

THIRD MONITORING REPORT

VERSION 1 DATED 5th January 2007

**FOR THE PERIOD
01ST JANUARY 2007 TO 31ST December 2007**

**"Biomass based independent power project at Malwa Power Private
Limited, Mukatsar, Punjab"
Reference no. UNFCCC00000331CDMP**

Project Location:
Village Gulabewalla, Tehsil Mukatsar, District Mukatsar
Punjab, India

**Malwa Power Pvt. Limited
43 Sector 27-C, Faridabad-121003
Haryana, India**

INDEX

Current Status of the Project	3
Statement to What Extent the Project has been	4
Monitoring Period	6
Sustainability – Economic and Social Well-being	7
Obtained Parameters According to Monitoring Plan	8
Power Generation, Export & Import, Fuel Consumption and Fuel Analysis.....	9
Fuel consumption and analysis.....	9
Electricity Generation, Export, Import and emission reductions	10
Emission Reductions	12
Measures to Ensure the Results/Uncertainty Analysis	13
Roles and Responsibilities.....	15
Annexure 1	16

Current Status of the Project

The biomass based power plant had been successfully commissioned by Malwa Power Pvt. Ltd. (MPPL). The project was completed with major equipment supplied as follows:

<u>S. No.</u>	<u>Equipment</u>	<u>Supplier</u>
1.	Boiler	Thermax Limited, Pune
2.	T.G. Set	M/s Triveni Engineering & Industries Ltd 12A, Peenya Industrial Area Bangalore, India
3.	Balance of Plant	Various suppliers like Kirloskar Electricals, Bangalore for Transformers /Switch Yard and other major electrical equipments; Hyper filtration, New Delhi for RO/Water softening plant; Paltech Sahibabad for Cooling Tower etc.
4.	Fuel Handling System	Kwality Engineering New Delhi

The entire equity was provided by the Company (MPPL) and loan was taken from IREDA.

During the present monitoring period i.e. 01st January 2007 to 31st December 2007, the plant exported net power of 52.82 Million kWh to PSEB grid and consumed 76,462 MT of biomass as fuel.

Statement to What Extent the Project has been Implemented as Planned

This project was completed as planned and described in the Project Design Document (PDD).

The plant is in operation continuously (with outages – forced & planned) since commissioning. Commercial operation was declared on April 27, 2005. The outages for the present monitoring period from 1st January, 2007 to 31st December, 2007 are given below:

Month	From		To		Time Period
	Date	Time	Date	Time	
January'07	2-Jan	12.39 am	2-Jan	10.48 am	10hr 9min
	3-Jan	2.10 pm	4-Jan	3.40 pm	25hr 30min
February'07	6-Feb	9.00 am	7-Feb	1.44 pm	28h 44min
	21-Feb	5.25 pm	22-Feb	7.14 pm	25h 49min
March'07	28-Mar	5.09 am	29-Mar	2.33 pm	33h 24min
April'07	16-Apr	1.44 pm	17-Apr	2.22 pm	24h 38min
	26-Apr	6.47 am	28-Apr	5.35 am	46h 48min
May'07	3-May	11.13 pm	4-May	5.50 am	6h 37min
June'07	4-Jun	11.34 pm	6-Jun	12.11 pm	36h 37min
	6-Jun	4.10 pm	7-Jun	6.22 am	14h 12min
	17-Jun	1.48 pm	18-Jun	3.33 pm	25h 45min
July'07	16-Jul	1.49 am	17-Jul	3.58 pm	38h 9min
August'07	5-Aug	11.11 pm	7-Aug	8.38 am	33h 27min
September'07	12-Sep	2.11 am	13-Sep	6.45 am	28hr 34min
	29-Sep	8.14 pm	30-Sep	1.05 pm	16hr 51min
October'07	3-Oct	10.34 pm	5-Oct	8.54 am	34hr 20min
November'07	5-Nov	10.42 pm	6-Nov	2.40 pm	15hr 58min
December'07	1-Dec	4.50 am	2-Dec	3.45 am	22hr 55min
	11-Dec	6.48 am	12-Dec	1.26 pm	30hr 38min
	13-Dec	12.11 am	13-Dec	7.54 pm	19hr 43min
	16-Dec	9.56 am	17-Dec	5.11 am	19hr 15min

The plant is mostly using crop residues and agro-industry waste available in the area such as mustard stalk, rice husk, Julia Flora & cotton stick.

Monitoring Period

This is the third monitoring report associated with the MPPL project activity.

The first monitoring report covered the period from 01/05/2005 to 31/03/2006. (Both days included) and was issued 42,337 CERs.

The second monitoring report covered the period from 01/04/2006 to 31/12/2006. (Both days included) and was issued 35,894 CERs.

The period covered in this monitoring report is from 01/01/2007 to 31/12/2007 (Both days included). This monitoring report does not cover any period of time covered by any of the previous monitoring reports.

Sustainability – Economic and Social Well-being

The project activity has contributed to sustainable development in the region as follows:

1. The project activity has created employment opportunities in the area for skilled and unskilled labour during operation and maintenance of the power plant. The project activity has generated opportunities for the uneducated and poor for collection and supply of agro waste material. The biomass collection activity has benefited approximately 1400 families from villages in and around the plant by way of revenue from selling the surplus biomass residues to the project plant.
2. MPPL has encouraged and motivated the unemployed, educated youth to arrange tractors, trollies, chippers etc to transport the biomass to project site.
3. MPPL has motivated the farmers in the regions to adopt mechanized farming methods by way of demonstration plantations on the MPPL land. This has helped in increasing awareness and technical know how of the farmers, thereby increasing yield as well as providing an additional source of income for the farmers by selling the surplus biomass residues to the company.
4. By generating clean power, project activity has helped to eliminate an equivalent Carbon dioxide, Sulphur dioxide, Nitrogen oxides, SPM etc. which would have been otherwise generated to produce electricity in the grid. The project activity also helps to conserve finite natural resources like coal and natural gas which dominates the fuel mix in the regional grid.
5. By generating decentralized power close to load points, the project activity has helped reduce transmission losses.
6. The project proponent also actively promotes social welfare activities in the neighbouring villages by providing financial and material aid to the poor and underprivileged.
7. The Sarpanch of Gram Panchayat of Gulabewala has acknowledged the valuable contribution of the project proponent in encouraging computer education among the children by paying their annual computer leaning fees. Also the project proponent distributed woolen clothes among the children to help them withstand the cold weather.

Obtained Parameters According to Monitoring Plan

For the project, following parameters were monitored on a continuous basis.

1. **Energy:** The net electricity exported to the grid by the project activity has been monitored through a main meter and check meter installed at the interconnection point for the delivery of the energy to the grid. Monthly joint meter readings have been taken and signed at interconnection point by representatives of both MPPL and Punjab State Electricity Board (PSEB). MPPL has used these joint meter readings to raise the invoices to PSEB against the net energy exported to grid (net saleable energy). MPPL has maintained all records of joint meter readings at the interconnection point as well as the monthly invoices raised against net saleable energy to PSEB. Furthermore, continuous monitoring of gross electricity generation and auxiliary consumption is being carried out at the generation end (at the power plant) as well.
2. **Fuel (Biomass):** Biomass fuel used in the power plant is weighed by electronic weigh bridge installed at project site. The quantity of biomass is based on invoices of fuel contractors. Biomass fuel consumption is recorded on daily as well as monthly basis. Physical trials conducted periodically with known weight of biomass fuel and the quantities of biomass required per unit electricity production are further used to ensure credibility of data.
3. **Fossil fuel:** No fossil fuel has been used during the current monitoring period.
4. **Energy Content of Fuel:** The calorific value of the Biomass fuel being used is measured periodically in the in house laboratory using bomb calorimeter for each type of biomass received.

Power Generation, Export & Import, Fuel Consumption and Fuel Analysis

Monthly data on gross power Generation, export of power to the grid, import of power from the grid, fuel consumption, fuel analysis and Net Emission Reductions for the monitoring period are as shown in the tables below:

Table 1: Fuel consumption and analysis

Billing month	Year	Mustard Husk (MT)	Rice husk / Paddy waste (MT)	Firewood (Julieflora) (MT)	Cotton stalk (MT)	Total quantity of biomass consumed (MT)
GCV	2007	3,650	3,354	3,656	3,420	-
Jan	2007	14	102	725	5,806	6,647
Feb	2007	9	17	635	5,276	5,937
Mar	2007	0	26	815	5,923	6,764
Apr	2007	1,050	7	395	4,429	5,881
May	2007	1,025	24	525	4,779	6,353
Jun	2007	5,035	0	535	481	6,051
Jul	2007	4,045	54	615	1,514	6,228
Aug	2007	3,055	60	520	3,044	6,679
Sep	2007	4,365	555	845	907	6,672
Oct	2007	2,045	1,430	2,855	131	6,461
Nov	2007	3,050	655	2,445	257	6,407
Dec	2007	1,220	505	805	3,852	6,382
Total	-	24,913	3,435	11,715	36,399	76,462

Table 2: Electricity Generation, Export, Import and emission reductions

As mentioned in the Project Design Document, Emission reductions are calculated based on the difference between the power exported to the grid and the power imported from the grid during shut down and start up of the power plant.

The emission reductions for the monitoring period are shown below:

Billing month	Year	Gross Electricity Generated (kWh)	Auxiliary consumption	Electricity Exported* (kWh)	Electricity Imported (kWh)	Net Saleable Energy (kWh)	Baseline Emission Factor (tCO₂/MWh)	Baseline Emissions (tCO₂)
Jan	2007	5,076,214	510,182	4,492,000	7,500	4,484,500	0.942	4,224
Feb	2007	4,489,981	453,250	3,984,000	23,500	3,960,500	0.942	3,731
Mar	2007	5,364,775	532,993	4,751,500	9,500	4,742,000	0.942	4,467
Apr	2007	4,701,371	477,113	4,160,500	22,500	4,138,000	0.942	3,898
May	2007	5,042,499	509,849	4,453,000	9,000	4,444,000	0.942	4,186
Jun	2007	4,840,558	502,326	4,275,500	24,500	4,251,000	0.942	4,004
Jul	2007	5,012,195	508,275	4,430,000	11,500	4,418,500	0.942	4,162
Aug	2007	5,105,669	511,820	4,515,000	11,000	4,504,000	0.942	4,243
Sep	2007	5,153,958	528,868	4,550,000	19,000	4,531,000	0.942	4,268
Oct	2007	5,135,919	446,794	4,551,500	18,500	4,533,000	0.942	4,270
Nov	2007	5,121,003	495,788	4,548,500	6,500	4,542,000	0.942	4,279

Dec	2007	4,868,227	516,696	4,309,000	37,000	4,272,000	0.942	4,024
Total	-	59,912,369	5,993,954	53,020,500	200,000	52,820,500	-	49,757

*The Electricity export figures also incorporate the losses in transmission from the power plant to the grid interconnection point and hence the difference between gross electricity generated and the auxiliary consumption is not the same as the figures for electricity exported.

Emission Reductions

Baseline Emissions:

Carbon Emission Factor as per the baseline adopted (kg CO₂/kWh) = 0.942

Energy exported to the grid (kWh) =53,020,500

Energy imported from the grid (kWh) = 200,000

Net saleable energy exported to the grid (kWh) = 52,820,500

Baseline emissions (tonnes CO₂) = 49,757

Project Emissions: NIL

Emission Reductions:

Baseline emissions – Project emissions

= 49,757 t CO₂ – NIL

=49,757 tCO₂

Note: A detailed excel sheet showing step by step calculations for arriving Net emission reductions is given as Annexure - I.

Measures to Ensure the Results/Uncertainty Analysis

The energy exported to the PSEB is recorded from two independent set of meters - Main Meter & Check Meter as per the Power Purchase Agreement (PPA). The readings from the Main Meter are used for billing purposes. In case the Main Meter goes out of operation, the reading of the backup meter (Check Meter) is to be used for billing. Till date only the main meter has been used for billing purposes.

The calibration of monitoring equipment is being carried out regularly according to the requirements of PSEB. Power Generation, Export & Auxiliary Consumption and fuel consumption is being recorded and verified daily by the Plant Manager which is thereafter approved by the Director. Since hourly data logging is being carried out along with daily reporting, the uncertainty level associated with the monitored data used for calculating emission reductions is low.

The following table indicates the details of Main meter and check meter including their accuracy levels and calibration dates:

Description	Main Meter	Check Meter
S. No.	4180597	4180598
Capacity	200/1A	200/1A
Accuracy Level	0.5	0.5
Make	L & T	L & T
Date of Calibration	8.12.07	8.12.07
Calibration Authority	Punjab State Electricity Board	Punjab State Electricity Board
Accuracy Level observed during calibration	0.28%	0.12%

In accordance with the monitoring plan, the meters at the generation end have also been test checked for accuracy. The half yearly test result details are as shown below:

Description	Gross generation meter	Auxiliary consumption meter
S. No.	4249596	63116/3171-0405

Capacity	600/1A	2500/5 A
Accuracy Class	0.5	1.0
Make	L & T	Enercon
Date of Testing	21.12.07	19.12.07
% Error	0.189-0.276	0.45

As can be seen, the error was found to be within permissible limits (0.5%) and no calibration or replacement was considered necessary.

MPPL had developed an internal audit procedure as a measure of internal control to ensure accuracy and credibility of data reported. The following parameters were verified during the internal audit:

- a. Gross energy generated;
- b. Auxiliary consumption;
- c. Electricity exported;
- d. Electricity imported;
- e. Net saleable energy;
- f. Biomass fuel inventory;
- g. Average calorific value and
- h. Calibration records.

Any corrective actions required were promptly implemented and overall the project was found to conform to the planned arrangements of the monitoring methodology and plan. The weigh bridge used to measure biomass consumption has also been inspected by an external agency to ensure effective operation.

Roles and Responsibilities

MPPL was the sole agency responsible for implementation of the monitoring plan. Furthermore specific roles and responsibilities have been outlined in the enclosed document - GHG Performance Procedure of Malwa Power Limited.

Annexure 1

Malwa Power Private Limited Emission Reduction Calculations: 01st January 2007 to 31st December 2007

Billing month	Year	Electricity generated (kWh)	Electricity exported (kWh)	Electricity imported (kWh)	Auxiliary consumption (kWh)	Net Saleable energy (kWh)	Biomass Used (MT)				Total quantity of biomass consumed (MT)	Baseline emission factor (kgCO ₂ /kWh)	Baseline emissions (kgCO ₂)	Emission reductions (tCO ₂)
							Mustard Husk /waste straw	Rice husk / Paddy waste	Firewood (Julieflora)	Cotton stick				
January	2007	5,076,214	4,492,000	7,500	510,182	4,484,500	14	102	725	5,806	6,647	0.942	4,224,399	4,224
February	2007	4,489,981	3,984,000	23,500	453,250	3,960,500	9	17	635	5,276	5,937	0.942	3,730,791	3,731
March	2007	5,364,775	4,751,500	9,500	532,993	4,742,000	0	26	815	5,923	6,764	0.942	4,466,964	4,467
April	2007	4,701,371	4,160,500	22,500	477,113	4,138,000	1,050	7	395	4,429	5,881	0.942	3,897,996	3,898
May	2007	5,042,499	4,453,000	9,000	509,849	4,444,000	1,025	24	525	4,779	6,353	0.942	4,186,248	4,186
June	2007	4,840,558	4,275,500	24,500	502,326	4,251,000	5,035	0	535	481	6,051	0.942	4,004,442	4,004
July	2007	5,012,195	4,430,000	11,500	508,275	4,418,500	4,045	54	615	1,514	6,228	0.942	4,162,227	4,162
August	2007	5,105,669	4,515,000	11,000	511,820	4,504,000	3,055	60	520	3,044	6,679	0.942	4,242,768	4,243
September	2007	5,153,958	4,550,000	19,000	528,868	4,531,000	4,365	555	845	907	6,672	0.942	4,268,202	4,268
October	2007	5,135,919	4,551,500	18,500	446,794	4,533,000	2,045	1,430	2,855	131	6,461	0.942	4,270,086	4,270
November	2007	5,121,003	4,548,500	6,500	495,788	4,542,000	3,050	655	2,445	257	6,407	0.942	4,278,564	4,279
December	2007	4,868,227	4,309,000	37,000	516,696	4,272,000	1,220	505	805	3,852	6,382	0.942	4,024,224	4,024
Total		59,912,369	53,020,500	200,000	5,993,954	52,820,500	24,913	3,435	11,715	36,399	76,462	-	49,756,911	49,757