MONITORING REPORT FORM (F-CDM-MR)
Version 02.0

MONITORING REPORT

Title of the project activity	Ganpati co-generation project at Medak, Andhra Pradesh
Reference number of the project activity	0370
Version number of the monitoring report	01
Completion date of the monitoring report	06/10/2012
Registration date of the project activity	29/08/2006
Monitoring period number and duration of this monitoring period	Monitoring period 1 of Crediting Period 2 01/01/2010 to 24/06/2012
Project participant(s)	- Ganpati Sugar Industries Limited - Noble Carbon Credits Limited (United Kingdom of Great Britain and Northern Ireland) - Vitol S.A (Switzerland)
Host Party(ies)	India
Sectoral scope(s) and applied methodology(ies)	Sectoral Scope: 01, AMS-I.C. ver. 17
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	116,613 tCO2e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	72,759 tonnes CO2e

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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The project activity is a bagasse based co-generation facility installed at Ganpati Sugar Industries Limited's (GSIL) sugar mill at Sanga Reddy, Medak District of Andhra Pradesh, India. The bagasse used as fuel in the project activity is the co-product of sugar production process and is therefore a renewable carbon neutral source of electricity. The project activity is a small scale project activity and conforms to Appendix B of the simplified modalities and procedures for small-scale CDM project activities.

The project activity is a grid connected bagasse based co-generation power plant with a high pressure and temperature steam configuration of 67kg/cm^2 and 480^{o}C boiler with an extraction cum condensing type turbo-generator, 55 tonnes per hour capacity boiler using bagasse as the fuel. The power generated from the project is partly utilized for the plant and its auxiliaries. The remaining power is exported to the grid.

Relevant dates for the project activity:

- Project implementation Started in 2001
- Continued its operation since 1st January 2003
- 1st crediting period Issued i.e., from 01/01/2003 to 31/12/2009

Total GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period: 72,759 tonnes CO2e

A.2. Location of project activity

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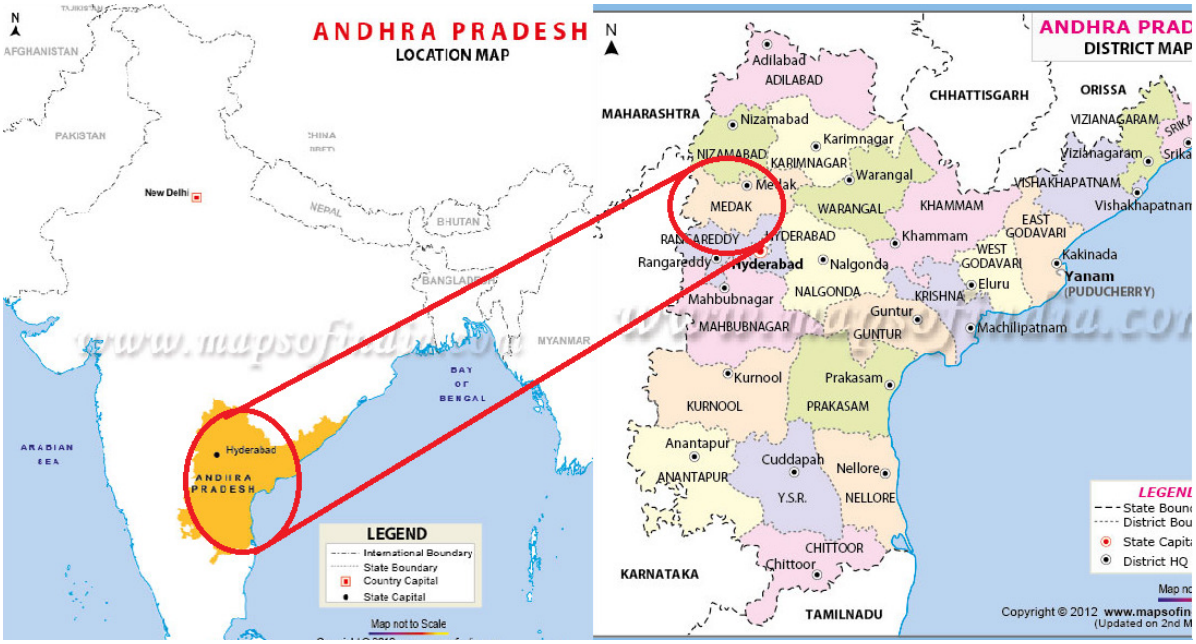
(a) Host Party: India

(b) Region/ State/ Province etc; Andhra Pradesh State

(c) City/ Town/ Community, etc: The project site is located at Kulbagur, Fasalwadi Village,Sanga Reddy Mandal, Medak District of Andhra Pradesh

(d) Physical/ Geographical location: latitude 17° 38' 17" N and longitude 78° 7' 17" E) some 75 Km from Hyderabad (nearest airport)



A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (Host Party)	Ganpati Sugar Industries Limited (Project participant)	No
United Kingdom of Great Britain and Northern Ireland	Noble Carbon Credits Limited	No
Switzerland	Vitol S.A	No

A.4. Reference of applied methodology

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The approved baseline and monitoring methodologies applied for the project activity are:

AMS.I.C	Thermal energy production with or without electricity	Version 17, Sectoral Scope: 01, EB 54

A.5. Crediting period of project activity

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Type of crediting period: Renewal
Start date of Crediting period: Second crediting period (01/01/2010 to 31/12/2016)
Length of the crediting period: 7years

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

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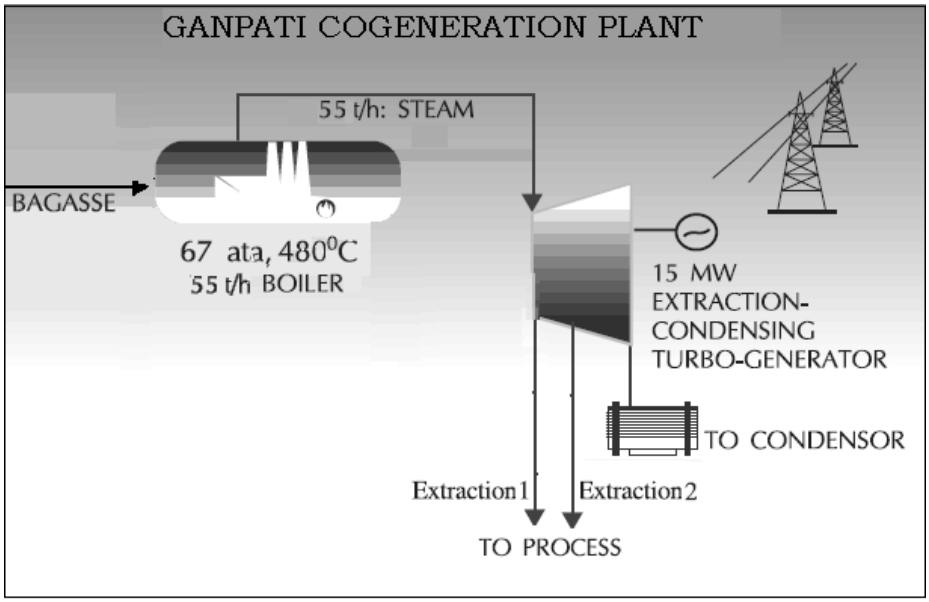
- Project implementation Started in 2001
- Commercial operations started from 1st January 2003
- This monitoring period is considered for total 906 days i.e., from 01/01/2010 to 24/06/2012. The total downtime hours during this monitoring period is found to be 11360.65hrs i.e., 473 days 8.64hrs. Hence the project activity is operational for only 432 days and 15.36hrs.
- During this monitoring period Total Electricity exported to the grid is 86137MWh and Total power import is 1688MWh. Hence the Net electricity supplied to the grid by the project activity is 84449MWh
- Generator Terminal meter, Main & check meters were changed on 25th July 2011 as per periodic calibration schedule.
- No adverse situation has arisen during the monitoring period of the project which may eventually impact the applicability of the methodology

Process Flow Diagram



B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan or applied methodology

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Not applicable

B.2.2. Corrections

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Not applicable

B.2.3. Permanent changes from registered monitoring plan or applied methodology

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Not applicable

B.2.4. Changes to project design of registered project activity

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Not applicable

B.2.5. Changes to start date of crediting period

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Not applicable

B.2.6. Types of changes specific to afforestation or reforestation project activity

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Not applicable

SECTION C. Description of monitoring system

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The project revenue is based on the units exported as measured by power meters, main and check meters at the high-tension substation of the APTRANSCO. The amount of electricity exported to grid shown in Joint meter reading cards are only be considered for CERs calculation purpose.

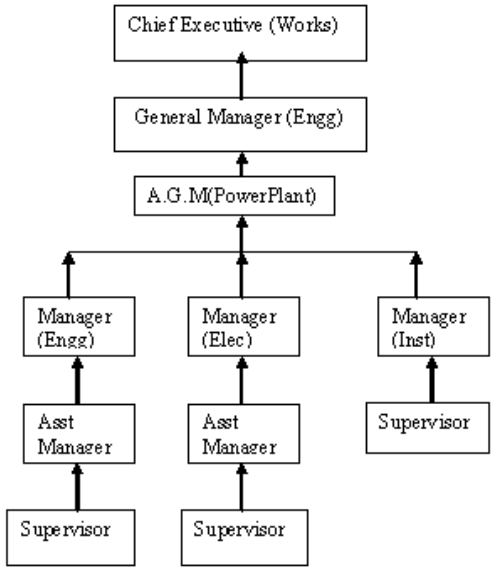
The GSIL project activity has employed PLC (Programmable Logic Controller) system and Micro processor based instruments which electronically monitors the main performance and output variables of the power plant, the systems for monitoring the CDM aspect of the project draws extensively from the above system, monitoring and control equipment that measure, monitor and control various key parameters.

Parameters being monitored according to Monitoring Plan

- Net electricity supplied to the grid by the project activity
- Electricity exported to the grid after meeting captive & auxiliary power requirements
- Electricity import from grid to the project activity
- Quantity of bagasse used in the project activity
- Net calorific value of bagasse used in the project activity
- Moisture content of bagasse used in the project activity
- Quantity of diesel consumed in DG set for electricity generation used by project activity

Operational and Management structure:

The operational and management structure of the co generation plant is provided in the following flow chart. The overall responsibility for ensuring the accuracy of the records as well as ensuring complete environmental integrity of the emissions reduction claims will rest with the Board, which has in turn appointed the Chief Executive (Works) to ensure that the details submitted are accurate.



Procedure for training monitoring personnel

Purpose is to establish a system for training and awareness of staff on monitoring and recording of clean development mechanism (CDM) related data. This procedure outlines the steps to ensure that staff receives adequate training to collect and archive complete and accurate data necessary for CDM monitoring.

Orientation/induction training is being conducted for all new operational staff. All the Managers and AGM are responsible for this task. Training records are being maintained and initiated

Handling of Day-to-Day record: Purpose of the monitoring plan is to define the procedures and responsibilities for GHG Performance, Project Management, Registration, Monitoring, Measurement and Reporting of data and dealing with uncertainties.

AGM of the plant is responsible for the collation of data required to conduct the monitoring plan who reports to the GM. The management of the plant puts in place monthly reporting of electricity generation. Plant Manager identifies day to day information/data/record that needs to be maintained as per the CDM norms and prepare a record matrix/list for records as per the protocol of the CDM. Supervisors maintain active files/registers/books for this data indexed in a manner to enable easy retrieval of specific data/record.

Reliability and calibration and maintenance of monitoring equipment:
The amount of emission reduction units is proportional to the net energy generation from the project. Thus the final KWh meter reading is the final value from project side. All measurement devices are with best accuracy procured from reputed manufacturers. Since the reliability of the monitoring system is governed by the accuracy of the measurement system and the quality of the equipment to produce the result all power measuring instruments is calibrated once a year for ensuring reliability of the system. Therefore the system ensures the final generation is highly reliable. AGM (Power Plant) is responsible for getting the instruments checked and calibrated as per calibration schedule

INFORMATION ON ACCURACY & LOCATION OF MONITORING EQUIPEMENTS

Description	Main Meter	Check Meter	Generation meter
Accuracy Class	Class 0.2	Class 0.2	Class 0.2
Location	Kandi Substation	Kandi Substation	Generator terminal at control room
Purpose	To measure the electricity exported to APTRANSCO and electricity imported from APTRANSCO grid. The amount of electricity exported to grid measured by this meter and as shown in Joint meter reading cards only be considered for CERs calculation purpose.	It is a stand by meter for export and import of electricity	Measures the total electricity generated from the project activity.

Uncertainties and Reliability:
The amount of emission reduction units is proportional to the net energy reduction due to the CDM Project. Measurement devices having good accuracy and procured from reputed manufacturers have been installed at site for the purpose of monitoring the various parameters of the Project. Since the reliability of the monitoring system is governed by the accuracy of the measurement system and the quality of the equipment for reproducibility, all instruments are calibrated as per the planned frequency for ensuring reliability of the system.

Emergency preparedness plan

Identify potential hazardous and emergency situations for the activities of different areas in consultation with the concerned heads/ managers. Make all concerned personnel aware of all the aspects & conditions that may lead to emergency situations. In the onsite emergency plan all the emergency conditions, preparedness and

response plan is described. Since the project activity does not result in any unidentified activity that can result in unpredicted and significant emissions from the project activity. Hence no major need is envisaged for emergency preparedness in data monitoring

Reporting procedures

The various measurements that need to be observed and recorded are identified as provided Section B of the PDD. Monthly reports are prepared stating the generation. In addition to the records maintained by the GSIL, APTRANSCO also monitors the power exported to the grid and certify the same. The data would be thus registered into softcopies for recording purposes.

Procedures for internal audit of GHG project compliance

A team consisting of experienced personnel is constituted for the Internal CDM Audit, who conducts yearly Audit. Wherever required the assistance from the CDM PDD consultants will be sought.

The internal audit and team reviews all the records pertaining to power generation, power exported, checking monitoring equipments for accuracy and whether calibration was performed. The manager in association with the Supervisor shall answers all the queries raised by the internal audit team. The internal audit team produces an audit report providing details of concerns that need to be attended to immediately before actual verification by the external verifier.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data/Parameter	$EF_{grid,OM,y}$
Unit	tCO_2e/MWh
Description	Simple operating Margin CO2 emission factor of the Southern regional grid
Source of data	Central Electricity Authority (CEA): "CO_2 Baseline Database", Version 05, November 2009. http://www.cea.nic.in/planning/c%20and%20e/government%20of%20india%20website.htm
Value(s) applied	0.9867 (Ex-ante)
Purpose of data	CEA has estimated the simple operating margin for the three years before the second crediting period. As per the tool the average need to be considered to fix the emission factor ex ante. Weight of 25% has been considered as 'Tool to calculate the emission factor for an electricity system' for the operating margin.
Additional comment	The operating margin emission factor has been fixed for the second crediting period.

Data/Parameter	$EF_{grid,BM,y}$
Unit	tCO_2e/MWh
Description	Build Margin CO2 emission factor of the Southern regional grid
Source of data	Central Electricity Authority (CEA): "CO_2 Baseline Database", Version 05, November 2009. http://www.cea.nic.in/planning/c%20and%20e/government%20of%20india%20website.htm
Value(s) applied	0.82 (Ex-ante)
Purpose of data	CEA has estimated the build margin for the last year (2008-2009). Weight of 75% has been considered as 'Tool to calculate the emission factor for an electricity system' for the build margin.
Additional comment	The build margin emission factor has been fixed for the second crediting period.

Data/Parameter	NCV_{diesel}
Unit	GJ/ton
Description	Net calorific value of diesel
Source of data	"Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" & **IPCC** 2006 default values. Volume 2, Chapter 1: Introduction.
Value(s) applied	43
Purpose of data	As per "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", NCV_{diesel} is required to calculate the CO2 emission factor of diesel (i.e, $COEF_{diesel}$) and thereafter project emissions from diesel consumption. Since the data on NCV_{diesel} from neither the supplier nor its measurement procedures are available with PP, also there are no regional or national default values publicly available. IPCC 2006 default value is used as data source. NCV_{diesel} is 43GJ/ton value taken from IPCC 2006 default values. Volume 2, Chapter 1: Introduction. Any future revision of the IPCC Guidelines should be taken into account as per the tool.
Additional comment	Data archived for Crediting period + 2 yrs

Data/Parameter	EF_{diesel} / $EF_{CO2,i,y}$
Unit	tCO_2/GJ
Description	CO_2 emission factor of diesel
Source of data	"Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" & **IPCC** 2006 default values. Volume 2, Chapter 1: Introduction.
Value(s) applied	0.0748
Purpose of data	As per "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", EF_{diesel} is required to calculate the CO2 emission factor of diesel (i.e, $COEF_{diesel}$) and thereafter project emissions from diesel consumption. Since the data on EF_{diesel} from neither the supplier nor its measurement procedures are available with PP, also there are no regional or national default values publicly available. IPCC 2006 default value is used as data source. EF_{diesel} is the CO2 emission factor of diesel 74.8 tCO2/TJ value taken from IPCC 2006 default values. Volume 2, Chapter 1: Introduction. Any future revision of the IPCC Guidelines should be taken into account as per the tool.
Additional comment	Data archived for Crediting period + 2 yrs

D.2. Data and parameters monitored

Data/Parameter	$EG_{BL,y}$
Unit	MWh
Description	Net electricity supplied to the grid by the project activity
Measured/Calculated /Default	Calculated
Source of data	Monthly joint meter readings
Value(s) of monitored parameter	84449
Monitoring equipment	-
Measuring/Reading/ Recording frequency	Measuring Frequency: Hourly Recording Frequency: Monthly
Calculation method (if applicable)	The Net electricity supplied to the grid by the project activity is calculated as: $EG_{BL,y}$ = (Electricity exported to the grid after meeting captive & auxiliary power requirements) – (Electricity Import from the grid). Total units exported to the grid and imported from the grid are measured by energy meters installed at APTRANSCO substation on 24th day of every month[1] and recorded by representatives of APTRANSCO (Grid operator) and project proponent (GSIL in a monthly Joint Meter Reading (JMR). The Net electricity supplied to the grid by the project activity ($EG_{BL,y}$) only be considered for CERs calculation purpose.
QA/QC procedures	Since this is a calculated value QA/QC procedures are not applicable
Purpose of data	This data is used to calculate the baseline emissions
Additional comment	Data is archived electronically and on paper. Archived data will be kept during the crediting period plus 2 years or the last issuance of CERs for this project activity, whichever occurs later

[1] Metering Date is subjected to the standards of the Agreement made with APTRANSO (as per the directions of Andhra Pradesh Electricity Regulatory Commission, Govt of AP).

<table>
<tr><td>Data/Parameter</td><td>$EG_{export,y}$</td></tr>
<tr><td>Unit</td><td>MWh</td></tr>
<tr><td>Description</td><td>Electricity exported to the grid after meeting captive & auxiliary power requirements during the year y</td></tr>
<tr><td>Measured/Calculated /Default</td><td>Measured</td></tr>
<tr><td>Source of data</td><td>Monthly joint meter readings</td></tr>
<tr><td>Value(s) of monitored parameter</td><td>86137</td></tr>
<tr><td>Monitoring equipment</td><td>Power export to grid is measured by energy meters installed at APTRANSCO substation on 24th day of every month. A monthly Joint Meter Reading (JMR) for the energy exported to the Grid is recorded by representatives of APTRANSCO (Grid operator) and project proponent (GSIL). The Net electricity supplied to the grid by the project activity ($EG_{BL,y}$) only be considered for CERs calculation purpose.
<table>
<tr><th>Description</th><th>Serial Number</th><th>Date of last calibration</th><th>Calibration Validity</th></tr>
<tr><td rowspan="3">Check meter
Make: L&T
Type: ER 300P
Accuracy: Class 0.2S
Calibration freq: 1 year</td><td>03148278</td><td>04/07/2011</td><td>04/07/2012</td></tr>
<tr><td>01999438</td><td>26/07/2010</td><td>26/07/2011</td></tr>
<tr><td>03148278</td><td>11/08/2009</td><td>11/08/2010</td></tr>
<tr><td rowspan="3">Main meter
Make: L&T
Type: ER 300P
Accuracy: Class 0.2S
Calibration freq: 1 year</td><td>01959480</td><td>04/07/2011</td><td>04/07/2012</td></tr>
<tr><td>01959478</td><td>26/07/2010</td><td>26/07/2011</td></tr>
<tr><td>01959480</td><td>11/08/2009</td><td>11/08/2010</td></tr>
</table></td></tr>
<tr><td>Measuring/Reading/ Recording frequency</td><td>Measuring Frequency: Hourly
Recording Frequency: Monthly</td></tr>
<tr><td>Calculation method (if applicable)</td><td>-</td></tr>
<tr><td>QA/QC procedures</td><td>This is cross checked with the bills raised by the company as well as the payment details by the grid operator as the Net electricity supplied to the grid by the project activity ($EG_{BL,y}$) only be considered for CERs calculation purpose.
Meters based with best accuracy procured from reputed manufacturers are calibrated to national standards. Recalibration frequency is either subject to appropriate intervals according to manufacturer specifications or with a minimum frequency of once a year</td></tr>
<tr><td>Purpose of data</td><td>This data is used to calculate the baseline emissions</td></tr>
<tr><td>Additional comment</td><td>Data is archived electronically and on paper. Archived data will be kept during the crediting period plus 2 years or the last issuance of CERs for this project activity, whichever occurs later</td></tr>
</table>

<table>
<tr><td>Data/Parameter</td><td>$EG_{import,y}$</td></tr>
<tr><td>Unit</td><td>MWh</td></tr>
<tr><td>Description</td><td>Electricity import from grid to the project activity during the year y</td></tr>
<tr><td>Measured/Calculated /Default</td><td>Measured</td></tr>
<tr><td>Source of data</td><td>Monthly joint meter readings</td></tr>
<tr><td>Value(s) of monitored parameter</td><td>1688</td></tr>
<tr><td>Monitoring equipment</td><td>Power imported from the grid is measured by energy meters installed at APTRANSCO substation on 24th day of every month. A monthly Joint Meter Reading (JMR) for the energy imported from the Grid is recorded by representatives of APTRANSCO (Grid operator) and project proponent (GSIL). The Net electricity supplied to the grid by the project activity ($EG_{BL,y}$) only be considered for CERs calculation purpose.
<table>
<tr><th>Description</th><th>Serial Number</th><th>Date of last calibration</th><th>Calibration Validity</th></tr>
<tr><td rowspan="3">Check meter
Make: L&T
Type: ER 300P
Accuracy: Class 0.2S
Calibration freq: 1 year</td><td>03148278</td><td>04/07/2011</td><td>04/07/2012</td></tr>
<tr><td>01999438</td><td>26/07/2010</td><td>26/07/2011</td></tr>
<tr><td>03148278</td><td>11/08/2009</td><td>11/08/2010</td></tr>
<tr><td rowspan="3">Main meter
Make: L&T
Type: ER 300P
Accuracy: Class 0.2S
Calibration freq: 1 year</td><td>01959480</td><td>04/07/2011</td><td>04/07/2012</td></tr>
<tr><td>01959478</td><td>26/07/2010</td><td>26/07/2011</td></tr>
<tr><td>01959480</td><td>11/08/2009</td><td>11/08/2010</td></tr>
</table></td></tr>
<tr><td>Measuring/Reading/ Recording frequency</td><td>Measuring Frequency: Hourly
Recording Frequency: Monthly</td></tr>
<tr><td>Calculation method (if applicable)</td><td>-</td></tr>
<tr><td>QA/QC procedures</td><td>This is cross checked with the bills raised by the company as well as the payment details by the grid operator as the Net electricity supplied to the grid by the project activity ($EG_{BL,y}$) only be considered for CERs calculation purpose.
Meters based with best accuracy procured from reputed manufacturers are calibrated to national standards. Recalibration frequency is either subject to appropriate intervals according to manufacturer specifications or with a minimum frequency of once a year
Accuracy: Class 0.2
Uncertainty level: Low</td></tr>
<tr><td>Purpose of data</td><td>This data is used to calculate the baseline emissions</td></tr>
<tr><td>Additional comment</td><td>Data is archived electronically and on paper. Archived data will be kept during the crediting period plus 2 years or the last issuance of CERs for this project activity, whichever occurs later</td></tr>
</table>

Data/Parameter	$B_{Biomass,y}$
Unit	Tons
Description	Quantity of bagasse used in the project activity
Measured/Calculated /Default	Estimated
Source of data	Plant Records
Value(s) of monitored parameter	230899
Monitoring equipment	-
Measuring/Reading/ Recording frequency	Measuring & Recording Frequency: Yearly Estimated based on cane crushed, steam generation, bagasse production, open stock bagasse and closed stock bagasse etc
Calculation method (if applicable)	-
QA/QC procedures	Since this is a calculated value QA/QC procedures are not applicable
Purpose of data	Value of data is not used for calculating expected emission reductions
Additional comment	Data is archived electronically and on paper. Archived data will be kept during the crediting period plus 2 years

Data/Parameter	$NCV_{bagasse}$
Unit	GJ/ton
Description	Net calorific value of bagasse used in the project activity
Measured/Calculated /Default	Measured
Source of data	Plant Records
Value(s) of monitored parameter	7.6 GJ/ton 1815.55 (Value is based on Laboratory test)
Monitoring equipment	The Net Calorific Value of Bagasse on dry basis is measured in Laboratory (in Kcal/kg) by conducting laboratory test on annual basis according to national standards and is converted to GJ/ton as required by the methodology

$NCV_{bagasse}$(KCal/Kg)	Date of testing	Applicable period
1813.1	19/01/2011	Season 2010-11
1818.0	04/01/2012	Season 2011-12

Measuring/Reading/ Recording frequency	Measuring & Recording Frequency: Yearly
Calculation method (if applicable)	-
QA/QC procedures	The consistency of the measurements is checked by comparing the measurement results with measurements from previous years. Testing laboratory comply with national quality standards. Laboratory test is conducted periodically once in a year.
Purpose of data	Value of data is not used for calculating emission reductions.
Additional comment	-

Data/Parameter	$Moisture_{bagasse}$
Unit	%
Description	Moisture content of bagasse used in the project activity
Measured/Calculated /Default	Measured
Source of data	Plant Records
Value(s) of monitored parameter	49.75% (Value is based on Laboratory test)
Monitoring equipment	The moisture content of bagasse used in the project activity is determined as per authorised laboratory test report.

$Moisture_{bagasse}$	Date of testing	Applicable period
49.80%	19/01/2011	Season 2010-11
49.70%	04/01/2012	Season 2011-12

Measuring/Reading/ Recording frequency	Measuring Frequency: Monthly Recording Frequency: Yearly (The weighted average shall be calculated for each monitoring period as per the applied methodology)
Calculation method (if applicable)	-
QA/QC procedures	Calibration frequency is either subject to appropriate intervals according to industry standards or with a minimum frequency of once a year
Purpose of data	Value of data is not used for calculating emission reductions
Additional comment	-

<table>
<tr><td>Data/Parameter</td><td>$FC_{i,j,y}$ (Diesel)</td></tr>
<tr><td>Unit</td><td>Litres</td></tr>
<tr><td>Description</td><td>Quantity of diesel consumed in DG set for electricity generation used by project activity</td></tr>
<tr><td>Measured/Calculated /Default</td><td>Measured</td></tr>
<tr><td>Source of data</td><td>Plant Records</td></tr>
<tr><td>Value(s) of monitored parameter</td><td>2980</td></tr>
<tr><td>Monitoring equipment</td><td>Diesel in DG set is used only for emergency purposes (trail runs to maintain its running condition) and not for the power generation purpose in the project activity. The diesel quantity and source are maintained at the point of entry by stores department. Diesel once received by stores department is issued to DG set department as and when required. Stores department maintains receipt, issue data everyday in excel sheet and takes issue slips from DG set department for the issued Quantity. The amount of diesel consumed by DG set is measured by using a level measuring gauge in the tank continuously and the same is cross verified with the issue slips
<table>
<tr><th colspan="3">DIESEL TANK LEVEL GUAGE CALIBRATION DETAILS</th></tr>
<tr><th>Sl.No</th><th>Calibration Date</th><th>Calibration Validity</th></tr>
<tr><td>1</td><td>05/06/2009</td><td>04/06/2010</td></tr>
<tr><td>2</td><td>02/06/2010</td><td>01/06/2011</td></tr>
<tr><td>3</td><td>30/05/2011</td><td>29/05/2012</td></tr>
<tr><td>4</td><td>28/05/2012</td><td>27/05/2013</td></tr>
</table></td></tr>
<tr><td>Measuring/Reading/ Recording frequency</td><td>Measuring Frequency: Continuously
Recording Frequency: Daily</td></tr>
<tr><td>Calculation method (if applicable)</td><td>-</td></tr>
<tr><td>QA/QC procedures</td><td>The measuring equipment is calibrated at least once a year. The consumption of diesel can be cross checked with the log books to find whether DG set is used for power generation. Mostly diesel is used in the DG sets for keeping them in better running condition and rarely diesel may be used for emergency purposes, the amount of electricity generation from the DG set and corresponding diesel consumption for electricity generation is monitored.</td></tr>
<tr><td>Purpose of data</td><td>Data is used to estimate project emissions</td></tr>
<tr><td>Additional comment</td><td>-</td></tr>
</table>

D.3. Implementation of sampling plan

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Not Applicable

SECTION E. Calculation of emission reductions or GHG removals by sinks
E.1. Calculation of baseline emissions or baseline net GHG removals by sinks
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As per Paragraph 17 of approved methodology AMS.I.C, the baseline emissions for supply of electricity to and/or displacement electricity from a grid shall be calculated as per the procedures detailed in AMS-I.D.

As per AMS I.D version 16, Paragraph 11 states that "The baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor"

$BE_y = EG_{BL,y} * EF_{CO2,grid,y}$

Where:

BE_y	Baseline Emissions in year *y*; t CO2
$EG_{BL,y}$	Energy baseline in year *y*; kWh
$EF_{CO2,grid,y}$	Emission Factor in year y; t CO2e/kWh

Energy baseline ($EG_{BL,y}$) is the net electricity produced by the renewable generating unit delivered to the grid by the project that otherwise would have been generated by the operation of grid connected fossil fuel power plants.

The Emission Factor ($EF_{CO2,grid,y}$) Is the CO2 grid emission factor. For this project activity, the combined margin baseline emission factor value for the southern regional grid has been directly adopted from the CEA database. EF_{CO2}=0.86167 tCO/MWh

Simple OM emission factor has been sourced from the most recent data available at the time of submission of the PDD for renewal and has therefore been fixed for the crediting period.

Simple Operating Margin (tCO2/MWh)[2] (incl. Imports)				
Region	2006-07	2007-08	2008-09	Average of last three years
South	1	0.99	0.97	0.9867

The Build Margin emission factor has been fixed ex ante for the second crediting period.

Build Margin (tCO2/MWh)[3] (not adjusted for imports)	
	2008-09
South	0.82

Combined Margin: The combined margin emissions factor is calculated as follows:

As per step 7 of "Tool to calculate the emission factor an electricity system" The following default values should be w_{OM} = 0.25 and w_{BM} =0.75 for the second and third crediting period

Therefore, The Grid emission factor will be:

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

$EF_{grid,OM,y}$ (tCO2/MWh)	w_{OM}	$EF_{grid,BM,y}$ (tCO2/MWh)	w_{BM}	$EF_{grid,CM,y}$ (tCO2/MWh)
0.9867	0.25	0.82	0.75	0.86167

$BE_y = EG_{BL,y}(MWh) * EF_{CO2,grid,y}(tCO2/MWh)$

$BE_y = 84449 * 0.86167 = 72767$ tCO2s

E.2. Calculation of project emissions or actual net GHG removals by sinks

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As per paragraph 35 of the AMS.I.C version 17 methodology, Project emissions include:

- CO2 emissions from on-site consumption of fossil fuels due to the project activity shall be calculated using the latest version of "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"
- CO2 emissions from electricity consumption by the project activity using the latest version of "Tool to calculate baseline, project and/or leakage emissions from electricity consumption"
- Any other significant emissions associated with project activity within the project boundary;

According to the operation of the project activity the following is the only source for the project emissions:

CO_2 emissions from on-site consumption of fossil fuels due to the project activity shall be calculated using the latest version of "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"

The project activity is renewal based electricity generation and can only fire bagasse as fuel (The local regulation also constraint use of fossil fuels for the bagasse based co-gen system implemented in sugar industry) and the emission reductions are calculated based on the net electricity supplied to the grid. Since it is not a co-fired plant the amount of fossil fuel input to the project activity need not to be monitored.

Fossil fuel combustion (diesel) in standby DG sets during trial runs and maintenance activities only (not for power generation purpose in the project activity) is included as a monitoring parameter. The consumption records of Diesel in DG set for maintenance purposes can be cross checked with the log books and purchase records. If diesel is consumed for the project activity, the project emissions from the same are calculated as below:

For the project activity, since the CO_2 emissions from fossil fuel combustion are only from diesel consumption for electricity generation. The above formula can henceforth be referred as:

$PE_y = FC_{diesel} \times COEF_{diesel}$

Where :

PE_y	Are the CO_2 emissions from diesel consumption during the year y (tCO_2/yr);
FC_{diesel}	Is the quantity of diesel consumed in process during the year y (tons/yr), which equals to the Quantity of diesel consumed in litres/yr times the density of diesel (ρ_{diesel}) in kg/lit and divide by 1000 kg/ton to convert the unit of FC_{diesel} to tons/yr.
$COEF_{diesel}$	Is the CO_2 emission coefficient of diesel in year y (tCO_2/ton). $COEF_{diesel}$ is based on Option B of "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion". $COEF_{diesel} = NCV_{diesel} \times EF_{CO2,\ diesel}$

Option A for calculating the CO_2 emission coefficient is not used, as the necessary data is not available since the approach is based on the chemical composition of the fossil fuel type. Hence the preferred approach is Option B of "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", Version 02, to calculate the CO_2 emission coefficient ($COEF_{i,y}$)

Therefore, Project emissions due to diesel consumption for electricity generation (PE_y) can be calculated finally as follows:

$PE_y = FC_{diesel} \times NCV_{diesel} \times EF_{CO2, diesel}$

Where:

FC_{diesel} Is the quantity of diesel consumed in process during the year y (tons/yr),

NCV_{diesel} Is net calorific value of the diesel (GJ/ton)

$EF_{CO2, diesel}$ Is the CO_2 emission factor of diesel in year y (tCO_2/GJ)

PE_y (tCO2)	FC_{diesel} (tonnes)	NCV_{diesel} (GJ/ton)	EF_{diesel} / $EF_{CO2,i,y}$ (tCO2/GJ)
7.96	2.47	43	0.0748

E.3. Calculation of leakage

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As per the guidance by the latest methodology AMS.I.C.Version 17, Para 37 states that "If the energy generating equipment currently being utilised is transferred from outside the boundary to the project activity, leakage is to be considered". No leakage emissions are considered for the proposed project activity since no energy generating equipment is from outside the boundary to the project activity transferred from another activity and/or the existing equipment is transferred to another activity.

Further Para 38 states that "In case collection/processing/transportation of biomass residues is outside the project boundary CO2 emissions from collection/processing/transportation (If biomass residues are transported over a distance of more than 200 kilometers due to the implementation of the project activity then this leakage source attributed to transportation shall be considered, otherwise it can be neglected) of biomass residues to the project site". The biomass used in the project activity is the mill generated bagasse available within the project premises. Collection/processing/transportation of bagasse is within the sugar plant and not outside the project boundary. Hence no leakage sources are considered and CO2 emissions from same are zero.

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

Time Period	Baseline emissions or baseline net GHG removals by sinks (tCO_2e)	Project emissions or actual net GHG removals by sinks (tCO_2e)	Leakage (tCO_2e)	Emission reductions or net anthropogenic GHG removals by sinks (tCO_2e)
Total	72767	7.96	0	72759

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (tCO_2e)	116,613 tCO2e	72,759 tonnes CO2e

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

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Emission Reduction value estimated in ex-ante calculation of registered PDD is 46,980 tCO2e per annum, whereas the estimated emission reduction from this monitoring period for 906days is 116,613 tCO2e. Actual achieved emission reduction by this project during the same period is 72,759 tCO2e. The net emission reduction for the reported period is 37.6% less than the estimated in the registered PDD. This difference has occurred due to less availability of sugar cane during 2010 and hence the project activity couldn't generate the estimated power. Therefore, less amount of power has been exported to the grid which resulted in lower number of emission reductions from project activity.

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History of the document

Version	Date	Nature of revision
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	EB 54, Annex 34 28 May 2010	Initial adoption.
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