

MONITORING REPORT

(Version- 02)

DATE: 20th January 2009

(Third Monitoring Report)

“Rice Husk Based Power Project”

Reference No. UNFCCC 00000186

Methodology: AMS I.D

Version 07

Monitoring Period

1st April 2007 – 31st March 2008

(Both days included)

Project Site

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1. General Information

1.1 Project Activity

The project activity is a rice husk based power generation project with provisions to co-fire coal with rice husk. The total capacity of the power plant is 7.7MW. Entire power generated from the project activity is exported to the Chattisgarh State Electricity Board (CSEB) Grid after meeting the auxiliary consumption of the power plant equipment.

1.2 Project Commissioning

Start date of commercial operation: 1st November 2001

(As per the “Investment Certificate” issued by Chattisgarh State Renewable Energy Development Agency)

1.3 Monitoring Period

The monitoring period is chosen from 01/04/2007 to 31/03/2008 (both days included).

1.4 Monitoring Protocol

The monitoring protocol requires the following parameters to be monitored for the computation of emission reductions:

- Power export
- Carbon content in coal

Apart from the above parameters, the project proponent also monitors the following supplementary parameters to check the operational performance of the power plant:

- Total electricity generated
- Auxiliary consumption
- Type of fuel used (Coal, Biomass)
- Total quantity of fuel consumption (Coal, Biomass)
- Calorific value of fuels used (Coal, Biomass)
- Plant heat rate
- Efficiency of power generation activity

Please refer to the following table for a detail description on the Monitoring Protocol:

Serial No.	Parameters	Monitoring Equipment	Monitoring Record(s)	Uncertainty Analysis
Parameters required to be monitored for the computation of Emission Reductions				
1.4.1	Power export	The CSEB Main Meter (MM) readings are used to determine the net export quantity. Under circumstances wherein the Main Meter is not functional, the CSEB Check Meter (CM) readings are used to determine the same.	CSEB- HT Meter Reading Statement	<p>1. These meters are maintained and calibrated by CSEB. All these meters are sealed by CSEB. Furthermore, the accuracy of the Main Meter readings is substantiated by the Check Meter readings.</p> <p>2. The parameter can also be cross-checked with the measured values of the net export, monitored by the In-house Export Meter. The In-house Export Meter (or the Static Meter) is a micro-processor based metering device supplied by Secure Meter Limited (SEMS).</p> <p>3. Any discrepancies in the Main Meter reading (for example, difference between Main Meter and Check Meter readings or extreme deviation in the net export figure from that reported by the In-house Export Meter of VVL), if identified, will immediately be brought to the notice of CSEB. CSEB will ensure the corrective actions to be undertaken at their earliest.</p>

Serial No.	Parameters	Monitoring Equipment	Monitoring Record(s)	Uncertainty Analysis
Parameters required to be monitored for the computation of Emission Reductions				
1.4.2	Total quantity of coal consumption	The quantity of coal consumed is monitored by scaling of bunker (i.e. by measuring the difference in levels of coal in the bunker before feeding coal and after discharging the same into the feeding hoppers of the FBC boiler). A standardized scaling chart for the bunker is used to calculate the fuel fed from the bunker to the FBC boiler.	Coal Stock Register	<p>1. The scaling of bunker was carried out by VVL which was certified by Rishu Engineering, Bilaspur.</p> <p>2. The daily coal consumption figure, as reported in the "Coal Stock Register" can also be cross-verified with the coal consumption figure of the "Details of daily Report".</p> <p>3. The annual coal consumption figure can also be cross-checked from the audited (by a third party statutory auditor) Balance Sheet of VVL.</p> <p>4. There is a defined procedure on "GHG Performance Monitoring, Measurement and Reporting of Data" which ensures that proper corrective actions are undertaken immediately if any discrepancies are identified in the coal consumption data. These discrepancies are also documented as 'History' in the daily report.</p>
1.4.3	Carbon content in coal	-	Coal Analysis Reports of National Accredited Laboratory	The carbon content of the coal used is analyzed by a National Accredited Laboratory following the standard testing procedure which will ensure lower uncertainty level of the parameter.

Serial No.	Parameters	Monitoring Equipment	Monitoring Record(s)	Uncertainty Analysis
Supplementary parameters required to be monitored for checking the operational performance of the power plant				
1.4.4	Total electricity generated	In-house Generation Meter	Monthly Performance Report	<p>1. The In-house Generation Meter (or the Energy Meter) is a micro-processor based metering device which is supplied by ABB. It is calibrated by a third party on a regular basis.</p> <p>2. The In-house Export Meter (or the Static Meter) is a micro-processor based metering device which is supplied by Secure Meter Limited (SEMS). This is calibrated as per the manufacturer's calibration schedule.</p>
1.4.5	Auxiliary consumption	Auxiliary Meter		<p>3. The Auxiliary meter is a micro-processor based metering device which is supplied by GEC ALSTOM. This is calibrated as per VVL's calibration schedule.</p> <p>4. The monthly generation, consumption and export figures, as reported in the "Monthly Performance Report" can also be cross-verified with the corresponding figures as reported in the "Details of daily Report".</p> <p>5. The annual generation, consumption and export figures can also be cross-checked from the audited (by a third party statutory auditor) Balance Sheet of VVL.</p> <p>6. There is a defined procedure on "GHG Performance Monitoring, Measurement and Reporting of Data" which ensures that proper corrective actions are undertaken immediately if any discrepancies are identified in the generation, consumption and export figures (like inconsistencies in reported parameters) and/or discrepancies in the operation of the power plant.</p>

				<p>These discrepancies are also documented as 'History' in the daily report.</p>
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Serial No.	Parameters	Monitoring Equipment	Monitoring Record(s)	Uncertainty Analysis
Supplementary parameters required to be monitored for checking the operational performance of the power plant				
1.4.6	Total quantity of rice husk consumption	The quantity of rice husk consumed is monitored by scaling of bunker (i.e. by measuring the difference in levels of rice husk in the bunker before feeding rice husk and after discharging the same into the feeding hoppers of the FBC boiler). A standardized scaling chart for the bunker is used to calculate the fuel fed from the bunker to the FBC boiler.	Rice Husk Stock Register	<p>1. The scaling of bunker was carried out by VVL which was certified by Rishu Engineering, Bilaspur.</p> <p>2. The daily rice husk consumption figure, as reported in the "Rice Husk Stock Register" can also be cross-verified with the rice husk consumption figure of the "Details of daily Report".</p> <p>3. The annual rice husk consumption figure can also be cross-checked from the audited (by a third party statutory auditor) Balance Sheet of VVL.</p> <p>4. There is a defined procedure on "GHG Performance Monitoring, Measurement and Reporting of Data" which ensures that proper corrective actions are undertaken immediately if any discrepancies are identified in the rice husk consumption data. These discrepancies are also documented as 'History' in the daily report.</p>
1.4.7	Calorific value of coal used	-	Reports of National Accredited Laboratory	<p>1. The calorific value of coal is tested by an external Laboratory, which is a National Accredited Laboratory (Central Fuel Research Institute, Bilaspur Unit).</p> <p>2. There is a defined procedure on "GHG Performance Monitoring, Measurement and Reporting of Data" which ensures that proper corrective actions are undertaken immediately if any discrepancies are identified in the calorific value data of coal. These discrepancies are also documented as 'History' in the daily report.</p>

1.4.8	Calorific value of rice husk used	Bomb Calorimeter	Lab Analysis Report	<p>1. The calorific value of the rice husk is determined in the in-house laboratory of VVL as per the standard national practices by taking samples at random.</p> <p>2. The Bomb Calorimeter is calibrated once in every year following the standard procedure for calibration.</p> <p>3. There is a defined procedure on “GHG Performance Monitoring, Measurement and Reporting of Data” which ensures that proper corrective actions are undertaken immediately if any observations in the calorific value of rice husk (like inconsistencies in reported parameters) are identified.</p>
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Serial No.	Parameters	Monitoring Equipment	Monitoring Record(s)	Uncertainty Analysis
Supplementary parameters required to be monitored for checking the operational performance of the power plant				
1.4.9	Plant Heat Rate	Computed	Computation Sheet	<p>1. The parameters are computed following the standard methods of calculation.</p> <p>2. There is a defined procedure on “GHG Performance Monitoring, Measurement and Reporting of Data” which ensures that proper corrective actions are undertaken immediately if any observations in the plant heat rate or efficiency of power generation (like inconsistencies in computed parameters) are identified. These discrepancies are also documented as ‘History’ in the daily report.</p>
1.4.10	Efficiency of power generation activity			

2. Monitored Results

Monitored parameters for the period April 2007 - March 2008											
Parameters Month	Electrical Energy				Rice Husk		Coal			Plant Operational Parameter	
	Gross Generation	Auxiliary Consumption	Export to CSEB (As per the in-house Export Meter of SEMS)	Export to CSEB Grid (As per CSEB Statement)	Consumption	GCV	Consumption	GCV	Total Carbon	Plant Heat Rate	Efficiency of Power Generation
	(kWh)	(kWh)	(kWh)	(kWh)	(tonnes)	(kCal/kg)	(tonnes)	(kCal/kg)	(%)	(kCal/kWh)	(%)
Apr-07	5357600	551800	4775920	4950400	4928.992	2760	1044.740	2630	29.10	3052.05	28.18
May-07	5017700	533200	4466960	4432480	4666.461	2746	983.466	2615	28.60	3066.32	28.05
Jun-07	5164500	545600	4596880	4592480	5112.855	2808	1058.727	2855	30.60	3365.20	25.56
Jul-07	5752800	623100	5106400	5115760	5292.576	2610	1121.804	2160	23.40	2822.40	30.47
Aug-07	5445100	598300	4826480	4822320	4955.041	2708	1061.802	2620	28.30	2975.18	28.91
Sep-07	5180800	576600	4587040	4476400	4921.760	2680	984.352	2690	28.60	3057.10	28.13
Oct-07	5720900	606050	5097280	5210080	5663.691	2712	1149.904	2805	29.90	3248.69	26.47
Nov-07	5284800	568850	4690960	4689360	5337.648	2680	1083.391	2835	29.60	3287.98	26.16
Dec-07	3793900	434000	3348300	3461360	3479.072	2728	718.504	2885	31.10	3048.00	28.22
Jan-08	3345500	345650	2981760	2861840	3378.955	2806	669.100	3280	35.90	3490.06	24.64
Feb-08	5193600	523900	4646720	4511440	4778.112	2666	1017.943	2710	29.70	2983.88	28.82
Mar-08	5615700	575050	5016000	5015840	5110.287	2690	1095.067	2680	28.90	2970.50	28.95
Total	60872900	6482100	54140700	54139760	57625.450		11988.800				

According to the Monitoring Plan of the Registered PDD, the Emission Reduction is calculated based on the electricity exported to the grid as per the CSEB Statement. The gross generation, auxiliary consumption and export to CSEB (as per in-house export meter of SEMS) has been recorded for monitoring purpose only as per the Monitoring Plan of the Registered PDD.

3. Computation of Emission Reductions

The emission reduction figures have been calculated based on the following equations:

Baseline Emissions = (Net Export to CSEB Grid * Grid emission Factor) tCO₂

Project Emissions = [(44/12) * Quantity of Coal consumed * Carbon content of coal] tCO₂

Emission Reductions = (Baseline Emissions – Project Emissions) tCO₂

Note: The grid emission factor is calculated ex-ante and is fixed for the entire crediting period. The value of the grid emission factor was calculated in the Registered PDD based on figures provided by the Central Electricity Authority, Government of India and other government agencies of India (mentioned in the Registered PDD).

Emission Reductions for the period April 2007 - March 2008							
Parameters Months	Baseline Emissions			Project Emissions			Emission Reductions
	Net Export to CSEB Grid	Grid Emission Factor	Baseline Emissions	Coal Consumption	Total Carbon in Coal	Project Emissions	
	(kWh)	(tCO ₂ /MU)	(tCO ₂)	(tonnes)	(%)	(tCO ₂)	(tCO ₂)
Apr-07	4950400	820.00	4059	1044.740	29.10	1115	2945
May-07	4432480	820.00	3635	983.466	28.60	1031	2603
Jun-07	4592480	820.00	3766	1058.727	30.60	1188	2578
Jul-07	5115760	820.00	4195	1121.804	23.40	963	3232
Aug-07	4822320	820.00	3954	1061.802	28.30	1102	2853
Sep-07	4476400	820.00	3671	984.352	28.60	1032	2638
Oct-07	5210080	820.00	4272	1149.904	29.90	1261	3012
Nov-07	4689360	820.00	3845	1083.391	29.60	1176	2669
Dec-07	3461360	820.00	2838	718.504	31.10	819	2019
Jan-08	2861840	820.00	2347	669.100	35.90	881	1466
Feb-08	4511440	820.00	3699	1017.943	29.70	1109	2591
Mar-08	5015840	820.00	4113	1095.067	28.90	1160	2953
Total	54139760		44395	11988.800		12836	31559

4. Summary of the Annual Emission Reductions

Year	Emission Reductions (tCO ₂)
April 2007 – March 2008	31559
Total Emission Reductions	31559

5. Biomass Survey in the region

The project proponent has hired the services of Power Tech Consulting Engineers to undertake an assessment on availability of biomass (rice husk) within a radial distance of 50 km from the project site. The study covers the rice husk availability, rice husk consumption and % surplus rice husk on total rice husk availability in the region. A summary of the survey findings are presented in the table below.

Rice Husk Availability (within 50 km radial distance of project activity) in 2007-08	Rice Husk Consumption of the project activity in 2007-08	Rice husk availability in the region as a % of rice husk consumption of the project activity in 2007-08
Ton	Ton	%
364000	57625.45	631.66

Thus, the rice husk available within 50km of the project activity is about 6 times greater than the quantity of rice husk utilized by the project activity.