



## Monitoring report form (Version 03.1)

### Monitoring report

<b>Title of the project activity</b>	Biomass Based Independent Power Project at Malwa Power Private Limited, Mukatsar, Punjab
<b>Reference number of the project activity</b>	0331
<b>Version number of the monitoring report</b>	1
<b>Completion date of the monitoring report</b>	19/02/2013
<b>Registration date of the project activity</b>	30/04/2006
<b>Monitoring period number and duration of this monitoring period</b>	8 <sup>th</sup> Monitoring Period 01/09/2011 – 31/12/2012
<b>Project participant(s)</b>	Malwa Power Private Limited (Private Entity) Vattenfall Europe Generation AG (Private Entity) EDF Trading Ltd. (Private Entity)
<b>Host Party(ies)</b>	India
<b>Sectoral scope(s) and applied methodology(ies)</b>	1 : Energy industries (renewable - / non-renewable sources) AMS-I.D. ver. 7 - Renewable electricity generation for a grid
<b>Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD</b>	58,472 tCO <sub>2</sub>
<b>Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period</b>	42,390 tCO <sub>2</sub>

**SECTION A. Description of project activity****A.1. Purpose and general description of project activity**

&gt;&gt;

Malwa Power Private Limited (MPPL) was incorporated in January 2002 as a Special Purpose Vehicle for setting up biomass based power plants. MPPL has set up the biomass based power plant at district Mukatsar in state of Punjab (project activity). The project activity generates electricity and exports it to the regional grid. The major equipment of the project activity comprise a 7.5 MW bleed cum condensing type turbine and one 31.5 tons per hour (TPH) and 67 atmosphere (atm) pressure boiler.

The purpose of the project activity is to utilize surplus biomass available in the region for effective generation of electricity for supply to grid to meet the ever-increasing demand for energy in the region. The project activity reduces the Green House Gas (GHG) emissions produced by the regional grid generation mix, which is mainly dominated by fossil fuel based power plants.

The technology employed in the project activity consists of a boiler to combust biomass and generate steam that drives a turbine. The turbine is connected to a generator that converts the mechanical energy into electricity energy. Since, the GHG emissions due to the combustion of biomass are neutralized by the sequestration that took place during the growth cycle of the biomass crop, the CO<sub>2</sub> emissions during combustion of biomass can be ignored. Therefore, electricity is generated through sustainable means without causing any negative effect on the environment and hence the technology is environmentally safe and sound.

The project activity was synchronized with the grid on 27 April 2005 and was declared commercially operative on the same day.

The total emission reductions achieved in this monitoring period are 42,390 tCO<sub>2</sub>.

**A.2. Location of project activity**

&gt;&gt;

The project activity has been implemented at the following location:

Village: Gulabewalla  
 Tehsil: Mukatsar  
 District: Mukatsar  
 State: Punjab  
 Country: India

GPS Coordinates at Boiler:

Latitude: 30.5511° N

Longitude: 74.4995° E

**A.3. Parties and project participant(s)**

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India	Malwa Power Private Limited (Private Entity)	No
Germany	Vattenfall Europe Generation AG (Private Entity)	No

United Kingdom of Great  
Britain and Northern Ireland

EDF Trading Ltd.  
(Private Entity)

No

#### A.4. Reference of applied methodology

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Title: AMS.I.D 'Grid connected renewable electricity generation' Version 07

Main Category: Type I - Renewable Energy Projects

Sub Category: I.D- Grid connected renewable electricity generation

The reference has been taken from the indicative simplified baseline and monitoring methodologies for small-scale CDM project activity categories - Version 7

#### A.5. Crediting period of project activity

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Crediting period: 01 May 2005 - 30 Apr 2015

Choice of crediting period: Fixed

### SECTION B. Implementation of project activity

#### B.1. Description of implemented registered project activity

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The project activity was synchronized with the grid on 27 April 2005 and was declared commercially operative on the same day. The project activity has been in operation continuously (with outages – forced & planned) ever since.

The plant operates in three shifts of eight hours every day:

Shift A: 06:00 AM to 02:00 PM

Shift B: 02:00 PM to 10:00 PM

Shift C: 10:00 PM to 06:00 AM (next day)

For example, the plant started operation at 12:42 AM on 21.09.2009 but this was recorded in the C shift of 20.09.2009 itself.

The outages in the current monitoring period are as follows:

Month	From Date	To Date	HRS	HRS	Remarks
September' 11	9/1/11 12:00 AM	9/23/11 3:07 PM	543.12	544.40	Scheduled Maintenance, Shut Down for Turbine & Boiler
	9/24/11 7:02 AM	9/24/11 7:14 AM	0.20		TG Tripping
	9/25/11 2:04 PM	9/25/11 3:09 PM	1.08		TG Tripping
	9/26/11 12:50 AM	9/26/11 1:58 AM	1.13		TG Tripping
	9/26/11 7:11 PM	9/26/11 7:20 PM	0.15		TG Tripping
	9/27/11 12:14 AM	9/27/11 12:38 AM	0.40		TG Tripping
	9/27/11 6:35 AM	9/27/11 7:32 AM	0.95		TG Tripping
	9/29/11 1:48 PM	10/1/11 12:00 AM	34.20		For Boiler Cleaning
October' 11	10/1/11 12:00 AM	10/4/11 5:20 PM	89.33	147.93	For Boiler Cleaning

	10/6/11 1:25 AM	10/6/11 1:36 AM	0.18		For BC-3 Tripping
	10/13/11 11:50 PM	10/15/11 6:15 PM	42.42		For Boiler Cleaning
	10/16/11 6:00 AM	10/16/11 10:00 PM	16.00		For Boiler Inspection
November' 11	11/3/11 3:53 AM	11/4/11 9:00 PM	41.12	73.37	For Boiler Cleaning
	11/24/11 10:29 PM	11/26/11 3:34 AM	29.08		For Boiler Cleaning
	11/30/11 1:47 PM	11/30/11 4:57 PM	3.17		TG Tripping
December' 11	12/7/11 10:55 PM	12/8/11 10:41 PM	23.77	73.02	For Boiler Cleaning
	12/12/11 12:36 PM	12/13/11 12:06 AM	11.50		For ID Fan Maintenance
	12/13/11 9:55 AM	12/13/11 9:59 AM	0.07		TG Tripping
	12/18/11 5:43 PM	12/19/11 4:48 AM	11.08		ESP Panel problem
	12/29/11 1:45 AM	12/30/11 4:21 AM	26.60		For Boiler Cleaning
January' 12	1/13/12 6:00 AM	1/18/12 2:23 PM	128.38	128.90	For Boiler Cleaning
	1/31/12 6:54 PM	1/31/12 7:25 PM	0.52		TG Tripping
February' 12	2/15/12 2:29 AM	2/17/12 12:55 PM	58.43	58.43	For Boiler Cleaning
March' 12	3/6/12 7:30 AM	3/12/12 5:36 PM	154.10	253.55	For Boiler Cleaning
	3/24/12 10:22 AM	3/28/12 12:23 PM	98.02		For Boiler Cleaning
	3/28/12 5:12 PM	3/28/12 6:38 PM	1.43		TG Tripping
April' 12	4/4/12 1:43 AM	4/9/12 8:35 PM	138.87	370.37	For Boiler Bed Cleaning
	4/16/12 1:56 AM	4/25/12 5:26 PM	231.50		For Boiler Cleaning
May' 12	5/1/12 4:03 AM	5/7/12 2:49 PM	154.77	193.63	For Boiler Cleaning
	5/10/12 2:20 AM	5/10/12 4:28 AM	2.13		TG Tripping
	5/11/12 6:42 AM	5/12/12 6:21 PM	35.65		ID Fan Problem
	5/26/12 1:52 PM	5/26/12 2:57 PM	1.08		Turbine tripping
June' 12	6/1/12 10:28 AM	6/1/12 3:17 PM	4.82	101.27	TG tripping due to DCS
	6/5/12 10:56 PM	6/5/12 11:38 PM	0.70		TG Tripping
	6/10/12 11:31 PM	6/12/12 5:12 PM	41.68		TG Tripping
	6/27/12 5:22 AM	6/29/12 11:26 AM	54.07		For Boiler Cleaning
July' 12	7/2/12 5:01 PM	7/6/12 3:45 PM	94.73	381.30	Due to Heavy Rain
	7/9/12 10:07 AM	7/9/12 9:31 PM	11.40		TG Tripping
	7/14/12 12:00 AM	7/20/12 10:03 AM	154.05		Due to Heavy Rain
	7/21/12 3:47 PM	7/22/12 9:02 PM	29.25		TG Tripping
	7/28/12 4:08 AM	8/1/12 12:00 AM	91.87		Due to Heavy Rain
August'12	8/1/12 12:00 AM	8/3/12 2:50 PM	62.83	499.98	Due to Heavy Rain
	8/4/12 7:31 PM	8/7/12 10:45 AM	63.23		For Boiler Cleaning
	8/8/12 5:23 PM	8/9/12 5:48 AM	12.42		TG Tripping
	8/11/12 10:19 PM	8/26/12 12:12 PM	349.88		Due to Heavy Rain
	8/31/12 12:23 PM	9/1/12 12:00 AM	11.62		Due to Heavy Rain
September'12	9/1/12 12:00 AM	9/13/12 8:19 PM	308.32	474.70	Due to Heavy Rain
	9/20/12 6:18 AM	9/21/12 9:14 AM	26.93		For Boiler Cleaning
	9/21/12 2:06 PM	9/21/12 5:52 PM	3.77		TG Tripping
	9/22/12 10:34 PM	9/28/12 2:15 PM	135.68		For Boiler Cleaning
October'12	10/1/12 5:20 AM	10/5/12 1:49 PM	104.48	227.35	Due to Heavy Rain
	10/10/12 8:48 PM	10/15/12 1:18 PM	112.50		For Boiler Cleaning

	10/29/12 6:24 AM	10/29/12 6:54 AM	0.50		TG Tripping
	10/29/12 7:16 AM	10/29/12 7:29 AM	0.22		TG Tripping
	10/31/12 2:21 PM	11/1/12 12:00 AM	9.65		TG Tripping due to Cupling Shear pins
November'12	11/1/12 12:00 AM	11/1/12 8:19 AM	8.32	119.57	TG Tripping due to Cupling Shear pins
	11/10/12 6:00 PM	11/13/12 9:04 PM	75.07		For Boiler Cleaning
	11/15/12 8:24 AM	11/16/12 8:35 PM	36.18		TG Tripping
December'12	12/8/12 7:12 AM	12/15/12 5:47 PM	178.58	285.83	For Boiler Cleaning
	12/20/12 4:02 AM	12/20/12 9:17 PM	17.25		TG Tripping
	12/28/12 6:00 AM	1/1/13 12:00 AM	90.00		For Boiler Cleaning
<b>Total</b>				<b>3933.60</b>	

No events or situations have occurred during the monitoring period which may impact the applicability of the methodology.

## B.2. Post registration changes

### B.2.1. Temporary deviations from registered monitoring plan or applied methodology

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There has been no revision in the monitoring plan for the project activity.

### B.2.2. Corrections

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There has been no revision in the monitoring plan for the project activity.

### B.2.3. Permanent changes from registered monitoring plan or applied methodology

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There has been no revision in the monitoring plan for the project activity.

### B.2.4. Changes to project design of registered project activity

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There has been no notification submitted or request of approval of changes from registered PDD applied to the project activity.

### B.2.5. Changes to start date of crediting period

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There have been no changes in the start date of the crediting period for the project activity.

### B.2.6. Types of changes specific to afforestation or reforestation project activity

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Not applicable

## SECTION C. Description of monitoring system

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The energy exported to the PSEB is recorded from two independent set of meters - Main Meter & Check Meter. The readings from the Main Meter are used for billing purposes. In case the Main Meter goes out of

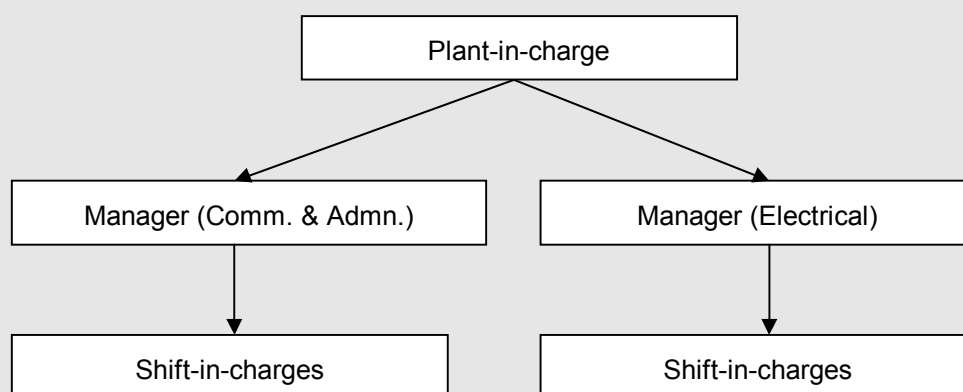
operation, the reading of the backup meter (Check Meter) is used for billing. Till date only the main meter has been used for billing purposes.

The calibration and testing of monitoring equipment is being carried out regularly according to the requirements of PSEB. Power Generation, Export & Auxiliary Consumption and fuel consumption is being recorded and verified daily by the Shift-in-charge which is thereafter approved by the Plant in-charge. Since hourly data logging is being carried out along with daily reporting, the uncertainty level associated with the monitored data used for calculating emission reductions is low.

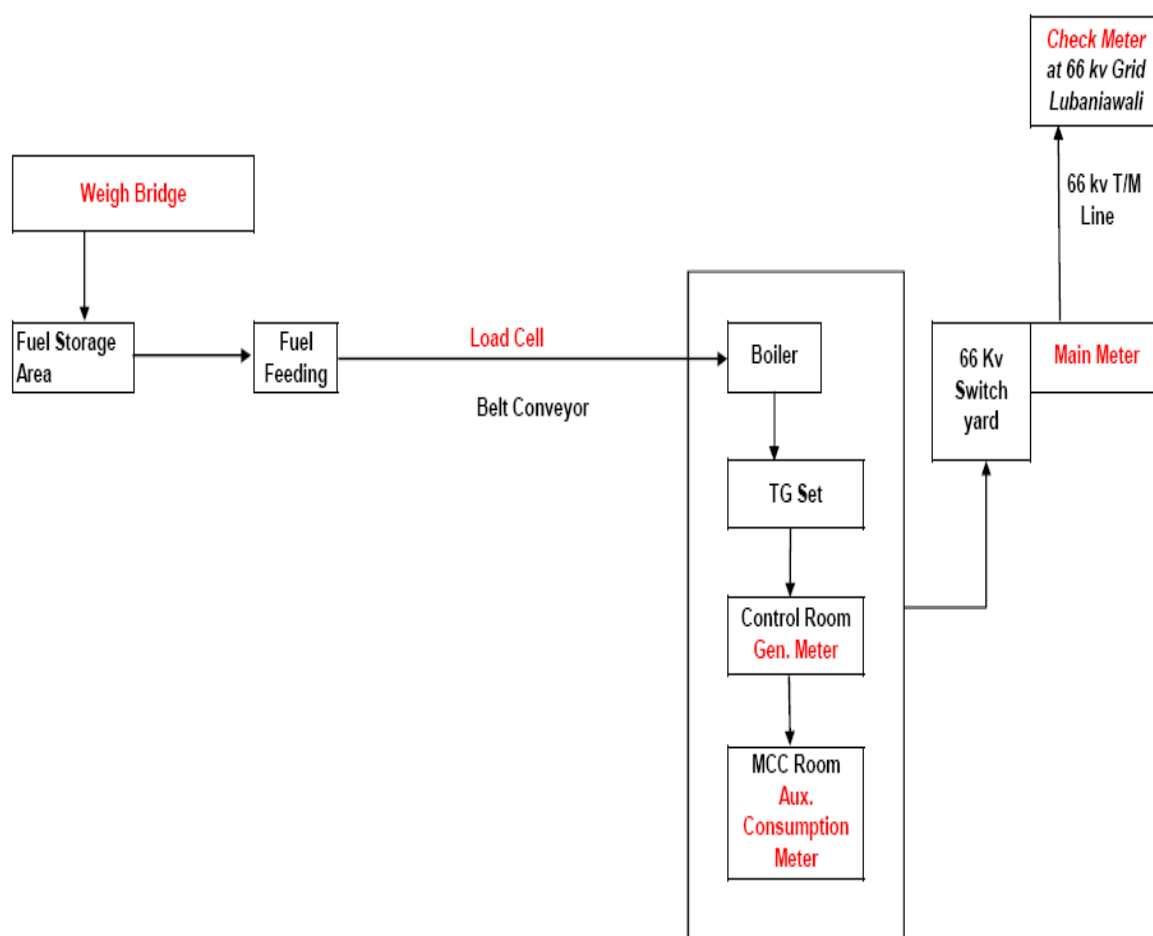
MPPL is the sole agency responsible for implementation of the monitoring plan. The Shift in-charge is responsible for the hourly data recording at generation end. Daily and monthly reports stating the generation, auxiliary consumption, and net power export are prepared by the Shift in-charge and verified by the Plant Manager. Records of the monthly joint meter reading are maintained by the Plant Manager at site as well as by PSEB at their office.

Furthermore Internal Audits are carried out in accordance with the GHG Performance Procedures of MPPL to ensure compliance with the monitoring methodology and plan.

### **Organizational Structure**



**Single Line Diagram for Monitoring Points of 7.5 MW Power Plant of M/s Malwa Power (P) Ltd.  
at Vill - Gulabewala, Distt - Muktsar (PB)**



## SECTION D. Data and parameters

### D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data / Parameter:	EF <sub>y</sub>
Unit:	tCO <sub>2</sub> /MWh
Description:	CO <sub>2</sub> baseline emission factor for the electricity displaced due to the project activity
Source of data:	The baseline emission factor for the project activity has been calculated in the registered PDD using the power generation mix and recent capacity additions of Northern Regional electricity grid
Value(s) applied:	0.942
Purpose of data:	Baseline emission calculations
Additional comment:	This parameter has been fixed ex-ante for the entire crediting period in the registered PDD.

## D.2. Data and parameters monitored

Data / Parameter:	Energy exported
Unit:	kWh
Description:	Electricity exported by the project activity to PSEB
Measured/ Calculated / Default:	Measured
Source of data:	Monthly Joint Meter Readings taken at the interconnection point in the presence of officials of MPPL and PSEB
Value(s) of monitored parameter:	Monthly recorded values of exported energy have been presented in a tabular format in section E.1
Monitoring equipment:	<p><b><u>Main Meter</u></b>  Type: Electronic Trivector Energy meter  Accuracy/Uncertainty Level: 0.5  Serial number: 04180597  Model No.: ER300P  Meter Manufacturer: L&amp;T  Measurement principle: 4 quadrant bidirectional meter  Measurement range: 0 – 99,999,999  Location: 66 kV Switch Yard near power plant  Calibration frequency: Six months</p> <p>Date of calibration test: 26.05.2011  Validity till: 26.11.2011  Calibration Agency: Punjab State Electricity Board</p> <p>Date of calibration test: 23.11.2011  Validity till: 23.05.2012  Calibration Agency: Punjab State Electricity Board</p> <p>Date of calibration test: 04.05.2012  Validity till: 04.11.2012  Calibration Agency: Punjab State Electricity Board</p> <p>Date of calibration test: 22.10.2012  Validity till: 22.04.2013  Calibration Agency: Punjab State Electricity Board</p> <p><b><u>Check Meter</u></b>  Type: Electronic Trivector Energy meter  Accuracy/Uncertainty Level: 0.5  Serial number: 04180598  Model No.: ER300P  Meter Manufacturer: L&amp;T  Measurement principle: 4 quadrant bidirectional meter  Measurement range: 0 – 99,999,999  Location: Lubaniawali Substation  Calibration frequency: Six months</p>



	<p>Date of calibration test: 26.05.2011 Validity till: 26.11.2011 Calibration Agency: Punjab State Electricity Board</p> <p>Date of calibration test: 23.11.2011 Validity till: 23.05.2012 Calibration Agency: Punjab State Electricity Board</p> <p>Date of calibration test: 04.05.2012 Validity till: 04.11.2012 Calibration Agency: Punjab State Electricity Board</p> <p>Date of calibration test: 22.10.2012 Validity till: 22.04.2013 Calibration Agency: Punjab State Electricity Board</p>	
Measuring/ Reading/ Recording frequency:	Recording frequency: Monthly	
Calculation method (if applicable):	Not applicable	
QA/QC procedures:	The calibration test of accuracy of main and check meters is done every six months.	
Purpose of data:	Baseline emission calculation	
Additional comment:	-	
<b>Data / Parameter:</b>	<b>Energy imported</b>	
Unit:	kWh	
Description:	Electricity imported by the project activity from PSEB	
Measured/ Calculated / Default:	Measured	
Source of data:	Monthly Joint Meter Readings taken at the interconnection point in the presence of officials of MPPL and PSEB	
Value(s) of monitored parameter:	Monthly recorded values of imported energy have been presented in a tabular format in section E.1	
Monitoring equipment:	<p><b><u>Main Meter</u></b>            Type: Electronic Trivector Energy meter            Accuracy/Uncertainty Level: 0.5            Serial number: 04180597            Model No.: ER300P            Meter Manufacturer: L&amp;T            Measurement principle: 4 quadrant bidirectional meter            Measurement range: 0 – 99,999,999            Location: 66 kV Switch Yard near power plant            Calibration frequency: Six months</p>	

	<p>Date of calibration test: 26.05.2011 Validity till: 26.11.2011 Calibration Agency: Punjab State Electricity Board</p> <p>Date of calibration test: 23.11.2011 Validity till: 23.05.2012 Calibration Agency: Punjab State Electricity Board</p> <p>Date of calibration test: 04.05.2012 Validity till: 04.11.2012 Calibration Agency: Punjab State Electricity Board</p> <p>Date of calibration test: 22.10.2012 Validity till: 22.04.2013 Calibration Agency: Punjab State Electricity Board</p> <p><b><u>Check Meter</u></b> Type: Electronic Trivector Energy meter Accuracy/Uncertainty Level: 0.5 Serial number: 04180598 Model No.: ER300P Meter Manufacturer: L&amp;T Measurement principle: 4 quadrant bidirectional meter Measurement range: 0 – 99,999,999 Location: Lubaniawali Substation Calibration frequency: Six months</p> <p>Date of calibration test: 26.05.2011 Validity till: 26.11.2011 Calibration Agency: Punjab State Electricity Board</p> <p>Date of calibration test: 23.11.2011 Validity till: 23.05.2012 Calibration Agency: Punjab State Electricity Board</p> <p>Date of calibration test: 04.05.2012 Validity till: 04.11.2012 Calibration Agency: Punjab State Electricity Board</p> <p>Date of calibration test: 22.10.2012 Validity till: 22.04.2013 Calibration Agency: Punjab State Electricity Board</p>	
Measuring/ Reading/ Recording frequency:	Recording frequency: Monthly	
Calculation method (if applicable):	Not applicable	
QA/QC procedures:	The calibration test of accuracy of main and check meters is done every six months.	
Purpose of data:	Baseline emission calculation	

Additional comment:	-
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<b>Data / Parameter:</b>	<b>Net saleable energy</b>
Unit:	kWh
Description:	Net electricity exported by the project activity to PSEB
Measured/ Calculated / Default:	Calculated
Source of data:	Monthly Joint Meter Readings taken at the interconnection point in the presence of officials of MPPL and PSEB
Value(s) of monitored parameter:	Monthly recorded values of net saleable energy have been presented in a tabular format in section E.1
Monitoring equipment:	Not applicable
Measuring/ Reading/ Recording frequency:	Recording frequency: Monthly
Calculation method (if applicable):	Net saleable energy = Energy exported – Energy imported
QA/QC procedures:	The calibration test of accuracy of main and check meters is done every six months.
Purpose of data:	Baseline emission calculation
Additional comment:	-

<b>Data / Parameter:</b>	<b>Energy generated</b>																						
Unit:	kWh																						
Description:	Gross energy generated from the project activity																						
Measured/ Calculated / Default:	Measured																						
Source of data:	Log books																						
Value(s) of monitored parameter:	<table border="1"> <thead> <tr> <th>Month</th><th>Gross generation (kWh)</th></tr> </thead> <tbody> <tr><td>Sep-11</td><td>818777</td></tr> <tr><td>Oct-11</td><td>4202350</td></tr> <tr><td>Nov-11</td><td>4838725</td></tr> <tr><td>Dec-12</td><td>4866252</td></tr> <tr><td>Jan-12</td><td>4198798</td></tr> <tr><td>Feb-12</td><td>4250693</td></tr> <tr><td>Mar-12</td><td>2995322</td></tr> <tr><td>Apr-12</td><td>2008508</td></tr> <tr><td>May-12</td><td>3678113</td></tr> <tr><td>Jun-12</td><td>4147188</td></tr> </tbody> </table>	Month	Gross generation (kWh)	Sep-11	818777	Oct-11	4202350	Nov-11	4838725	Dec-12	4866252	Jan-12	4198798	Feb-12	4250693	Mar-12	2995322	Apr-12	2008508	May-12	3678113	Jun-12	4147188
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	<table><tr><td>Jul-12</td><td>2151063</td></tr><tr><td>Aug-12</td><td>1541655</td></tr><tr><td>Sep-12</td><td>1662024</td></tr><tr><td>Oct-12</td><td>3338453</td></tr><tr><td>Nov-12</td><td>4123522</td></tr><tr><td>Dec-12</td><td>2952731</td></tr><tr><td><b>Total</b></td><td><b>51774174</b></td></tr></table>	Jul-12	2151063	Aug-12	1541655	Sep-12	1662024	Oct-12	3338453	Nov-12	4123522	Dec-12	2952731	<b>Total</b>	<b>51774174</b>	
Jul-12	2151063															
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Nov-12	4123522															
Dec-12	2952731															
<b>Total</b>	<b>51774174</b>															
Monitoring equipment:	<p>Type: Electronic Energy meter Accuracy/Uncertainty Level: 0.5 Serial number: 4249596 Model No.: ER300P Meter Manufacturer: L&amp;T Measurement principle: 4 quadrant bidirectional meter Measurement range: 0 – 99,999,999 Location: Power Plant Control Room Calibration frequency: Six months</p> <p><b>(Procedure for internal testing of meters:</b> The energy meter is fed by two signals i.e. 110 Volt signal from voltage source and 1 amp current signal from current source. The meter on the basis of above parameters calculates the power factor and thus KW reading. The calculated KW reading by the meter is cross checked by factory calibrated independent ammeters, voltmeters and a power factor meter. The signal to the above master voltmeters, ampere meters and power factor meter is fed from the same source i.e. 110 volt from voltage source and 1 amp from current source. The calculated KW reading from the above meters is compared with KW reading shown by the energy meter. The error between the two readings reflects the accuracy of meter under trial.)</p> <p>Date of calibration: 17.05.2011 Validity till: 17.11.2011 Calibration Agency: Internal Testing</p> <p>Date of calibration: 15.11.2011 Validity till: 15.05.2012 Calibration Agency: Internal Testing</p> <p>Date of calibration: 08.05.2012 Validity till: 08.11.2012 Calibration Agency: Internal Testing</p> <p>Date of calibration: 05.11.2012 Validity till: 05.05.2013 Calibration Agency: Internal Testing</p>															
Measuring/ Reading/ Recording frequency:	Recording frequency: Hourly															
Calculation method (if applicable):	Not Applicable															

QA/QC procedures:	The meter is checked every six months through internal testing.	
Purpose of data:	Not used for any calculations. Demonstrates smooth operation of the power plant.	
Additional comment:	-	

Data / Parameter:	Auxiliary energy consumption																																					
Unit:	kWh																																					
Description:	Auxiliary energy consumption of the project activity																																					
Measured/ Calculated / Default:	Measured																																					
Source of data:	Log books																																					
Value(s) of monitored parameter:	<table><tr><th>Month</th><th>Gross generation (kWh)</th></tr><tr><td>Sep-11</td><td>119000</td></tr><tr><td>Oct-11</td><td>422800</td></tr><tr><td>Nov-11</td><td>461900</td></tr><tr><td>Dec-12</td><td>506000</td></tr><tr><td>Jan-12</td><td>447000</td></tr><tr><td>Feb-12</td><td>439000</td></tr><tr><td>Mar-12</td><td>367000</td></tr><tr><td>Apr-12</td><td>259000</td></tr><tr><td>May-12</td><td>390000</td></tr><tr><td>Jun-12</td><td>441000</td></tr><tr><td>Jul-12</td><td>271000</td></tr><tr><td>Aug-12</td><td>197000</td></tr><tr><td>Sep-12</td><td>197000</td></tr><tr><td>Oct-12</td><td>366000</td></tr><tr><td>Nov-12</td><td>437000</td></tr><tr><td>Dec-12</td><td>336000</td></tr><tr><td>Total</td><td>5656700</td></tr></table>		Month	Gross generation (kWh)	Sep-11	119000	Oct-11	422800	Nov-11	461900	Dec-12	506000	Jan-12	447000	Feb-12	439000	Mar-12	367000	Apr-12	259000	May-12	390000	Jun-12	441000	Jul-12	271000	Aug-12	197000	Sep-12	197000	Oct-12	366000	Nov-12	437000	Dec-12	336000	Total	5656700
Month	Gross generation (kWh)																																					
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Dec-12	336000																																					
Total	5656700																																					

Monitoring equipment:	<p>Type: Electronic Energy meter Accuracy/Uncertainty Level: 1.0 Serial number: 63116/3171-0405 Model No.: ELF-3234 Meter Manufacturer: Enercon Measurement principle: 3 phase 4 wire Electronic energy meter Measurement range: 0 – 9,999 Location: Power Plant Control Room Calibration frequency: Six months</p> <p>(Procedure for internal testing of meters: The energy meter is fed by two signals i.e. 110 Volt signal from voltage source and 1 amp current signal from current source. The meter on the basis of above parameters calculates the power factor and thus KW reading. The calculated KW reading by the meter is cross checked by factory calibrated independent ammeters, voltmeters</p>	
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	<p>and a power factor meter. The signal to the above master voltmeters, ampere meters and power factor meter is fed from the same source i.e. 110 volt from voltage source and 1 amp from current source. The calculated KW reading from the above meters is compared with KW reading shown by the energy meter. The error between the two readings reflects the accuracy of meter under trial.)</p> <p>Date of calibration: 17.05.2011 Validity till: 17.11.2011 Calibration Agency: Internal Testing</p> <p>Date of calibration: 15.11.2011 Validity till: 15.05.2012 Calibration Agency: Internal Testing</p> <p>Date of calibration: 08.05.2012 Validity till: 08.11.2012 Calibration Agency: Internal Testing</p> <p>Date of calibration: 05.11.2012 Validity till: 05.05.2013 Calibration Agency: Internal Testing</p>
Measuring/ Reading/ Recording frequency:	Recording frequency: Hourly
Calculation method (if applicable):	Not Applicable
QA/QC procedures:	The meter is checked every six months through internal testing.
Purpose of data:	Not used for any calculations. Demonstrates smooth operation of the power plant.
Additional comment:	-

<b>Data / Parameter:</b>	<b>Biomass Quantity</b>																								
Unit:	MT																								
Description:	Quantity of biomass consumed in the project activity																								
Measured/ Calculated / Default:	Measured																								
Source of data:	Log books																								
Value(s) of monitored parameter:	<table><tr><th rowspan="2">Month</th><th colspan="4">Biomass consumed (MT)</th></tr><tr><th>Cotton stick</th><th>Mustar d Husk</th><th>Paddy waste</th><th>Wheat straw</th></tr><tr><td>Sep-11</td><td>958</td><td>0</td><td>42</td><td>103</td></tr><tr><td>Oct-11</td><td>1,604</td><td>268</td><td>1,981</td><td>1,889</td></tr><tr><td>Nov-11</td><td>3,249</td><td>0</td><td>1,509</td><td>1,978</td></tr></table>	Month	Biomass consumed (MT)				Cotton stick	Mustar d Husk	Paddy waste	Wheat straw	Sep-11	958	0	42	103	Oct-11	1,604	268	1,981	1,889	Nov-11	3,249	0	1,509	1,978
Month	Biomass consumed (MT)																								
	Cotton stick	Mustar d Husk	Paddy waste	Wheat straw																					
Sep-11	958	0	42	103																					
Oct-11	1,604	268	1,981	1,889																					
Nov-11	3,249	0	1,509	1,978																					

Dec-11	3,341	6	1,845	1,526
Jan-12	2,511	0	1,103	1,979
Feb-12	2,963	0	1,598	1,407
Mar-12	651	0	2,522	849
Apr-12	1,124	6	56	1,468
May-12	450	108	400	3,570
Jun-12	3,062	57	88	1,960
Jul-12	877	17	130	1,706
Aug-12	507	3	1,162	392
Sep-12	563	14	1,186	483
Oct-12	1,184	19	2,165	1,189
Nov-12	1,347	68	3,276	1,044
Dec-12	1,276	37	474	2,289
<b>Total</b>	<b>25,664</b>	<b>604</b>	<b>19,536</b>	<b>23,832</b>

Monitoring  
equipment:

**Load Cell**

Type: Load Cell

Serial number: 167205

Accuracy/Uncertainty Level:  $\pm 5\%$

Model No.: BR011L0

Capacity: 10 MT

Location: Belt Conveyor

Calibration frequency: Annually

Date of calibration: 18.05.2011

Validity till: 17.05.2012

Calibration Agency: IPA Private Limited

Date of calibration: 15.05.2012

Validity till: 14.05.2013

Calibration Agency: IPA Private Limited

**Weighbridge**

Type: Electro-Mechanical Weighbridge

Make: Leotronic

Model No.: EDS501

Accuracy/Uncertainty level: 5/10 kg

Capacity: 30 MT

Location: Before Fuel Yard

Calibration frequency: Annually

Date of calibration: 29.10.2010

Validity till: 29.10.2011

Calibration Agency: Leotronic Scales Private Ltd.

Date of calibration: 27.01.2011

Validity till: 27.01.2012

Calibration Agency: Leotronic Scales Private Ltd.

Date of calibration: 25.04.2011

Validity till: 25.04.2012

	<p>Calibration Agency: Leotronic Scales Private Ltd. Date of calibration: 22.07.2011 Validity till: 22.07.2012 Calibration Agency: Leotronic Scales Private Ltd.</p> <p>Date of calibration: 19.10.2011 Validity till: 19.10.2012 Calibration Agency: Leotronic Scales Private Ltd.</p> <p>Date of calibration: 16.01.2012 Validity till: 16.01.2013 Calibration Agency: Leotronic Scales Private Ltd.</p> <p>Date of calibration: 13.04.2012 Validity till: 13.04.2013 Calibration Agency: Leotronic Scales Private Ltd.</p> <p>Date of calibration: 11.07.2012 Validity till: 11.07.2013 Calibration Agency: Leotronic Scales Private Ltd.</p> <p>Date of calibration: 09.10.2012 Validity till: 09.10.2013 Calibration Agency: Leotronic Scales Private Ltd.</p>	
Measuring/ Reading/ Recording frequency:	<p>Recording frequency: Daily</p> <p>A fuel stock inventory is maintained at the plant which contains a record of the amount of each type of biomass purchased based on invoices / receipts from fuel contractors after weighing with the electronic weigh bridge installed at project site. The amount of biomass fed into the boiler is also recorded based on readings of the online meter load cell installed on the conveyor belt prior to feeding the biomass into the boiler.</p>	
Calculation method (if applicable):	Not Applicable	
QA/QC procedures:	<p>The load cell is an online meter used to measure biomass consumption of the project activity and is calibrated on an annual basis.</p> <p>The weighbridge calibration is to be carried out annually but it is conducted on a regular basis (generally three months) to ensure greater accuracy.</p> <p>Biomass consumption readings are also verified through audit reports and are recorded on a daily as well as monthly basis.</p>	
Purpose of data:	Not used for any calculations. Substantiates the power generation from the project activity.	
Additional comment:	-	
<b>Data / Parameter:</b>	<b>Biomass – Calorific Value</b>	
Unit:	kCal/kg	
Description:	Calorific value of the different types of biomass fuels used in the project activity	



Measured/ Calculated / Default:	Measured
Source of data:	Log books
Value(s) of monitored parameter:	Results of calorific value tests conducted on 18 <sup>th</sup> December 2011: Mustard Husk: 3,154 kcal/kg Wheat Straw: 3,206 kcal/kg Paddy Waste: 2,892 kcal/kg Cotton Stick: 3,054 kcal/kg
Monitoring equipment:	<p>The energy content of biomass is measured in the in-house lab using a bomb calorimeter as and when the biomass is received at the power plant site, however the GCV of each type of biomass is reported once in the monitoring report based on the internal audit conducted for calorific value of biomass used.</p> <p>In the in-house testing with bomb calorimeter, the mass of the combustible charge used can vary from less than one gram to 1,100 grams. However, the calories liberated in the test should not be more than 10,000.</p> <p>A sample from the biomass received at plant is taken and tested for its GCV before being used in the boiler. The procedure for measurement of the calorific value of biomass using bomb calorimeter is as per the manufacturer's manual using the standard procedure prescribed in IS: 1350 of the Bureau of Indian Standards (BIS) and ensures standardization of apparatus every time it is used. The procedure is first performed with a sample of benzoic acid whose calorific value is known (6,319 cal/gram) to determine the water equivalent (cal/°C). After determination of the water equivalent, the same procedure is performed with the biomass sample to calculate the calorific value.</p>
Measuring/ Reading/ Recording frequency:	Recording frequency: Once in a year for each type of biomass.
Calculation method (if applicable):	$GCV = \frac{T \times W - (CV_T + CV_W)}{M}$ <p>Where,</p> <p>GCV is the calorific value of sample in calories per gram T is the final rise in temperature in °C M is the mass of sample in grams W is the water equivalent in calories per °C CV<sub>T</sub> is the calorific value of thread = 2.1/cm CV<sub>W</sub> is the calorific value of ignition wire = 2.33/cm</p>
QA/QC procedures:	The bomb calorimeter can be used to measure calorific value of a wide range of solid as well as liquid fuels and since it is standardized according to procedures in the manufacturer's manual every time it is used, the uncertainty level of the monitored data is low.
Purpose of data:	Not used for any calculations. Substantiates the power generation from the project activity.
Additional comment:	-

<b>Data / Parameter:</b>	<b>Coal Quantity</b>
Unit:	MT
Description:	Quantity of coal used in the project activity
Measured/ Calculated / Default:	Measured
Source of data:	Log books
Value(s) of monitored parameter:	0
Monitoring equipment:	Not applicable
Measuring/ Reading/ Recording frequency:	Recording frequency: Daily
Calculation method (if applicable):	Not Applicable
QA/QC procedures:	Coal has not been used during the current monitoring period. Further, the power plant does not have a coal mill required to grind the coal for use in the boiler.
Purpose of data:	Calculation of the project emissions from the project activity.
Additional comment:	-

<b>Data / Parameter:</b>	<b>Carbon content in coal</b>
Unit:	%
Description:	Carbon content of coal used in the project activity
Measured/ Calculated / Default:	Measured
Source of data:	Test reports
Value(s) of monitored parameter:	Not applicable
Monitoring equipment:	Not applicable
Measuring/ Reading/ Recording frequency:	Recording frequency: For each batch of coal
Calculation method (if applicable):	Not Applicable
QA/QC procedures:	Coal has not been used by the project proponent in the current monitoring period.
Purpose of data:	Calculation of the project emissions from the project activity.

Additional comment: -

**D.3. Implementation of sampling plan**

&gt;&gt;

Not applicable for the project activity.

**SECTION E. Calculation of emission reductions or GHG removals by sinks****E.1. Calculation of baseline emissions or baseline net GHG removals by sinks**

&gt;&gt;

The baseline emissions have been calculated as per the formula presented in section E.1.2.4 of the registered PDD:

$$BE_y = EF_y \times EG_y$$

Where

$BE_y$  - are the baseline emissions due to displacement of electricity during the year y in tons of CO<sub>2</sub>  
 $EG_y$  - is the net quantity of electricity generated by the project activity during the year y in MWh, and  
 $EF_y$  - is the CO<sub>2</sub> baseline emission factor for the electricity displaced due to the project activity in tons CO<sub>2</sub>/MWh

Billing Period	Electricity exported (kWh)	Electricity imported (kWh)	Net Saleable energy (kWh)	Baseline Emission Factor (kgCO <sub>2</sub> e/kWh)	Baseline Emissions (tCO <sub>2</sub> e)
Sep-11	705,500	36,000	669,500	0.942	630
Oct-11	3,877,500	14,000	3,863,500	0.942	3,639
Nov-11	4,129,000	14,500	4,114,500	0.942	3,875
Dec-11	4,436,500	19,500	4,417,000	0.942	4,160
Jan-12	3,513,500	11,500	3,502,000	0.942	3,298
Feb-12	3,871,000	8,500	3,862,500	0.942	3,638
Mar-12	2,569,500	22,000	2,547,500	0.942	2,399
Apr-12	1,699,500	23,500	1,676,000	0.942	1,578
May-12	3,239,000	15,000	3,224,000	0.942	3,037
Jun-12	3,774,500	15,500	3,759,000	0.942	3,540
Jul-12	1,682,500	40,500	1,642,000	0.942	1,546
Aug-12	1,336,000	40,500	1,295,500	0.942	1,220
Sep-12	1,448,000	33,000	1,415,000	0.942	1,332
Oct-12	3,095,000	20,000	3,075,000	0.942	2,896
Nov-12	3,751,500	11,000	3,740,500	0.942	3,523
Dec-12	2,230,500	23,000	2,207,500	0.942	2,079
<b>Total</b>	<b>45,359,000</b>	<b>348,000</b>	<b>45,011,000</b>	<b>-</b>	<b>42,390</b>

**E.2. Calculation of project emissions or actual net GHG removals by sinks**

&gt;&gt;

As per registered PDD section E.1.2.1 project emissions would take place from the combustion of coal in the project activity. Since, no coal has been consumed in the current monitoring period,

project emissions have not been considered.

### E.3. Calculation of leakage

>>

As per registered PDD section E.1.2.1 leakage emissions from the transportation of biomass have been ignored.

Further, as per “General guidance on leakage in biomass project activities” Version 03 Paragraph 18, the project participant is required to evaluate once in the beginning of the crediting period if biomass is available in surplus in the region. If it is demonstrated that the surplus biomass is at least 25% larger than the consumption of the region, then leakage emissions due to competing uses of biomass can be neglected.

In accordance with this guidance, an independent third party (Pranam Consultants) prepared a biomass assessment report dated 06 February 2009 in the fourth monitoring period<sup>1</sup> of the project activity. The major findings of the study with respect to the fuels used in the current monitoring period are tabulated below:

Crop	Generation (MT)	Consumption (MT)			Surplus (MT)	Surplus as % of Consumption
		Muktsar District	MPPL	Total		
Mustard Husk	10,165	0	4,637	4,637	5,528	119.22%
Wheat Straw	1,107,917	644,361	30,104	674,465	433,452	64.27%
Paddy Waste	431,280	239,609	5,018	244,628	186,652	76.30%
Cotton Stick	105,699	0	29,399	29,399	76,300	259.53%

Since, all fuels are available in more than 25% surplus of the consumption; leakage emissions due to the competing use of biomass have been neglected.

### E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

Month	Baseline emissions or baseline net GHG removals by sinks (t CO <sub>2</sub> e)	Project emissions or actual net GHG removals by sinks (t CO <sub>2</sub> e)	Leakage (t CO <sub>2</sub> e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO <sub>2</sub> e)
Sep-11	630	0	0	630
Oct-11	3,639	0	0	3,639
Nov-11	3,875	0	0	3,875
Dec-11	4,160	0	0	4,160
Jan-12	3,298	0	0	3,298
Feb-12	3,638	0	0	3,638
Mar-12	2,399	0	0	2,399
Apr-12	1,578	0	0	1,578

<sup>1</sup> <http://cdm.unfccc.int/Projects/DB/TUEV-SUED1142618808.04/iProcess/TUEV-SUED1233142421.54/view>

May-12	3,037	0	0	3,037
Jun-12	3,540	0	0	3,540
Jul-12	1,546	0	0	1,546
Aug-12	1,220	0	0	1,220
Sep-12	1,332	0	0	1,332
Oct-12	2,896	0	0	2,896
Nov-12	3,523	0	0	3,523
Dec-12	2,079	0	0	2,079
<b>Total</b>	<b>42,390</b>	<b>0</b>	<b>0</b>	<b>42,390</b>

**E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD**

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
<b>Emission reductions or GHG removals by sinks (t CO<sub>2</sub>e)</b>	58,472	42,390

**E.6. Remarks on difference from estimated value in registered PDD**

>>

The emission reductions estimated in the registered PDD are 58,472 tCO<sub>2</sub> per annum. The emission reductions actually achieved in the monitoring period are 42,390 tCO<sub>2</sub>. The emission reductions generated in the current monitoring period are less than the estimation for the period in the registered PDD because of the lower Plant Load Factor (PLF) attained in the current monitoring period by the project activity than that assumed in the registered PDD.

**E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards**

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
<b>Emission reductions or GHG removals by sinks (t CO<sub>2</sub>e)</b>	3,39,994	-

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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory		
Document Type: Form		
Business Function: issuance		
Keywords: monitoring report, performance monitoring		