MONITORING REPORT

Monitoring Period
03.12.2007 to 17.11.2008
(Both days included)

Version 01 / 23.12.2008

Project Ref No: 1302

Biomass Gasification based Power Generation by Arashi Hi-Tech Bio-Power Private Limited

Project Site : Varapatti Village,
Palladam Taluka,
Coimbatore District.

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INTRODUCTION:

Arashi Hi-Tech Bio-Power Private Limited (AHBPPL) established a 1.25 MW biomass gasification power project located in Coimbatore district, Tamilnadu. AHBPPL is the first grid connected biomass gasification power project in India and supplying power to Tamil Nadu State Electricity Board (TNEB) grid.

STATUS OF THIS PROJECT:

The 1.25 MW biomass gasification power project at Varapatti Village, Palladam Taluka, Coimbatore District was commissioned in 28th March 2003.

The project was completed with major equipment supplied as follows:

S.No	Equipment	Specification	Supplier
1	Gasifier	2*500 KW	M/S Energreen Power Ltd Chennai
2	Gas Engine	5*250 KW Gas genset for use with biogasifier.	M/S Cummins
3	Weigh Bridge	Model PPS-100 Capacity 100kg, Accuracy 1Kg	IOTA

The entire equity was provided by company and loan taken from Indian Bank, Coimbatore.

STATEMENT TO WHAT EXTENT THE PROJECT HAS BEEN IMPLEMENTED AS PLANNED

The project was completed as planned and described in the Project Design Document (PDD).The plant started its operation from 28th March 2003. Coconut residues are the major fuel for this project activity which is available abundantly in this region .

MONITORING PERIOD

The monitoring period is from 03/12/2007 to 17/11/2008

SUSTAINABILITY –SOCIAL AND ECONOMIC WELL- BEING

The project activity has resulted in sustainable development in the region as follows:

Social well being

- The fuel for this power plant is locally available biomass residue like coconut shell .The economy of the local people is improved by selling biomass residue for the power plant.

- Since the project is located in a village it will assist in alleviation of poverty to certain extent by generating both direct and indirect employment in the area of skilled/unskilled jobs for regular operation and maintenance of the power plant.

Economic well being

- The biomass gasification process is a alternative to fossil fuel based power plants and the decentralised power generation through biomass gasification will reduce the transmission and distribution losses
- The project shall create new rural income resulting from the sales of biomass fuel like coconut shells. Increased income levels shall contribute to the economic security and empowerment of the most vulnerable sections of the society.

Environmental Well being

- The project is using biomass for power generation. There is no GHG emission from this project activity. Combustion of biomass in the proposed project does not result in net increase in GHG emissions of CO2, CH4 and NOx.
- There is no fly ash or solid waste from this biomass gasification process.

Technology Well being

- The possibility of using the gasifier for internal combustion engine makes it a potential competitor for decentralized power generation. The advantage of decentralised power generation is reduction in transmission and distribution losses and the prospect of rural electrification- a major concern for India.

- The biomass gasification is a cleaner technology there is no Green House Gas (GHG) emission.

OBTAINED PARAMETERS ACCORDING TO MONITORING PLAN

For the project, following parameters were monitored on a continuous basis:

Power: The power generated export to the grid is measured by the energy meters in hourly basis and recorded by Shift In-charge .The recorded datas are verified and transferred to make monthly report. The monthly export meter readings are taken at the interconnection point by AHBPPL and TNEB on the 17th or 18th day of the each month. Records of joint meter reading are maintained at site and a copy is maintained at the head office.

Fuel (Biomass): The biomass required for this power plant is transported from near by village area through trucks and Lorries. All the biomass coming to plant is weighed by the weigh bridge installed in the project site. The weigh bridge receipt is cross checked by the monthly biomass consumption report.

EMISSION REDUCTIONS

From	To	Net Units Exported	Emission Reduction achieved	Project Emission	Leakage Emission	Net Emission Reduction
03.12.07	17.12.07	81400	70004	0	0.67	69.33
17.12.07	18.01.08	174600	150156	0	1.43	148.73
18.01.08	16.02.08	218000	187480	0	1.73	185.75
16.02.08	17.03.08	163600	140696	0	1.19	139.51
17.03.08	17.04.08	120800	103888	0	1.07	102.82
17.04.08	15.05.08	57400	49364	0	0.57	48.794
15.05.08	18.06.08	81000	69660	0	0.71	68.95
18.06.08	17.07.08	146000	125560	0	1.22	124.34
17.07.08	18.08.08	115600	99416	0	0.91	98.51
18.08.08	17.09.08	76800	66048	0	0.84	65.21
17.09.08	17.10.08	0	0	0	0.00	0.00
17.10.08	17.11.08	51000	43860	0	0.50	43.36
Total		1286200	1106132	0	10.84	**1095.30**

Emission Reduction (ER)

ER = $BE_{electricity}$ – PE - L

Baseline Emission ($BE_{electricity,}$):

$BE_{electricity}$	=	**P_{net}*$EF_{electricity}$**
$EF_{electricity}$	=	Baseline emission factor
	=	0.86 tCO_2/MWh
P_{net}	=	Power export to Grid (P_{export}) – Power Import from grid (P_{import})
	=	1286.200 - 0
P_{net}	=	1286.200 MWh
$BE_{electricity}$	=	1286.200*0.86
$BE_{electricity}$	=	**1106.132 Ton of CO_2**

Project emissions (*PE*):

There is no fossil fuel co fired in this project activity. Hence there is no project emission emission within the project boundary.

PE = 0

CO_2 emission due to biomass transportation (L):

▪ Total biomass consumed by the project	:	2550.68	MT
▪ Truck capacity	:	10	MT
▪ Total Return trip distance travelled between project site and biomass collection centres	:	100	km
▪ Number of return trips	:	255.068	Trips
▪ Total Distance travelled between project site and biomass collection centres	:	**25506.8**	km
▪ CO2 Emission factor for Diesel	:	0.0004246	t CO2/km
▪ Total CO_2 emission	:	**10.84**	t CO2

Total estimated leakage due to project (L) = 10.84 tons of CO_2

Emission Reduction (ER)

ER = $BE_{electricity}$ – PE - L

= 1106.132 – 0 – 10.84

= 1095.30 tons of CO_2

MONITORING PROCEDURES

The responsibility and reporting of the monitoring parameters follows the procedures set out in the monitoring plan. During each shift the electrical operator records the generation meter and export meter readings at the site. This is then checked and signed off by the shift in charge. Daily reports and monthly reports are prepared and these reports are incorporated into the overall factory monitoring systems.

As emission reductions from the project are determined by the number of units exported to the grid, it is mandatory to have a monitoring system in place and ensure that the project activity produces and exports the rated power at the stipulated norms. The sole objective of having monitoring system is to have a constant watch on the emission reductions.

Metering equipment is electronic meters of accuracy $\pm$ 0.5. The monthly meter readings are taken at the interconnection point by AHBPPL and TNEB on the 17th or 18th day of the each month. Records of joint meter reading are maintained at site and a copy is maintained at the head office.

The export main meter and check meter are installed at the project shall be of accuracy class $\pm$ 0.5. The export meters are jointly inspected and sealed on behalf of AHBPPL and TNEB, in the presence of its authorized representatives. The meters shall be tested for accuracy every six months with reference to a portable standard meter which shall be of an accuracy class of 0.1%. As the instruments are calibrated and marked at regular intervals, the accuracy of measurement can be assured at all times. Necessary records of calibration are maintained by both TNEB and AHBPPL. The other meters at the project site are calibrated at regular intervals by AHBPPL through independent agency.

Sl.No	Meter	Serial No.	Make	Accuracy	Date of last calibration
1	Generation Meter	02221159	ABB	0.5	17/11/2008
2	Auxiliary Meter	04802582	L&T	0.3 %	Feb 2006*
3	Main Export Meter	05462945	L&T	0.2 %	June 2007* (Accuracy

					check : 28/03/2007)
4	Weigh Bridge	PPS- 100	IOTA	1kg	01/11/2008

* Installed in the month of February, 2006 and the initial testing certificates were provided by the suppliers

ROLES & RESPONSIBILITIES

AHBPPL has experienced engineers to address all O&M issues. Though the overall authority and responsibility belongs the management, it has formed a team of Supervisors and Field Representatives headed by a Plant Manager to effectively control and monitor the complete process of fuel procurement, quality issues, and the handling and storage of material in the plant area.

The monitoring data required are taken by labours/ supervisors and it is reported to the shift in charges who maintains a log book. The shift in charges reports daily to the Plant Manager. The Plant manager submits daily and monthly reports to the management. The Management team analyses the data for inconsistencies and if required seek corrective action. The corrected data will be documented and stored in physical and Compact Disc form in the custody of the Managing Director.