

DCM SHRIRAM CONSOLIDATED LTD

MONITORING REPORT

Ajbapur Sugar Complex Cogeneration Project

CDM REGISTRATION REFERENCE NO: 0332

Monitoring period: 1st January 2007 to 31st May 2008

Prepared by: DSCL, Agrinergy

Date: 26th June, 2008, Version 1

Introduction

The data presented in this verification report has been collected in line with the PDD for the registered CDM project, Ajbapur Sugar Complex Cogeneration Project, reference number 0332. The starting date of the period under verification is the 1st January 2007 and the ending date is 31st May 2008.

The project involves the generation of electricity in the Ajbapur sugar factory located at Ajbapur village, Lakhimpur Kheri district, in the state of Uttar Pradesh, India. The fuel used in the power plant is bagasse, a fibrous material derived from the crushing of sugar cane. The combustion of this biomass residue therefore results in the generation of renewable electricity. The power plant is grid connected and the emission reductions are calculated from the product of the carbon dioxide grid emissions factor and the electricity supplied to the grid.

The carbon dioxide grid emissions factor was calculated on an *ex-ante* basis in the PDD and will therefore be held constant over the life of the project. This data is therefore not part of the monitoring plan.

The project activity was commissioned in line with the PDD and after a period of testing the project activity started to continuously export to the UPPCL in October 2005. The starting date of the crediting period, as outlined in the PDD, is 1st October 2005.

The CDM project was registered on 1st May 2006 under methodology AMS I.D version 7. However, the project activity requested for a revision in the monitoring plan in order to incorporate a change in the point of metering of the small scale project activity to the plant itself (net electricity generation of the 7.5 MW turbine now qualifies for CER calculations rather than exports to the grid). The application for revision of monitoring plan was made on 11th September 2007 and the revised monitoring plan was approved by the UN CDM Executive Board on 17th November 2007. Hence, this monitoring report has been prepared based on this new plan approved by the UN CDM Executive Board.

Technology employed

The technology employed in the new cogeneration plant was an upgrade of an existing boiler and the installation of a 7.5MW turbine generator. Whilst the adjacent sugar factory is operating some steam is extracted for use in the sugar plant whilst during the off-season the steam generated from the combustion of bagasse passes to the condenser.

The power generation of the turbine generator is at the 11kV level and the turbine operates in parallel with the UPPCL grid. The exportable power is stepped up to 132kV at a step up station within the plant and is connected to the Mohammadi sub-station.

Emission reductions generated

In line with the PDD for the project activity the total number of CERs (tCO₂e) is calculated from the following equation:

$$CERs = P_e \cdot C$$

Where:

CERs = Emission reduction, tCO₂e

P_e = Net electricity generated by the 7.5 MW turbine, MWh

C = Grid emission factor, tCO₂e/MWh

The grid emission factor has been calculated *ex-ante* in the PDD and fixed for the crediting period at 0.918 tCO₂e/MWh.

The net electricity generated by the 7.5 MW turbine is calculated as follows:

$$P_e = G_e - A_e - T_e$$

Where:

- P_e = Net electricity generation by 7.5 MW turbine, MWh
- G_e = Gross electricity generation by 7.5 MW turbine, MWh
- A_e = Auxiliary consumption for 7.5 MW turbine, MWh
- T_e = Transmission Losses

The transmission losses are calculated as follows:

$$T_e = \left(\frac{E_{e, \text{gross}} - E_{e, \text{net}}}{E_{e, \text{gross}}} \right) \times (G_e - A_e)$$

Where

- E_{e,gross} = This item will be based on the energy supplied from factory to UPPCL(meter reference no.APS00864)
- E_{e,net} = This item will be based on energy received at UPPCL and monthly invoice raised by the factory to UPPCL (meter reference no.APMO4047)

Monitored data

a) *Fossil fuel consumption*

In line with the PDD confirmation that no fossil fuels have been combusted in the boiler will be provided at the time of verification site visit.

b) *Monitored energy data/transmission losses*

The following data has been monitored for the project. The gross electricity generation data and auxiliary consumption of the 7.5 MW turbine has been obtained via metering at the plant. The transmission losses have been calculated on the basis of the difference between the export meter readings installed at the plant (APS00864) i.e. E_{e,gross} and those from the meter installed at the UPPCL substation situated at Mohammadi (APMO4047) i.e. E_{e,net}. The qualifying electricity is then calculated on the basis of these parameters as per the equations shown above.

	G _e , MWh	A _e , MWh	E _{e,gross} , MWh	E _{e,net} , MWh	T _e	P _e , MWh
Jan-07	5,272	227	2,939	2,928	18	5,026
Feb-07	3,957	223	8,184	8,308	-57	3,791
Mar-07	4,284	248	12,505	9,715	900	3,136
Apr-07	4,985	276	14,205	13,908	98	4,611
May-07	2,332	158	11,773	11,876	-19	2,193
Jun-07	3,581	221	10,063	9,385	226	3,133
Jul-07	1,130	82	5,737	5,077	121	927
Aug-07	0	0	0	0	0	0
Sep-07	222	31	168	160	9	181

Oct-07	4,777	257	8,815	9,050	-120	4,641
Nov-07	4,567	212	12,035	11,974	22	4,333
Dec-07	4,830	233	14,196	14,438	-78	4,676
Jan-08	5,211	288	13,610	13,610	0	4,923
Feb-08	5,125	278	14,324	14,433	-37	4,884
Mar-08	5,393	301	15,062	16,183	-379	5,471
Apr-08	5,157	287	16,887	15,884	289	4,581
May-08	2,108	123	4,792	4,766	11	1,974
Total						58,481

c) *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 main energy meter reading at the site as well as the auxiliary consumption of the power plant. This is then checked and signed off by the shift in charge. Whilst gross exports to the grid are monitored on a daily basis at the plant end, net exports are obtained from the invoices raised by the plant on UPPCL, the purchaser of electricity. Daily reports and a monthly report of electricity generated and exports to the grid are prepared and these reports are incorporated into the overall factory monitoring systems.

The monthly monitored data is sent to Agrinergy which then prepares a CER generation report. This CER generation report forms the basis of the on-going CDM monitoring and reporting of the project activity.

d) *Environmental monitoring*

The plant operated under a valid consent from the Uttar Pradesh Pollution Control Board (UPPCB) and a copy of this consent will be provided to the DOE responsible for verification.

e) *Recalibration of meters, uncertainty/accuracy levels*

The meters for the recording of gross power generation and auxiliaries have been re-calibrated and calibration certificates will be provided at the time of verification. The meters for the recording of exports are situated both at the plant end and also at the UPPCL sub-station end. Whilst the export meter at the plant end has been re-calibrated by DSCL, the meter at the sub-station end belongs to UPPCL and was re-calibrated independently by them.

The data reported in the monitoring report has a low level of uncertainty and high accuracy. All the meters are calibrated which coupled with their internal accuracy levels leads to high overall accuracy. The accuracy of the meters is provided in the table below.

Meter	Make of meter	Meter number	Accuracy level	Calibration status
Energy meter	SECURE METER	TNB01177	0.2	Calibrated
Auxiliary meter	L & T	3701203	0.02	Calibrated
Export meter (plant end)	SECURE APEX	APM04092	0.2	Calibrated
Export meter (UPPCL end)	SECURE APEX	APM 04047	0.2	Calibrated

There was no recourse to check meters for the measurement of data and therefore the uncertainty level of the data is low.

Emergencies

No emergencies occurred during the period under verification which could have given rise to emissions.

Calculation of emission reductions

The calculation of the emission reductions from the project activity requires us to consider the net electricity generated from the project activity (the 7.5 MW turbine), this is shown through the following equation and the resultant CERs are determined.

$$CERs = P_e.C$$

$$CERs = P_e.0.918$$

$$\begin{aligned} CERs &= 58,481 * 0.918 \\ &= 53,685 \text{ tCO}_2\text{e} \end{aligned}$$