

MONITORING REPORT

Monitoring Period
15.04.04 to 24.11.06
(Both days included)

Version 01

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

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: info@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.

First synchronization of the Project with 33 KV sub station at Chennur (AP TRANSCO grid) was performed on 14-04-2004 after trial operations and after obtaining permission for commercial operations. Plant exported 96.5512 million KWh to APTRANSCO grid and consumed 154,171 MT of biomass fuel and not used coal since beginning of the operations till October 2006.

The list of vendors who supplied major equipments in the Plant is given below.

<u>S.No</u>	<u>Equipment</u>	<u>Supplier</u>
1	Boiler	M/s.Walchand nagar Industries Ltd. Walchandnagar(V & F) Indapur(Tq),Pune DL
2	Turbo-Generator Set	M/S.Triveni Engineering & Industries Ltd,Turbine Business Group Bangalore.
3	Plant Auxiliaries 1.Cooling Tower	M/s.CEA Cooling tower technologies(India) Pvt Ltd,443,Anna Salai, Teynampet,Chennai-18
4	Fuel Handling System	M/s.Scorpio Engineering(P) Ltd.,130,Wheeler Road,Cox Town,Bangalore-5

Plant obtained term loan from financial institutions namely SBI, IOB, Andhra Bank and Promoters Equity.

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) since 15-04-2004. The Plant is using renewable Biomass fuels like Rice Husk, Ground nut shell, Prosopis 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	Weeks	Hrs.	Weeks
04-05	6161	1499	9	788	5
05-06	5856	2348	14	556	4
06-07 (April to 24 November)	4139	1263	8	296	2

Plant was under shut down from 07.03.05 to 19.04.05 because of Major break down of Turbine. Plant was under shut down from 06.05.06 to 12.05.06 because of Boiler Furnace front wall collapse.

Monitoring Period

The Monitoring period is chosen from 15.04.2004 to 24.11.2006(both days included).

Sustainability – Economic and Social well being

The Company has spent around Rs. 159.4 million (USD 3.47 million @ IUS\$ = Rs 46/-) 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 24th 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 APTRANS CO grid (Million KWh)	Electricity Imported, Million KWh	Total Biomass used MT	Coal Used, MT	Diesel Consumption liters
15 April	2004	1.1443	1.0142	0.0200	1800	0	3580.0
May	2004	4.7995	4.2572	0.0268	6985	0	6195.0
June	2004	3.7224	3.2614	0.0165	5520	0	4780.0
July	2004	4.2687	3.7278	0.0178	6345	0	3750.0
Aug	2004	2.9600	2.5736	0.0228	4595	0	2692.0
Sept	2004	3.4661	3.0702	0.0273	5210	0	2790.0
Oct	2004	4.2166	3.7670	0.0198	6225	0	3010.0
Nov	2004	3.8057	3.3980	0.0192	5605	0	2846.0
Dec	2004	3.5153	3.1374	0.0166	5180	0	3144.0
Jan	2005	3.4349	3.0714	0.0228	5110	0	3090.0
Feb	2005	3.8594	3.4476	0.0219	5410	0	2972.0
March	2005	1.1691	1.0446	0.0364	1715	0	2843.0
April	2005	1.8172	1.6250	0.0477	3005	0	2380.0
May	2005	4.1424	3.7198	0.0191	6251	0	2040.0
June	2005	3.5353	3.1690	0.0170	5235	0	2205.0
July	2005	3.7067	3.3098	0.0160	5483	0	5373.0
Aug	2005	3.7041	3.3110	0.0168	5937	0	2842.0

Month	Year	Electricity Generated, Million KWh	Export to APTRANS CO grid (Million KWh)	Electricity Imported, Million KWh	Total Biomass used MT	Coal Used, MT	Diesel Consumption liters
Sept	2005	3.1373	2.8009	0.0173	4914	0	3790.0
Oct	2005	3.5039	3.1078	0.0159	5411	0	2064.0
Nov	2005	3.6423	3.2504	0.0220	5161	0	1446.0
Dec	2005	4.2291	3.7987	0.0197	5530	0	1970.0
Jan	2006	4.0782	3.6543	0.0169	5321	0	1940.0
Feb	2006	3.5257	3.1703	0.0169	4722	0	1985.0
March	2006	2.4502	2.1994	0.0170	3281	0	1955.0
April	2006	4.2103	3.7934	0.0152	5400	0	2380.0
May	2006	3.9158	3.5212	0.0212	5050	0	2040.0
June	2006	3.4548	3.0987	0.0131	4415	0	2205.0
July	2006	3.7112	3.3215	0.0142	5005	0	5373.0
Aug	2006	3.6508	3.2695	0.0135	4735	0	2842.0
Sept	2006	3.9102	3.4792	0.0144	5115	0	3790.0
Oct	2006	3.5434	3.1809	0.0098	4500	0	2064.0
24 Nov	2006	2.6154	2.3430	0.0161	3330	0	3142
TOTAL		110.8463	98.8942	0.6277	157501	0	95518

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 (15.04.04 to 24.11.06) 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 [15.04.04] to [24.11.06] .

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
15 April	2004	1.1443	1.0142	0.0200	1800	0	3580.0	815
May	2004	4.7995	4.2572	0.0268	6985	0	6195.0	3494
June	2004	3.7224	3.2614	0.0165	5520	0	4780.0	2680
July	2004	4.2687	3.7278	0.0178	6345	0	3750.0	3069
Aug	2004	2.9600	2.5736	0.0228	4595	0	2692.0	2110
Sept	2004	3.4661	3.0702	0.0273	5210	0	2790.0	2518
Oct	2004	4.2166	3.7670	0.0198	6225	0	3010.0	3102
Nov	2004	3.8057	3.3980	0.0192	5605	0	2846.0	2797
Dec	2004	3.5153	3.1374	0.0166	5180	0	3144.0	2582
Jan	2005	3.4349	3.0714	0.0228	5110	0	3090.0	2522
Feb	2005	3.8594	3.4476	0.0219	5410	0	2972.0	2835
March	2005	1.1691	1.0446	0.0364	1715	0	2843.0	829
April	2005	1.8172	1.6250	0.0477	3005	0	2380.0	1303
May	2005	4.1424	3.7198	0.0191	6251	0	2040.0	3066

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
June	2005	3.5353	3.1690	0.0170	5235	0	2205.0	2610
July	2005	3.7067	3.3098	0.0160	5483	0	5373.0	2719
Aug	2005	3.7041	3.3110	0.0168	5937	0	2842.0	2726
Sept	2005	3.1373	2.8009	0.0173	4914	0	3790.0	2300
Oct	2005	3.5039	3.1078	0.0159	5411	0	2064.0	2561
Nov	2005	3.6423	3.2504	0.0220	5161	0	1446.0	2676
Dec	2005	4.2291	3.7987	0.0197	5530	0	1970.0	3131
Jan	2006	4.0782	3.6543	0.0169	5321	0	1940.0	3014
Feb	2006	3.5257	3.1703	0.0169	4722	0	1985.0	2612
March	2006	2.4502	2.1994	0.0170	3281	0	1955.0	1806
April	2006	4.2103	3.7934	0.0152	5400	0	2380.0	3129
May	2006	3.9158	3.5212	0.0212	5050	0	2040.0	2899
June	2006	3.4548	3.0987	0.0131	4415	0	2205.0	2555
July	2006	3.7112	3.3215	0.0142	5005	0	5373.0	2731
Aug	2006	3.6508	3.2695	0.0135	4735	0	2842.0	2695
Sept	2006	3.9102	3.4792	0.0144	5115	0	3790.0	2866
Oct	2006	3.5434	3.1809	0.0098	4500	0	2064.0	2626
24 Nov	2006	2.6154	2.3430	0.0161	3330	0	3142	19501
GRAND TOTAL		110.8463	98.8942	0.6277	157501	0	95518	81303

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 (tCO ₂ /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)

Yearly Summary

Sl. No	Particular	Year 1 2004-05	Year 2 2005-06	Year 3 April 2005- 24 Nov 2006
1	CEF, kgCO ₂ /kWh	0.830	0.830	0.830
2	Power export to the grid, Million KWh	35.7704	37.1164	26.0074
3	Emission Reductions, tons of CO ₂	29354	30524	21424
GRAND TOTAL:		81303 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 – Project Manager (CDM)**
- 4. Mr. Malla Reddy – O & M Manager**
- 5. Mr. Krishna – 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 , kgCO ₂ / kWh	Diesel consumption , lit	Baseline emissions, tCO ₂ e	Project Emissions, tCO ₂ e				Nett Emission Reductions, tCO ₂ e
					Million kWh	Total Biomass							Emissions due to import	Emissions due to Coal	Emissions due to Diesel	Total Project emissions	
15 April	2004	1.1443	1.0142	0.0200	0.1301	1800	0	1800		0.83	3580.0	842	17	0	10	26	815
May	2004	4.7995	4.2572	0.0268	0.5423	6985	0	6985		0.83	6195.0	3533	22	0	17	39	3494
June	2004	3.7224	3.2614	0.0165	0.4610	5520	0	5520		0.83	4780.0	2707	14	0	13	27	2680
July	2004	4.2687	3.7278	0.0178	0.5409	6345	0	6345		0.83	3750.0	3094	15	0	10	25	3069
Aug	2004	2.9600	2.5736	0.0228	0.3864	4595	0	4595		0.83	2692.0	2136	19	0	7	26	2110
Sept	2004	3.4661	3.0702	0.0273	0.3959	5210	0	5210		0.83	2790.0	2548	23	0	8	30	2518
Oct	2004	4.2166	3.7670	0.0198	0.4496	6225	0	6225		0.83	3010.0	3127	16	0	8	25	3102
Nov	2004	3.8057	3.3980	0.0192	0.4077	5605	0	5605		0.83	2846.0	2820	16	0	8	24	2797
Dec	2004	3.5153	3.1374	0.0166	0.3779	5180	0	5180		0.83	3144.0	2604	14	0	9	22	2582
Jan	2005	3.4349	3.0714	0.0228	0.3635	5110	0	5110		0.83	3090.0	2549	19	0	8	27	2522
February	2005	3.8594	3.4476	0.0219	0.4118	5410	0	5410		0.83	2972.0	2862	18	0	8	26	2835
March	2005	1.1691	1.0446	0.0364	0.1245	1715	0	1715		0.83	2843.0	867	30	0	8	38	829

Month	Year	Electricit y Generat ed, Million kWh	Electricit y Exporte d, Million kWh	Electricit y Importe d, Million kWh	Auxiliary Consum ption	Biomass Used, MT	Coal Used, MT	Grand Total, MT	% Carbo n in Coal	Emiss ion Factor , kgCO 2/ kWh	Diesel consu mptio n , lit	Baseline emissio ns, tCO2e	Project Emissions, tCO2e				Nett Emissio n Reducti ons, tCO2e
					Million kWh	Total Biomass							Emissio ns due to import	Emiss ions due to Coal	Emissio ns due to Diesel	Total Projec t emissi ons	
Total		40.3620	35.7704	0.2679	4.5916	59700	0	59700			41692	29689	222	0	113	335	29354
April	2005	1.8172	1.6250	0.0477	0.1922	3005	0	3005		0.83	2380.0	1349	40	0	6	46	1303
May	2005	4.1424	3.7198	0.0191	0.4226	6251	0	6251		0.83	2040.0	3087	16	0	6	21	3066
June	2005	3.5353	3.1690	0.0170	0.3663	5235	0	5235		0.83	2205.0	2630	14	0	6	20	2610
July	2005	3.7067	3.3098	0.0160	0.3969	5483	0	5483		0.83	5373.0	2747	13	0	15	28	2719
Aug	2005	3.7041	3.3110	0.0168	0.3931	5937	0	5937		0.83	2842.0	2748	14	0	8	22	2726
Sept	2005	3.1373	2.8009	0.0173	0.3364	4914	0	4914		0.83	3790.0	2325	14	0	10	25	2300
Oct	2005	3.5039	3.1078	0.0159	0.3961	5411	0	5411		0.83	2064.0	2579	13	0	6	19	2561
Nov	2005	3.6423	3.2504	0.0220	0.3919	5161	0	5161		0.83	1446.0	2698	18	0	4	22	2676
Dec	2005	4.2291	3.7987	0.0197	0.4304	5530	0	5530		0.83	1970.0	3153	16	0	5	22	3131
Jan	2006	4.0782	3.6543	0.0169	0.4239	5321	0	5321		0.83	1940.0	3033	14	0	5	19	3014
Feb	2006	3.5257	3.1703	0.0169	0.3554	4722	0	4722		0.83	1985.0	2631	14	0	5	19	2612
March	2006	2.4502	2.1994	0.0170	0.2508	3281	0	3281		0.83	1955.0	1826	14	0	5	19	1806

Month	Year	Electricit y Generat ed, Million kWh	Electricit y Exporte d, Million kWh	Electricit y Importe d, Million kWh	Auxiliary Consum ption	Biomass Used, MT	Coal Used, MT	Grand Total, MT	% Carbo n in Coal	Emiss ion Factor , kgCO 2/ kWh	Diesel consu mptio n , lit	Baseline emissio ns, tCO2e	Project Emissions, tCO2e				Nett Emissio n Reducti ons, tCO2e
					Million kWh	Total Biomass							Emissio ns due to import	Emiss ions due to Coal	Emissio ns due to Diesel	Total Projec t emissi ons	
Total		41.4724	37.1164	0.2423	4.3560	60251	0	60251			29990	30807	201	0	81	282	30524
April	2006	4.2103	3.7934	0.0152	0.4169	5400	0	5400		0.83	2380.0	3149	13	0	6	19	3129
May	2006	3.9158	3.5212	0.0212	0.3946	5050	0	5050		0.83	2040.0	2923	18	0	6	23	2899
June	2006	3.4548	3.0987	0.0131	0.3561	4415	0	4415		0.83	2205.0	2572	11	0	6	17	2555
July	2006	3.7112	3.3215	0.0142	0.3897	5005	0	5005		0.83	5373.0	2757	12	0	15	26	2731
Aug	2006	3.6508	3.2695	0.0135	0.3813	4735	0	4735		0.83	2842.0	2714	11	0	8	19	2695
Sept	2006	3.9102	3.4792	0.0144	0.4310	5115	0	5115		0.83	3790.0	2888	12	0	10	22	2866
Oct	2006	3.5434	3.1809	0.0098	0.3625	4500	0	4500		0.83	2064.0	2640	8	0	6	14	2626
24 Nov	2006	2.6154	2.3430	0.0161	0.2724	3330	0	3330		0.83	3142.0	1945	13	0	9	22	1923
Total		29.0199	26.0074	0.1175	3.0045	37550	0	37550			23836	21586	98	0	65	162	21424
GRAND TOTAL		110.8463	98.8942	0.6277	11.9521	157501	0	157501			95518	82082	521	0	259	780	81303