



## Monitoring report form (Version 03.2)

### Monitoring report

<b>Title of the project activity</b>	Abohar Branch Canal Based Small Hydro Power Project in Punjab, India
<b>Reference number of the project activity</b>	4856
<b>Version number of the monitoring report</b>	01
<b>Completion date of the monitoring report</b>	07/04/2014
<b>Registration date of the project activity</b>	28/12/2011
<b>Monitoring period number and duration of this monitoring period</b>	Monitoring period : Second (2 <sup>nd</sup> ) Duration of monitoring period: 01/12/2012 to 31/03/2014
<b>Project participant(s)</b>	Abohar Power Generation Private Limited
<b>Host Party(ies)</b>	India
<b>Sectoral scope(s) and applied methodology(ies)</b>	Sectoral scope : 01  Methodology : AMS I.D Version 16
<b>Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD</b>	31,326 tCO <sub>2</sub>
<b>Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period</b>	26,358 tCO <sub>2</sub>
<b>Actual GHG emission reduction or net anthropogenic GHG removals by sinks achieved during the period upto 31 December 2012 (if applicable)</b>	2,236 tCO <sub>2</sub>
<b>Actual GHG emission reduction or net anthropogenic GHG removals by sinks achieved during the period from 01 January 2013 (if applicable)</b>	24,122 tCO <sub>2</sub>

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

&gt;&gt;

Five Mini Hydroelectric Projects (MHP) aggregating to 5.3 MW at Khanpur, Sudhar, Akhara, Gholian and Channowal, villages on the Abohar Branch Canal in the state of Punjab (India) have been setup. Mini hydro electric projects at Khanpur (1.1 MW) was commissioned on 22 April 2010, Sudhar (1.4 MW) was commissioned on 03 May 2010, Akhara (1.1 MW) was commissioned on 25 March 2010, Gholian (0.8MW) was commissioned on 04 October 2009 and Channowal (0.9 MW) was commissioned on 30 September 2009. The plants are operating successfully since then.

The purpose of the project activity is to generate electricity by utilizing water flowing through the existing canal system as a renewable energy resource to meet the ever-increasing demand of energy in the region. The development of the project activity contemplates the production of clean hydroelectric power that will contribute to reduce CO<sub>2</sub> emissions, which would have occurred otherwise, in absence of these projects.

1.1 MW (550 KW X 2) hydroelectric project at Khanpur, 1.4 MW (700 KW X 2) hydroelectric project at Sudhar, 1.1 MW (550 KW X 2) hydroelectric project at Akhara, 0.8 MW (800 KW X 1) hydroelectric project at Gholian and 0.9 MW (900 KW X 1) hydroelectric project at Channowal of this project activity generate power and sell it to state utility i.e. Punjab State Electricity Board through Power Purchase Agreement (PPA) contract.

These five plants are of low head, canal drop based mini hydroelectric projects. The projects are canal based renewable hydroelectric generating plants, which includes forebay, intake, power house, draft tube, turbine and tailrace. The component plants do not involve any type of displacement, rehabilitation or relocation.

The projects are generating electricity successfully by converting the potential of kinetic energy of the canal water and the renewable electricity produced is fed into the Punjab State Electricity Board Grid thereby replacing the equivalent amount of electricity produced from thermal stations and thus reducing green house gas emission.

**Equipment Detail**

The projects were completed with major equipment supplied by the supplier as under:

SN	MHP	Equipment	No. of Turbines / capacity	Turbine type	Suppliers
1	Khanpur	Turbines & its accessories	2 x 550 kW	Vertical axis semi Kaplan turbines	Boving Fouress Limited
		Synchronous Generator	2 x 550 kW		
2	Sudhar	Turbines & its accessories	2 x 700 kW	Vertical axis semi Kaplan turbines	Boving Fouress Limited
		Synchronous Generator	2 x 700 kW		
3	Akhara	Turbines & its accessories	2 x 550 kW	Vertical axis semi Kaplan turbines	Boving Fouress Limited
		Synchronous Generator	2 x 550 kW		
4	Gholian	Turbines & its accessories	1 x 800 kW	Vertical axis full Kaplan turbines	Boving Fouress Limited
		Synchronous Generator	1 x 800 kW		
5	Channowal	Turbines & its accessories	1 x 900 kW	Vertical axis full Kaplan turbines	Boving Fouress Limited
		Synchronous Generator	1 x 900 kW		

The projects were completed as planned and described in the Project Design Document (PDD).

The current monitoring period covers the period from 01/12/2012 to 31/03/2014.

During the present monitoring period i.e. 01/12/2012 to 31/03/2014, all the five (5) plants achieved net energy generation of MWh 32,822.116 and have achieved 26,358 tCO<sub>2</sub> emission reduction in this monitoring period

## A.2. Location of project activity

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MHP Khanpur : The project is located at Abohar Branch Canal

Latitude : 30.7859 N, Longitude : 75.9073 E  
 Town : Khanpur  
 District : Ludhiana  
 State : Punjab  
 Country : India

MHP Sudhar : The project is located at Abohar Branch Canal

Latitude : 30.7675 N, Longitude : 75.6469 E  
 Town : Sudhar  
 District : Ludhiana  
 State : Punjab  
 Country : India

MHP Akhara : The project is located at Abohar Branch Canal

Latitude : 30.7612 N, Longitude : 75.4931 E  
 Town : Akhara  
 District : Ludhiana  
 State : Punjab  
 Country : India

MHP Gholian : The project is located at Abohar Branch Canal

Latitude : 30.6608 N, Longitude : 75.2147 E  
 Town : Gholian  
 District : Moga  
 State : Punjab  
 Country : India

MHP Channowal : The project is located at Abohar Branch Canal

Latitude : 30.6439 N, Longitude : 75.1055 E  
 Town : Channowal  
 District : Moga  
 State : Punjab  
 Country : India

## 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 (host)	Private entity: Abohar Power Generation Private Limited	No

**A.4. Reference of applied methodology**

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Type I : Renewal Energy Projects  
 Category : I.D. Grid Connected Renewable Electricity Generation  
 Version : 16

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

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Crediting period for this project activity is 28/12/2011 to 27/12/2021 (Fixed).

**SECTION B. Implementation of project activity**

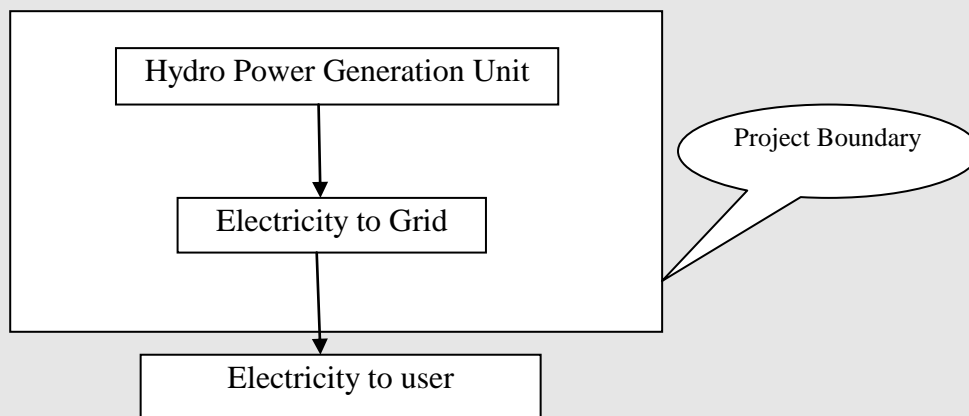
**B.1. Description of implemented registered project activity**

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The projects activities were commissioned on dates as mentioned below while it was registered with CDM EB on 28/12/2011.

SN	Name of the Project	Date of Commissioning
1	Khanpur	22 April 2010
2	Sudhar	03 May 2010
3	Akhara	25 March 2010
4	Gholian	04 October 2009
5	Channowal	30 September 2009

The project proponent has installed all monitoring equipment to monitor the parameters which were described in the registered CDM PDD.



The project activity is in continuous operation since the date of commissioning. No special events or change of equipments have taken place during the current monitoring period.

No events occurred during the current monitoring period which may have affected 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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Not Applicable

**B.2.2. Corrections**

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Not Applicable

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

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Not Applicable

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

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Not Applicable

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

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Not Applicable

**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**

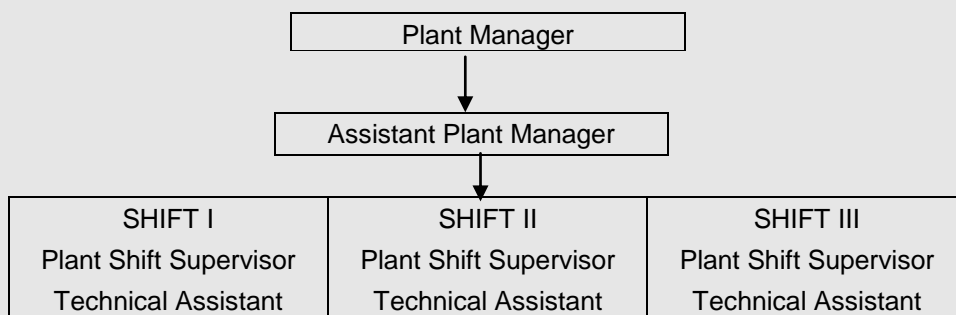
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For this project activity, the monitoring systems and procedures are followed as described below:

**Energy:**

1. The Energy exported (MWh) and Energy imported (MWh) at the interconnection points have been measured by the bidirectional meters (i.e. Trivector Meters) installed at the interconnection points at all the 5 (five) project sites.
2. The Net Saleable Energy (Net electricity exported to grid) has been calculated as a difference between energy exported and energy imported. It is based on monthly joint meter readings.
3. Monthly joint meter readings were taken at interconnection points and certified by representatives of Abohar Power Generation Private Limited (APGPL) and the Grid / Licensee / purchaser i.e. Punjab State Electricity Board (PSEB).
4. The joint meter readings were used to raise invoice for sale of net energy to PSEB.
5. The energy generated has been measured by the energy meters installed at the generation points on an hourly basis.
6. The auxiliary energy consumption has been measured by the auxiliary energy consumption meters installed at each of the plant sites on an hourly basis.
7. The hourly reading of electricity generation and auxiliary consumption were aggregated to daily & monthly electricity figure.
8. Monthly reports stating the energy exported, energy imported, energy generated and auxiliary energy consumption were prepared by shift-in-charge and verified by plant managers.
9. The finance department cross checked the data provided by plant managers.

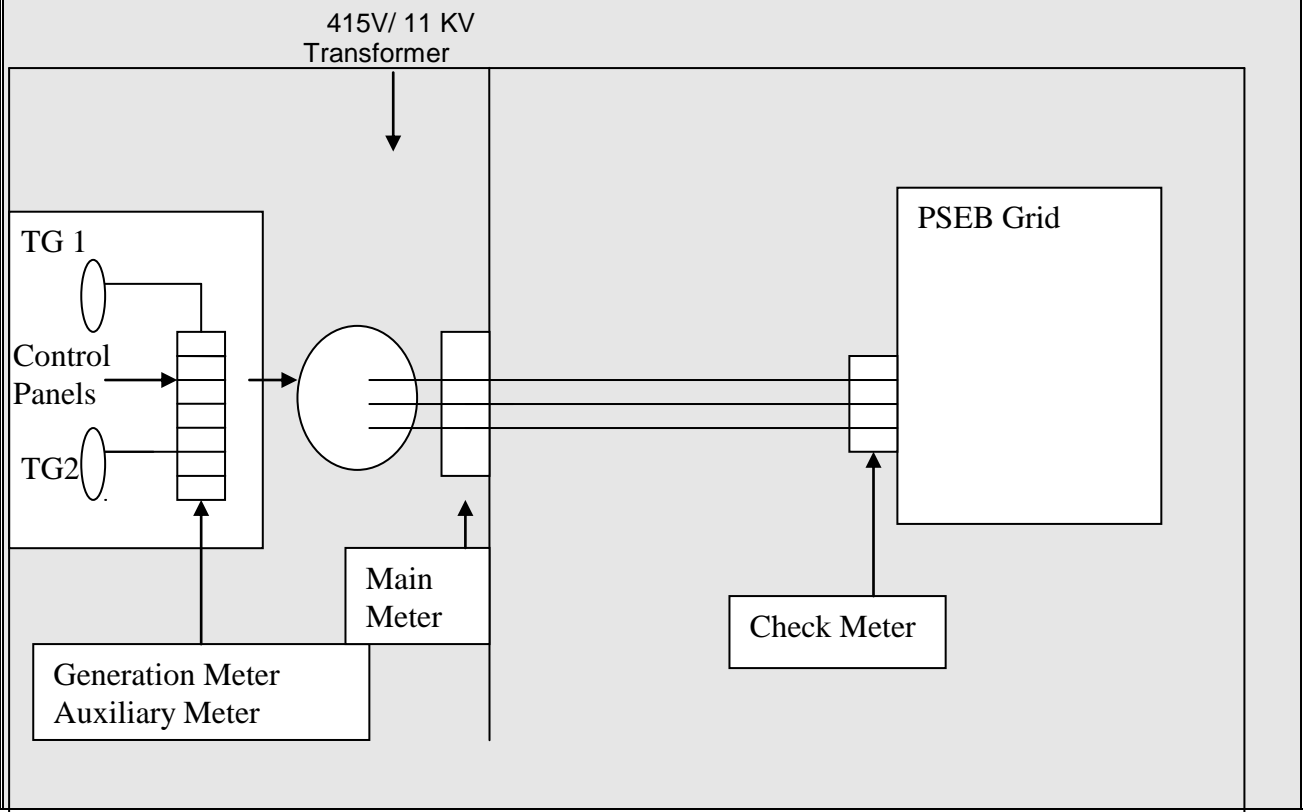
The Organizational structure responsible for monitoring the various parameters as per Monitoring Plan is as below:-



The hourly data is monitored and recorded in the log books by the shift staff comprising of Plant Shift Supervisor and Technical Assistant. The daily data is checked and countersigned by the Assistant Plant Manager. The daily and monthly data is checked and verified by the CDM team leader (plant in-charge) along with the assistance of head of the commercial & finance, Civil and Electrical & Mechanical department. The data is audited annually by the auditor of the Company having financial background.

As per the registered PDD main meter will be the basis for billing. In case of failure of the main meter, check meter will be decisive for billing. In case of failure of both main and check meter, the emission reduction calculation will be done based on the hourly generation and auxiliary consumption data recorded by APGPL at generation end.

The Diagram showing all relevant monitoring points has been displayed as below:



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

(Copy this table for each piece of data and parameter.)

<b>Data / Parameter:</b>	$EF_{grid}/EF_{CM}$
Unit:	tCO <sub>2</sub> / MWh
Description:	The Grid Emission Factor has been calculated as the weighted average of the operating Margin Emission Factor ( $EF_{OM}$ ) and the Build Margin Emission Factor ( $EF_{BM}$ ).
Source of data:	NEWNE regional grid – baseline carbon dioxide emission data base, Version 4.0 given by Central Electricity Authority, CEA.
Value(s) applied):	0.8031
Purpose of data:	Baseline emission calculations
Additional comment:	This parameter is fixed ex-ante for the full crediting period

**D.2. Data and parameters monitored**

<b>Data / Parameter:</b>	$EG_{export, y}$																	
Unit:	MWh																	
Description:	Electricity exported by project activity in year y																	
Measured/ Calculated / Default:	Measured																	
Source of data:	Joint Meter Reading																	
Value(s) of monitored parameter:	<table border="1"> <thead> <tr> <th>Khanpur</th> <th>Sudhar</th> <th>Akhara</th> <th>Gholian</th> <th>Channowal</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>7,813.187</td> <td>7,566.394</td> <td>6,692.720</td> <td>5,323.786</td> <td>5,481.255</td> <td>32,877.342</td> </tr> </tbody> </table>						Khanpur	Sudhar	Akhara	Gholian	Channowal	Total	7,813.187	7,566.394	6,692.720	5,323.786	5,481.255	32,877.342
Khanpur	Sudhar	Akhara	Gholian	Channowal	Total													
7,813.187	7,566.394	6,692.720	5,323.786	5,481.255	32,877.342													



Monitoring equipment:	Main Meter					
	<b>Particulars</b>	<b>Khanpur</b>	<b>Sudhar</b>	<b>Akhara</b>	<b>Gholian</b>	<b>Channowal</b>
	Type	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter
	Accuracy class	± 0.20%	± 0.20%	± 0.20%	± 0.20%	± 0.20%
	Serial number	11069548	11071246	11071253	11071244	11071251
	Calibration frequency	2 year	2 year	2 year	2 year	2 year
	Calibrations during monitoring period	27/06/2012 (valid till 26/06/2014)	22/06/2012 (valid till 21/06/2014)	22/06/2012 (valid till 21/06/2014)	19/06/2012 (valid till 18/06/2014)	19/06/2012 (valid till 18/06/2014)

	Check Meter					
	Particulars	Khanpur	Sudhar	Akhara	Gholian	Channowal
	Type	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter
	Accuracy class	± 0.20%	± 0.20%	± 0.20%	± 0.20%	± 0.20%
	Serial number	11069549	11071247	11071254	11071259	11071261
	Calibration frequency	2 year	2 year	2 year	2 year	2 year
	Calibrations during monitoring period	27/06/2012 (valid till 26/06/2014)	22/06/2012 (valid till 21/06/2014)	22/06/2012 (valid till 21/06/2014)	19/06/2012 (valid till 18/06/2014)	19/06/2012 (valid till 18/06/2014)
Measuring/ Reading/ Recording frequency:	Continuous monitoring and Monthly recording					
Calculation method (if applicable):	Not Applicable					
QA/QC procedures:	<p>The electricity exported by APGPL is monitored through monthly joint meter readings of energy meters installed at grid interconnection point.</p> <p>Joint Meter Readings are based on the main meter readings for the export and import of the electricity to end from the grid.</p> <p>The principles of Frequency, Data recording and Reliability as mentioned in the PDD are strictly adhered to.</p> <p>The energy meters are test checked for accuracy and calibrated once in two years.</p>					
Purpose of data:	To calculate baseline emission					
Additional comment:	The data will be kept for 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.					

<b>Data / Parameter:</b>	EG <sub>Import, y</sub>																	
Unit:	MWh																	
Description:	Energy imported by the project activity in year y																	
Measured/ Calculated / Default:	Measured																	
Source of data:	Joint Meter Reading																	
Value(s) of monitored parameter:	<table border="1"> <thead> <tr> <th><b>Khanpur</b></th> <th><b>Sudhar</b></th> <th><b>Akhara</b></th> <th><b>Gholian</b></th> <th><b>Channowal</b></th> <th><b>Total</b></th> </tr> </thead> <tbody> <tr> <td><b>7.794</b></td> <td><b>8.793</b></td> <td><b>12.535</b></td> <td><b>11.325</b></td> <td><b>14.779</b></td> <td><b>55.226</b></td> </tr> </tbody> </table>						<b>Khanpur</b>	<b>Sudhar</b>	<b>Akhara</b>	<b>Gholian</b>	<b>Channowal</b>	<b>Total</b>	<b>7.794</b>	<b>8.793</b>	<b>12.535</b>	<b>11.325</b>	<b>14.779</b>	<b>55.226</b>
<b>Khanpur</b>	<b>Sudhar</b>	<b>Akhara</b>	<b>Gholian</b>	<b>Channowal</b>	<b>Total</b>													
<b>7.794</b>	<b>8.793</b>	<b>12.535</b>	<b>11.325</b>	<b>14.779</b>	<b>55.226</b>													

Monitoring equipment:	Main Meter					
	<b>Particulars</b>	<b>Khanpur</b>	<b>Sudhar</b>	<b>Akhara</b>	<b>Gholian</b>	<b>Channowal</b>
	Type	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter
	Accuracy class	± 0.20%	± 0.20%	± 0.20%	± 0.20%	± 0.20%
	Serial number	11069548	11071246	11071253	11071244	11071251
	Calibration frequency	2 year	2 year	2 year	2 year	2 year
	Calibrations during monitoring period	27/06/2012 (valid till 26/06/2014)	22/06/2012 (valid till 21/06/2014)	22/06/2012 (valid till 21/06/2014)	19/06/2012 (valid till 18/06/2014)	19/06/2012 (valid till 18/06/2014)
	Check Meter					
	<b>Particulars</b>	<b>Khanpur</b>	<b>Sudhar</b>	<b>Akhara</b>	<b>Gholian</b>	<b>Channowal</b>
	Type	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter	L&T Bidirectional Trivector Meter
	Accuracy class	± 0.20%	± 0.20%	± 0.20%	± 0.20%	± 0.20%
	Serial number	11069549	11071247	11071254	11071259	11071261
	Calibration frequency	2 year	2 year	2 year	2 year	2 year
	Calibrations during monitoring period	27/06/2012 (valid till 26/06/2014)	22/06/2012 (valid till 21/06/2014)	22/06/2012 (valid till 21/06/2014)	19/06/2012 (valid till 18/06/2014)	19/06/2012 (valid till 18/06/2014)

Measuring/ Reading/ Recording frequency:	Continuous monitoring and Monthly recording
Calculation method (if applicable):	Not Applicable
QA/QC procedures:	The electricity imported by APGPL is monitored through monthly joint meter readings of energy meters installed at grid interconnection point. Joint Meter Readings are based on the main meter readings for the export and import of the electricity to and from the grid. The principles of Frequency, Data recording and Reliability as mentioned in the PDD are strictly adhered to. The energy meters are test checked for accuracy and calibrated once in two years.
Purpose of data:	To calculate baseline emission
Additional comment:	The data will be kept for 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.
<b>Data / Parameter:</b>	$EG_{Net, y}$
Unit:	MWh
Description:	Net electricity exported to the Grid/Licensee in year y
Measured/ Calculated / Default:	Calculated
Source of data:	Joint Meter Reading

Value(s) of monitored parameter:	<table border="1"> <thead> <tr> <th>Khanpur</th> <th>Sudhar</th> <th>Akhara</th> <th>Gholian</th> <th>Channowal</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>7,805.393</td> <td>7,557.601</td> <td>6,680.185</td> <td>5,312.461</td> <td>5,466.476</td> <td>32,822.116</td> </tr> </tbody> </table>						Khanpur	Sudhar	Akhara	Gholian	Channowal	Total	7,805.393	7,557.601	6,680.185	5,312.461	5,466.476	32,822.116
	Khanpur	Sudhar	Akhara	Gholian	Channowal	Total												
7,805.393	7,557.601	6,680.185	5,312.461	5,466.476	32,822.116													
Monitoring equipment:	As this is calculated, this section is not applicable for this monitoring parameter.																	
Measuring/ Reading/ Recording frequency:	Monthly																	
Calculation method (if applicable):	Net Saleable energy = Energy exported – Energy imported																	
QA/QC procedures:	<p>Net Saleable energy is calculated as the difference between energy exported and energy imported from the Grid. They are monitoring by Joint Meter Reading by meters installed at the Grid Interconnection Point every month and would be recorded monthly for each site. Based on the data recorded, monthly bills is raised for payment against net electricity exported (<math>EG_{Net, y}</math>). The net sold value can be cross checked with the invoices raised for the respective months.</p> <p>The energy meters are test checked for accuracy and calibrated once in two years.</p>																	
Purpose of data:	To calculate baseline emission																	
Additional comment:	<p>The data will be kept for 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.</p> <p>The data are archived on paper and electronically.</p>																	

<b>Data / Parameter:</b>	EG <sub>Gross, y</sub>					
<b>Unit:</b>	MWh					
<b>Description:</b>	Gross electricity generation by the project activity in year y					
<b>Measured/ Calculated / Default:</b>	Measured					
<b>Source of data:</b>	Plant records					
<b>Value(s) of monitored parameter:</b>	<b>Khanpur</b>	<b>Sudhar</b>	<b>Akhara</b>	<b>Gholian</b>	<b>Channowal</b>	<b>Total</b>
	8,100.682	7,880.258	6,901.068	5,463.494	5,690.024	34,035.526

Monitoring equipment:	Particulars	Khanpur	Sudhar	Akhara	Gholian	Channowal	
	Type	Unit 1: Elecon Unit 2: Elecon	Unit 1: Elecon Unit 2: Elecon	Unit 1: Elecon Unit 2 : Elecon	Elecon	Elecon	
	Accuracy class	±0.50%	±0.50%	±0.50%	±0.50%	±0.50%	
	Serial number	10440TM0309 1204TM0309	34122TM0309 1214TM0309	8221TM0309 34125TM0309	1210TM0309	1215TM0309	
	Calibration frequency	Annually	Annually	Annually	Annually	Annually	
	Calibrations during monitoring period	07/03/2012 (valid till 06/03/2013)	07/03/2012 (valid till 06/03/2013)	07/03/2012 (valid till 06/03/2013)	07/03/2012 (valid till 06/03/2013)	07/03/2012 (valid till 06/03/2013)	07/03/2012 (valid till 06/03/2013)
		01/03/2013 (valid till 28/02/2014)	01/03/2013 (valid till 28/02/2014)	01/03/2013 (Valid till 28/02/2014)	02/03/2013 (valid till 01/03/2014)	02/03/2013 (valid till 01/03/2014)	02/03/2013 (valid till 01/03/2014)
30/08/2013 (valid till 29/08/2014)		30/08/2013 (valid till 29/08/2014)	30/08/2013 (valid till 29/08/2014)	31/08/2013 (valid till 30/08/2014)	31/08/2013 (valid till 30/08/2014)	31/08/2013 (valid till 30/08/2014)	
Measuring/ Reading/ Recording frequency:	Continuous monitoring and Hourly recording						
Calculation method (if applicable):	Not Applicable						
QA/QC procedures:	The gross electricity generated by the project activity is monitored through energy meter of accuracy class 0.5 or better installed in the plant and recorded in the plant log book by the supervisor on an hourly basis. This data is used for the purpose of cross verification of meter electricity export and import data. The energy meters are calibrated at least annually.						
Purpose of data:	This data is not used for emission reduction calculation						



Additional comment:	The data will be kept for 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later.					
<b>Data / Parameter:</b>	EG <sub>Aux, y</sub>					
Unit:	MWh					
Description:	Auxiliary electricity consumption in year y					
Measured/ Calculated / Default:	Measured					
Source of data:	Plants records					
Value(s) of monitored parameter:	<b>Khanpur</b>	<b>Sudhar</b>	<b>Akhara</b>	<b>Gholian</b>	<b>Channowal</b>	<b>Total</b>
	<b>63.720</b>	<b>66.161</b>	<b>62.058</b>	<b>49.600</b>	<b>55.503</b>	<b>297.042</b>

Monitoring equipment:	<b>Particulars</b>	<b>Khanpur</b>	<b>Sudhar</b>	<b>Akhara</b>	<b>Gholian</b>	<b>Channowal</b>
	Type	Rishabh	Rishabh	Rishabh	Rishabh	Rishabh
	Accuracy class	±.50%	±.50%	±.50%	±.50%	±.50%
	Serial number	8/12/6441	8/12/6440	8/12/6433	8/12/6439	8/12/6442
	Calibration frequency	Annually	Annually	Annually	Annually	Annually
	Calibrations during monitoring period	07/03/2012 (valid till 06/03/2013) 01/03/2013 (valid till 28/02/2014) 26/02/2014 (valid till 25/02/2015)	07/03/2012 (valid till 06/03/2013) 01/03/2013 (valid till 28/02/2014) 26/02/2014 (valid till 25/02/2015)	07/03/2012 (valid till 06/03/2013) 01/03/2013 (valid till 28/02/2014) 26/02/2014 (valid till 25/02/2015)	07/03/2012 (valid till 06/03/2013) 01/03/2013 (valid till 28/02/2014) 26/02/2014 (valid till 25/02/2015)	07/03/2012 (valid till 06/03/2013) 02/03/2013 (valid till 01/03/2014) 27/02/2014 (valid till 26/02/2015)
Measuring/ Reading/ Recording frequency:	Continuous monitoring and Hourly recording					
Calculation method (if applicable):	Not Applicable					
QA/QC procedures:	The Auxiliary electricity consumption by the project activity is monitored through energy meter of accuracy class 0.5 installed in the plant and recorded in the plant log book by the supervisor on an hourly basis. This data is used for the purpose of cross verification of meter electricity export and import data. The Auxiliary meter were calibrated annually.					
Purpose of data:	This data is not used for emission reduction calculation					

Additional comment:	The data will be kept for 2 years after the end of crediting period or the last issuance of CERs for this project activity, whichever occurs later. The data are archived on paper and electronically.
<b>D.3. Implementation of sampling plan</b> >>100 percent data is monitored, no data or parameters have been determined by sampling approach, hence not applicable.	

**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;

SN	Description	Formula	Unit	Value
A	Energy Exported		MWh	32,877.342
B	Energy Imported		MWh	55.226
C	Net Saleable Energy	$C = A - B$	MWh	<b>32,822.116</b>
D	Carbon Emission Factor as per the baseline adopted		tCO <sub>2</sub> /MWh	0.8031
E	Baseline Emissions	$E=(C*D)$	tCO <sub>2</sub>	26,358

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

&gt;&gt;

No project emissions are associated with the project activity during this monitoring period. This is also in line with the PDD and methodology.

**E.3. Calculation of leakage**

&gt;&gt;

As the energy generating equipment is not transferred from another activity or the existing equipment is also not transferred to another activity, leakage is not considered. The same is in line with the methodology and the registered PDD.

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

Item	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)
<b>Total</b>	26,358	NIL	NA	26,358

**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
Emission reductions or GHG removals by sinks (t CO <sub>2</sub> e)	31,326	26,358

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

&gt;&gt;

The actual emission reductions during the monitoring period are less than the estimated value 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 01 January 2013 onwards**

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 01 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO <sub>2</sub> e)	2,236	24,122

**Annexure – I**

The month wise data on energy generated is given hereunder. The monthly data is based on the hourly reading taken at the meters installed at the generation end

**Energy Generated (kWh)**

<b>Billing Month</b>	<b>Year</b>	<b>Khanpur</b>	<b>Sudhar</b>	<b>Akhara</b>	<b>Gholian</b>	<b>Channowal</b>	<b>Total</b>
Dec	2012	618.855	643.399	566.485	521.635	540.340	2,890.714
Jan	2013	483.102	488.129	411.815	317.950	317.462	2,018.458
Feb	2013	397.524	399.175	344.578	274.013	293.439	1,708.729
Mar	2013	451.869	449.700	368.460	319.375	308.047	1,897.451
Apr	2013	208.435	204.463	171.755	170.700	158.192	913.545
May	2013	693.755	637.716	540.840	448.980	473.020	2,794.311
Jun	2013	602.945	595.131	522.230	453.100	477.610	2,651.016
Jul	2013	793.990	733.188	707.369	582.848	615.317	3,432.712
Aug	2013	557.770	499.926	445.207	281.320	271.355	2,055.578
Sep	2013	735.375	764.203	646.720	410.170	407.520	2,963.988
Oct	2013	413.601	354.280	293.335	223.812	206.410	1,491.438
Nov	2013	208.450	185.942	170.069	79.400	68.677	712.538
Dec	2013	594.965	589.356	531.000	441.710	514.106	2,671.137
Jan	2014	452.763	450.104	398.881	322.915	365.215	1,989.878
Feb	2014	480.691	504.241	450.012	320.180	364.110	2,119.234
Mar	2014	406.592	381.305	332.312	295.386	309.204	1,724.799
<b>Total Energy Generated in (kWh)</b>		<b>8100.682</b>	<b>7880.258</b>	<b>6901.068</b>	<b>5463.494</b>	<b>5690.024</b>	<b>34,035.526</b>

**Annexure – II**

The month-wise data on auxiliary energy consumption is given hereunder. The monthly data is based on hourly reading taken at the auxiliary meters installed at the panel:

**Auxiliary Energy Consumption (kWh)**

<b>Billing Month</b>	<b>Year</b>	<b>Khanpur</b>	<b>Sudhar</b>	<b>Akhara</b>	<b>Gholian</b>	<b>Channowal</b>	<b>Total</b>
Dec	2012	3.158	3.287	2.498	3.408	2.774	15.125
Jan	2013	2.364	3.109	2.449	2.424	2.363	12.709
Feb	2013	1.869	2.206	1.940	2.011	1.966	9.992
Mar	2013	2.356	2.930	2.377	2.322	2.307	12.292
Apr	2013	2.305	2.354	2.625	1.962	2.275	11.521
May	2013	6.491	6.385	6.815	4.871	5.496	30.058
Jun	2013	5.787	7.026	5.816	4.916	5.170	28.715
Jul	2013	7.366	7.579	7.026	5.276	6.368	33.615
Aug	2013	6.778	5.977	5.609	4.159	4.631	27.154
Sep	2013	6.389	7.271	6.908	4.085	4.911	29.564
Oct	2013	4.157	4.099	3.936	2.986	3.615	18.793
Nov	2013	2.376	2.639	2.518	1.320	1.498	10.351
Dec	2013	3.030	3.774	3.027	3.083	3.258	16.172
Jan	2014	2.793	3.422	2.639	2.433	3.039	14.326
Feb	2014	2.948	2.176	3.023	2.103	2.742	12.992
Mar	2014	3.553	1.927	2.852	2.241	3.090	13.663
<b>Total Auxiliary Energy Consumption (kWh)</b>		<b>63.720</b>	<b>66.161</b>	<b>62.058</b>	<b>49.600</b>	<b>55.503</b>	<b>297.042</b>



The energy generated data and auxiliary energy consumption data is not used for calculation of emission reductions as the calculation of emission reductions is based on Net Saleable energy i.e. the difference of energy exported and energy imported.



**Annexure - III**

Month-wise data on Net Saleable Energy for the monitoring period is given as under: As per the Project Design Document, Emission reductions are to be calculated based on the energy exported minus energy imported during shut-down and start-ups by the power plant.

**Net Saleable Energy (kWh)**

Billing Month	Year	Energy Exported						Energy Imported						Net Saleable Energy
		Khanpur	Sudhar	Akhara	Gholian	Channawal	Total	Khanpur	Sudhar	Akhara	Gholian	Channawal	Total	
Dec	2012	599.332	614.157	551.153	498.486	522.666	2,785.794	0.078	0.064	0.078	0.101	0.188	0.509	2,785.285
Jan	2013	468.700	464.581	401.355	311.850	306.959	1,953.445	0.025	0.216	0.547	0.634	0.932	2.354	1,951.091
Feb	2013	384.937	380.257	335.274	272.354	283.151	1,655.973	0.447	0.417	0.526	0.510	0.740	2.640	1,653.333
Mar	2013	436.705	428.866	357.734	315.462	296.555	1,835.322	0.507	0.681	0.963	0.624	0.955	3.730	1,831.592
Apr	2013	201.200	194.807	166.464	168.632	152.276	883.379	1.828	1.712	2.490	1.502	1.808	9.340	874.039
May	2013	667.528	605.612	523.246	442.300	454.766	2,693.452	0.110	0.133	0.299	0.320	0.182	1.044	2,692.408
Jun	2013	580.077	564.345	505.233	439.948	459.130	2,548.733	0.540	0.475	0.702	0.666	0.654	3.037	2,545.696
Jul	2013	762.156	696.499	684.301	563.728	590.916	3,297.600	0.171	0.133	0.309	0.160	0.134	0.907	3,296.693
Aug	2013	534.664	484.978	430.000	274.878	260.558	1,985.078	1.376	1.330	1.428	1.852	2.830	8.816	1,976.262
Sep	2013	706.756	740.452	624.796	397.680	391.368	2,861.052	0.120	0.164	0.227	0.176	0.142	0.829	2,860.223
Oct	2013	398.420	342.848	283.702	216.994	197.556	1,439.520	0.650	0.762	0.980	0.964	1.214	4.570	1,434.950
Nov	2013	200.832	179.622	164.658	77.122	66.024	688.258	0.514	1.276	1.836	1.978	2.512	8.116	680.142
Dec	2013	576.240	571.530	516.916	430.050	496.674	2,591.410	0.034	0.028	0.118	0.262	0.338	0.780	2,590.630
Jan	2014	438.520	436.578	388.334	314.792	352.652	1,930.876	0.418	0.590	0.750	0.710	0.868	3.336	1,927.540
Feb	2014	464.728	490.256	436.820	311.860	351.192	2,054.856	0.018	0.022	0.094	0.066	0.164	0.364	2,054.492
Mar	2014	392.392	371.006	322.734	287.650	298.812	1,672.594	0.958	0.790	1.188	0.800	1.118	4.854	1,667.740
<b>Total in (kWh)</b>		<b>7813.187</b>	<b>7566.394</b>	<b>6692.72</b>	<b>5323.786</b>	<b>5481.255</b>	<b>32,877.342</b>	<b>7.794</b>	<b>8.793</b>	<b>12.535</b>	<b>11.325</b>	<b>14.779</b>	<b>55.226</b>	<b>32,822.116</b>



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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.2	5 November 2013	Editorial revision to correct table in page 1.
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).
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