

MONITORING REPORT
(Version- 03)
DATE: 24th April 2008
(Second Monitoring Report)

“Rice Husk Based Power Project”
Reference No. UNFCCC 00000186
Methodology: AMS I.D

Monitoring Period
1st April 2006 – 31st March 2007
(Both days included)

Project Site
Bilaspur, Chattisgarh, India

M/s Vandana Vidhyut Limited
Vandana Bhawan, M.G.Road,
District- Raipur, PIN- 492001,
State- Chattisgarh, India
Tel: + 91 771-2535440
Fax: + 91 771- 2535804
E-mail: Vil-nib@sancharnet.in

Index

<u>Description</u>	<u>Page No.</u>
1. General Information	
1.1 Project Activity	3
1.2 Project Commissioning	3
1.3 Monitoring Period	3
1.4 Monitoring Protocol	3-10
2. Monitored Results	11
3. Computation of Emission Reductions	12
4. Summary of Annual Emission Reductions	12

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 01/04/2006 to 31/03/2007 (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>
--	--	--	--	----------------------------------------------------------------------------------

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 or Bhagavathi Ana Labs Ltd).</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>
-------	-----------------------------------	------------------	---------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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 2006 - March 2007											
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-06	5357600	545600	4785520	4934240	5411.176	2812	910.792	3380	35.60	3414.72	25.19
May-06	5615700	590550	5002720	4974000	5556.042	2980	1039.468	3471	36.27	3590.83	23.95
Jun-06	5257600	548700	4678640	4553760	5362.752	2920	973.184	3613	32.30	3647.17	23.58
Jul-06	5461600	592100	4840080	4827920	6116.992	2810	1092.320	3327	28.11	3812.60	22.56
Aug-06	5581500	592100	4956960	4971760	6251.280	2860	1116.300	2505	26.90	3704.20	23.22
Sep-06	4884500	496000	4362960	4146560	5470.640	3048	976.900	3000	31.80	4013.76	21.43
Oct-06	5509400	544050	4927760	5107040	6170.528	2942	1101.880	3715	37.70	4038.04	21.30
Nov-06	5518700	551800	4946160	4944960	6180.944	2860	1103.740	3030	31.30	3809.20	22.58
Dec-06	5241200	522350	4696160	4525840	5870.144	2910	1048.240	2780	29.40	3815.20	22.54
Jan-07	5658000	567300	5065120	5233920	6336.960	2840	1131.600	2505	27.00	3681.80	23.36
Feb-07	5198900	528550	4644150	4661760	5822.768	2915	1039.780	2430	26.80	3750.80	22.93
Mar-07	5577400	568850	4976880	4816480	6246.688	2810	1115.480	2815	29.90	3710.20	23.18
Total	64862100	6647950	57883110	57698240	70796.914		12649.684				

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 2006 - March 2007							
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)	(kgCO ₂ /kWh)	(tCO ₂)	(tonnes)	(%)	(tCO ₂)	(tCO ₂)
Apr-06	4934240	0.820	4046	910.792	35.60	1189	2857
May-06	4974000	0.820	4079	1039.468	36.27	1382	2696
Jun-06	4553760	0.820	3734	973.184	32.30	1153	2582
Jul-06	4827920	0.820	3959	1092.320	28.11	1126	2833
Aug-06	4971760	0.820	4077	1116.300	26.90	1101	2976
Sep-06	4146560	0.820	3400	976.900	31.80	1139	2261
Oct-06	5107040	0.820	4188	1101.880	37.70	1523	2665
Nov-06	4944960	0.820	4055	1103.740	31.30	1267	2788
Dec-06	4525840	0.820	3711	1048.240	29.40	1130	2581
Jan-07	5233920	0.820	4292	1131.600	27.00	1120	3172
Feb-07	4661760	0.820	3823	1039.780	26.80	1022	2801
Mar-07	4816480	0.820	3950	1115.480	29.90	1223	2727
Total	57698240		47313	12649.684		14375	32938

4. Summary of the Annual Emission Reductions

Year	Emission Reductions (tCO ₂)
April 2006 – March 2007	32938
Total Emission Reductions	32938