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

## CONTENTS



* as contained within the document entitled "Guidelines for completing the monitoring report form (CDM-MR)" (EB 54 meeting report, annex 34).

**MONITORING REPORT**
**Version 01 dated 13/10/2010**
**Chambal Power Limited's (CPL) proposed 7.5 MW biomass based power project at Rangpur, Kota District, Rajasthan, India**
**Reference Number: 0347**
**Sixth Monitoring Report for the Project activity: 01/02/2010 to 30/09/2010 (Both days Included)**

## SECTION A. General description of the project activity

### A.1. Brief description of the project activity: >>

>>

A brief description of the registered CDM project activity UN0347 "Chambal Power Limited's (CPL) proposed 7.5 MW biomass based power project at Rangpur, Kota District, Rajasthan, India" is as provided below.

1) **Purpose of Project Activity:**

Suryachambal Power Limited has established a biomass based gird connected power plant at village Rangpur, Kota district, Rajasthan, India. The main purpose of the project is to generate and export eco friendly biomass generated power to the Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL), which is a Transmission company of the Rajasthan State Electricity Board (RSEB) and a part of the North East Western North Eastern Gird (NEWNE) formerly known as Northern Regional Electricity Board (NREB). CPL has implemented a modern 7.5 MW Power Project based on mustard husk and stalks, corn cobs, bagasse and other available agricultural wastes as fuel. The project exports surplus power to RRVPNL after meeting the in-house auxiliary demand.

2) **Technology Employed:**

The power plant is based on Rankine Cycle. The steam generator is designed to operate on any biomass like mustard and soya husk and stalks, corncobs and bagasse to ensure consistent plant efficiency. One 35 TPH, 67 kg/cm2, 450 +/- 5°C high pressure boiler and a single bleed cum condensing steam turbine generator (STG) of 7.5 MW capacity are installed at the plant site. The 35 TPH of steam from boiler is fed into condensing turbine. The boiler is of fluidized bed combustion (FBC) type and will have the advantages of high thermal and combustion efficiency reducing quantity of husk needed, to a minimum, automatic operation for consistent high efficiencies and reduced need for manpower. Steam turbine of fully condensing mode with suitable alternator generator is installed for generating electricity. The turbine will be single cylinder, single exhaust fully condensing type, designed for high operating efficiencies and maximum reliability. Along with the new 35-TPH boiler and the 7.5-MW turbo-generator (TG), the other auxiliary units of the plant would include: fuel handling system with storage and processing arrangements; ash handling system; air pollution control devices; cooling water system and cooling tower; de-mineralized (DM) water plant; compressed air system; fire protection system; air conditioning and ventilation; complete electrical system for power plant and grid interconnection including power evacuation, instrumentation and control systems etc.

3) **Relevant dates for Project Activity:**

The Construction Activity of this project was started in 2004 and subsequently the Plant was commissioned on 31st March 2006 when the power generated by the unit was fed to the RVPNL Grid. This power plant is under operation 31st March 2006 onwards round the year. Relevant dates for the project activity are mentioned as below:
Project Commissioned: 31/03/2006
CDM Registration date: 08/05/2006
1st Monitoring Period: 01/03/2006 to 30/06/2007
2nd Monitoring Period: 01/07/2007 to 31/12/2007
3rd Monitoring Period: 01/01/2008 to 31/08/2008
4th Monitoring Period: 01/09/2008 to 31/03/2009
5th Monitoring Period: 01/04/2009 to 31/01/2010
6th Monitoring Period: 01/02/2010 to 30/09/2010 (Current One)

4) **Emission Reductions for the monitoring period:**

The total actual emission reductions achieved in this monitoring period (01/02/2010 to 30/09/2010) are 24508 tCO2e.

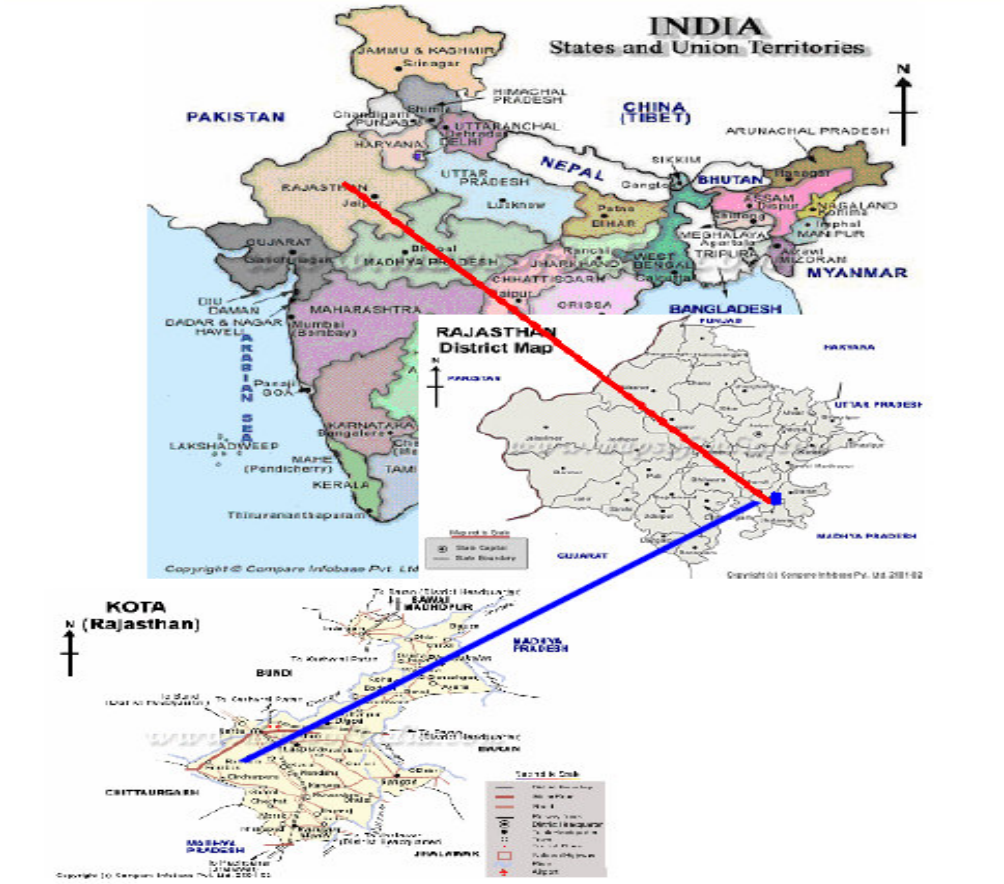
## A.2. Project Participants

- Suryachambal Power Limited, India
- EcoSecurities Capital Ltd., United Kingdon of Great Britain and Northern Ireland
- EcoSecurities Capital Ltd., Switzerland
- Effinergy Trading Ltd., Switzerland
- Bunge Emissions Fund Limited, Tortola, British Virgin Island

## A.3. Location of the project activity:

>>

The project is located at Rangpur village area of Kota District, Rajasthan State, India, which is about 8 km from Kota railway station towards north direction and about 1 km south of village Rangpur. The latitude & longitude of the site are 25°16'36'' North & 75°56'22'' East. The location map is as follows:



## A.4. Technical description of the project

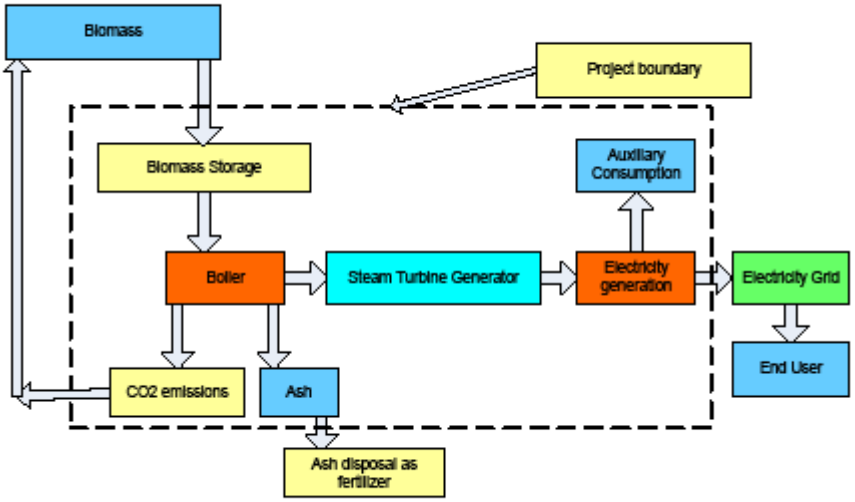
>>

The power plant is based on Rankine Cycle. The steam generator is designed to operate on any biomass like mustard and soya husk and stalks, corncobs and bagasse to ensure consistent plant efficiency even in times of biomass efficiency, if any. There will be one 35 TPH, 67 kg/cm2, 450 +/- 5°C high pressure boiler and a single bleed cum condensing steam turbine generator (STG) of 7.5 MW capacity.

The 35 TPH of steam from boiler will be fed into condensing turbine. The boiler will be of fluidized bed combustion (FBC) type and will have the advantages of high thermal and combustion efficiency reducing quantity of husk needed, to a minimum, automatic operation for consistent high efficiencies and reduced need for manpower.

Steam turbine of fully condensing mode with suitable alternator generator will be installed for generating electricity. The turbine will be single cylinder, single exhaust fully condensing type, designed for high operating efficiencies and maximum reliability.

Along with the new 35-TPH boiler and the 7.5-MW turbo-generator (TG), the other auxiliary units of the plant would include: fuel handling system with storage and processing arrangements; ash handling system; air pollution control devices; cooling water system and cooling tower; de-mineralized (DM) water plant; compressed air system; fire protection system; air conditioning and ventilation; complete electrical system for power plant and grid interconnection including power evacuation, instrumentation and control systems etc.
A pictorial representation of the technical process is provided as below.




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

The approved baseline and monitoring methodology applied to the project activity is: *"Grid connected renewable electricity generation", AMS 1D. (Version 7) dated 27th November 2005.*

## A.6. Registration date of the project activity:

8th May 2006

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

01 Mar 06 - 28 Feb 13 (Renewable)

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

Mr. S. R. Wagle
Director,
Suryachambal Power Limited
82, Veer Nariman Road
7, Nagin Mahal, Churchgate, Mumbai
Maharashtra – 400020
Phone: +91 – 22 – 22874323/ 22850341, FAX: +91 – 22 – 22046206
Email: Power@chambalpower.com

## SECTION B. Implementation of the project activity

### B.1. Implementation status of the project activity

>>

The project was started on 01/03/2004 and commissioned on 31st March 2006. The power generated and commissioning date was dispatched to the Grid and the plant is in continuous in operation since then.

1. There is only one project site for the project activity, the project activity has been fully implemented and commissioned. The start date of operation of the project activity is 31st March 2006, when the project started exporting electricity to the grid.
2. The down time considered for similar unit is about 35 days in a year as about 20 days required for annual inspection of Boiler and upgrading the equipments and maintenance. Another 15 days of stoppage are considered due to sudden machinery breakdown, Grid related problem.

**Plant Performance during the period 01/02/2010 to 30/09/2010**

| Month | Shut down time (hrs) |
|---|---|
| February-10 | 141.25 |
| March-10 | 142.20 |
| April-10 | 110.30 |
| May-10 | 343.55 |
| June-10 | 158.35 |
| July-10 | 83.50 |
| August-10 | 92.15 |
| September | 159.20 |
| **Total** | **1,231** |

We have not so far observed any abnormality till date, which may affect the applicability of the applied methodology. No event or situation has occurred during the monitoring period, which may impact the applicability of the methodology.

### B.2. Revision of the monitoring plan

>>

Monitoring Plan is revised during second verification of the project activity and same has been approved by CDM Executive Board on 10/08/2008. The registered monitoring plan was revised to include grid emission factor as ex-post monitoring parameter in monitoring plan.

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

>>

Not Applicable

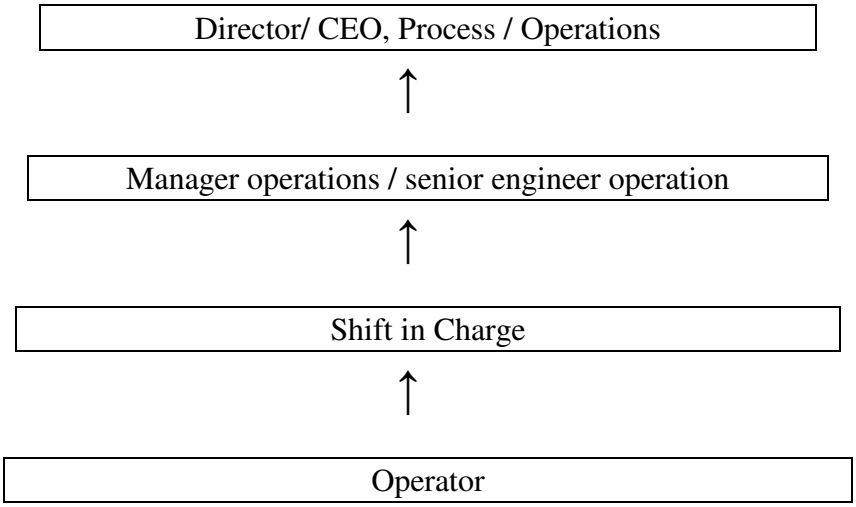
### B.4. Notification or request of approval of changes

>>

Not Applicable

## SECTION C. Description of the monitoring system

The Following structure of monitoring and reporting-




**Role and responsibility:-**

**1)** Director/ CEO, Process / Operations:-

Decision on the contents of the training program
Ensuring implementation of monitoring procedures
Internal audit and project conformance review

2) Manager operations / senior engineer operation:-

Organizing and conduct training program
Implementing all monitoring control procedure
Association with Manager QA toward maintenance and calibration of monitoring equipment
Has the overall responsibility for record handling and maintenance
Reviewing of records and dealing with monitoring data
Organizing internal audit for checking the data recorded
Has the overall responsibility for closing project non conformance and Implementing Corrective actions before the verification

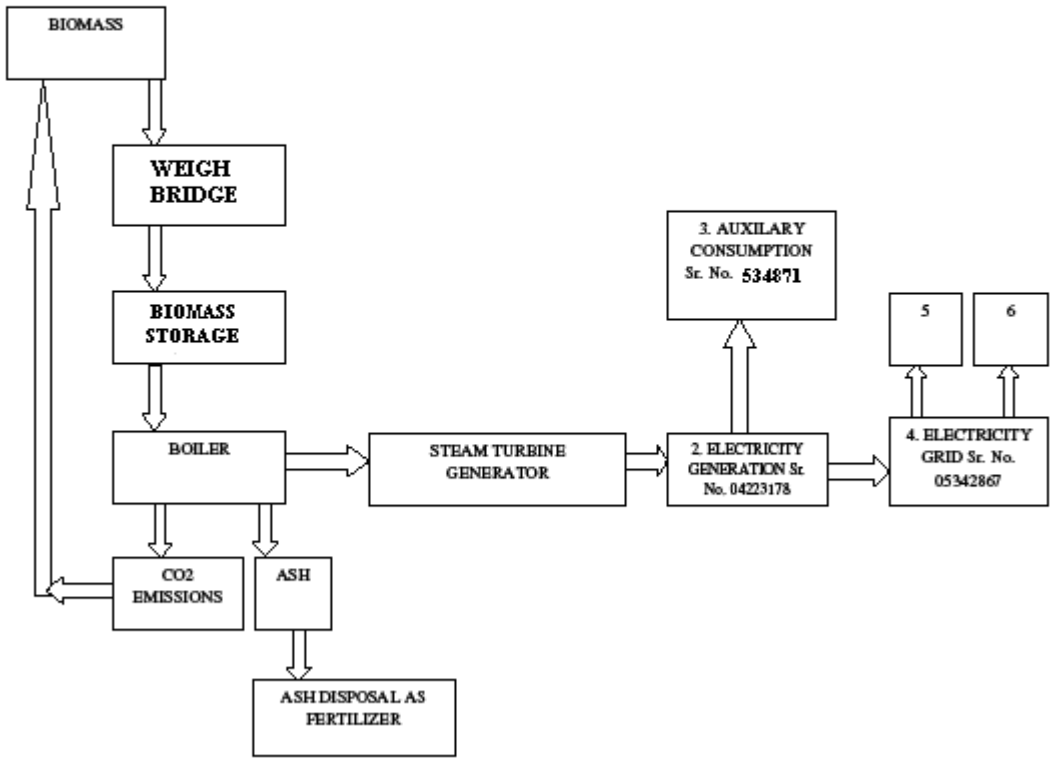
3) Shift In charge:-

Supervision and training the operators and maintaining training records
Has the overall responsibility of monitoring measurement and reporting
Will assist the Manager Operations in record handling, record checks and review during internal audit
Check the data recorded by the operation in the individual sections as described in section D.3 under tables 3a and 3b respectively

4) Operator:-

The responsibility of operator to record appropriate data of the project activities represented in the monitoring table. Based on the monitoring frequency, the operator will measure and record the data in the logbook as per the instruction of his supervisor. The operational procedures for the training ,emergency preparedness, maintenance and calibration of monitoring equipment, monitoring measurements and reporting, record handling and maintenance , reviewing monitoring data, internal audit, performance reviews and corrective action are available at the plant.

**A pictorial representation of the location of the monitoring equipment involved in project activities: -**




**Monitoring Equipment Calibration Details**

| S.No. | Details of Meter | Sr. No. of Meter | Date of Calibration |
|---|---|---|---|
| 1 | Weigh Bridge | 272 | 05/03/2010 |
| 2 | Generation Meter | 04223178 | 12/08/2010 |
| 3 | Auxiliary * Consumption Meter | 5342871 | 12/08/2010 |
| 4 | Export Meter (Plant) | 05342867 | 12/08/2010 |
| 5 | Export Meter, Main (GSS) | 5294806 | 12/08/2010 |
| 6 | Export Meter, Check (GSS) | 5293314 | 12/08/2010 |

* The Auxiliary Consumption meter change during the monitoring period as the old one was damaged. The new meter is same in make and accuracy class as previous meter. Sr. No. of previous meter was 05-10-UNI-117 and Sr. No. of New Meter is 534871.

## 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 |
|---|
| (Copy this table for each data and parameter. To report multiple values, a table may be used) |

| Data / Parameter: | **Density of fuel** |
|---|---|
| Data unit: | **Kg/Litre** |
| Description: | Here fuel is referred to diesel which being consumed while biomass transporting to the project site. |
| Source of data used: | Paper |
| Value(s) : | 0.89 |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | Leakage emission calculations |
| Additional comment: | Density of fuel (Diesel) had been measured in house laboratory through sample testing. This parameter will be fixed through out crediting period. |

| Data / Parameter: | **Capacity of vehicle** |
|---|---|
| Data unit: | **MT** |
| Description: | This parameter referred to capacity of the vehicle being used for transportation of biomass to the project site. |
| Source of data used: | Paper |
| Value(s) : | Truck 10 MT and Trolley 3.5 MT |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | Leakage emission calculations |
| Additional comment: | This parameter indicates capacity of the vehicle transporting biomass to be project site and it will be fixed for through out crediting period. |

| Data / Parameter: | **Coal Caloric Value** |
|---|---|
| Data unit: | **Kcal/Kg** |
| Description: | This parameter referred to calorific value of fossil fuel ( Coal) used if any |
| Source of data used: | Paper |
| Value(s) : | - |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | Leakage emission calculations |
| Additional comment: | Not applicable as no fossil fuel ( Coal) is used since start of the project activity as well as in current monitoring period. |

| **D.2. Data and parameters monitored** | |
|---|---|
| | |
| **Data / Parameter:** | **Total electricity generated** |
| Data unit: | **kWh** |
| Description: | This parameter referred to electricity generation from the project activity measured in plant premises. |
| Measured /Calculated /Default: | Measured |
| Source of data: | Log book record ( Electronically archived) |
| Value(s) of monitored parameter: | 33726200 |
| 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) | Monitoring equipment – Energy Meter<br>Type- ER300P<br>Accuracy class- 0.2<br>Serial number- 4223178<br>Calibration frequency- Annual<br>Date of last calibration – 12/08/10 |

| | |
|---|---|
| | Validity- Till 12/08/11 |
| Measuring/ Reading/ Recording frequency: | Measured – Shift wise |
| Calculation method (if applicable): | - |
| QA/QC procedures applied: | ISO 9001 or similar type of system will be used and the same procedure are available at the project site, this data is being continuously monitored through DCS |

| | |
|---|---|
| **Data / Parameter:** | **Auxiliary Consumption** |
| Data unit: | **kWh** |
| Description: | This parameter referred to electricity Auxiliary Consumption by the project activity measured in plant premises. |
| Measured /Calculated /Default: | Measured |
| Source of data: | Log book record ( Electronically archived) |
| Value(s) of monitored parameter: | 3291803 |
| 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) | Monitoring equipment – Energy Meter<br>Type- ER300P<br>Accuracy class- 0.5<br>Serial number- 5342871<br>Calibration frequency- Annual<br>Date of last calibration – 12/08/10<br>Validity- Till 12/08/11 |
| Measuring/ Reading/ Recording frequency: | Measured - Shift wise |
| Calculation method (if applicable): | - |
| QA/QC procedures applied: | ISO 9001 or similar type of system will be used and the same procedure are available at the project site, this data is being continuously monitored through DCS |
| | |
| **Data / Parameter:** | **Power Export** |
| Data unit: | **kWh** |
| Description: | This parameter referred to electricity Export to the grid by the project activity and it is being measured at RRVPNL |
| Measured /Calculated /Default: | Measured |
| Source of data: | Joint Meter Reading ( Electronically archived) |
| Value(s) of monitored parameter: | 29689890 |
| 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) | Monitoring equipment – Energy Meter<br>Type- ER300P<br>Accuracy class- 0.2<br>Serial number- 5342867<br>Calibration frequency- Annual<br>Date of last calibration – 12/08/10<br>Validity- Till 12/08/11 |
| Measuring/ Reading/ | Measured – Monthly |

| | |
|---|---|
| Recording frequency: | |
| Calculation method (if applicable): | - |
| QA/QC procedures applied: | ISO 9001 or similar type of system will be used and the same procedures are available at the project site. Joint Meter Reading are being taken in presence of RRVPNL official and PP repetitive. |

| | |
|---|---|
| **Data / Parameter:** | **Biomass Quantity** |
| Data unit: | **MT** |
| Description: | This parameter referred to Quantity of Biomass transported to the project site. |
| Measured /Calculated /Default: | Measured |
| Source of data: | Weigh Bridge Register ( Archived on paper ) |
| Value(s) of monitored parameter: | 58074 |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | Leakage Emission Calculation |
| Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity) | Monitoring equipment –Weigh Bridge<br>Type- Electronic Road Weigh Bridge<br>Accuracy class-<br>Serial number- 272<br>Calibration frequency- Annual<br>Date of last calibration – 05/03/10<br>Validity- Till 05/03/11 |
| Measuring/ Reading/ Recording frequency: | Daily |
| Calculation method (if applicable): | - |
| QA/QC procedures applied: | ISO 9001 or similar type of system will be used and the same procedure are available at the project site |

| | |
|---|---|
| **Data / Parameter:** | **Biomass Calorific Value** |
| Data unit: | **Kcal/Kg** |
| Description: | This parameter referred to Calorific Value of the biomass being used in project activity. |
| Measured /Calculated /Default: | Measured |
| Source of data: | Laboratory record ( Archived on paper) |
| Value(s) of monitored parameter: | 3434.83 (Average) |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | Leakage Emission Calculation |
| Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity) | Monitoring equipment – Bomb Calorimeter<br>Type- Macro Scientific Works, MSW - 506<br>Accuracy class- 23 to 27 C, LC- 0.1C<br>Serial number- 272<br>Calibration frequency- Annual<br>Date of last calibration – 05/03/10<br>Validity- Till 05/03/11 |
| Measuring/ Reading/ Recording frequency: | Fortnightly |
| Calculation method (if | - |

| | |
|---|---|
| applicable): | |
| QA/QC procedures applied: | ISO 9001 or similar type of system will be used and the same procedure are available at the project site |

| | |
|---|---|
| **Data / Parameter:** | **Coal Quantity** |
| Data unit: | **MT** |
| Description: | This parameter referred to coal consumption in the project activity if any |
| Measured /Calculated /Default: | Measured |
| Source of data: | Log Book records (Archived on paper) |
| Value(s) of monitored parameter: | - |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | Leakage Emission Calculation |
| Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity) | Not applicable as no fossil fuel (Coal) is used since start of the project activity as well as in current monitoring period. |
| Measuring/ Reading/ Recording frequency: | - |
| Calculation method (if applicable): | - |
| QA/QC procedures applied: | Yes, ISO 9001 or similar type of system will be used and the same procedure are available at the project site |

| | |
|---|---|
| **Data / Parameter:** | **Distance of procurement** |
| Data unit: | **Km** |
| Description: | This parameter referred to distance of procurement of biomass for the project activity. |
| Measured /Calculated /Default: | Calculated |
| Source of data: | Gate Entry slip, Letter from biomass supplier. ( Archived on Paper) |
| Value(s) of monitored parameter: | 25 |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | Leakage Emission calculation |
| Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity) | - |
| Measuring/ Reading/ Recording frequency: | Daily |
| Calculation method (if applicable): | This parameter is being calculated at vehicle entry gate and at is being recorded in gate entry slip. |
| QA/QC procedures applied: | ISO 9001 or similar type of system will be used and the same procedure are available at the project site |

| | |
|---|---|
| **Data / Parameter:** | **Mileage of Vehicles** |

| | |
|---|---|
| Data unit: | **Km/Litre** |
| Description: | This parameter referred to the mileage of the vehicle being used for transportation of biomass to be project site. |
| Measured /Calculated /Default: | Estimated |
| Source of data: | Letter from biomass supplier ( Archived on paper) |
| Value(s) of monitored parameter: | 3.5 |
| Indicate what the data are used for (Baseline/ Project/ Leakage emission calculations) | Leakage emission calculation |
| Monitoring equipment (type, accuracy class, serial number, calibration frequency, date of last calibration, validity) | - |
| Measuring/ Reading/ Recording frequency: | Monthly |
| Calculation method (if applicable): | |
| QA/QC procedures applied: | ISO 9001 or similar type of system will be used and the same procedure are available at the project site |

## SECTION E. Emission reductions calculation

### E.1. Baseline emissions calculation

>>

If in the project activity only biomass fuel is used then the emissions from the project activity will be 'nil'.
If any supplementary fossil fuel (*e.g.* coal) is used with biomass then the emissions will be calculated based on this formula:
CO2 Emission (kg) = Stoicheiometric CO2 release from carbon content in coal (based on total carbon content)
To have an estimate of the project CO2 emission quantity due to combustion of coal along with the biomass, total carbon content of the coal should be known. Combustion reaction for CO2 emission is as under.

C + O2 = CO2
Assuming complete combustion of coal, following formula can be used for conservative Estimation of CO2 emissions.
*CEC* = (44 /12) * C*Q

Where,
CEc - Stoichiometric CO2 emission due to coal burning at project, MT
C - Carbon percentage in coal, %
Q - Quantity of coal burned, MT

**Baseline Emission Calculations**

Baseline emissions will be calculated by multiplying the total power exported to the grid with net baseline emission factor, as applicable for every monitoring period.

$BE = TP_{exp} \times NEFB$

Where,
BE – Baseline Emissions per annum (tones/year)
$TP_{exp}$ – Total clean power export to grid per annum
NEFB – Net baseline emission factor

**Baseline Emissions**

| Emission Reduction Calculations | Value | Units |
|---|---|---|
| **CO2 Emission Factor** | 0.8346 | KgCo2/kWh |
| **Net Electricity Exported** | 29504490 | kWh |
| **Total Baseline Emission** | 24624447 | KgCO2e |
| **Total Baseline emission** | 24624 | TCO2e |

## E.2. Project emissions calculation

No project emissions are involved for the project activity as no fossil fuel i.e. coal is consumed in the project activity ever since start of the project activity.

## E.3. Leakage calculation

>>

The leakage activity identified, which contributes for GHG emissions outside the project boundary is transportation of biomass from biomass collection centers to biomass power project site.

Leakage will be calculated as per below:

$$Leakage = \frac{Q_{bio} \times D_p \times N_y \times D_n \times C_v \times C_f \times E_f}{C_t \times M}$$

$Q_{bio}$ = Quantity of biomass transported (MT/day)

$C_t$ = Capacity of truck/ vehicle carrying biomass (MT)

$D_p$ = Distance of procurement including return journey of vehicle (km)

M = Mileage of vehicle (km/litre)

$N_y$ = No of days in a year

$D_n$ = Density of fuel (Kg/Litre)

$C_v$ = Calorific value of fuel (Kcal/ kg)

$C_f$ = Conversion factor from Kcal to Trillion Joules (TJ)

$E_f$ = Emission factor of fuel (ton $CO_2$/ TJ)

| | | | |
|---|---|---|---|
| 1 | Bio mass quantity | MT | 58074 |
| 2 | Bio mass calorific value | KCal/kg | As per Annexure 4 |
| 3 | Coal quantity | MT | 0 |
| 4 | Coal calorific value | KCal/kg | NA |
| 5 | Average distance of procurement | Km | 25 Km |
| 6 | Mileage of vehicle | Km/Liter | Truck - 3.5<br>Tractor – 3.5 |
| 7 | Density of fuel | Kg/Liter | 0.89 |
| 8 | Average capacity of | MT | Truck – 10.0 |

| | | | |
|---|---|---|---|
| | vehicle | | Trolley – 3.5 |

## E.4. Emission reductions calculation / table

>>

**Emission Reduction Calculation**

The emission reductions will be calculated as per the equation:

ER = BE – NEP

Where,
ER - CO2 Emission reduction per annum by project activity (tCO2/year)
BE - Baseline Emissions per annum (tCO2/year)
$NE_p$ - Net emissions by project activity (tCO2/year)

**Baseline Emissions**

| **Emission Reduction Calculations** | **Value** | **Units** |
|---|---|---|
| **CO2 Emission Factor** | 0.8346 | KgCo2/ kWh |
| **Net Electricity Exported** | 29504490 | kWh |
| **Total Baseline Emission** | 24624447 | KgCO2e |
| **Total Baseline emission** | 24624 | TCO2e |

**Project Emissions**

| | Unit | Quantity |
|---|---|---|
| **Coal Consumption** | Mt | 0 |
| **Carbon %** | % | 0 |
| **Project emission** | tCO2e | 0 |

**Leakage**

| | **Units** | **Trucks** | **Tractors** |
|---|---|---|---|
| Biomass transported | MT | 23424 | 34650 |
| Capacity of each vehicle | MT | 10 | 3.5 |
| Average distance of procurement | Km | 25 | 25 |
| Mileage | Km/Liter | 3.5 | 3.5 |
| Density of diesel | Kg/Liter | 0.89 | 0.89 |
| Calorific value of diesel | KCal/kg | 10272 | 10272 |
| Conversion factor | TJ/Kcal | 4.186E-09 | 4.186E-09 |
| Co2 emission factor | TCO2e/TJ | 47.45 | 67.56 |
| Annual GHG emissions | TCO2e | 70.13 | 124.78 |

**Emission Reductions**

| | | |
|---|---|---|
| **Total baseline emissions** | 24624 | tCO2e |
| **Project emissions** | 0 | tCO2e |
| **Leakage** | 116 | tCO2e |
| **Emission reduction** | **24508** | tCO2e |

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

**Comparison Between actual emission reduction and estimated reduction-**
**For the period February 2010 to September 2010**

| Item | Values applied in ex-ante calculation of the registered CDM-PDD | Actual values reached during the monitoring period |
|---|---|---|
| **Emission reductions ($tCO_2e$)** | 33,551 | 24,508 |

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

Net CER emission reduction reduced due to-

1. Reduction in CO2 emission factor (Net weight Average tCO2/MWh) from 0.94288 to 0.8346
2. Less electricity unit supplied to DISCOMs due to plant shut down.
3. Excess leakage emission due to more biomass transport during the period, due to procurement season of biomass