

MONITORING REPORT
(Version- 01)
DATE: 22nd March 2010
(Fourth Monitoring Report)

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

Monitoring Period
1st April 2008 – 31st March 2009
(Both days included)

Project Site
Bilaspur, Chattisgarh, India

M/s Vandana Vidhyut Limited
Vandana Bhawan, M.G.Road,
District- Raipur, PIN- 492001,
State- Chattishgarh, India
Tel: + 91 771-2535440/42077777
Fax: + 91 771- 4265491
E-mail: Vil-nib@sancharnet.in

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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 01/04/2008 to 31/03/2009 (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 2008 - March 2009											
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-08	4970600	546440	4424160	4679520	5268.836	2842	1540.886	2895	31.40	3909.97	22.00
May-08	4968400	558000	4410400	4331200	5326.125	2710	1540.204	2730	29.80	3751.42	22.92
Jun-08	5127200	557120	4574080	4653280	5490.384	3044	1595.805	2040	23.10	3894.56	22.08
Jul-08	5703700	621300	5082400	4982400	6114.363	2906	1842.300	2595	29.40	3953.42	21.75
Aug-08	5561500	619980	4941520	4788080	5967.491	2890	1807.496	2310	27.30	3851.72	22.33
Sep-08	5374500	587460	4787040	4993600	5815.207	2916	1762.838	2755	29.10	4058.75	21.19
Oct-08	5472400	590160	4882240	4837360	5746.020	3020	1756.637	2870	31.90	4092.27	21.02
Nov-08	5327100	581980	4745120	4575680	5540.184	2984	1534.208	2435	24.70	3804.64	22.60
Dec-08	5331400	603720	4727680	4896960	5491.548	3062	1540.832	2335	25.70	3828.82	22.46
Jan-09	5797400	630040	5163360	5144800	5909.268	2858	1297.727	2020	22.60	3365.32	25.55
Feb-09	5231200	556800	4674400	4695840	5440.448	3016	1192.721	2705	28.40	3753.38	22.91
Mar-09	5777500	634940	5142560	5107200	5893.050	2898	1311.486	1935	21.80	3395.20	25.33
Total	64642900	7087940	57554960	57685920	68002.924		18723.140				

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 2008 - March 2009							
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-08	4679520	820.00	3837	1540.886	31.40	1774	2063
May-08	4331200	820.00	3552	1540.204	29.80	1683	1869
Jun-08	4653280	820.00	3816	1595.805	23.10	1352	2464
Jul-08	4982400	820.00	4086	1842.300	29.40	1986	2100
Aug-08	4788080	820.00	3926	1807.496	27.30	1809	2117
Sep-08	4993600	820.00	4095	1762.838	29.10	1881	2214
Oct-08	4837360	820.00	3967	1756.637	31.90	2055	1912
Nov-08	4575680	820.00	3752	1534.208	24.70	1389	2363
Dec-08	4896960	820.00	4016	1540.832	25.70	1452	2564
Jan-09	5144800	820.00	4219	1297.727	22.60	1075	3143
Feb-09	4695840	820.00	3851	1192.721	28.40	1242	2609
Mar-09	5107200	820.00	4188	1311.486	21.80	1048	3140
Total	57685920		47302	18723.140		18747	28556

4. Summary of the Annual Emission Reductions

Year	Emission Reductions (tCO ₂)
April 2008 – March 2009	28556
Total Emission Reductions	28556