

4th MONITORING REPORT

Version 1, 03/03/2009

Chambal Power Limited's (CPL) proposed 7.5 MW biomass based power project at Rangpur, Kota District, Rajasthan, India

Reference No. UNFCCC 0347

Monitoring Period: 1st September, 2008 to 31st March, 2009

PROJECT LOCATION

Surya Chambal Power Limited (SCPL)
Rangpur, Kota District, Rajasthan, India.

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1. Title of the Project

Title: CPL's proposed 7.5 MW biomass based power project at Rangpur, Kota District, Rajasthan, India.

Date of Registration: 8th May 2006

2. Introduction

The purpose of the monitoring report is to calculate the Greenhouse Gas (GHG) Emission reductions achieved by the project activity for periodic verification. This is the fourth monitoring report and covers the activity from 01/09/2008 to 31/03/2009. As per registered PDD the start date of the project activity was 01/03/2004 and of the crediting period is 01/03/2006.

3. Reference

3.1. Sectoral Scope

Category 1: Energy industries (renewable - / non-renewable sources)

3.2. Approved Baseline Methodology

The name of the approved baseline methodology applied to the project activity is:

"Grid connected renewable electricity generation", AMS 1D. (Version 7) dated 28th November 2005.

3.3. Approved Monitoring Methodology

The name of the approved monitoring methodology applied to the project activity is: *"Grid connected renewable electricity generation", AMS 1D.*

*(Version 7)
dated 28th November 2005.*

3.4. Project Design Document

Title: CPL's proposed 7.5 MW biomass based power project at Rangpur, Kota District, Rajasthan, India.

Version: 02,

Date: 8th December 2005

4. Definitions in the Report

CPL: Chambal Power Limited
PDD: Project Design Document
ER: Emission Reduction
RRVPNL: Rajasthan Rajya Vidyut Prasaran Nigam Limited
RSEB: Rajasthan State Electricity Board
CEA: Central Electricity Authority
NREB: Northern Regional Electricity Board
NEWNE: North East Western North Eastern

5. Project Description

Project Activity

The main purpose of the project is to generate and export eco-friendly 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 Grid (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 is likely to export surplus power to RRVPNL after meeting the in-house auxiliary demand.

Project Participants

The project participants are 'Chambal Power Limited.'

Project Location

The project is proposed to be 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:

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Figure 1: Location Map of Project Activity

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 even in times of biomass deficiency, 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.

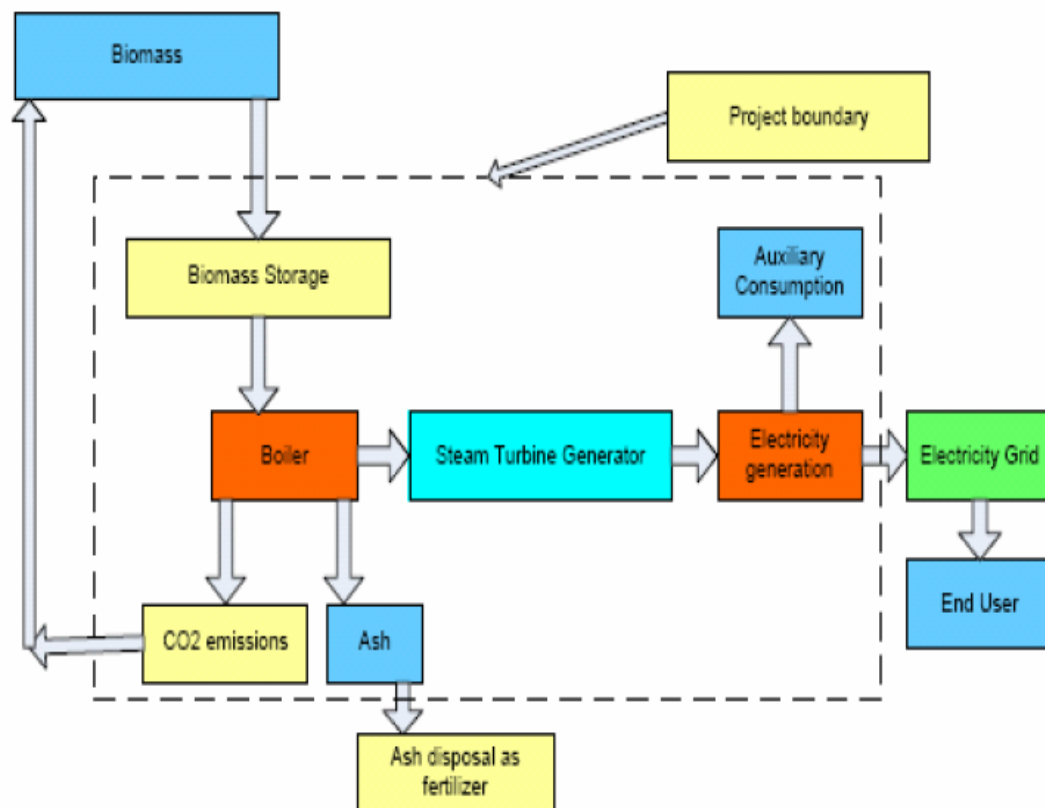
Steam turbine of fully condensing mode with suitable alternator generator will be installed for generating electricity. The turbine will be single cylinder, single exhaust fully condensing type, designed for high operating efficiencies and maximum reliability.

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.

Project Boundary

A pictorial representation of the project boundary is given below:

Figure 2: Pictorial Representation of Project Boundary



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6.0 Plant Performance during the period 01/09/2008 to 31/03/2009

Month	Shut down time (hrs)
Sept 08	115:43
Oct 08	92:15
Nov 08	81:45
Dec 08	47:50
Jan 09	55:10
Feb 09	68:50
March 09	310:20
Total	771:53

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7.0 Monitoring Methodology and Plan

Table 1: List of Parameters to be monitored for Project Emission

a) Parameters affecting emission reduction of project activity

ID Number	Data Type	Data Variable	Data Unit	Measured(m) Calculated (c) Or estimated (e)	Recording frequency	Proportion of Data to be monitored	How will the data will be archived? Electronic/paper	For how long archive data to be kept	comment
D.3.a.1	Power	Total electricity generated	kwh	M	Shift wise	100%	Electronic	3year after issue of CER	Measured in plant premises and monitored and recorded continuously through DCS.
D.3.a.2	Power	Auxiliary consumption	kwh	M	Shift wise	100%	Electronic	3year after issue of CER	
D.3.a.3	Power	Power export	kwh	M	Shift wise	100%	Electronic	3year after issue of CER	As per PPA with RSEB (Rajasthan State electricity board)
D.3.a.4	Emission on factor	North east western North eastern Grid	Tco2/mwh	C (calculated by CEA) Central Electricity authority latest published report	Annual		Electronic	3year after issue of CER	The weighted average grid emission factor (including imports) for the Northern Grid given by CEA shall be used each year for emission reduction

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								calculations. In case this data is not available for a particular year from CEA, then this factor will be computed using published data as per ACM0002.
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b) Parameters affecting the leakage emissions from project activity

ID Number	Data Type	Data Variable	Data Unit	Measured(m) Calculated (c) Or estimated (e)	Recording frequency	Proportion of Data to be monitored	How will the data will be archived? Electronic/paper	For how long archive data to be kept	comment
D.3.b.1	Fuel	Biomass quantity	MT	Measured	Daily	100%	Paper	3year after issue of CER	
D.3.b.2	Fuel	BioMass Calorific value	Kcal/Kg	Measured	Fortnightly		Paper	3year after issue of CER	Through sample testing
D.3.b.3	Fuel	Coal quantity	MT	Measured	Daily	100%	Paper	3year after issue of CER	
D.3.b.4	Fuel	Coal calorific Value	Kcal/Kg	Measured	Once	Grab sample	Paper	3year after issue of CER	Through sample testing
D.3.b.5	Distance	Distance of procurement	Km	Calculated	Daily	100%	Paper	3year after issue of CER	
D.3.b.6	Mileage	Mileage of Vehicle	Km/Liter	Estimated	Monthly		Paper	3year after issue of CER	
D.3.b.7	Density	Density of fuel	Kg/Liter	Measured	Once		Paper	3year after issue of CER	Through sample testing
D.3.b.8	Volume	Capacity of Vehicle	MT	Measured	Once		Paper	3year after issue of CER	

8.0 Quality Assurance (QA)/Quality Control (QC) Plan

Quality control and quality assurance mechanisms for the monitored data have been followed as mentioned in the registered PDD.

9.0 GHG Calculations

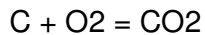
9.1 Project Emission Calculations

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:

$\text{CO}_2 \text{ Emission (kg)} = \text{Stoichiometric CO}_2 \text{ release from carbon content in coal (based on total carbon content)}$

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.



Assuming complete combustion of coal, following formula can be used for conservative Estimation of CO₂ emissions.

$$\text{CEC} = (44 / 12) * \text{C} * \text{Q}$$

where,

CEC - Stoichiometric carbon-dioxide emission due to coal burning at project, MT

C - Carbon percentage in coal, %

Q - Quantity of coal burned, MT

9.2 Baseline Emission Calculations

Baseline emissions will be calculated by multiplying the total power exported to the grid with net baseline emission factor, as given in the PDD.

$$\text{BE} = \text{TPexp} \times \text{NEFB}$$

Where,

BE – Baseline Emissions per annum (tones/year)

TPexp – Total clean power export to grid per annum

NEFB – Net baseline emission factor

9.3 Leakage

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:

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

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 CO₂/ TJ)

9.4 Emission Reduction Calculation

The emission reductions will be calculated as per the equation:

ER = BE - NEP

ER - CO₂ Emission reduction per annum by project activity (tCO₂/year)

BE - Baseline Emissions per annum (tCO₂/year)

NEP - Net emissions by project activity (tCO₂/year)

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Appendix 1 : Monitored Data (September 2008 – March 2009)

The annual values of the parameters monitored is given below.

S.No Parameter Unit Value

Sr. No	Parameter	Unit	value
1	Electricity exported to Grid Net of Auxiliary consumption	Kwh	29470500
2	Net import from the grid	Kwh	107800
3	Net Power export	Kwh	29362700
4	Bio mass quantity	Kg.	45241188
5	Bio mass calorific value	Kcal/Kg	As per Annexure 4
6	Coal quantity	MT	0
7	Coal calorific value	Kcal/Kg	NA
8	Average distance of procurement	Km	15 Km
9	Mileage of vehicle	Km/Liter	Truck - 3.5 Tractor – 6
10	Density of fuel	Kg/Liter	0.889
11	Average capacity of vehicle	MT	Truck – 10 Trolley – 3.5
12	Emission factor	tCo2/MWH	0.81 * (as per latest CEA database)

Appendix 2: Emission Reduction Calculations

1) Baseline Emissions

Emission Reduction Calculations	Value	Units
CO2 Emission Factor	0.81	KgCo2/Kwh
Net Electricity Exported	29362700	kg CO2e
Total Baseline Emission	23783787	KgCO2e
Total Baseline emission	23784	TCO2e

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2) Project Emissions

	Unit	Quantity
Coal Consumption	Mt	0
Carbon %	%	0
Project emission	tCO2e	0

3) Leakage

	Units	Trucks	Tractors
Biomass transported	MT	34437	10804
Capacity of each vehicle	MT	10	3.5
Average distance of procurement	Km	15	15
Mileage	Km/Liter	3.5	6
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	74.1	74.1
Annual GHG emissions	Tco2e	42	22

4) Emission Reductions

Total baseline emissions	23784	tCO2e
Project emissions	0	tCO2e
Leakage	64	tCO2e
Emission reduction	23720	tCO2e

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Annexure 3: Contact Information

Organization:	Surya Chambal Power Limited
Street/P.O.Box:	82, Veer Nariman Road
Building / Location:	7, Nagin Mahal
City:	Churchgate, Mumbai
State/Region:	Maharashtra
Postfix/ZIP:	400020
Country:	India
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Represented by:	
Title:	Director
Salutation:	Mr.
Last Name:	Wagle
Middle Name:	R
First Name:	S
Department:	Directorate Office
Mobile:	+91- 9821525426

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**Annexure 4: Calorific Value of biomass
Date Calorific Value (kCal/kg)**

Date	Calories Per Gm
4/9/2008	3093.36
16/9/2008	3212.67
2/10/2008	3352.73
12/10/2008	3190.06
23/10/2008	3501.74
5/11/2008	3432.85
13/11/2008	3251.93
24/11/2008	3223.57
7/12/2008	3005.24
20/12/2008	2875.02
6/1/2009	3059.66
18/01/2009	2497.98
31/01/2009	2889.99
17/02/2009	2967.01
28/02/2009	3498.19
09/03/2009	3672.93
19/03/2009	3609.13