

**MONITORING REPORT FORM (F-CDM-MR)**  
**Version 02.0****MONITORING REPORT**

<b>Title of the project activity</b>	Lohgarh, Chakbhai and Sidhana Mini Hydroelectric Projects
<b>Reference number of the project activity</b>	0327
<b>Version number of the monitoring report</b>	03
<b>Completion date of the monitoring report</b>	05/03/2013
<b>Registration date of the project activity</b>	30/04/2006
<b>Monitoring period number and duration of this monitoring period</b>	Monitoring period : 6 <sup>th</sup> Duration of monitoring period: 01/08/2011 to 30/09/2012
<b>Project participant(s)</b>	1. Aqua Power Private Limited 2. EDF Trading Limited
<b>Host Party(ies)</b>	India
<b>Sectoral scope(s) and applied methodology(ies)</b>	Sectoral scope : 01 Methodology : AMS I.D Version 07
<b>Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD</b>	31,454 tCO <sub>2</sub>
<b>Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period</b>	30,772 tCO <sub>2</sub>

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

&gt;&gt;

Three Mini Hydro electric projects aggregating to 5.20 MW at Lohgarh, Chakbhai and Sidhana on the Bathinda Branch Canal, District Ludhiana, Sangrur and Bathinda respectively in Punjab, India have been set-up. Mini Hydroelectric Project at Lohgarh (2 MW) was commissioned in October, 2005, Chakbhai (2 MW) was commissioned in November 2004 and Sidhana (1.20 MW) was commissioned in October, 2007. The plants are operating successfully.

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 for energy in the region. The development of the project activity contemplates the production of clean hydroelectric power that will contribute to reduce the CO<sub>2</sub> emissions, which would have occurred otherwise, in the absence of these projects.

Lohgarh with total installed capacity of 2.0 MW (1 MW x 2), Chakbhai 2.0 MW (1 MW x 2) and Sidhana 1.2 MW (1.2 MW x 1) generate electricity and sell it to the Punjab State Electricity Board (PSEB) through Power Purchase Agreement (PPA) contract.

These projects are low head, canal drop based mini hydroelectric projects (project activity) located on the Bathinda Branch Canal, District Ludhiana, Sangrur and Bathinda respectively in Punjab. The projects are canal drop renewable hydroelectric generating plants, which include forebay, mechanical intake gates, trashracks, draft tubes, vertical turbine and a powerhouse with its discharge channel and adjoining roads. The projects do not involve any type of displacement, rehabilitation or relocation.

The Projects are generating electricity successfully by converting the potential and kinetic energy of the canal water and the 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 emissions.

**Equipment Details:**

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

S.No.	MHP	Equipment	Number of Turbine/capacity	Supplier
1	Lohgarh	Turbine & its accessories	2*1000kW	Boving Fouress Limited, Bangalore
		Synchronous Generator	2*1000 kW	
2	Chakbhai	Turbine & its accessories	2*1000kW	Boving Fouress Limited, Bangalore
		Synchronous Generator	2*1000 kW	
3	Sidhana	Turbine & its accessories	1*1200kW	Boving Fouress Limited, Bangalore
		Synchronous Generator	1*1200 kW	

The project consists of 3 sites of Small hydro Power Plant i.e. Chakbhai, Lohgarh & Sidhana utilizing the potential and kinetic Energy of the canal water to generate electricity.



Lohgarh:- The Powerhouse comprises of two synchronous generators of capacity 1,000 kW each coupled to two numbers of vertical Full Kaplan turbines. The power is generated at a voltage of 6.6 kV, which is further stepped- up to 11 kV to match the nearest substation voltage level.

Chakbhai: The powerhouse comprises of two synchronous generators of capacity of 1,000 kW each coupled to two numbers of vertical Full- Kaplan turbines. The power is generated at a voltage of 6.6 kV which is further stepped-up to 11 kV to match the nearest substation voltage level.

Sidhana: The Powerhouse comprises of one synchronous generator of capacity 1,200 kW coupled to a vertical Full-Kaplan turbine. The power is generated at a voltage of 6.6 kV, which is further stepped-up to 11 kV to match the nearest substation voltage level.

The principal components of each scheme are:-

- (a) Forebay and Intake: Forebay is partly trapezoidal and RCC and trough section where the water is diverted towards the powerhouse upon closure of main canal gates via the intake.
- (b) Power House:- A semi outdoor type powerhouse has been provided to house the turbines, generators and related electro- mechanical equipment.
- (c) Draft Tube:- RCC draft tube has been provided to convey the tail water emerging from discharge side of the turbine to the main canal via tailrace channel.
- (d) Turbine:- Vertical full Kaplan has been provided for all the three projects.
- (e) Tailrace:- The discharge emerging out the draft tubes is carried back to main canal on downstream of the project by trapezoidal shaped tailrace channel connecting draft tube exit to the main canal.
- (f) Switchyard:- Surface type switchyard has been provided with necessary equipment for interfacing with the Grid.

The projects were completed as planned and described in the Project Design Document (PDD). During the present monitoring period i.e. 01/08/2011 to 30/09/2012, all the three (3) Plants achieved net energy generation of 32.666940 million kWh and have achieved 30,772 tCO<sub>2</sub> emissions reduction in this monitoring period.

## A.2. Location of project activity

>> LOHGARH: The project is located on Bathinda branch canal.

Latitude        30° 35' 51.39" N ; Longitude    75° 40' 3.99" E  
Town:            Raikot  
Distt:            Ludhiana  
State:            Punjab  
Country:        India

CHAK BHAI : The project is located on Bathinda branch canal .

Latitude        30° 34' 30.94" N ; Longitude    75° 29' 22.04" E



Town : Mehal Kalan  
 Distt.: Barnala  
 State: Punjab  
 Country: India

SIDHANA : The project is located on Bathinda branch canal having

Latitude 30° 21' 7.82" N ; Longitude 75° 13' 42.65" E  
 Town : Rampura Phul  
 Distt.: Bathinda  
 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: Aqua Power Pvt. Limited	No
United Kingdom of Great Britain and Northern Ireland	Private entity: EDF Trading Limited	No

### A.4. Reference of applied methodology

Type I- Renewal Energy Projects  
 Category: I.D.: Renewable electricity generation for a grid  
 Version: 07

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

Crediting Period for this project activity is 20/11/2004 to 19/11/2014 (fixed)

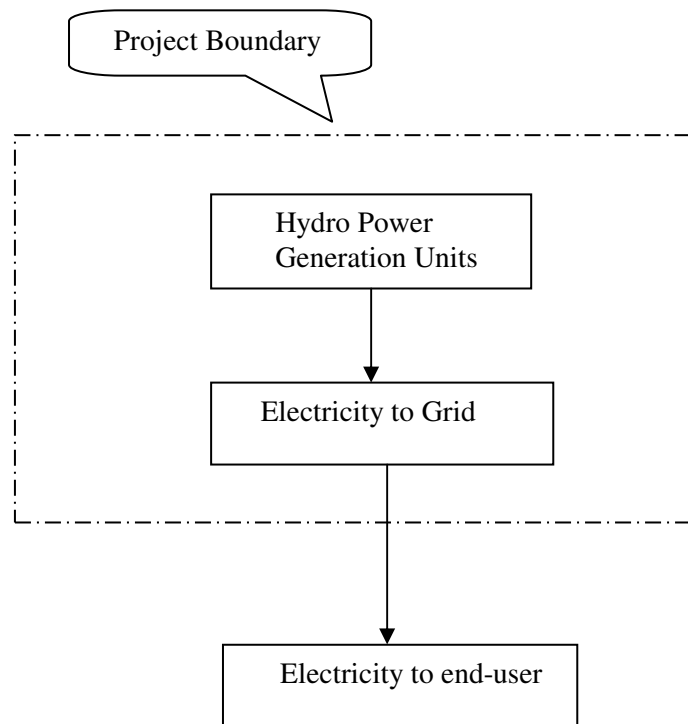
## SECTION B. Implementation of project activity

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

>> The projects activities were commissioned on dates as mentioned below while it was registered with CDM EB on 30/04/2006.

Sr. No	Name of Project	Date of Commissioning
1.	Chakbhai	November 2004
2.	Lohgarh	October 2005
3.	Sidhana	October 2007

The project promoter 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**

>>Not Applicable

### **B.2.2. Corrections**

>> Not Applicable

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

>> Not Applicable

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

>> Not Applicable

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

>> Not Applicable

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

>> Not Applicable

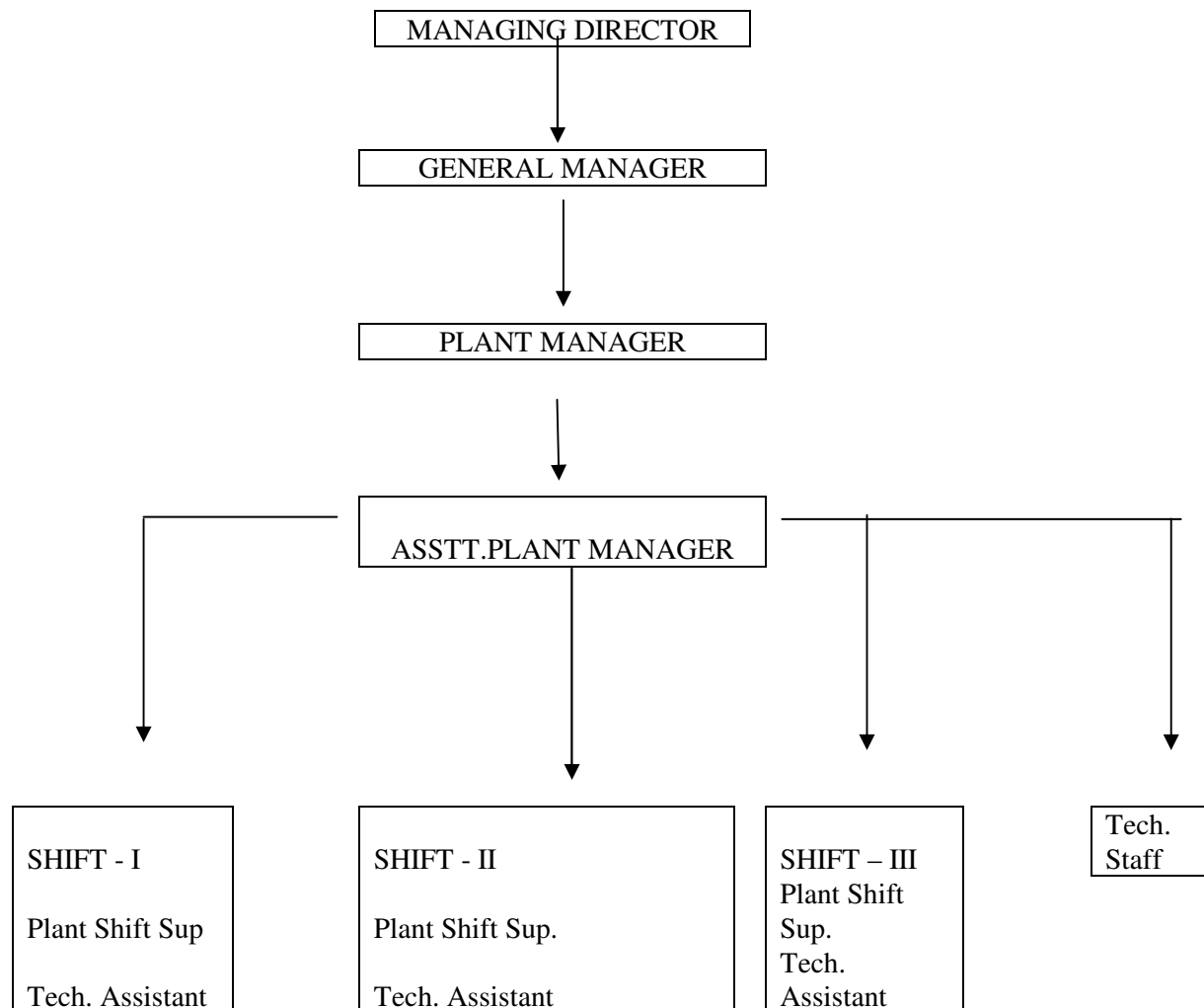
**SECTION C. Description of monitoring system**

>> For this project activity the monitoring procedure was followed as described below.

- i. The Energy exported (kWh) and Energy imported (kWh) at the interconnection point have been measured from the electronic energy meters (i.e. Trivector Meters) installed at the interconnection points at all 3 (three) project schemes.
- ii. The Net saleable energy has been calculated as a difference between energy exported and energy imported. It is based on monthly joint meter readings.
- iii. Monthly joint meter readings were taken at interconnection point and certified by representatives of Aqua Power Private Limited (APPL) and the purchaser i.e. Punjab State Electricity Board (PSEB).
- iv. The joint meter readings were used to raise invoice for sale of net energy to PSEB.
- v. The energy generated has been measured by the energy meters installed at the generation end on an hourly basis.
- vi. The auxiliary energy consumption has been measured by the auxiliary energy consumption meters installed at the plant on an hourly basis.
- vii. The data of the aforesaid parameters are recorded on hourly basis which are summed into a daily reading.
- viii. The Daily readings were aggregated to monthly readings.
- ix. 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.
- x. The finance department cross checked the data provided by plant managers.



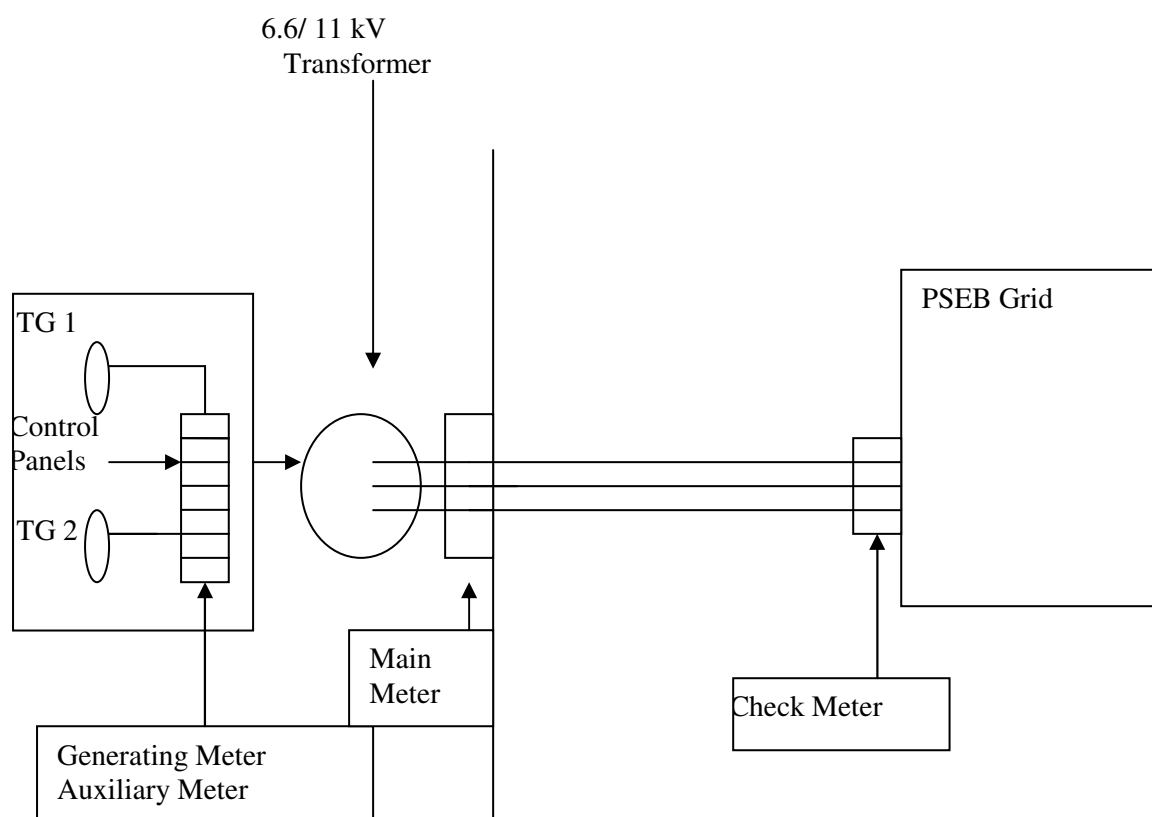
The Organizational structure responsible for monitoring the various parameters as per Monitoring Plan for each site is as below:-



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 Plant Manager. 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 meters, the emission reduction calculations will be done based on the hourly generation and auxiliary consumption data recorded by APPL at generation end. During this monitoring period, the main meters for all the sites were in normal operating conditions and hence the main meters are decisive for emission reduction calculations.

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

<b>Data/Parameter</b>	Grid Emission Factor
<b>Unit</b>	kg CO <sub>2</sub> / kWh
<b>Description</b>	The Grid Emission Factor has been calculated as the weighted average of the operating Margin Emission Factor (EF <sub>OM</sub> ) and the Build Margin Emission Factor (EF <sub>BM</sub> ).
<b>Source of data</b>	Northern Region Grid's emission from Central Electricity Authority
<b>Value(s) applied</b>	0.942
<b>Purpose of data</b>	Baseline emission calculations
<b>Additional comment</b>	This parameter is fixed ex-ante for the full crediting period



**D.2. 1 Data and parameters monitored**

<b>Data/Parameter</b>	Energy exported		
<b>Unit</b>	kWh		
<b>Description</b>	Energy Exported to grid		
<b>Measured/Calculated/Default</b>	Measured		
<b>Source of data</b>	Joint Meter Readings		
<b>Value(s) of monitored parameter</b>	Total for project activity: 32,715,070 (Chakbhai: 14,303,700, Lohgarh:12,049,850 and Sidhana: 6,361,520 <sup>1</sup> )		
<b>Monitoring equipment</b>	Main Meters:		
	<b>Lohgarh</b>	<b>Chakbhai</b>	<b>Sidhana</b>
	Electronics Bidirectional meter ( L& T ) S. No.11059669 accuracy: $\pm 0.5\%$ Calibration Frequency- 6 month Date of Calibration and validity <ul style="list-style-type: none"> <li>16/03/2011 valid till 15/09/2011</li> <li>26/08/2011 valid till 25/02/2012</li> <li>24/02/2012 valid till 23/08/2012</li> <li>22/08/2012 valid till 21/02/2013</li> </ul>	Electronics Bidirectional meter ( L& T ) S. No.04187462 accuracy: $\pm 0.5\%$ Calibration Frequency- 6 month Date of Calibration and validity <ul style="list-style-type: none"> <li>10/05/2011 valid till 09/11/2011</li> <li>07/11/2011 valid till 06/05/2012</li> <li>17/04/2012 valid till 16/10/2012</li> </ul>	Electronics Bidirectional meter ( L& T ) S. No.05271089 accuracy: $\pm 0.5\%$ Calibration Frequency- 6 month Date of Calibration and validity <ul style="list-style-type: none"> <li>05/03/2011 valid till 04/09/2011</li> <li>31/08/2011 valid till 02/03/2012</li> <li>29/02/2012 valid till 28/08/2012</li> <li>17/08/2012 valid till 16/02/2013</li> </ul>
	Check Meters:		
	<b>Lohgarh</b>	<b>Chakbhai</b>	<b>Sidhana</b>
	Electronics Bidirectional meter ( L& T ) S. No.11059670 accuracy: $\pm 0.5\%$ Calibration Frequency- 6 month Date of Calibration and validity <ul style="list-style-type: none"> <li>16/03/2011 valid</li> </ul>	Electronics Bidirectional meter ( L& T ) S. No.04187461 accuracy: $\pm 0.5\%$ Calibration Frequency- 6 month Date of Calibration and validity <ul style="list-style-type: none"> <li>10/05/2011 valid</li> </ul>	Electronics Bidirectional meter ( L& T ) S. No.04223082 accuracy: $\pm 0.5\%$ Calibration Frequency- 6 month Date of Calibration and validity <ul style="list-style-type: none"> <li>05/03/2011 valid</li> </ul>

<sup>1</sup> Closing day Joint Meter Reading for Sidhana site for September 2012 was taken on 01/10/2012. Hence the last day export has been deducted based on the daily Main meter reading records maintained at the plant site as this monitoring is till 30/09/2012.



	<div> <div>till 15/09/2011</div> <ul style="list-style-type: none"> <li>• 26/08/2011 valid till 25/02/2012</li> <li>• 24/02/2012 valid till 23/08/2012</li> <li>• 22/08/2012 to 21/02/2013</li> </ul> </div> <div> <div>till 09/11/2011</div> <ul style="list-style-type: none"> <li>• 07/11/2011 valid till 06/05/2012</li> <li>• 17/04/2012 valid till 16/10/2012</li> </ul> </div> <div> <div>till 04/09/2011</div> <ul style="list-style-type: none"> <li>• 31/08/2011 valid till 02/03/2012</li> <li>• 29/02/2012 valid till 28/08/2012</li> <li>• 17/08/2012 valid till 16/02/2013</li> </ul> </div>
<b>Measuring/Reading/Recording frequency</b>	Continuous monitoring and monthly recording
<b>Calculation method (if applicable)</b>	Not applicable
<b>QA/QC procedures</b>	<p>The power exported by Aqua Power Private Limited is monitored and recorded on the basis of reading of the Main Meter. The same is cross checked with the Check Meter installed before feeding electricity produced by the project into the Grid. Joint Meters reading are based on the Main Meter reading for the export and import of the electricity to and from the Grid.</p> <p>The principles of Frequency, Data recording and Reliability as mentioned in the PDD are strictly adhered to. The Main Meter and Check Meter are test checked for accuracy every six months by the team of Punjab State Electricity Board.</p> <p>The Meters installed at generation end are also test checked for accuracy every six months.</p>
<b>Purpose of data</b>	Baseline emission calculation
<b>Additional comment</b>	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.

**D2.2 Data and parameters monitored**

<b>Data/Parameter</b>	Energy imported		
<b>Unit</b>	kWh		
<b>Description</b>	Energy imported from grid		
<b>Measured/Calculated /Default</b>	Measured		
<b>Source of data</b>	Joint Meter Readings		
<b>Value(s) of monitored parameter</b>	48,130 (Chakbhai: 10,890, Lohgarh: 13,020 and Sidhana: 24,220)		
<b>Monitoring equipment</b>	Main Meters:		
	<b>Lohgarh</b>	<b>Chakbhai</b>	<b>Sidhana</b>
	Electronics Bidirectional meter ( L& T ) S. No.11059669 accuracy: $\pm 0.5\%$ Calibration Frequency- 6 month Date of Calibration and validity <ul style="list-style-type: none"> <li>16/03/2011 valid till 15/09/2011</li> <li>26/08/2011 valid till 25/02/2012</li> <li>24/02/2012 valid till 23/08/2012</li> <li>22/08/2012 to 21/02/2013</li> </ul>	Electronics Bidirectional meter ( L& T ) S. No.04187462 accuracy: $\pm 0.5\%$ Calibration Frequency- 6 month Date of Calibration and validity <ul style="list-style-type: none"> <li>10/05/2011 valid till 09/11/2011</li> <li>07/11/2011 valid till 06/05/2012</li> <li>17/04/2012 valid till 16/10/2012</li> </ul>	Electronics Bidirectional meter ( L& T ) S. No.05271089 accuracy: $\pm 0.5\%$ Calibration Frequency- 6 month Date of Calibration and validity <ul style="list-style-type: none"> <li>05/03/2011 valid till 04/09/2011</li> <li>31/08/2011 valid till 02/03/2012</li> <li>29/02/2012 valid till 28/08/2012</li> <li>17/08/2012 valid till 16/02/2013</li> </ul>
	Check Meters:		
	<b>Lohgarh</b>	<b>Chakbhai</b>	<b>Sidhana</b>
	Electronics Bidirectional meter ( L& T ) S. No.11059670 accuracy: $\pm 0.5\%$ Calibration Frequency- 6 month Date of Calibration and validity <ul style="list-style-type: none"> <li>16/03/2011 valid till 15/09/2011</li> <li>26/08/2011 valid till 25/02/2012</li> <li>24/02/2012 valid till 23/08/2012</li> </ul>	Electronics Bidirectional meter ( L& T ) S. No.04187461 accuracy: $\pm 0.5\%$ Calibration Frequency- 6 month Date of Calibration and validity <ul style="list-style-type: none"> <li>10/05/2011 valid till 09/11/2011</li> <li>07/11/2011 valid till 06/05/2012</li> <li>17/04/2012 valid till 16/10/2012</li> </ul>	Electronics Bidirectional meter ( L& T ) S. No.04223082 accuracy: $\pm 0.5\%$ Calibration Frequency- 6 month Date of Calibration and validity <ul style="list-style-type: none"> <li>05/03/2011 valid till 04/09/2011</li> <li>31/08/2011 valid till 02/03/2012</li> <li>29/02/2012 valid till 28/08/2012</li> </ul>



	<ul style="list-style-type: none"><li>• 22/08/2012 to 21/02/2013</li></ul>		<ul style="list-style-type: none"><li>• 17/08/2012 valid till 16/02/2013</li></ul>
<b>Measuring/Reading/Recording frequency</b>	Continuous monitoring and monthly recording		
<b>Calculation method (if applicable)</b>	Not applicable		
<b>QA/QC procedures</b>	<p>The power exported by Aqua Power Private Limited is monitored and recorded on the basis of reading of the Main Meter. The same is cross checked with the Check Meter installed before feeding electricity produced by the project into the Grid. Joint Meters reading are based on the Main Meter reading for the export and import of the electricity to and from the Grid.</p> <p>The principles of Frequency, Data recording and Reliability as mentioned in the PDD are strictly adhered to. The Main Meter and Check Meter are test checked for accuracy every six months by the team of Punjab State Electricity Board.</p> <p>The Meters installed at generation end are also test checked for accuracy every six months.</p>		
<b>Purpose of data</b>	Baseline emission calculation		
<b>Additional comment</b>	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.		

**D2.3 Data and parameters monitored**

<b>Data/Parameter</b>	Net saleable energy
<b>Unit</b>	kWh
<b>Description</b>	Net saleable energy to grid
<b>Measured/Calculated/Default</b>	Calculated
<b>Source of data</b>	Joint Meter Readings
<b>Value(s) of monitored parameter</b>	32,666,940 (Chakbhai: 14,292,810, Lohgarh: 12,036,830 and Sidhana: 6,337,300)
<b>Monitoring equipment</b>	As this is calculated, this section is not applicable for this monitoring parameter.
<b>Measuring/Reading/Recording frequency</b>	Monthly
<b>Calculation method (if applicable)</b>	Energy exported – Energy imported
<b>QA/QC procedures</b>	<p>Net Saleable energy is the net exported energy which is the difference of energy exported and energy imported. Joint Meters reading are taken from the Main and Check Meter every month to arrive at Net Saleable energy.</p> <p>The Main and Check Meters are tested for accuracy every six months.</p>
<b>Purpose of data</b>	Baseline emission calculation
<b>Additional comment</b>	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.

**D2.4 Data and parameters monitored**

<b>Data/Parameter</b>	Energy generated		
<b>Unit</b>	kWh		
<b>Description</b>	Gross energy generated		
<b>Measured/Calculated/Default</b>	Measured		
<b>Source of data</b>	Plant records		
<b>Value(s) of monitored parameter</b>	33,495,030 (Chakbhai: 14,589,806, Lohgarh 12,393,594 and Sidhana: 6,511,630)		
<b>Monitoring equipment</b>	Generation meters		
	<b>Lohgarh</b> Make: Minsun Digital Power Meter 882-332 Unit 1: 6851013 Unit 2: 68B0512 Accuracy (±) 1% Frequency of calibration- 6 month Date of calibration and validity <ul style="list-style-type: none"> <li>13/05/2011 valid till 12/11/2011</li> <li>12/11/2011 valid till 11/05/2012</li> <li>03/05/2012 valid till 02/11/2012</li> </ul>	<b>Chakbhai</b> Make: Minsun Digital Power Meter 882-332 Unit 1: 6851001 Unit 2 : 6790517 Accuracy (±) 1% Frequency of calibration- 6 month Date of calibration and validity <ul style="list-style-type: none"> <li>13/05/2011 valid till 12/11/2011</li> <li>12/11/2011 valid till 11/05/2012</li> <li>03/05/2012 valid till 02/11/2012</li> </ul>	<b>Sidhana</b> Make: Enercon EM 6400 66927/3665-0605 Accuracy (±) 0.5 % Frequency of calibration- 6 month Date of calibration and validity <ul style="list-style-type: none"> <li>13/05/2011 valid till 12/11/2011</li> <li>12/11/2011 valid till 11/05/2012</li> <li>03/05/2012 valid till 02/11/2012</li> </ul>
<b>Measuring/Reading/Recording frequency</b>	Continuous monitoring and hourly recording		
<b>Calculation method (if applicable)</b>	Not applicable		
<b>QA/QC procedures</b>	The reading of the energy generated are taken from the meters installed at generation end. These are test checked for accuracy every six months.		
<b>Purpose of data</b>	This data is not used for emission reduction calculation		
<b>Additional comment</b>	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.		

**D2.5 Data and parameters monitored**

<b>Data/Parameter</b>	Auxiliary energy consumption		
<b>Unit</b>	kWh		
<b>Description</b>	Auxiliary energy consumed for running the plant		
<b>Measured/Calculated/Default</b>	Measured		
<b>Source of data</b>	Plant records		
<b>Value(s) of monitored parameter</b>	388,706 (chakbhai:129,125, Lohgarh: 148,842, and Sidhana: 110,739)		
<b>Monitoring equipment</b>	Auxiliary meters		
	<b>Lohgarh</b> <b>Make: Enercon</b> 56248/1285-3404 Accuracy ( $\pm$ )1% Frequency of calibration- 6 month Date of calibration and validity <ul style="list-style-type: none"> <li>13/05/2011 valid till 12/11/2011</li> <li>12/11/2011 valid till 11/05/2012</li> <li>03/05/2012 valid till 02/11/2012</li> </ul>	<b>Chakbhai</b> <b>Make: Enercon</b> E 64/1640-903 Accuracy ( $\pm$ )1% Frequency of calibration- 6 month Date of calibration and validity <ul style="list-style-type: none"> <li>13/05/2011 valid till 12/11/2011</li> <li>12/11/2011 valid till 11/05/2012</li> <li>03/05/2012 valid till 02/11/2012</li> </ul>	<b>Sidhana</b> <b>Make: Enercon</b> 148153/13538-1608 Accuracy ( $\pm$ )1% Frequency of calibration- 6 month Date of calibration and validity <ul style="list-style-type: none"> <li>13/05/2011 valid till 12/11/2011</li> <li>12/11/2011 valid till 11/05/2012</li> <li>03/05/2012 valid till 02/11/2012</li> </ul>
<b>Measuring/Reading/Recording frequency</b>	Continuous monitoring and hourly recording		
<b>Calculation method (if applicable)</b>	Not applicable		
<b>QA/QC procedures</b>	Auxiliary Energy Consumption readings are recorded at the Auxiliary meters installed in the panel. These are test checked for accuracy every six months		
<b>Purpose of data</b>	This data is not used for emission reduction calculation		
<b>Additional comment</b>	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.		

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

&gt;&gt; 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

Sl. No.	Description	Formula	Unit	Value
A	Energy exported		kWh	32,715,070
B	Energy imported		kWh	48,130
C	Net Saleable Energy	$C=A-B$	kWh	32,666,940
D	Carbon Emission Factor as per the baseline adopted		kg CO <sub>2</sub> /kWh	0.942
E	Baseline Emissions	$E=(C*D) / 1,000$	tCO <sub>2</sub>	30,772

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

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

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

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Time Period	Baseline emissions or baseline net GHG removals by sinks (tCO <sub>2e</sub> )	Project emissions or actual net GHG removals by sinks (tCO <sub>2e</sub> )	Leakage (tCO <sub>2e</sub> )	Emission reductions or net anthropogenic GHG removals by sinks (tCO <sub>2e</sub> )
Total	30,772	NIL	NA	30,772

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

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Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (tCO <sub>2e</sub> )	31,454	30,772

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

The actual emission reductions during this monitoring period are less than estimated value in the registered PDD for the equivalent time period.

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**History of the document**

<b>Version</b>	<b>Date</b>	<b>Nature of revision</b>
02.0	EB 66 13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	EB 54, Annex 34 28 May 2010	Initial adoption.
<b>Decision Class:</b> Regulatory <b>Document Type:</b> Form <b>Business Function:</b> Issuance		



## Annexure – I

The month-wise data on energy generated is given in Table 1 below: This monthly data is based on the hourly reading taken at the meters installed at the Generation end.

Table 1: Energy Generation (kWh)

Billing Month	Year	Chakbhai	Lohgarh	Sidhana	Total
August	2011	1,109,660	986,818	0	2,096,478
Sept.	2011	370,820	229,185	0	600,005
Oct.	2011	875,235	73,3070	9,190	1,617,495
Nov.	2011	885,240	727,836	457,700	2,070,776
Dec.	2011	614,380	593,817	20,110	1,228,307
Jan	2012	969,740	759,367	406,200	2,135,307
Feb	2012	1,080,460	1,050,816	750,520	2,881,796
Mar	2012	1,542,070	1,216,495	857,520	3,616,085
Apr	2012	390,530	415,666	238,610	1,044,806
May	2012	1,274,330	1,055,867	661,610	2,991,807
June	2012	1,249,730	1,056,717	683,110	2,989,557
July	2012	1,490,530	1,261,874	829,700	3,582,104
August	2012	1,465,810	1,247,616	832,210	3,545,636
Sept.	2012	1,271,271	1,058,450	765,150	3,094,871
Total		14,589,806	12,393,594	6,511,630	33,495,030

**Annexure II**

The month-wise data on auxiliary energy consumption is given in Table 2 below: This monthly data is based on the hourly reading taken at the Auxiliary meters installed at the Panel.

**Table 2: Auxiliary Energy Consumption**

Billing Month	Year	Chakbhai	Lohgarh	Sidhana	Total
August	2011	9,802	12,670	3,381	25,853
Sept.	2011	7,879	6,144	2,732	16,755
Oct.	2011	8,284	11,551	3,110	22,945
Nov.	2011	8,640	13,054	9,700	31,394
Dec.	2011	8,026	9,884	3,108	21,018
Jan	2012	9,998	11,520	9,414	30,932
Feb	2012	6,954	10,790	12,041	29,785
Mar	2012	8,270	10,402	11,689	30,361
Apr	2012	4,852	4,976	4,970	14,791
May	2012	10,401	10,293	10,413	31,107
June	2012	11,488	11,606	9,978	33,072
July	2012	11,799	12,706	12,285	36,790
August	2012	11,416	12,398	10,078	33,892
Sept.	2012	11,316	10,848	7,840	30,004
<b>Total</b>		<b>129,125</b>	<b>148,842</b>	<b>110,739</b>	<b>388,706</b>

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

**Annexure III****Power Generation:**

Month-wise data on Net Saleable Energy for the monitoring period is given in Table 3 below.

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.

**Table 3: Net Saleable Energy (kWh)**

Billing Month	Year	Energy Exported				Energy Imported				Net Saleable Energy
		Chakbhai	Lohgarh	Sidhana	Total	Chakbhai	Lohgarh	Sidhana	Total	
August <sup>2</sup>	2011	1,087,150	959,430	0	2,046,580	440	800	3,400	4,640	2,041,940
Sept.	2011	362,240	222,370	0	584,610	4,720	4,530	2,640	11,890	572,720
Oct.	2011	858,470	710,380	8,900	1,577,750	620	900	4,520	6,040	1,571,710
Nov.	2011	868,340	703,730	443,920	2,015,990	10	130	380	520	2,015,470
Dec.	2011	600,680	572,820	19,280	1,192,780	280	700	4,500	5,480	1,187,300
Jan	2012	949,900	734,120	394,100	2,078,120	130	180	2,260	2,570	2,075,550
Feb	2012	1,059,720	1,017,020	732,560	2,809,300	60	80	180	320	2,808,980
Mar	2012	1,515,890	1,183,110	838,900	3,537,900	40	50	200	290	3,537,610
Apr	2012	383,620	404,920	233,800	1,022,340	3,590	3,360	2,600	9,550	1,012,790

<sup>2</sup> Starting date is 01/08/2011 for all the three sites



<b>May</b>	<b>2012</b>	1,249,390	1,031,080	648,160	2,928,630	190	610	1,500	2,300	2,926,330
<b>June</b>	<b>2012</b>	1,224,000	1,031,350	668,460	2,923,810	230	500	1,020	1,750	2,922,060
<b>July</b>	<b>2012</b>	1,461,500	1,230,300	811,480	3,503,280	260	440	540	1,240	3,502,040
<b>August</b>	<b>2012</b>	1,437,480	1,216,990	816,220	3,470,690	210	450	340	1,000	3,469,690
<b>Sept.<sup>3</sup></b>	<b>2012</b>	1,245,320	1,032,230	745,740	3,023,290	110	290	140	540	3,022,750
<b>Total</b>		<b>14,303,700</b>	<b>12,049,850</b>	<b>6,361,520</b>	<b>32,715,070</b>	<b>10,890</b>	<b>13,020</b>	<b>24,220</b>	<b>48,130</b>	<b>32,666,940</b>

<sup>3</sup> End date for Chakbhai and Lohgarh sites is 29/09/2012 and for Sidhana site is 30/09/2012