# ***MONITORING REPORT***

Monitoring Period
25.11.2006 to 24.09.2007
(Both days included)

## Project 0362: Sri Balaji 6 MW Non-Conventional Renewable Sources Biomass Power Project

Version: Balaji/001
Date: 07/10/2007

**Project Site:**
Chennur Village, Chennur Mandal
Kadapa district, Andhra Pradesh

**SRI BALAJI BIOMASS POWER PVT. LTD.**
Plot No:1071, Road No 44,
Jubilee Hills, Hyderabad – 500033
Andhra Pradesh, India
Email: sribalaji@greenkogroup.com

## Current Status of the Project

**Project 0362: Sri Balaji 6 MW Non-Conventional Renewable Sources Biomass Power Project** Plant at Chennur Village, Chennur Mandal Kadapa district, Andhra Pradesh, India, has been commissioned and is operational since 14-04-2004.

## Monitoring Period

The Monitoring period is chosen from 25.11.2006 to 24.09.2007(both days included).

During the second monitoring period i.e, from 25.11.2006 to 24.09.2007 (Both days inclusive), plant exported 30.1384 million Kwh to APTRANSCO grid and consumed 46880 MT of biomass fuel and no coal during the period.

## Statement to what extent the Project has been implemented as planned

The Project has been completed as planned and described in the Project Design Document (PDD).

The Plant is in operation continuously (with outages – forced & planned) in continuation with the first monitoring period. The Plant is using renewable Biomass fuels like Rice Husk, Ground nut shell, Prosophis Juliflora, and other biomass fuels like Bengal gram, jowar husk and sunflower stalks. 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:

| Year | Running hours | Planned outages | Forced Outages |
|---|---|---|---|
| | | Hrs | Hrs. |
| Dec 2006 | 486 | 253 | 5 |
| Jan 2007 | 497 | 242 | 5 |
| Feb 2007 | 503 | 153 | 16 |
| Mar 2007 | 405 | 336 | 3 |
| April 2007 | 400 | 319 | 1 |
| May 2007 | 537 | 196 | 11 |
| June 2007 | 517 | 171 | 32 |
| July 2007 | 539 | 150 | 55 |
| Aug 2007 | 558 | 183 | 3 |
| Sep 2007 | 654 | 0 | 66 |
| Total | 5096 | 2003 | 197 |

**Sustainability – Economic and Social well being**

The Company has spent around Rs. 47.1 million (USD 1.17 million @ IUS$ = Rs 40/-) 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 300 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.

## Parameters being monitored according to Monitoring Plan

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

1 ***Power Generation:*** 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 compare the auxiliary consumption of the plant after deducting power exported to the grid with the consumption measured from the auxiliary energy meters.

2 ***Power Export and import***: Power exported to the grid and imported from the grid is monitored from energy meters installed at APTRANSCO sub station on 24$^{th}$ day of every 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 SREE BALAJI BIOMASS POWER PRIVATE LIMITED.

3 ***Biomass Fuel of all kinds:*** 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 of all kinds of all kinds:*** The calorific value of the Biomass fuel used is being measured in the out side Govt. approved laboratory at regular intervals, as per the arrivals and average value will be considered on monthly basis. This is being used for energy balance in the plant.

5 ***Coal/Diesel:*** Coal never has been used in plant during the complete monitoring period. Diesel consumption will be monitored on regular basis using level gauge/measurement on store issues.

## Power Generation, Export & Fuel Consumption

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

| Month | Year | Electricity Generated, Million KWh | Export to APTRANSCO grid (Million KWh) | Electricity Imported, Million KWh | Total Biomass used MT | Coal Used, MT | Diesel Consumption liters |
|---|---|---|---|---|---|---|---|
| Dec (From 25th Nov) | 2006 | 3.5093 | 3.1566 | 0.0129 | 4520 | 0 | 2420 |
| Jan | 2007 | 3.5934 | 3.2232 | 0.0111 | 4410 | 0 | 2323 |
| Feb | 2007 | 3.6246 | 3.258 | 0.0143 | 4465 | 0 | 1781 |
| March | 2007 | 3.3849 | 3.0447 | 0.0162 | 4345 | 0 | 1954 |
| April | 2007 | 2.1765 | 1.9556 | 0.0216 | 2805 | 0 | 1733 |
| May | 2007 | 3.4971 | 3.1154 | 0.0127 | 4859 | 0 | 2605 |
| June | 2007 | 3.6247 | 3.2245 | 0.0139 | 5196 | 0 | 2631 |
| July | 2007 | 3.5144 | 3.1209 | 0.0115 | 5495 | 0 | 3012 |
| Aug | 2007 | 3.6874 | 3.2567 | 0.0089 | 5790 | 0 | 3188 |
| 24-Sep | 2007 | 3.1693 | 2.7828 | 0.0192 | 4995 | 0 | 2986 |
| **TOTAL** | | **33.7816** | **30.1384** | **0.1423** | **46880** | **0** | **24633** |

Note: Electricity generated, exported and imported is mentioned in million KWh for easy readability though the same are measured and monitored in KWh.

## Emission Reductions

The emission reductions per year during the chosen monitoring period ( 25.11.06 to 24.09.07 ) are as given below:

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 from [25.11.06 ] to [24.09.07 ] .

| Month | Year | Electricity Generated, Million KWh | Export to APTRANSCO grid (Million KWh) | Electricity Imported, Million KWh | Total Biomass used MT | Coal Used, MT | Diesel Consumption liters | Net Emission Reductions tCO2e |
|---|---|---|---|---|---|---|---|---|
| Dec (From 25th Nov) | 2006 | 3.5093 | 3.1566 | 0.0129 | 4520 | 0 | 2420 | 2603 |
| Jan | 2007 | 3.5934 | 3.2232 | 0.0111 | 4410 | 0 | 2323 | 2660 |
| Feb | 2007 | 3.6246 | 3.258 | 0.0143 | 4465 | 0 | 1781 | 2687 |
| March | 2007 | 3.3849 | 3.0447 | 0.0162 | 4345 | 0 | 1954 | 2508 |
| April | 2007 | 2.1765 | 1.9556 | 0.0216 | 2805 | 0 | 1733 | 1601 |
| May | 2007 | 3.4971 | 3.1154 | 0.0127 | 4859 | 0 | 2605 | 2568 |
| June | 2007 | 3.6247 | 3.2245 | 0.0139 | 5196 | 0 | 2631 | 2658 |
| July | 2007 | 3.5144 | 3.1209 | 0.0115 | 5495 | 0 | 3012 | 2573 |
| Aug | 2007 | 3.6874 | 3.2567 | 0.0089 | 5790 | 0 | 3188 | 2687 |
| 24-Sep | 2007 | 3.1693 | 2.7828 | 0.0192 | 4995 | 0 | 2986 | 2286 |
| **GRAND TOTAL** | | **33.7816** | **30.1384** | **0.1423** | **46880** | **0** | **24633** | **24830** |

Note: Electricity generated, exported and imported is mentioned in million kWh for easy readability though the same are measured and monitored in kWh.

The detailed calculation sheet for the same is given in **Annexure – I** of the monitoring report.

Baseline and project emissions are calculated as per the formulas mentioned in Section E of the PDD. The same is given below:

| **Emissions** | **Formula used** |
|---|---|
| **Baseline emissions** | = Electricity exported to the grid (kWh) x grid emission factor (tCO2/kWh) |

| **Project emissions** | |
|---|---|
| Due to coal consumption | = Actual Coal consumed in MT x % carbon in coal x (44/12) |
| Due to diesel consumption | = [(Diesel consumed in liters x calorific value (TJ/kg) x density of fuel (kg/l))] x IPCC emission factor ($tCO_2$/TJ) x oxidation factor |
| Due to import of power from Grid | = Electricity imported from grid (kWh) x grid emission factor ($tCO_2$/kWh) |

**Monitoring period Summary**

| **Sl. No** | **Particular** | **Monitoring period (10 Months)** |
|---|---|---|
| 1 | CEF, kgCO2/kWh | 0.830 |
| 2 | Power export to the grid, Million KWh | 30.1384 |
| 3 | Emission Reductions, tons of $CO_2$ | 24830 |
| **GRAND TOTAL:** | | **24830** tCO2e |

**Measures to ensure the Results / uncertainty analysis**

As per the Power Purchase Agreement (PPA), the energy exported to the AP 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.

The calibration of monitoring equipment is being maintained as per the requirement of APTRANSCO. Power Generation, Export & Auxiliary Consumption, fuel consumption are being recorded daily and the same is being verified by Manager (O&M) and approved by General Manager (Operation).

**Roles & Responsibilities**

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

**CDM team member names :**

1. **Mr. Mahesh Kolli - Director**
2. **Mr. B.M.K.Murthy – General Manager**
3. **Mr. M.Thirumala Raju – DGM Projects (CDM)**
4. **Mr. Malla Reddy – O & M Manager**
5. **Mr. K.Venkatesh – Biomass Manager**

## Annexure – I: CER Calculation Sheet

| Month | Year | Electricity Generated, Million kWh | Electricity Exported, Million kWh | Electricity Imported, Million kWh | Auxiliary Consumption | | Biomass Used, MT | | | | | Coal Used, MT | Grand Total, MT | % Carbon in Coal | Emission Factor, kgCO2/ kWh | Diesel consumption , lit | | Baseline emissions, tCO2e | Project Emissions, tCO2e | | | | Nett Emission Reductions, tCO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Million kWh | % | Rice Husk | GN Shell | Juliflora | *Others | Total Biomass | | | | | | | | Emissions due to import | Emissions due to Coal | Emissions due to Diesel | Total Project emissions | |
| Dec (From 25th Nov) | 2006 | 3.5093 | 3.1566 | 0.0129 | 0.3527 | 10.1 | 2105 | 1335 | 1065 | 15 | 4520 | 0 | 4520 | | 0.83 | 2420 | 73.359 | 2620 | 10.71 | 0 | 6.55 | 17 | 2603 |
| Jan | 2007 | 3.5934 | 3.2232 | 0.0111 | 0.3702 | 10.3 | 2719 | 805 | 795 | 91 | 4410 | 0 | 4410 | | 0.83 | 2323 | 73.359 | 2675 | 9.21 | 0 | 6.29 | 16 | 2660 |
| Feb | 2007 | 3.6246 | 3.258 | 0.0143 | 0.3666 | 10.1 | 3685 | 30 | 325 | 425 | 4465 | 0 | 4465 | | 0.83 | 1781 | 73.359 | 2704 | 11.87 | 0 | 4.82 | 17 | 2687 |
| March | 2007 | 3.3849 | 3.0447 | 0.0162 | 0.3402 | 10.1 | 2335 | 515 | 140 | 1355 | 4345 | 0 | 4345 | | 0.83 | 1954 | 73.359 | 2527 | 13.45 | 0 | 5.29 | 19 | 2508 |
| April | 2007 | 2.1765 | 1.9556 | 0.0216 | 0.2209 | 10.1 | 490 | 615 | 30 | 1670 | 2805 | 0 | 2805 | | 0.83 | 1733 | 73.359 | 1623 | 17.93 | 0 | 4.69 | 23 | 1601 |
| May | 2007 | 3.4971 | 3.1154 | 0.0127 | 0.3817 | 10.9 | 1363 | 906 | 106 | 2484 | 4859 | 0 | 4859 | | 0.83 | 2605 | 73.359 | 2586 | 10.54 | 0 | 7.05 | 18 | 2568 |
| June | 2007 | 3.6247 | 3.2245 | 0.0139 | 0.4002 | 11.0 | 1985 | 581 | 65 | 2565 | 5196 | 0 | 5196 | | 0.83 | 2631 | 73.359 | 2676 | 11.54 | 0 | 7.12 | 19 | 2658 |
| July | 2007 | 3.5144 | 3.1209 | 0.0115 | 0.3935 | 11.2 | 2675 | 455 | 40 | 2325 | 5495 | 0 | 5495 | | 0.83 | 3012 | 73.359 | 2590 | 9.55 | 0 | 8.16 | 18 | 2573 |
| Aug | 2007 | 3.6874 | 3.2567 | 0.0089 | 0.4307 | 11.7 | 2453 | 393 | 449 | 2495 | 5790 | 0 | 5790 | | 0.83 | 3188 | 73.359 | 2703 | 7.39 | 0 | 8.63 | 16 | 2687 |
| 24-Sep | 2007 | 3.1693 | 2.7828 | 0.0192 | 0.3865 | 12.2 | 2400 | 240 | 180 | 2175 | 4995 | 0 | 4995 | | 0.83 | 2986 | 73.359 | 2310 | 15.94 | 0 | 8.09 | 24 | 2286 |
| **Total** | | **33.7816** | **30.1384** | **0.1423** | **3.6432** | **10.8** | **22210** | **5875** | **3195** | **15600** | **46880** | **0** | **46880** | | | **24633** | | **25015** | **118.11** | **0** | **66.70** | **185** | **24830** |