.

Auxiliary electricity generation meter (baseline units);

Description	Gross electricity generation
S. No.	M-9908008
Make	Sycom
Accuracy	0.2s

Description	Gross electricity generation
S. No.	M-9908009
Make	Sycom
Accuracy	0.2s

Description	Gross electricity generation
S. No.	M-9908010
Make	Sycom
Accuracy	0.2s

Description	Gross electricity generation
S. No.	M-9908011
Make	Sycom
Accuracy	0.2s

Description	Gross electricity generation
S. No.	M-9908012
Make	Sycom
Accuracy	0.2s

Description	Gross electricity generation
S. No.	M-9908013
Make	Sycom
Accuracy	0.2s

	<table><tr><th rowspan="2">Serial Number of the Meter</th><th>Date of Calibration</th><th>Due Date of Calibration</th><th>Date of Calibration</th><th>Due Date of Calibration</th></tr><tr><th colspan="2">2011</th><th colspan="2">2012</th></tr><tr><td>M-9908008</td><td>26.08.2010</td><td>25.08.2011</td><td>24.08.2011</td><td>23.08.2012</td></tr><tr><td>M-9908009</td><td>26.08.2010</td><td>25.08.2011</td><td>24.08.2011</td><td>23.08.2012</td></tr><tr><td>M-9908010</td><td>26.08.2010</td><td>25.08.2011</td><td>24.08.2011</td><td>23.08.2012</td></tr><tr><td>M-9908011</td><td>26.08.2010</td><td>25.08.2011</td><td>24.08.2011</td><td>23.08.2012</td></tr><tr><td>M-9908012</td><td>26.08.2010</td><td>25.08.2011</td><td>24.08.2011</td><td>23.08.2012</td></tr><tr><td>M-9908013</td><td>26.08.2010</td><td>25.08.2011</td><td>24.08.2011</td><td>23.08.2012</td></tr></table>
Measuring/ Reading/ Recording frequency:	Measuring Frequency- Continuous Recording Frequency- Daily basis in log books Reporting Frequency- Monthly basis in ER spread sheet
Calculation method (if applicable):	For auxiliary consumption at the project site, the total was calculated by adding the auxiliary consumption of all power generating units. For each individual power generating unit auxiliary consumption has been monitored by energy meters. Energy meters were calibrated annually as per standard procedures internally.
QA/QC procedures applied:	Total quantity of electricity consumption has been monitored by energy meters of class- 0.2

Data / Parameter:	**$Q_{project\ plant}$**
Data unit:	MWh
Description:	Net quantity of heat generated from firing biomass in the project plant
Measured /Calculated /Default:	Calculated
Source of data:	Log book records
Value(s) of monitored parameter:	<table><tr><th>Month</th><th>MWh</th></tr><tr><td>June 11</td><td>-</td></tr><tr><td>July 11</td><td>-</td></tr><tr><td>Aug 11</td><td>-</td></tr><tr><td>Sep 11</td><td>-</td></tr><tr><td>Oct 11</td><td>-</td></tr><tr><td>Nov 11</td><td>34660.977</td></tr><tr><td>Dec 11</td><td>64873.769</td></tr><tr><td>Jan 12</td><td>59647.034</td></tr><tr><td>Feb 12</td><td>46202.288</td></tr></table>
Indicate what the data are used for (Baseline/ Project/	Baseline emissions

Leakage emission calculations)	
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Please refer the details delineated in the following parameters, i.e. Pressure, Temperature and Flow of the steam generated.
Measuring/ Reading/ Recording frequency:	Not Applicable as the value of the parameter is calculated
Calculation method (if applicable):	Steam quantity, its pressure and temperature has been monitored on continuous basis throughout the monitoring period. Net quantity of heat was calculated from monitored parameters. All meters were calibrated by accredited external third party, as per standard procedures, annually.
QA/QC procedures applied:	Net quantity of heat can be calculated from monitored parameters. The meters are calibrated on annual basis. The consistency of the net heat generation shall be checked by dividing the net heat generated by the quantity of biomass fired so as to compare the thermal efficiency obtained from the one calculated. The net heat efficiency of the boiler was checked with the previous year data and was found to be comparable. Also, the efficiency of the boiler is cross checked with the efficiency provided by the technological supplier, i.e. 71.2%, and was found to be comparable.

Data / Parameter:	**$BF_{i,y}$**
Data unit:	**Tons**
Description:	Quantity of Biomass combusted in the project plan during year y
Measured /Calculated /Default:	Measured
Source of data:	Metering records
Value(s) of monitored parameter:	112662
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	**Belt Weighing System**

Conveyor No. BC-2

Belt Scale		Load Cell		Date of Calibration	Due Date of Calibration
Model no.	**Serial no.**	**Model no.**	**Serial no.**		
BCW55LO	091/05	BR071H0	160505, 160606, 160705, 160805	01/10/2010	01/10/2011

BCW55LO	091/05	BR071H0	160505, 160606, 160705, 160805	01/10/2011	01/10/2012

Conveyor No. BC-4					
Belt Scale		**Load Cell**		**Date of Calibration**	**Due date of Calibration**
Model no.	**Serial No.**	**Model no.**	**Serial No**		
BCW55LO	202/06	BR071H0	064206, 064306, 064506, 238007	01/10/2010	01/10/2011
BCW55LO	202/06	BR071H0	064206, 064306, 064506, 238007	01/10/2011	01/10/2012

Conveyor No. BC-7					
Belt Scale		**Load Cell**		**Date of Calibration**	**Due date of Calibration**
Model no.	**Serial No.**	**Model no.**	**Serial No**		
BCW55LO	092/05	BR071H0	157405,157505,182205, 055204	01/10/2010	01/10/2011
BCW55LO	092/05	BR071H0	157405,157505,182205, 055204	01/10/2011	01/10/2012

Measuring/ Reading/ Recording frequency:	Monitoring frequency: Continuous Recording frequency: Daily basis Reporting frequency: Monthly
Calculation method (if applicable):	-
QA/QC procedures applied:	Quantity of biomass type combusted in the project plant is measured on wet basis through conveyor belt which are calibrated on annual basis. The quantity of biomass combusted was cross checked by performing an energy balance. The biomass quantity was calculated using the monthly average values of enthalpy of steam and the feed

	water. The variation observed in the quantity of calculated quantity of biomass combusted from the actual quantity of biomass was found to be (-) 1.5% which is in an acceptable range as the same is dependent on a number variables like, plant shutdowns, quality of biomass, etc.

Data / Parameter:	**NCV_i**
Data unit:	**MWh/tonne**
Description:	Net calorific value of biomass
Measured /Calculated /Default:	Measured or Calculated
Source of data:	Third party reports
Value(s) of monitored parameter:	01/06/2011 – 29/02/2012: 2.60 MWh/tonne
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emissions
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Not Applicable
Measuring/ Reading/ Recording frequency:	Annually
Calculation method (if applicable):	The NCV value is taken as the average of the two analyses.
QA/QC procedures applied:	Net Calorific value of biomass has been measured in accredited labs on wet basis. IPCC provides a range for the NCV value 1409191 – 5493456 Kcal/Tonne and the NCV values measured for the project activity lie within the same.

Data / Parameter:	**E_{boiler}**
Data unit:	**%**
Description:	Thermal energy efficiency
Measured /Calculated /Default:	Calculated
Source of data:	Calculated using energy balance
Value(s) of monitored parameter:	Monthly average value are delineated which is a transparent approach:

Month	Thermal energy efficiency (%)
June 11	-
July 11	-
Aug 11	-
Sep 11	-
Oct 11	-
Nov 11	69.0
Dec 11	71.0
Jan 12	70.0
Feb 12	69.0

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline emission
Monitoring equipment (type,	Thermocouple based temperature measuring device

<table>
<tr><td>accuracy class, serial number, calibration frequency, date of last calibration, validity)</td><td>
<table>
<tr><td>Description</td><td>Steam Temperature Meter</td></tr>
<tr><td>S. No.</td><td>S-196303</td></tr>
<tr><td>Model No</td><td>644J6M5</td></tr>
<tr><td>Make</td><td>Emerson</td></tr>
</table>
<table>
<tr><td colspan="2">Make</td><td>Emerson</td></tr>
<tr><td colspan="2">Sr. No.</td><td>S-196303</td></tr>
<tr><td>S. No.</td><td>Calibration Date</td><td>Due Date</td></tr>
<tr><td>1.</td><td>01/10/2010</td><td>01/11/2011</td></tr>
<tr><td>2.</td><td>01.10.2011</td><td>1.10.2012</td></tr>
</table>
</td></tr>
<tr><td>Measuring/ Reading/ Recording frequency:</td><td>Quarterly</td></tr>
<tr><td>Calculation method (if applicable):</td><td>Boiler efficiency was calculated by dividing energy output of steam from project plant boilers by total energy of biomass input in boilers.</td></tr>
<tr><td>QA/QC procedures applied:</td><td>The boiler efficiency lies in the range of 69 – 71 which is comparable to the efficiency provided by the supplier, i.e. 71.2% as the efficiency is dependent on various factors, like quality of bagasse, maintenance, etc.</td></tr>
</table>

<table>
<tr><td>Data / Parameter:</td><td>$T_{project\ plant}$</td></tr>
<tr><td>Data unit:</td><td>^{0}C</td></tr>
<tr><td>Description:</td><td>Steam temperature</td></tr>
<tr><td>Measured /Calculated /Default:</td><td>Measured</td></tr>
<tr><td>Source of data:</td><td>Log book</td></tr>
<tr><td>Value(s) of monitored parameter:</td><td>
<table>
<tr><td colspan="2">Monthly average values</td></tr>
<tr><td>Month</td><td>Temp (^{o}C)</td></tr>
<tr><td>June 11</td><td>-</td></tr>
<tr><td>July 11</td><td>-</td></tr>
<tr><td>Aug 11</td><td>-</td></tr>
<tr><td>Sep 11</td><td>-</td></tr>
<tr><td>Oct 11</td><td>-</td></tr>
<tr><td>Nov 11</td><td>507.18</td></tr>
<tr><td>Dec 11</td><td>511.14</td></tr>
<tr><td>Jan 12</td><td>511.45</td></tr>
<tr><td>Feb 12</td><td>508.91</td></tr>
</table>
</td></tr>
<tr><td>Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)</td><td>Baseline</td></tr>
<tr><td>Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)</td><td>Thermocouple based temperature measuring device.

<u>Steam Temperature meter:</u>
<table>
<tr><td>Description</td><td>Steam Temperature Meter</td></tr>
<tr><td>Model No</td><td>644J6M5</td></tr>
<tr><td>Make</td><td>Emerson</td></tr>
</table>
</td></tr>
</table>

	Sr. No. S-196303 **S. No.** / **Calibration Date** / **Due Date** 1. 01/10/2010 — 01/11/2011 2. 01.10.2011 — 1.10.2012
Measuring/ Reading/ Recording frequency:	Monitoring frequency: Continuous Recording frequency: Daily
Calculation method (if applicable):	-
QA/QC procedures applied:	It will be logged using temperature gauges. In order to maintain the highest levels of accuracy the measuring instruments are calibrated annually as per the manufacturers' specification.

Data / Parameter:	**$P_{Project\ plant}$**
Data unit:	Kg/cm^2
Description:	Steam pressure
Measured /Calculated /Default:	Measured
Source of data:	Log book
Value(s) of monitored parameter:	Monthly average values Month / Pressure (kg/cm^2) June 11 - - July 11 - - Aug 11 - - Sep 11 - - Oct 11 - - Nov 11 - 83.83 Dec 11 - 83.76 Jan 12 - 83.02 Feb 12 - 84.51
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	Pressure transmitter **Make** Emerson **Model No** 1151 SP9S12B1M4DF **Sr. No.** S 0196038 **S. No.** / **Calibration Date** / **Due Date** 1. 01/10/2010 — 01/11/2011 2. 01.10.2011 — 1.10.2012
Measuring/ Reading/ Recording frequency:	Monitoring frequency: Continuous Reporting frequency: Daily

Calculation method (if applicable):	-
QA/QC procedures applied:	It will be logged using pressure gauges. In order to maintain the highest levels of accuracy the measuring instruments are calibrated annually as per the manufacturers' specification.

Data / Parameter:	**$S_{Project\ plant}$**
Data unit:	MT
Description:	Total steam generated
Measured /Calculated /Default:	Measured
Source of data:	Log book
Value(s) of monitored parameter:	

Month	Quantity of steam (MT)
June 11	-
July 11	-
Aug 11	-
Sep 11	-
Oct 11	-
Nov 11	45957
Dec 11	85905
Jan 12	78933
Feb 12	61478

Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	**Steam Flow Meter:**

Description	**Steam Flow Meter**
S. No.	S 0196056
Model No	1151 DP5S1213 1M4-DF
Make	Emerson
Accuracy	+ 1.5 % FSD

S. No.	**Calibration Date**	**Due Date**
1.	01/10/2010	01/11/2011
2.	01.10.2011	1.10.2012

Measuring/ Reading/ Recording frequency:	Monitoring frequency: Continuous Reporting frequency: Daily
Calculation method (if applicable):	-
QA/QC procedures applied:	It will be logged using steam flow meters. In order to maintain the highest levels of accuracy the measuring instruments are calibrated annually as per the manufacturers' specification.

Data / Parameter:	**E_{steam}**
Data unit:	MJ/Tonne
Description:	Enthalpy of steam
Measured /Calculated	Calculated

/Default:	
Source of data:	Steam tables
Value(s) of monitored parameter:	<table><tr><th>Month</th><th>Enthalpy of steam</th></tr><tr><td>June 11</td><td>-</td></tr><tr><td>July 11</td><td>-</td></tr><tr><td>Aug 11</td><td>-</td></tr><tr><td>Sep 11</td><td>-</td></tr><tr><td>Oct 11</td><td>-</td></tr><tr><td>Nov 11</td><td>2722.760</td></tr><tr><td>Dec 11</td><td>2726.283</td></tr><tr><td>Jan 12</td><td>2728.038</td></tr><tr><td>Feb 12</td><td>2713.089</td></tr></table>
Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations)	Baseline
Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity)	-
Measuring/ Reading/ Recording frequency:	Monitoring frequency: Daily Reporting frequency: Monthly
Calculation method (if applicable):	Monthly average of steam temperature and pressure are used to determine enthalpy using steam tables.
QA/QC procedures applied:	It will be logged using steam flow meters. In order to maintain the highest levels of accuracy the measuring instruments are calibrated annually as per the manufacturers' specification.

SECTION E. Emission reductions calculation

E.1. Baseline emissions calculation

Estimation of Baseline emissions:

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

where

$ER_{electricity,y}$: Are the baseline emissions due to displacement of electricity during the year y in tons of CO_2

EG y : Min {(EG project plant, y), (EG total, y – (EG historic, 3 yr)/3)}

Carbon Emission Factor as per the baseline adopted (t CO_2/million KWh) = 923.54

The following table gives the details about the historic generation in Kilo Watt Hours (KWh).

Turbo Generator	**T4**	**T5**	**T3**	**T1**	**T2**	**Total**
2001- 2002	4170480	4277190	0	10783292	10958904	30189866
2002- 2003	4279200	4570080	0	10621988	10544352	30015620
2003- 2004	4542060	4880640	0	11175840	11134240	31732780

The historic generation details had been verified by DOE during validation

Baseline emissions for 01/06/2011 - 29/02/2012:

$EG_{project\ plant,y}$ = 45163.14MWh

$EG_{total,y} - (EG_{historic,\ 3\ yr})/3$ = 50740.60 – ((91938.27/3)*9/12)
= 50740.60 – 22984.57
= 27756.03MWh

EG_{y} = Min (45163.14, 27756.03)
= 27756.03MWh

$ER_{electricity,y}$ = EG_{y} X $EF_{electricity,y}$
= 27756.03 X 0.92354 tCO_2
= 25633.81 tCO_2

Baseline emissions for the monitoring period = 25633.81 tCO_2

E.2. Project emissions calculation

According to the methodology, project emissions include CO2 emissions from transportation of biomass to the project site (PET_y), CO_2 emissions from on-site consumption of fossil fuels due to the project activity ($PEFF_y$) and CH_4 emissions from the storage of biomass.

Estimation of Project emissions:

(A) Project emissions associated with the transportation of bagasse fuel

$$PET_y = N_y \ X \ AVD_y \ X \ EF_{km,CO2}$$

Where

PET_Y CO_2 emissions during the year due to transport of the biomass residues to the project plant (tCO2/MWh)

N_y is the number of truck trips during the period y

AVD_y is the average return trip distance between the biomass fuel supply sites and the site of the project plant in kilometers (km);

$EF_{km,CO2}$ is the average CO_2 emission factor for the trucks measured in tCO_2/km

Estimation of $EF_{km,CO2}$ (Average CO_2 emission factor for transportation of biomass with trucks)

Description	Value	References
Density (t/klitre)	0.83	Baseline Carbon Dioxide Emission Database Version 7.0 (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)
Mileage (Km/litre)	4.00	World Bank Report titled "Road Transport Service Efficiency Study" (India)
NCV (GJ /t)	41.76	Baseline Carbon Dioxide Emission Database Version 7.0 (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm) Calculated from (GCV-NCV)/GCV = 5% GCV value =10,500
EF_{Diesel} (tCO_2/GJ)	0.0726	Baseline Carbon Dioxide Emission Database Version 7.0 (http://www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm)
$EF_{Km,\ CO2}$ (tCO_2/ Km)	0.000629	Calculated

Project emissions for the period 01/06/2011 - 29/02/2012:

PET_y = 35340 X 0.000629
= 22 tCO_2

Project emissions associated with the transportation of bagasse fuel for the monitoring period = 22 tCO_2

(B) Project emissions associated with fossil fuel consumption
As there is no fossil fuel consumption in the project activity, there are no project emissions associated to fossil fuel combustion due to the project activity.

(c) Project emissions associated with the storage of bagasse fuel
The net increase of methane emissions associated with the storage of bagasse fuel is regarded as negligible if the bagasse is not stored for more than one year. The bagasse utilized for the project activity is stored in open piles for not more than one year. Therefore, there would be no project emission associated with the storage of the bagasse fuel.

E.3. Leakage calculation

In case of scenario 12, according to ACM0006 (Version 03), the diversion of biomass residues to the project activity is already considered in the calculation of baseline reductions. Thus, the leakage effects do not need to be addressed i.e. **L_y = 0.**

E.4. Emission reductions calculation / table

Period	Project emissions (ton of CO_2)	Baseline emissions (ton of CO2)	Leakage emissions (ton of CO_2)	Emission reductions (ton of CO2)
01/06/2011 – 29/02/2012	22.23	25633.81	0	25611
Total Emission reductions	**22.23**	**25633.81**	**0**	**25611**

E.5. Comparison of actual emission reductions with estimates in the CDM-PDD

Item	Values applied in ex-ante calculation of the registered CDM-PDD	Actual values reached during the monitoring period
Emission reductions (tCO_2e) for 01/06/2011 – 29/02/2012	**88411*(9/12) = 66308.25**	**25611**

E.6. Remarks on difference from estimated value in the PDD

The estimated ER's for the present Monitoring period are as given in section E.5, based on the PDD assumptions and the actual emission reductions. With regard to comparison of CER claimed in the monitoring period and that estimated for the present monitoring period the explanation has been cited as under:

The crushing season of sugar mills depends on the availability of sugarcane which is a seasonal crop. Due to less availability of sugarcane in the year of the monitoring period under consideration, the plant

was not operational for the envisaged number of days, which is representative of 270 operational days, i.e. 175 crushing season days and 95 non-crushing season.

- - - - -

History of the document

Version	Date	Nature of revision
01	EB 54, Annex 34 28 May 2010	Initial adoption.
Decision Class: Regulatory **Document Type**: Guideline, Form **Business Function**: Issuance		

ANNEXURE - 1

MONITORED DATA (FY 11-12)

Month	Existing Units								Project Plant						
	Generation (KWh)						Auxiliary consumption	Net Generation	Gross quantity of electricity generated in the project plant during the year $EG_{Gross,project\ plant,y}$	Auxiliary electricity consumption in the project plant during the year EG Aux,project plant,y	Import form banked electricity	Net quantity of electricity generated in the project plant during the year EG project plant,y	Gross quantity of electricity generation at the project site (Including the project plant and any other plant at site existing at the start of the project activity) $EG_{Gross\ total,\ y}$	Total auxiliary consumption at the project site (Including the project plant and any other plant at site existing at the start of the project activity) $EG_{Aux,\ total,\ y}$	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) $EG_{total,\ y}$
	T1	T2	T3	T4	T5	Total			T6						
June 11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31.28	-31.28	0.00	0.00	-31.28
July 11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.08	-34.08	0.00	0.00	-34.08
Aug 11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.08	-34.08	0.00	0.00	-34.08
Sep 11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.75	-36.75	0.00	0.00	-36.75
Oct 11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.69	-35.69	0.00	0.00	-35.69
Nov 11	0.00	0.00	0.00	418.18	640.33	1058.51	156.09	902.43	7862.10	797.03	20.58	7044.50	8920.61	953.11	7946.92
Dec 11	0.00	0.00	0.00	1095.12	1403.43	2498.55	334.07	2164.48	16038.00	1437.87	0.00	14600.13	18536.55	1771.94	16764.61
Jan 12	0.00	0.00	0.00	695.24	772.36	1467.60	210.38	1257.22	14977.20	1394.13	0.00	13583.07	16444.80	1604.51	14840.29
Feb 12	0.00	0.00	0.00	1425.27	0.00	1425.27	171.93	1253.34	11219.10	1111.79	0.00	10107.32	12644.37	1283.72	11360.65
TOTAL	**0.00**	**0.00**	**0.00**	**3633.81**	**2816.11**	**6449.92**	**872.47**	**5577.46**	**50096.40**	**4740.81**	**192.45**	**45163.14**	**56546.32**	**5613.28**	**50740.60**

where,

T1 - 1.5 MW turbine
T2 - 1.5 MW turbine
T3 - 1.25MW turbine
T4 - 3.0 MW turbine
T5 - 3.0 MW turbine
T6 - 22MW Project turbine

ANNEXURE - 2

Parameters related to bagasse transportation (FY 11-12)

Biomass Quantity transported				
	(Tons)	**Km**	**No.**	**Km**
	Quantity of Biomass transported (BFi,,y)	**Average return trip distance between biomass fuel supply site and project site (AVDy)**	**Number of truck trips for biomass transportation (Ny)**	**Total distance travelled (AVDy * Ny)**
June 11	–	–	_	–
July 11	–	–	_	–
Aug 11	–	–	_	–
Sep 11	–	–	_	–
Oct 11	–	–	_	–
Nov 11	211	50.00	20	1000
Dec 11	3152	42.53	241	10250
Jan 12	4080	40.66	302	12280
Feb 12	3580	42.33	279	11810
TOTAL	**11024**		**842**	**35340**

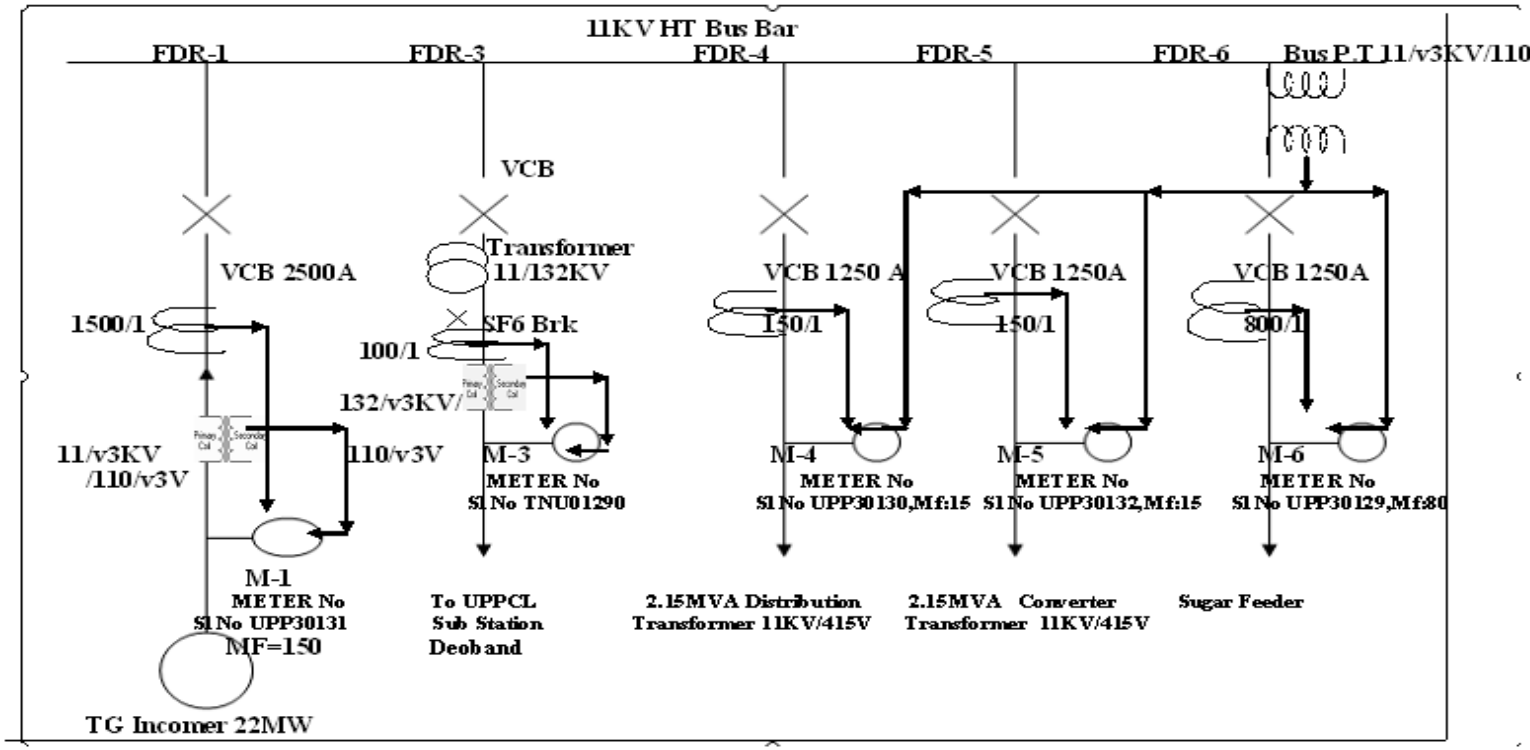
ANNEXURE - 3

Parameters related to bagasse and thermal energy (FY 11-12)

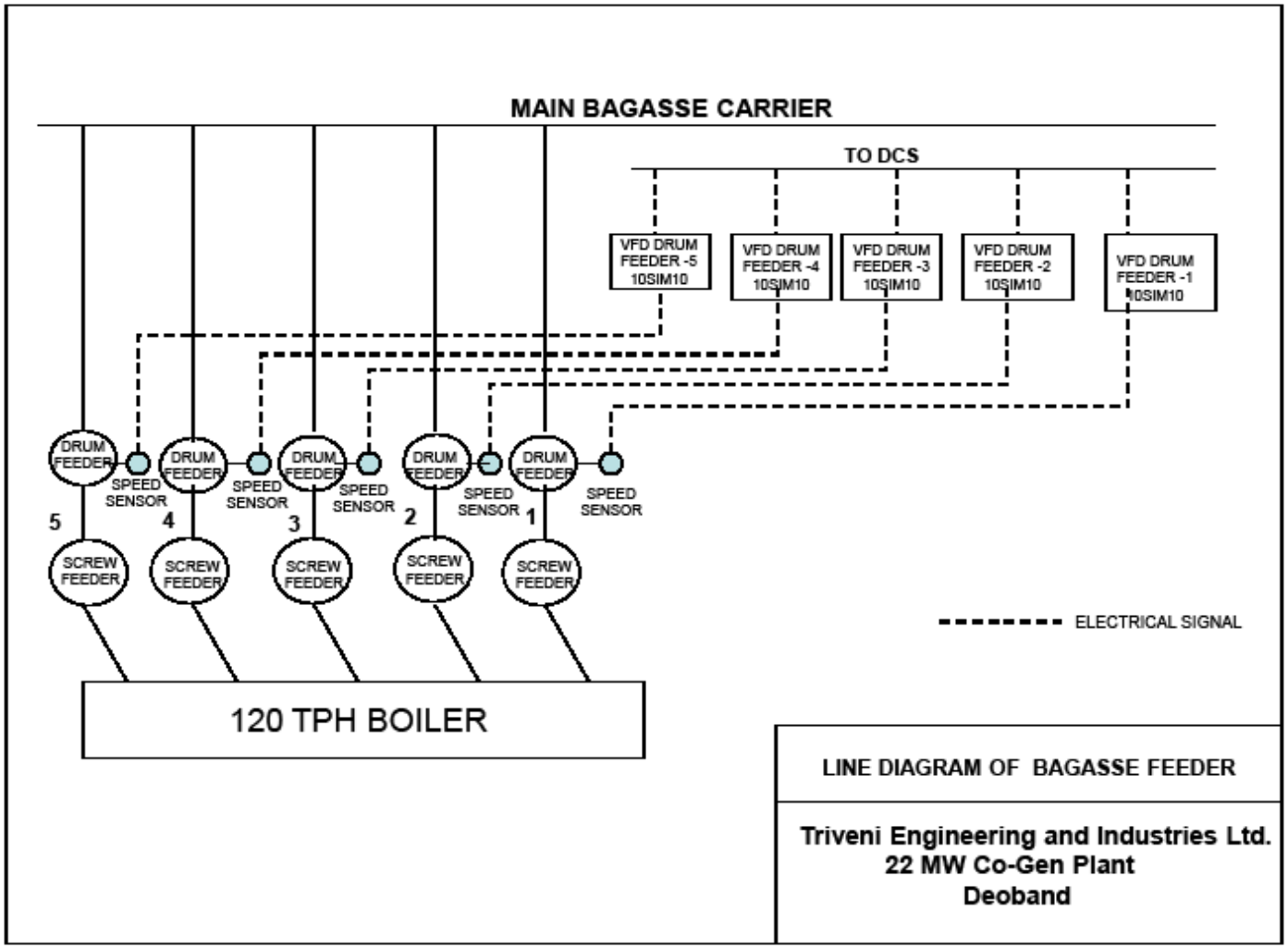
Month	Quantity of biomass combusted in project plant during year (Bf i,y)	Net Calorific Value of biomass (NCV i)	Heat input	Enthalpy of steam generated in the project boiler (E steam)	Enthalpy of Feed Water (E feed)	Enthalpy of steam generated in the project boiler (E steam)	Quantity of steam generated by the project boiler (S project plant)	Net quantity of heat generated from firing biomass in the project plant (Q project plant)	Average net energy of heat generation in the Project plant boiler (E boiler)
	tonne	Mwh/tonne	Mwh	MJ/tonne	MJ/tonne	MJ/tonne	tonnes	MWh	%
June 11	–	–	–	–	–	–	–	–	–
July 11	–	–	–	–	–	–	–	–	–
Aug 11	–	–	–	–	–	–	–	–	–
Sep 11	–	–	–	–	–	–	–	–	–
Oct 11	–	–	–	–	–	–	–	–	–
Nov 11	19193	2.60047	49910.782	3412.760	690.000	2722.760	45957	34660.977	69.0
Dec 11	35338	2.60047	91895.338	3422.670	696.387	2726.283	85905	64873.769	71.0
Jan 12	32562	2.60047	84676.439	3424.290	696.252	2728.038	78933	59647.034	70.0
Feb 12	25569	2.60047	66491.366	3416.270	703.181	2713.089	61478	46202.288	69.0
TOTAL	19193	2.60047	49910.782	3412.760	690.000	2722.760	45957	34660.977	69.0

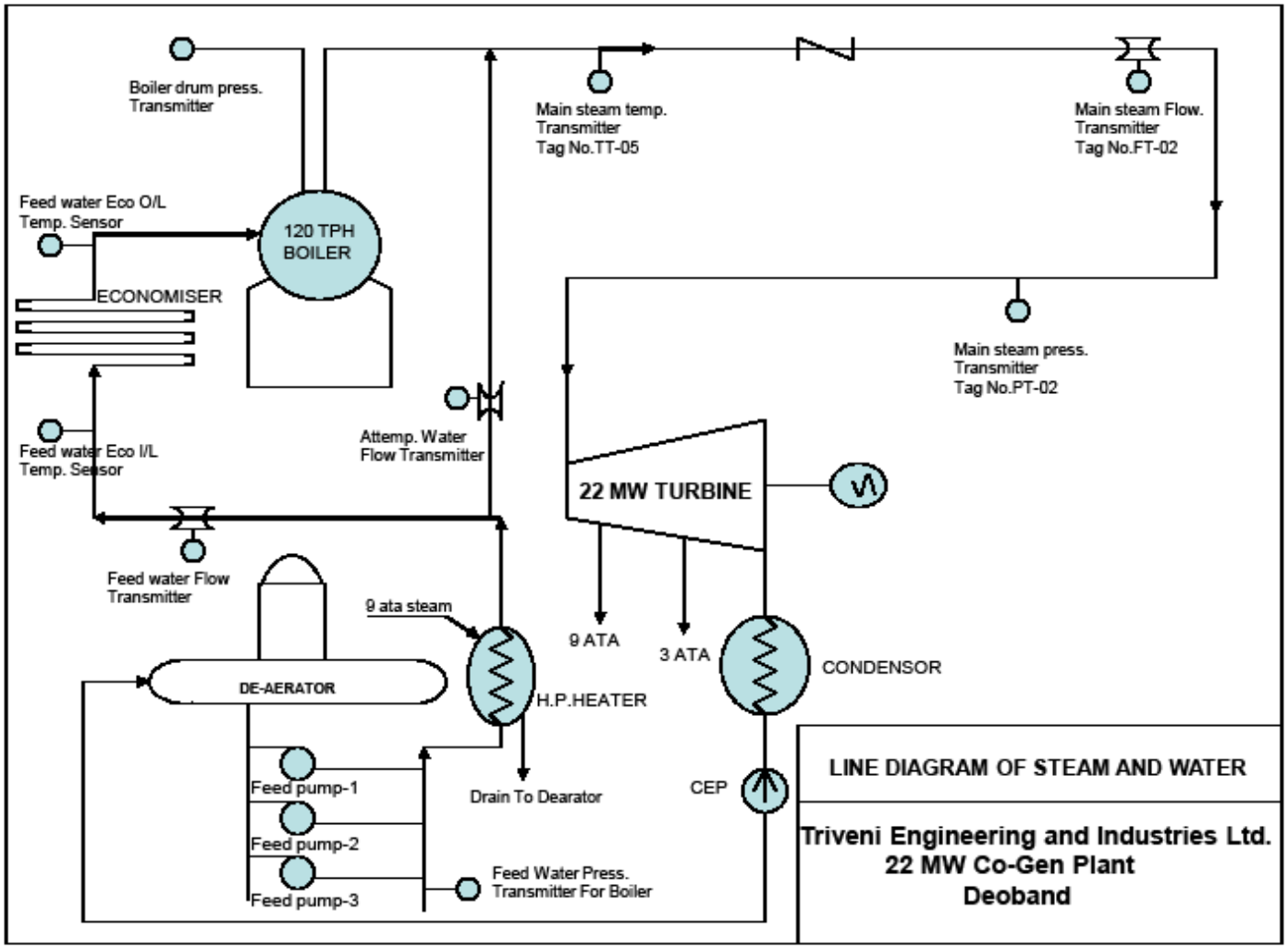
ANNEXURE - 4

22 MW Cogen Power Plant Deoband



S.No	Abb	Meter S.No	Location
1	M1	UPP30131	Generator Energy Meter
2	M3	TNU01290	Export Meter
2	M4	UPP30130	Distribution Transformer Energy Meter(Aux.)
3	M5	UPP30132	Converter Transformer Energy Meter(Aux.)
4	M6	UPP30129	Sugar Distribution Energy Meter


MAIN BAGASSE CARRIER
TO DCS
VFD DRUM FEEDER -5 10SIM10
VFD DRUM FEEDER -4 10SIM10
VFD DRUM FEEDER -3 10SIM10
VFD DRUM FEEDER -2 10SIM10
VFD DRUM FEEDER -1 10SIM10
DRUM FEEDER
SPEED SENSOR
5
4
3
2
1
SCREW FEEDER
ELECTRICAL SIGNAL
120 TPH BOILER
LINE DIAGRAM OF BAGASSE FEEDER
Triveni Engineering and Industries Ltd.
22 MW Co-Gen Plant
Deoband


Boiler drum press.
Transmitter
Main steam temp.
Transmitter
Tag No.TT-05
Main steam Flow.
Transmitter
Tag No.FT-02
Feed water Eco O/L
Temp. Sensor
120 TPH
BOILER
ECONOMISER
Main steam press.
Transmitter
Tag No.PT-02
Attemp. Water
Flow Transmitter
Feed water Eco I/L
Temp. Sensor
22 MW TURBINE
Feed water Flow
Transmitter
9 ata steam
9 ATA
3 ATA
CONDENSOR
DE-AERATOR
H.P.HEATER
Feed pump-1
Drain To Dearator
CEP
Feed pump-2
Feed pump-3
Feed Water Press.
Transmitter For Boiler
LINE DIAGRAM OF STEAM AND WATER
Triveni Engineering and Industries Ltd.
22 MW Co-Gen Plant
Deoband