Shree Nakoda Ispat Ltd 12MW Biomass power generation project

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Project Title	Shree Nakoda Ispat Ltd 12MW Biomass power generation project
Version	4
Date of Issue	28-11-2011
Project ID	3148 (CDM reference number)
Monitoring Period	27-01-2009 to 21-10-2010
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1 PROJECT DETAILS

1.1 Summary Description of Project

The purpose of the project activity is to generate electricity using renewable biomass and thereby reducing GHG emissions by displacing the fossil fuel dominated grid based electricity with biomass based renewable electricity. The project activity involves the installation of a high pressure boiler 70 TPH (66 kg/cm^2) and a 12 MW steam turbine. The project activity was commissioned on 13/01/2009 and the commercial operation started on 27/01/2009. Total emission reductions achieved in this monitoring period is 68,566 tCO_2e

1.2 Sectoral Scope and Project Type

Type I - Energy industries (renewable - / non-renewable sources)

1.3 Project Proponent

Host Parties	India	Shree Nakoda Ispat Ltd	Involved indirectly

1.4 Other Entities Involved in the Project

No other entities are involved in the Project

1.5 Project Start Date

The project activity was commissioned on 13-01-2009 and the commercial operation started on 27-01-2009

1.6 Project Crediting Period

Crediting Period: 22-10-2010 to 21-10-2020 (Fixed)

1.7 Project Location

The project activity is located in the village Siltara of Raipur district in Chhattisgarh, India. The GPS coordinates are 21º21'36"N and 81º39'6"E.

1.8 Title and Reference of Methodology

Title and version: "Grid connected renewable electricity generation" AMS I D, version 13
Reference: http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

- The project activity was commissioned on 13/01/2009 and the commercial operation started on 27/01/2009

- The information regarding the actual operation of the project activity during this monitoring period, including downtimes of equipment is given below,

Month	Running days/hours		Down time days/hours		Reason for down time
	Days	Hours	Days	Hours	
Jan 09	-	2	4	22	Shutdown
Feb 09	21	8	6	16	Shutdown/ boiler trip
Mar-09	28	16	2	8	Turbine trip/ boiler trip
Apr-09	28	8	1	16	Turbine trip/ Gen Breaker trip
May-09	12	18	18	6	Shutdown/ boiler trip
Jun-09	11	7	18	17	Shutdown
Jul-09	26	5	4	19	Turbine trip/ boiler trip
Aug-09	27	5	3	19	Shutdown/ boiler trip
Sep-09	26	0	4	0	Shutdown/ boiler trip
Oct-09	30	20	0	4	Turbine trip/ Gen Breaker trip
Nov-09	26	11	3	13	Turbine trip/ boiler trip
Dec-09	26	7	4	17	Turbine trip/ boiler trip
Jan-10	22	15	8	9	Shutdown/ turbine trip
Feb-10	21	3	6	21	Shutdown
Mar-10	29	2	1	22	Boiler trip
Apr-10	29	8	0	16	Turbine trip/ boiler box up
May-10	30	17	0	7	Turbine trip
Jun-10	29	10	0	14	Turbine trip
Jul-10	18	2	12	22	Shutdown/ boiler trip
Aug-10	27	18	2	6	Boiler trip
Sep-10	26	4	3	20	Turbine trip/ boiler box up
Oct-10	20	20	0	4	Turbine trip/ boiler box up
Total	512	206	99	298	

- The project activity was operated as mentioned in the registered PDD during the monitoring period.

- There are no events or situations that occurred during the monitoring period which may impact the applicability of the methodology.

2.2 Deviations from the Monitoring Plan

There is no deviation applied to this monitoring period.

2.3 Grouped Project

This is not a grouped project.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data Unit / Parameter:	$EG_{m,y}$
Data unit:	GWh

Description:	Net electricity generated and delivered to the grid by power plants/units
Source of data:	Official CO_2 database published by the Central Electricity Authority, Ver 3
Value applied:	185,493 (Net electricity generated in WESTERN grid during 2006-07)
Purpose of the data:	Baseline emissions
Any comment:	-

Data Unit / Parameter:	$\mathbf{EF_{CO2,i,y}}$
Data unit:	gCO_2/MJ
Description:	CO_2 emission factor of fossil fuel type *i* in the year *y*
Source of data:	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Value applied:	95.8 for Coal 106.2 for Lignite 54.3 for Gas 72.6 for Diesel Oil 75.5 for Residual Fuel Oil
Purpose of the data:	Baseline emissions
Any comment:	-

Data Unit / Parameter:	$\mathbf{EF_y}$
Data unit:	tCO_2e/MWh
Description:	Emission Factor for WESTERN Grid of which CSEB is a part
Source of data:	Calculated based on the Official data Published by Central Electricity Authority
Value applied:	0.7959
Purpose of the data:	Baseline emissions
Any comment:	-

Data Unit / Parameter:	$\mathbf{EF_{OM,y}}$
Data unit:	tCO_2e/MWh
Description:	Operating Margin for the WESTERN Grid
Source of data:	Calculated based on the Official data Published by Central Electricity Authority

Value applied:	0.9982
Purpose of the data:	Baseline emissions
Any comment:	-

Data Unit / Parameter:	$EF_{BM,y}$
Data unit:	tCO_2e/MWh
Description:	Build Margin for the WESTERN Grid
Source of data:	Calculated based on the Official data Published by Central Electricity Authority
Value applied:	0.5938
Purpose of the data:	Baseline emissions
Any comment:	-

Data Unit / Parameter:	Amount of surplus biomass (rice husk) available in districts of Chhattisgarh within a radius of 50 kms from the project site
Data unit:	Tonnes/Year
Description:	Quantity of surplus biomass (rice husk) that is available in districts of Chhattisgarh within a radius of 50 km from the project site and can be used for power generation.
Source of data:	Survey or published statistics
Value applied:	940,000
Purpose of the data:	Leakage emissions
Any comment:	-

3.2 Data and Parameters Monitored

Data Unit / Parameter:	$\mathbf{EG_{Gross\ y}}$
Data unit:	MWh /Year
Description:	Gross electricity generated at the power plant
Source of data:	Measured by the project developer

<table>
<tr><td>Description of measurement methods and procedures to be applied:</td><td>Measured</td></tr>
<tr><td>Frequency of monitoring/recording:</td><td>Hourly</td></tr>
<tr><td>Value monitored:</td><td>121,433.3</td></tr>
<tr><td>Monitoring equipment:</td><td>Type: Energy meter, Calibration frequency: Annually
<table>
<tr><th>Serial No.</th><th>Make</th><th>Accuracy class</th><th>Calibration date</th><th>Valid till</th><th>Calibrating Agency</th></tr>
<tr><td rowspan="2">04954131</td><td rowspan="2">Elster</td><td rowspan="2">0.2</td><td>25/01/2009</td><td>24/01/2010</td><td>Elster</td></tr>
<tr><td>02/01/2010</td><td>01/01/2011</td><td>CPTC</td></tr>
<tr><td colspan="6">CPTC: Chhattisgarh Power Transmission Company Ltd.</td></tr>
</table></td></tr>
<tr><td>QA/QC procedures to be applied:</td><td>Energy meters of 0.2 class accuracy is put in place to measure the gross electricity generated by the Project. The meter is calibrated according to manufacturer’s instructions, but at least once in every 3 years.</td></tr>
<tr><td>Calculation method:</td><td>-</td></tr>
<tr><td>Any comment:</td><td>-</td></tr>
</table>

Data Unit / Parameter:	$EG_{Aux\ y}$
Data unit:	MWh /Year
Description:	Auxiliary consumption of electricity for operation of power plant
Source of data:	Measured by the project developer
Description of measurement methods and procedures to be applied:	Measured
Frequency of monitoring/recording:	Hourly
Value monitored:	15,949.82

<table>
<tr><td>Monitoring equipment:</td><td>Type: Energy meter, Calibration frequency: Annually
<table>
<tr><th>Serial No.</th><th>Make</th><th>Accuracy class</th><th>Calibration date</th><th>Valid till</th><th>Calibrating Agency</th></tr>
<tr><td rowspan="3">813358</td><td rowspan="3">SATEC</td><td rowspan="3">0.2</td><td>26/05/2008</td><td>25/05/2009</td><td>SATEC</td></tr>
<tr><td>27/08/2009</td><td>26/08/2010</td><td>CPTC</td></tr>
<tr><td>06/07/2010</td><td>05/07/2011</td><td>CPTC</td></tr>
<tr><td colspan="6">CPTC: Chhattisgarh Power Transmission Company Ltd.</td></tr>
</table></td></tr>
<tr><td>QA/QC procedures to be applied:</td><td>Energy meters of 0.2 class accuracy is put in place to measure the auxiliary consumption of electricity for operation of power plant. The meter is calibrated according to manufacturer's instructions, but at least once in every 3 years</td></tr>
<tr><td>Calculation method:</td><td>-</td></tr>
<tr><td>Any comment:</td><td>-</td></tr>
</table>

Data Unit / Parameter:	**EGy**
Data unit:	MWh /year
Description:	Net electricity generated and exported to the sponge iron plant of Shree Nakoda Ispat Ltd or the Grid
Source of data:	Measured by the project developer
Description of measurement methods and procedures to be applied:	Calculated
Frequency of monitoring/recording:	Hourly
Value monitored:	105,483.48 86,149.09 (as per para 16 and 18 of the AMS I.D version 13)
Monitoring equipment:	-
QA/QC procedures to be applied:	The record is kept electronically in the systems and crosschecked with the generation log books on monthly basis.
Calculation method:	Net electricity supplied to the sponge iron plant and the grid is calculated as a difference of gross electricity generation and auxiliary electricity consumption $EG_y = EG_{Gross\ y} - EG_{Aux\ y}$

	OR As per para 16 and 18 of the AMS I.D version 13, whichever is minimum
Any comment:	-

Data Unit / Parameter:	$Q_{Biomass.y}$
Data unit:	Tonnes /year
Description:	Quantity of biomass (Rice husk) fired for power generated
Source of data:	Measured by the project developer
Description of measurement methods and procedures to be applied:	Measured
Frequency of monitoring/recording:	Daily
Value monitored:	122,659.31
Monitoring equipment:	Type: Weigh bridge, Calibration frequency: Annually

Serial No.	Accuracy class	Calibration date	Valid till	Calibrating Agency
O7E18	C3 as per OIML R 60	25/09/2008	24/09/2009	Weight & Measurement Department Govt. of Chhattisgarh
		24/09/2009	23/09/2010	
		26/09/2010	25/09/2011	
O11EM06	C3 as per OIML R 60	03/02/2010	02/02/2011	
		04/03/2011	03/03/2012	

QA/QC procedures to be applied:	Actual amount of biomass (Rice husk) consumed is quantified based on the weigh bridge records of biomass received in the plant and cross checked against the financial records of the project developer. Actual specific consumption of fuel is calculated based on actual fuel consumed and gross electricity generated. The calorific value of the biomass is analyzed periodically in-house or through outside recognized laboratory The weigh bridge is calibrated according to manufacturer's instructions, but at least once in every 3 years to ensure the accuracy of measurement
Calculation method:	-
Any comment:	-

Data Unit /	FC_{Coal}

<table>
<tr><td>Parameter:</td><td></td></tr>
<tr><td>Data unit:</td><td>Tonnes /year</td></tr>
<tr><td>Description:</td><td>Quantity of fossil fuel (coal) fired in the power plant during non-availability of biomass</td></tr>
<tr><td>Source of data:</td><td>Measured by the project developer</td></tr>
<tr><td>Description of measurement methods and procedures to be applied:</td><td>Measured</td></tr>
<tr><td>Frequency of monitoring/recording:</td><td>Daily</td></tr>
<tr><td>Value monitored:</td><td>2,605.96</td></tr>
<tr><td>Monitoring equipment:</td><td>Type: Weigh bridge, Calibration frequency: Annually
<table>
<tr><th>Serial No.</th><th>Accuracy class</th><th>Calibration date</th><th>Valid till</th><th>Calibrating Agency</th></tr>
<tr><td rowspan="3">O7E18</td><td rowspan="3">C3 as per OIML R 60</td><td>25/09/2008</td><td>24/09/2009</td><td rowspan="5">Weight & Measurement Department Govt. of Chhattisgarh</td></tr>
<tr><td>24/09/2009</td><td>23/09/2010</td></tr>
<tr><td>26/09/2010</td><td>25/09/2011</td></tr>
<tr><td rowspan="2">O11EM06</td><td rowspan="2">C3 as per OIML R 60</td><td>03/02/2010</td><td>02/02/2011</td></tr>
<tr><td>04/03/2011</td><td>03/03/2012</td></tr>
</table></td></tr>
<tr><td>QA/QC procedures to be applied:</td><td>Actual amount of fossil fuel (coal) consumed is quantified based on the weigh bridge records of biomass received in the plant and cross checked against the financial records of the project developer. The weigh bridge is calibrated according to manufacturer's instructions, but at least once in every 3 years to ensure the accuracy of measurement.</td></tr>
<tr><td>Calculation method:</td><td>-</td></tr>
<tr><td>Any comment:</td><td>-</td></tr>
</table>

Data Unit / Parameter:	$W_{C, coal}$
Data unit:	tC/ton of Coal
Description:	Weighted average mass fraction of carbon in Coal
Source of data:	Outside laboratory through coal analysis
Description of measurement methods and procedures to be applied:	Measured
Frequency of monitoring/recording:	Monthly

Value monitored:	29.87 %
Monitoring equipment:	-
QA/QC procedures to be applied:	-
Calculation method:	-
Any comment:	-

3.3 Description of the Monitoring Plan

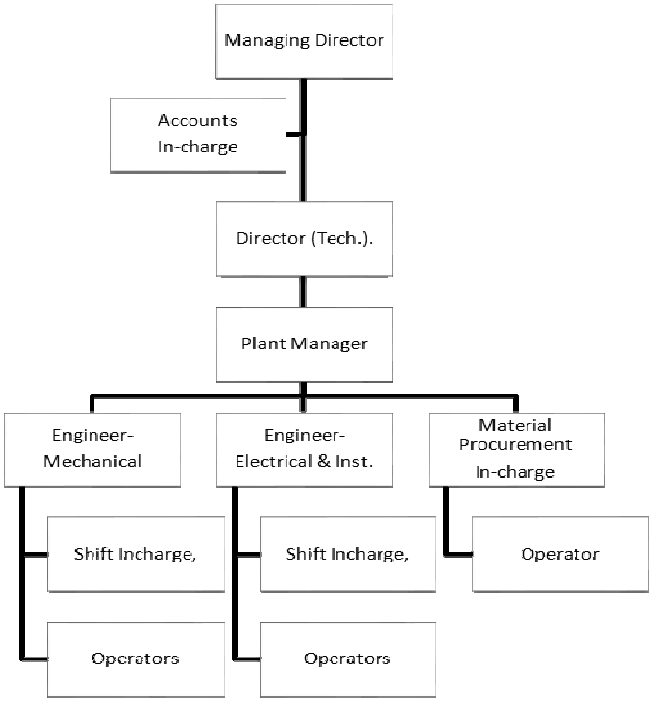
Shree Nakoda Ispat Ltd have formed a CDM team comprising of personnel from the Mechanical, Electrical, Instrumentation and accounts departments, headed by the Managing Director of the company. The personnel in the team perform the dual functions of power plant O&M and compliance with CDM procedures.

The quantity biomass received daily at the plant site is weighed at the weigh bridge before it is stored in biomass –yard. The monthly fuel consumption report is prepared by plant manager based on the opening and closing stock of biomass fuel, which is then counter checked by the Head of CDM Team.

The gross power generation and the auxiliary power consumption is monitored continuously on hourly basis from the installed energy meters and readings are recorded in the respective log sheets by the shift in-charge. The Engineer records the shift-wise parameters and calculates net power exported to the Steel plant or Gird on daily basis and submits the daily generation report to the Plant Manager.

The electricity exported to grid is monitored through the joint meter reading of grid meter. The grid meter reading is noted once in a month in the presence of plant manager and the grid electricity officials. This statement then jointly certified by the representatives of the company and grid electricity officials. A consolidated statement of power generation, auxiliary consumption and net export is prepared on monthly basis. This statement is verified & approved by the Director CDM.

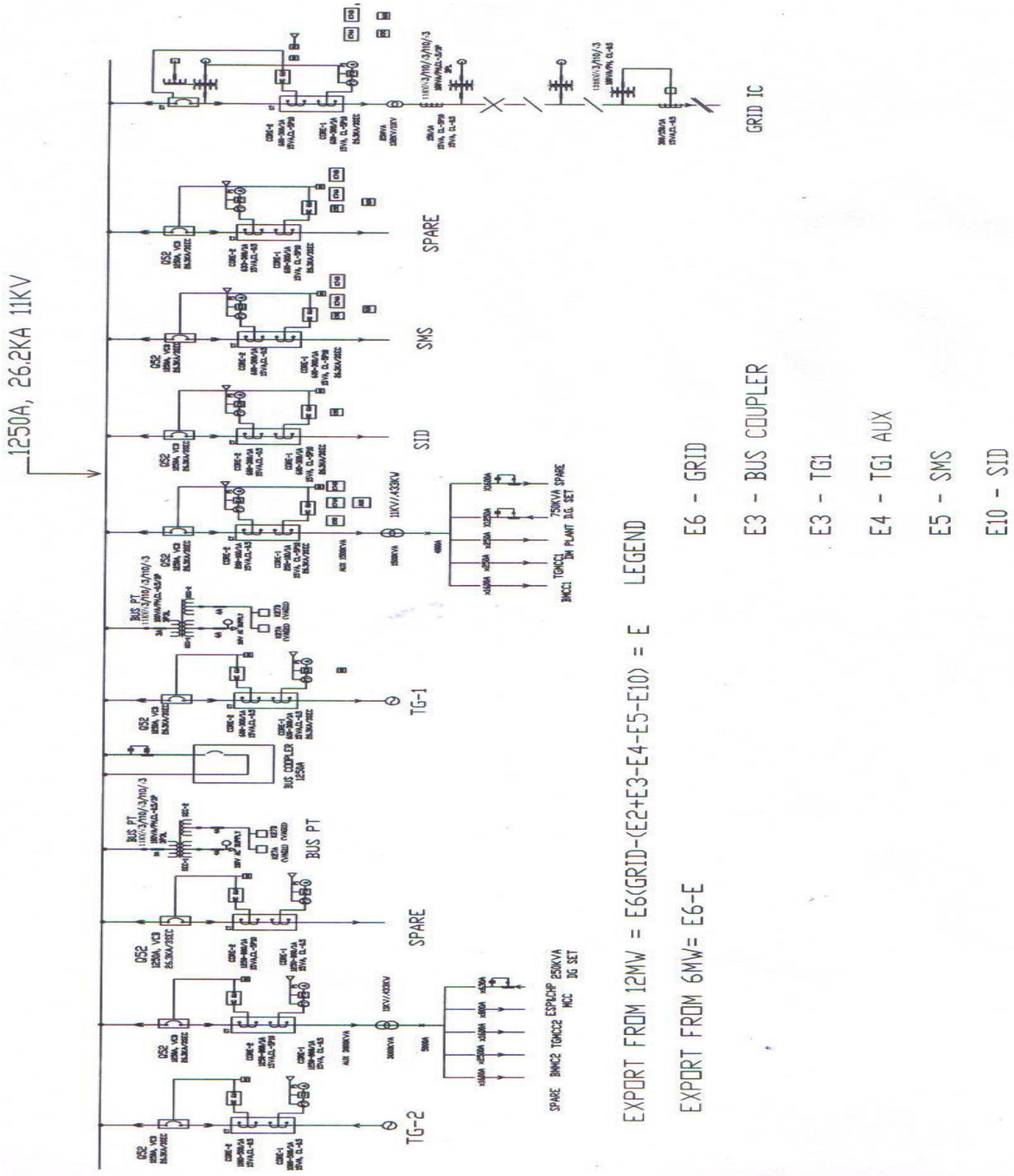
Organizational Structure:



Roles & Responsibilities:

Designation	**Responsibility**
Managing Director	Overall responsibility of CDM Project
Accounts In-charge	Responsible for maintaining and checking of commercial data
Director (Tech.).	Co-ordination of day to day CDM activities
Plant Manager	Data checking – Mechanical Side
Engineer- Mechanical	Data checking – Electrical & Instrumentation side
Engineer-Electrical & Inst.	Responsible for procurement for raw materials.
Material Procurement In-charge	Recording of Electricity Generation & Auxiliary Consumption Data including Consumption of Fossil Fuel, if any
Shift in Charge and Operators	Overall responsibility of CDM Project

Single Line Diagram for the monitoring system:



4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

$$BE_y = EG_y * EF_y$$

Where,

BE_y Baseline emissions in year *y* (tCO_2)

EG_y Net Electricity exported by the project in year *y* (MWh)

EF_y Combined margin emissions factor (Baseline emission factor) for the year *y*

= 86,149.09 * 0.7959

= 68,566.06 tCO_2

4.2 Project Emissions

$$PE_{Coal} = FC_{Coal} * COEF_{Coal}$$

Where,

PE_{Coal} Project emissions due to combustion of coal for the project activity (tCO_2)

FC_{Coal} Is the quantity of coal combusted in process during the year (Tonnes)

$COEF_{Coal}$ Is the CO_2 emission coefficient of Coal (tCO_2/ Tonnes of Coal)

$$COEF_{Coal} = W_{C,coal} * 44/12$$

Where,

$W_{C, coal}$ Is the weighted average mass fraction of carbon in Coal (tC/tonnes of Coal)

Project emissions are accounted by applying the para 16 and 18 of AMS I.D version 13.

4.3 Leakage

Approach L_2 is used to assess the leakage effects from the project activity. The surplus availability of the biomass (25% larger than the quantity of biomass that is utilized including the project activity) has been established *ex-ante*. Hence the leakage emissions from the project activity for the monitoring period are taken as zero[1].

L_y = 0 tCO_2

4.4 Summary of GHG Emission Reductions and Removals

$$ER_y = BE_y - PE_y - L_y$$

ER_y = 68,566.06 – 0 - 0

[1] As per para 18 of "General guidance on leakage in biomass project activities", Annex 28, EB 47.

= 68,566.06 tCO_2e

Emission reductions = 68,566 tCO_2e (round down to nearest integer)

Item	27th January 2009 – 31st December 2009	1st January 2010 – 21st October 2010
Emission reductions, tCO_2	32,164	36,402
Baseline emissions, tCO_2	32,164	36,402
Project Emissions, tCO_2	0	0
Leakage Emissions (Secondary Effects), tCO_2	0	0

5 ADDITIONAL INFORMATION

Diagram for the project setup