

# **FOURTH MONITORING REPORT**

Monitoring Period  
22.07.2008 to 21.07.2009  
(Both Days Included)

## **Project 0374: KMS Power 6 MW Renewable Sources Biomass Power project**

**Version: KMS/001**  
**Date : 20.08.2009**

**Project Site:**  
Lakkaraju Garlapadu village,  
Sattenapalli Mandal, Guntur district,  
Andhra Pradesh, India

**KMS POWER PRIVATE LIMITED**  
**1071, Road No 44, Jubilee Hills,**  
**Hyderabad – 500033,**  
**Andhra Pradesh, India.**  
e- Mail: [kms@greenkogroup.com](mailto:kms@greenkogroup.com)

## **A. Project Reference:**

**Title:** KMS Power 6 MW Renewable Sources Biomass Power project

**UNFCCC Reference No:** 0374

**Registration Date:** 04 June 2006

**Methodology:** AMS ID Version 7

## **B. Monitoring Period**

The Monitoring period is chosen from 22.07.2008 to 21.07.2009 (both days included).

## **C. Location of the Project:**

Project 0374: KMS Power 6 MW Renewable Sources Biomass Power Project Plant at Lakkaraju Garlapadu, Sattenapalli Mandal, Guntur Dist., Andhra Pradesh, India, has been commissioned and is operational since 22.07.2002. The Plant is using renewable Biomass fuels like Rice Husk, Cotton & Chilly Stalks, Prosopis Julie flora etc.

## **D. Brief Description and Current Status of the Project:**

The project was registered with CDM Executive Board on 04 June 2006.

During the first Monitoring Period (23 July 2002 to 24 June 2006) plant exported 143.9 Million units to the grid and issued 89596 CERs.

During the second Monitoring Period (25 June 2006 to 23 July 2007) plant exported 36.5 Million units to the grid and issued 27790 CERs.

During the Third Monitoring Period (24 July 2007 to 21 July 2008) plant exported 39.7 Million units to the grid and issued 28684 CERs.

The specifications of major equipment and their suppliers are detailed below.

S. No	Equipment	Supplier	Specifications
1	Boiler	Cithar Vessels (P) Ltd	Capacity - 35 TPH Pressure - 67 kg/cm <sup>2</sup> Temperature - 490 °C Type - Water Tube FBC
2	Turbo Generator	Triveni Engineering & Industries Ltd.	Model - NK 32/45/20 Rating - 8000 KW Pressure - 64.7 kg/cm <sup>2</sup> Temperature - 480 °C

The Plant is in operation continuously (with outages – forced & planned) during the monitoring period. The Plant is using renewable Biomass fuels like Rice Husk, GN Shell, Julie flora, Cotton & Chilly Stalks, etc. In addition, plant also uses small quantity of diesel very occasionally for power generation using DG set to meet emergency power requirement during complete black out and factory also for internal vehicles for fuel transfer.

The Plant had suffered major outages as detailed below during the period:

Month	Running hours	Forced outages	Reason for forced outage
		Hrs.	
AUG – 08	406.68	337.15	APH Tubes replacing work, Wet fuels.
SEP – 08	52.74	680.76	Bed Coils replacing work, APH Tubes replacing work.
OCT – 08	649.81	66.94	Wet fuels.
NOV – 08	580.41	162.54	Boiler Clinker formation.
DEC – 08	440.82	273.63	Bed coils puncture & Clinker formation.
JAN – 09	336.35	407.45	Bed coils puncture & replacement work.
FEB – 09	730.35	13.65	FD Fan Motor terminal block shortage, Internal lug cut.
MAR – 09	419.22	251.23	Husk Screener problem & P.A Lines jammed, APH Tubes cleaning work.
APR – 09	668.08	76.22	Auxiliary Breaker Problem.
MAY – 09	698.59	19.76	BC1 Motor winding problem, ID Fan Coupling spring broken.
JUN – 09	638.46	106.84	BC1 Belt cut off.
JUL – 09	547.14	169.66	Bed coils puncture, P.A fan NDE bearing replacement, BC1 belt conveyor motor internal leg cut.
<b>TOTAL</b>	<b>6168.650</b>	<b>2573.830</b>	

## **E. Sustainability – Economic and Social well being:**

The Company has spent around Rs.46.4 million (USD 0.96 million @ IUS\$ = Rs 48/-) during the monitoring period towards fuel usage in the Plant. Procurement of biomass fuel from local farmers and biomass suppliers has generated additional income and improved economic condition of the community.

This has also resulted in local employment generation. Plant has generated employment opportunities directly / indirectly to more than 500 people.

As a part of social responsibility, Plant has been contributing to social infrastructure by way of employing local people for the Plant operations and also paying significant amount as tax for Sales Tax, water charges to Irrigation Department, and for the local Panchayat.

## **F. Baseline Emission Factor**

The baseline emissions and the emission reductions from project activity are estimated based on the quantum of electricity to be exported by the project activity and the Baseline Emission Factor (BEF) of the chosen Southern Regional grid (India). The baseline emission factor (combined margin) has been calculated as per the guidance provided in ACM0002 (Version 06). The Baseline Emission Factor 0.83 Kg CO<sub>2</sub>/ KWh has been validated and is available in the [registered CDM PDD](#).

## **G. Baseline Emission Factor**

Baseline and project emissions are calculated as per the formulas mentioned in Section B of the PDD.

- Baseline emissions are calculated as per the formula given below:

Baseline emissions = Net Electricity exported to the grid (KWh) x Grid emission factor (tCO<sub>2</sub>/KWh)

Grid emission factor of 0.83 kgCO<sub>2</sub>/kWh is considered based on the data provided in the registered PDD and procedures mentioned in ACM0002 (Version 6).

- Emission Reductions:

The project activity reduces carbon dioxide through displacement of grid electricity generation with fossil fuel based power plants by renewable-wind electricity. The emission reduction E<sub>Ry</sub> due to project activity during a given year y is calculated as the difference between baseline emissions (B<sub>Ey</sub>), project emissions (P<sub>Ey</sub>) and emissions due to leakage (L<sub>y</sub>), as per the formulae given below:

$$E_{Ry} = B_{Ey} - P_{Ey} - L_y$$

Where,

B<sub>Ey</sub> = Baseline emissions

P<sub>Ey</sub> = Project emissions;

L<sub>y</sub> = Emissions due to Leakage.

P<sub>Ey</sub>(Import) = Net Electricity imported to the grid (KWh) x Grid emission factor (tCO<sub>2</sub>/KWh)

P<sub>Ey</sub>(coal) = (Coal used in MT X (Carbon content in % / 100)) x 44/12

P<sub>Ey</sub>(diesel) = [(Diesel consumed in liters x calorific value (TJ/kg) x density of fuel (kg/l))] x IPCC emission factor (tCO<sub>2</sub>/TJ) x oxidation factor

Where,

CV = Calorific value = 10270 Kcal/Kg (*Ex-Ante*)

EF = Emission Factor = 74.1 tCO<sub>2</sub>/TJ (*Ex-Ante*) IPCC 2006

In the case of this project activity L<sub>y</sub> = 0 ([Please refer to the registered PDD](#))

<b>Monitoring Period</b>	<b>Baseline Emissions (tCO<sub>2</sub>)</b>	<b>Project Emissions (tCO<sub>2</sub>)</b>	<b>Net Emission Reduction (tCO<sub>2</sub>)</b>
22.07.2008 to 21.07.2009	23611	67	23544

## **H. Parameters being monitored:**

For the Project, the following parameters are being monitored on continuous basis:

- 1 **Power Generation (KWh):** Power generation from the plant is measured continuously using the generation meter installed in the control room of the plant. The total generated power will also be used to measure the auxiliary consumption of the plant after deducting power exported to the grid.
- 2 **Power Export & Import (KWh):** Power exported to the grid and imported from the grid is monitored from energy meters installed at APTransco substation on end of every billing month. A joint meter reading for the energy exported to the Grid will be recorded by representatives of APTransco and Company and the readings will be jointly signed by both the parties as a proof of export of Power to the grid from power plant and import of Power from grid by the power plant. These meter readings are the basis for the invoices raised by KMS POWER PRIVATE LIMITED.
- 3 **Biomass Fuel (MT):** The Biomass fuel (of all kinds) on receipt in the Plant is weighed in the Electronic Weigh Bridge installed at the entry of the Plant and unloaded in the fuel storage yard. The biomass fuel after necessary preparation is fed to the Boiler as per the requirement and consumption will be recorded on daily basis.
- 4 **Calorific value of the Biomass fuel (Kcal/Kg):** The calorific value of the Biomass fuel (of all kinds) used is being measured in the laboratory at regular intervals, as per the arrivals and average value will be considered on monthly basis. Though this parameter is not directly used in the emission reduction calculations the project

proponent monitors the same for maintaining a check on the quality of biomass being fired in the boiler.

- 5 **Coal (MT):** Coal on receipt in the Plant is weighed in the Electronic Weigh Bridge installed in the Plant and unloaded in the fuel storage yard. Coal is fed to the Boiler as and when required and consumption will be recorded accordingly.
- 6 **Carbon content in Coal (%):** Carbon content in the coal received is being considered as per the analysis reports of laboratory, which are being obtained at regular intervals.
- 7 **Calorific value (CV) of coal (Kcal/Kg):** CV of coal is being analyzed at government approved outside laboratory at regular intervals. Though this parameter is not directly used in the emission reduction calculations the project proponent monitors the same for maintaining a check on the quality of coal being fired in the boiler.
- 8 **Diesel (Litres):** Diesel will be consumed for emergency operations of the DG set in case total block out situation. Diesel consumption will be monitored on regular basis using level gauge/measurement on store issues.
- 9 **Net Calorific value of Diesel (Kcal/Kg):** CV of the diesel will be obtained from the documents published by IPCC or supplier data.
- 10 **Density of Diesel (Kg/L):** Density of the diesel will be obtained from Indian Oil Corporation website.
- 11 **Oxidation Factor of Diesel:** IPCC default value at the time of monitoring will be used.

Month-wise data on Power Generation, export, import, fuel consumption and diesel consumption is given below for the monitoring period:

Billing Month	Year	Electricity Generated, KWH	Electricity Exported KWH	Electricity Imported KWH	Biomass Used, MT	Coal Used, MT	Diesel consumption, lit
Aug (22/07 to 21/08)	2008	1468000	1208800	48400	2749	0	2477
Sep (22/08 to 21/09)	2008	134800	105100	47000	393	0	1158
Oct (22/09 to 21/10)	2008	3147100	2738800	16700	5161	0	2816
Nov (22/10 to 21/11)	2008	2793600	2360200	31600	5909	0	2919
Dec (22/11 to 21/12)	2008	2516400	2243700	20300	3712	0	2702
Jan (22/12 to 21/01)	2009	1997100	1785900	19400	3075	0	1688
Feb (22/01 to 21/02)	2009	4276000	3803500	4100	6654	0	2047
Mar (22/02 to 21/03)	2009	2289600	2022400	22700	3635	0	1654
Apr (22/03 to 21/04)	2009	3869100	3438800	8700	6686	0	1555
May (22/04 to 21/05)	2009	3881100	3432700	7300	6642	0	1165
June (22/05 to 21/06)	2009	3455500	3050300	14300	5574	0	1663
July (22/06 to 21/07)	2009	2883700	2527400	29900	4953	0	2605
<b>Total For The Monitoring Period</b>		<b>32712000</b>	<b>28717600</b>	<b>270400</b>	<b>55143</b>	<b>0</b>	<b>24449</b>

Emission reductions are calculated based on the power exported to the grid, power imported from the grid during shut down and start up, coal and diesel consumed in the plant for the monitoring period.

Billing Month	Year	Electricity Exported, KWH	Electricity Imported KWH	Electricity Displaced, KWH	Biomass Used, MT	Coal Used , MT	Diesel consumption, lit	Net Emission Reductions (tCO2e)
Aug (22/07 to 21/08)	2008	1208800	48400	1160400	2749	0	2477	956
Sep (22/08 to 21/09)	2008	105100	47000	58100	393	0	1158	45
Oct (22/09 to 21/10)	2008	2738800	16700	2722100	5161	0	2816	2252
Nov (22/10 to 21/11)	2008	2360200	31600	2328600	5909	0	2919	1925
Dec (22/11 to 21/12)	2008	2243700	20300	2223400	3712	0	2702	1838
Jan (22/12 to 21/01)	2009	1785900	19400	1766500	3075	0	1688	1462
Feb (22/01 to 21/02)	2009	3803500	4100	3799400	6654	0	2047	3148
Mar (22/02 to 21/03)	2009	2022400	22700	1999700	3635	0	1654	1655
Apr (22/03 to 21/04)	2009	3438800	8700	3430100	6686	0	1555	2843
May (22/04 to 21/05)	2009	3432700	7300	3425400	6642	0	1165	2840
June (22/05 to 21/06)	2009	3050300	14300	3036000	5574	0	1663	2515
July (22/06 to 21/07)	2009	2527400	29900	2497500	4953	0	2605	2066
<b>Total For The Monitoring Period</b>		<b>28717600</b>	<b>270400</b>	<b>28447200</b>	<b>55143</b>	<b>0</b>	<b>24449</b>	<b>23544</b>

## **I. Measures to ensure the Results / uncertainty analysis**

As per the Power Purchase Agreement (PPA), the energy exported to the APSEB Grid is recorded from two independent meters viz., Main Meter and Check Meter and reading of main meter is used for billing. In the event of main meter not in operation / fails, the reading of the check meter shall be used for Billing.

As per the requirements of APSEB the plant will undertake the calibration of meters once in a year to make sure the accurateness of readings. Power Generation, Export & Auxiliary Consumption, fuel consumption are being recorded and measured daily and the same is being verified by Manager (O&M) and approved by General Manager (Operation).

Weight Bridge will be calibrated once in year to assure the quantity of biomass used during the plant operation.

## **J. Roles & Responsibilities**

A CDM team has been formed in KMS POWER PRIVATE LIMITED for monitoring and verification of all the monitoring parameters as per the guidelines formulated by the management of KMS POWER PRIVATE LIMITED. Qualified and trained people monitor the parameters and emission reduction calculations. In the complete implementation and monitoring Plan, KMS POWER PRIVATE LIMITED is the sole agency responsible for implementation and monitoring.

### **CDM team member names:**

1. Mr. Raju M
2. Mr. Rama Rao
3. Mr. Murali krishna M
4. Ms. Anwasha

## Emission Reduction Calculations

Month	Year	Electricity Generated, KWH	Electricity Exported KWH	Electricity Imported KWH	Net Electricity Exported, KWH (Export - Import)	Auxiliary Consumption		Biomass Used, MT					Coal Used, MT	Grand Total, MT	% Carbon in Coal	Emission Factor, kgCO <sub>2</sub> /kWh	EMISSION REDUCTIONS, Tons	GHG Emissions due to consumption of diesel for emergency DG sets and fuel handling vehicles			NET EMISSION REDUCTIONS, Tons (Nett of Import and Diesel emissions)	
						Meter reading	Gross - Net Export	Juliflora	Rice Husk	GN Shell	Turmeric Dust	Others						Total Biomass	Diesel consumption, lit	CO <sub>2</sub> emissions from diesel considering IPCC's oxidation factor of diesel as 0.99 tCO <sub>2</sub> /TJ		GHG Emissions due to consumption of Diesel, Tons
Aug (22/07 to 21/08)	2008	1468000	1208800	48400	1160400	250200	307600	65	2502	20	0	162	2749	0	2749	0.00	0.83	963	2477	74.1	6.77	956
Sep (22/08 to 21/09)	2008	134800	105100	47000	58100	307000	76700	2	386	0	0	5	393	0	393	0.00	0.83	48	1158	74.1	3.17	45
Oct (22/09 to 21/10)	2008	3147100	2738800	16700	2722100	391300	425000	511	4095	43	39	473	5161	0	5161	0.00	0.83	2259	2816	74.1	7.70	2252
Nov (22/10 to 21/11)	2008	2793600	2360200	31600	2328600	354700	465000	400	4899	139	99	372	5909	0	6170	0.00	0.83	1933	2919	74.1	7.98	1925
Dec (22/11 to 21/12)	2008	2516400	2243700	20300	2223400	271000	293000	0	3541	29	0	142	3712	0	3712	0.00	0.83	1845	2702	74.1	7.39	1838
Jan (22/12 to 21/01)	2009	1997100	1785900	19400	1766500	202700	230600	0	2971	0	0	104	3075	0	3075	0.00	0.83	1466	1688	74.1	4.62	1462
Feb (22/01 to 21/02)	2009	4276000	3803500	4100	3799400	444900	476600	0	6259	0	0	395	6654	0	6705	0.00	0.83	3154	2047	74.1	5.60	3148
Mar (22/02 to 21/03)	2009	2289600	2022400	22700	1999700	252700	289900	29	3350	0	134	122	3635	0	3635	0.00	0.83	1660	1654	74.1	4.52	1655
Apr (22/03 to 21/04)	2009	3869100	3438800	8700	3430100	411600	439000	16	6117	0	10	543	6686	0	6686	0.00	0.83	2847	1555	74.1	4.25	2843
May (22/04 to 21/05)	2009	3881100	3432700	7300	3425400	435200	455700	0	6286	0	0	356	6642	0	6642	0.00	0.83	2843	1165	74.1	3.19	2840
June (22/05 to 21/06)	2009	3455500	3050300	14300	3036000	389700	419500	0	5566	0	0	8	5574	0	5574	0.00	0.83	2520	1663	74.1	4.55	2515
July (22/06 to 21/07)	2009	2883700	2527400	29900	2497500	341000	386200	0	4953	0	0	0	4953	0	4953	0.00	0.83	2073	2605	74.1	7.12	2066
		3271200	2871760	27040	2844720	4052000	4264800	1023	50925	231	282	2682	55143	0	55455	0	0.83	23611	24449	74.1	67	23544