

MONITORING REPORT
(Version- 01)
DATE: 31st August 2007
(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
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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 01/04/2006 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)
- 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 | Computed from the readings of In-house Generation Meter and In-house Export Meter | | <p>3. 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>4. 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>5. 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. 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 | <ol style="list-style-type: none"> 1. The scaling of bunker was carried out by VVL which was certified by Rishu Engineering, Bilaspur. 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". 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. 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. |
| 1.4.7 | Calorific value of coal used | Bomb Calorimeter | Lab Analysis Report | <ol style="list-style-type: none"> 1. The calorific values of the rice husk and coal are determined in the in-house laboratory of VVL as per the standard national/international practices by taking samples at random. 2. The Bomb Calorimeter is calibrated once in every year |

| | | | | |
|-------|-----------------------------------|--|--|--|
| 1.4.8 | Calorific value of rice husk used | | | <p>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 | 1. The parameters are computed following the standard methods of calculation. |
| 1.4.10 | Efficiency of power generation activity | | | 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. |

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 | 572080 | 4785520 | 4934240 | 5411.176 | 2812 | 910.792 | 3510 | 35.60 | 3436.82 | 25.02 |
| May-06 | 5615700 | 612980 | 5002720 | 4974000 | 5556.042 | 2980 | 1039.468 | 3674 | 36.27 | 3628.40 | 23.70 |
| Jun-06 | 5257600 | 578960 | 4678640 | 4553760 | 5362.752 | 2920 | 973.184 | 3760 | 32.30 | 3674.38 | 23.41 |
| Jul-06 | 5461600 | 621520 | 4840080 | 4827920 | 6116.992 | 2810 | 1092.320 | 3616 | 25.70 | 3870.40 | 22.22 |
| Aug-06 | 5581500 | 624540 | 4956960 | 4971760 | 6251.280 | 2860 | 1116.300 | 3509 | 26.90 | 3905.00 | 22.02 |
| Sep-06 | 4884500 | 521540 | 4362960 | 4146560 | 5470.640 | 3048 | 976.900 | 3616 | 31.80 | 4136.96 | 20.79 |
| Oct-06 | 5509400 | 581640 | 4927760 | 5107040 | 6170.528 | 2942 | 1101.880 | 3688 | 37.70 | 4032.64 | 21.33 |
| Nov-06 | 5518700 | 572540 | 4946160 | 4944960 | 6180.944 | 2860 | 1103.740 | 3590 | 31.30 | 3921.20 | 21.93 |
| Dec-06 | 5241200 | 545040 | 4696160 | 4525840 | 5870.144 | 2910 | 1048.240 | 3448 | 29.40 | 3948.80 | 21.78 |
| Jan-07 | 5658000 | 592880 | 5065120 | 5233920 | 6336.960 | 2840 | 1131.600 | 3390 | 27.00 | 3858.80 | 22.29 |
| Feb-07 | 5198900 | 554740 | 4644160 | 4661760 | 5822.768 | 2915 | 1039.780 | 3710 | 26.80 | 4006.80 | 21.46 |
| Mar-07 | 5577400 | 600520 | 4976880 | 4816480 | 6246.688 | 2810 | 1115.480 | 3662 | 29.90 | 3879.60 | 22.17 |
| Total | 64862100 | 6978980 | 57883120 | 57698240 | 70796.914 | | 12649.684 | | | | |

3. Computation of Emission Reductions

| 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) | (tCO ₂ /MU) | (tCO ₂) | (tonnes) | (%) | (tCO ₂) | (tCO ₂) |
| Apr-06 | 4934240 | 819.68 | 4044 | 910.792 | 35.60 | 1189 | 2856 |
| May-06 | 4974000 | 819.68 | 4077 | 1039.468 | 36.27 | 1382 | 2695 |
| Jun-06 | 4553760 | 819.68 | 3733 | 973.184 | 32.30 | 1153 | 2580 |
| Jul-06 | 4827920 | 819.68 | 3957 | 1092.320 | 25.70 | 1029 | 2928 |
| Aug-06 | 4971760 | 819.68 | 4075 | 1116.300 | 26.90 | 1101 | 2974 |
| Sep-06 | 4146560 | 819.68 | 3399 | 976.900 | 31.80 | 1139 | 2260 |
| Oct-06 | 5107040 | 819.68 | 4186 | 1101.880 | 37.70 | 1523 | 2663 |
| Nov-06 | 4944960 | 819.68 | 4053 | 1103.740 | 31.30 | 1267 | 2787 |
| Dec-06 | 4525840 | 819.68 | 3710 | 1048.240 | 29.40 | 1130 | 2580 |
| Jan-07 | 5233920 | 819.68 | 4290 | 1131.600 | 27.00 | 1120 | 3170 |
| Feb-07 | 4661760 | 819.68 | 3821 | 1039.780 | 26.80 | 1022 | 2799 |
| Mar-07 | 4816480 | 819.68 | 3948 | 1115.480 | 29.90 | 1223 | 2725 |
| Total | 57698240 | | 47294 | 12649.684 | | 14278 | 33016 |

4. Summary of the Annual Emission Reductions

| Year | Emission Reductions (tCO ₂) |
|----------------------------------|--|
| April 2006 – March 2007 | 33016 |
| Total Emission Reductions | 33016 |