Revised Monitoring Plan

For

Project Title

Rithwik 6 MW Renewable Sources Biomass Power Project

Project Participant

Rithwik Energy Systems Limited

Reference

UNFCCC Ref No. 0253

ID number (Please use numbers to ease cross-referencing to table D.6)	Data type	Data variable	Data unit	Measured (m), calculated (c) or estimated (e)	Recording Frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	For how long is archived data to be kept?	Comment
D.3.1	Power	Electricity generated	kWh	Measured	Continuous	100%	Electronic	2 years	
D.3.2	Power	Auxiliary consumption	kWh	Calculated	Continuous	100%	Electronic	2 years	Calculated based on the difference between electricity generated and exported.
D.3.3	Power	Electricity export	kWh	Measured	Continuous	100%	Electronic	2 years	Based on the certified joint meter readings of AP TRANSCO and Company recorded on monthly basis
D 3.4	Power	Electricity import from Grid	kWh	Measured	Monthly	100%	Paper	2 Years	Based on the certified joint meter readings of AP TRANSCO and Company on monthly basis
D.3.5	Fuel	Biomass used	MT	Measured	Daily	100%	Paper	2 years	
D.3.6	Fuel	Avg. Calorific value of Biomass used	kcal/kg	Measured	Monthly	100%	Paper	2 years	Through sample testing in lab internally
D.3.7	Fuel	Coal used	MT	Measured	Daily	100%	Paper	2 years	
D.3.8	Fuel	Carbon content in coal	%	Measured	For each batch of coal	Grab Sample	Paper	2 years	Through sample testing in external lab

D.3.9	Fuel	Calorific Value of Coal	kcal/kg	Measured	For each batch of coal	Grab Sample	Paper	2 years	Through sample testing in external lab
D.3.10	Fuel	Diesel used	L	Measured	As and when consumed	100%	Paper	2 Years	Based on the level drop in the diesel tank attached to the DG sets.
D.3.11	Fuel	Net Calorific Value of Diesel	kcal/kg	-	-	100%	Paper	2 Years	Standard Value as published by CEA for Calorific Value (http://www.cea.nic.in/planning/c%20and%20e/Government%20of%20India%20website.htm) and Density of diesel from IOCL website (http://www.iocl.com/Products/DieselSpecifications.pdf) will be used
D.3.12	Fuel	Oxidation Factor of Diesel	-	-	-	100%	Paper	2 Years	IPCC value has been used as no country specific value is available

Note: All the data will be archived during the crediting period and two years from the issuance of CERs.

Data	**Uncertainty Level of Data (High/Medium/Low)**	**Explain QA/QC procedures planned for these data, or why such procedures are not necessary**
D.3.1 to D.3.10	Low	The data will be directly measured/calculated and monitored at the project site. All relevant records will be checked to ensure consistency.
D.3.11	Low	Use of standard / IPCC value
D.3.12	Low	Use of standard / IPCC value

Monitoring Methodology

1. Electricity Generation by the Plant: Electricity generation from the plant is monitored and recorded continuously on daily basis using the generation meter installed in the control room of the plant. Generation meter is calibrated on yearly basis by third party.

2. Electricity Export to the grid: Electricity exported to the grid is monitored and recorded continuously on daily basis and cross checked on monthly basis from joint meter readings taken from the energy meters installed at APTRANSCO sub station on 24th day of every month. Meter readings for the electricity exported to the Grid are recorded by representatives of APTRANSCO and the Company and the readings are jointly signed by both the parties as a proof of export of Power to the grid from power plant. These joint meter readings are the basis for the invoices raised by the Company. Export meters are calibrated every half yearly by AP TRANSCO .

3. Electricity Import from Grid: As per the registered PDD (UNFCCC No. 0253), the monitoring plan did not include the monitoring of electricity imported from the grid, which is required for emergency operations of the Plant when the plant is not generating power. However, the same was being monitored since the project was commissioned and now has been included in the CDM monitoring plan to improve the monitoring plan of the registered PDD.

Electricity 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 electricity imported from the grid is recorded by representatives of APTRANSCO and Company and the readings are jointly signed by both the parties. The emissions due to import of electricity are considered as Project emissions while arriving the emission reductions.

Therefore, the proposed revision is an improvement from the existing monitoring plan and has a positive impact on the monitoring process and provides a conservative approach for estimation of the emission reductions.

4. Auxiliary Consumption: As per the registered CDM – PDD, the monitoring methodology for auxiliary consumption for the plant operations is reported as 'Measured' and the explanation provided in the PDD for arriving the Auxiliary Consumption was "based on the difference between electricity generated and exported". The Auxiliary Consumption was reported on basis of calculation in the Monitoring Report as difference between electricity generated and exported. In this view the PP is proposing a revision in the monitoring plan to change the method of capturing the auxiliary consumption from 'Measured' to 'Calculated' for better information for the registered monitoring plan.

Project participant measures the auxiliary consumption using the various energy meters installed in the plant. The auxiliary energy meters are of different class and accuracy compared to generation and export meters. The Generation and export meters are of superior class of accuracy comparatively and these meters are calibrated at regular intervals. The readings of the Auxiliary meter has no significance while calculating emission reductions and are used only to find out the actual auxiliary consumption of major utilities within the plant and to take appropriate action to keep the auxiliary consumption within the prescribed limits. PP calculates the auxiliary consumption based on the difference between generation meter and export meter readings mainly to have better accuracy. Hence, the same is included in the monitoring plan.

The auxiliary consumption will be “calculated” instead “of measured” and this is more accurate as the difference is calculated from the gross generation meter and the export meter which are both meters of high class accuracy (0.2).

Monitoring of auxiliary consumption is only for the internal purpose of the plant and does not impact emission reduction calculations. The emission reductions are being calculated on basis of power export to grid as per the registered PDD and this is in accordance with methodology AMS ID version 7.

5. Consumption of Biomass Fuel (all kinds): The Biomass fuel of all kinds on receipt in the Plant is weighed in the Electronic Weigh Bridge installed in 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.

6. Calorific value of the Biomass fuels (all kinds): The calorific value of the Biomass fuel being used is measured in the in-house laboratory as per the approved internal procedures and average value is recorded on monthly basis.

7. Consumption of Coal: Coal on receipt in the Plant is weighed in the Electronic Weigh Bridge installed in the Plant and unloaded in the storage yard. Coal is fed to the Boiler as and when required and consumption will be recorded accordingly. Daily records will be kept on usage of coal. If there is no consumption on a particular day, the same will be mentioned as Zero in the record.

8. Carbon content and Calorific value of Coal: Carbon content in the each batch of coal received is being considered as per the analysis reports provided by the coal supplier or as per the test reports of third party reputed laboratories authorised by the Company.

9. Diesel Consumption: As per the registered PDD (UNFCCC No. 0253), the monitoring plan did not include the monitoring of diesel consumed for emergency operations of the DG set at the plant site in case of total blackout situation. However, the same was being monitored since the project was commissioned and now has been included in the CDM monitoring plan to improve the monitoring plan of the registered PDD. The plant is also going in for ISO 14001 systems and GHG accounting has been one of the objectives in the Apex Manual, The emissions due to the usage of diesel are observed to be nominal.

The diesel consumption that is used for emergency purposes is accounted as project emissions which are as per point 9 in the monitoring methodology for AMS 1D version 7.

Therefore, the proposed revision is an improvement from the existing monitoring plan and has a positive impact on the monitoring process and provides a conservative approach for estimation of the emission reductions.

Sample Calculation of CERs

Emissions	Formula used
Baseline emissions	
Baseline emissions	= Electricity exported (kWh) x grid emission factor (tCO2/kWh)
Project emissions	
Due to coal consumption	= Actual Coal Used x heat value of coal x CO_2 emission factor of coal as per IPCC[1]
Due to diesel consumption	= [(Diesel consumed in liters x calorific value (TJ/kg) x density (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)
Total Project emissions	=Emission due to coal consumption + due to diesel consumption + import of power from grid
Net Emission Reductions	
	= Baseline emission – total project emissions

[1] As per IPCC reference manual, CO_2 emission factor for coal is 96.1 tCO_2 /TJ