



## F-CDM-MR

**Monitoring report form  
(Version 03.0)****Monitoring report**

<b>Title of the project activity</b>	Abohar Branch Canal Based Small Hydro Project in Punjab, India
<b>Reference number of the project activity</b>	4856
<b>Version number of the monitoring report</b>	03
<b>Completion date of the monitoring report</b>	13/6/2013
<b>Registration date of the project activity</b>	28/12/2011
<b>Monitoring period number and duration of this monitoring period</b>	Monitoring period : First (1 <sup>st</sup> )  Duration of monitoring period: 28/12/2011 to 30/11/2012
<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>	21,851 tCO <sub>2</sub>
<b>Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period</b>	21,837 tCO <sub>2</sub>

**F-CDM-MR****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		

**F-CDM-MR**

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 28 Dec 2011 (i.e. date of registration of the project under CDM and also the start date of crediting period) to 30 Nov 2012, As the part JMR for the month of December 2011 from 28/12/2011 to 31/12/2011 is not available, PP is not claiming emission reduction for the four days of December 2011.

During the present monitoring period i.e. 01 Jan 2012 to 30 Nov 2012, all the five (5) plants achieved net energy generation of 27,192 MWh and have achieved 21,837 tCO<sub>2</sub> emissions reductions in this monitoring period.

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

&gt;&gt;

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

**F-CDM-MR**

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**

&gt;&gt;

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

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

&gt;&gt;

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



## F-CDM-MR

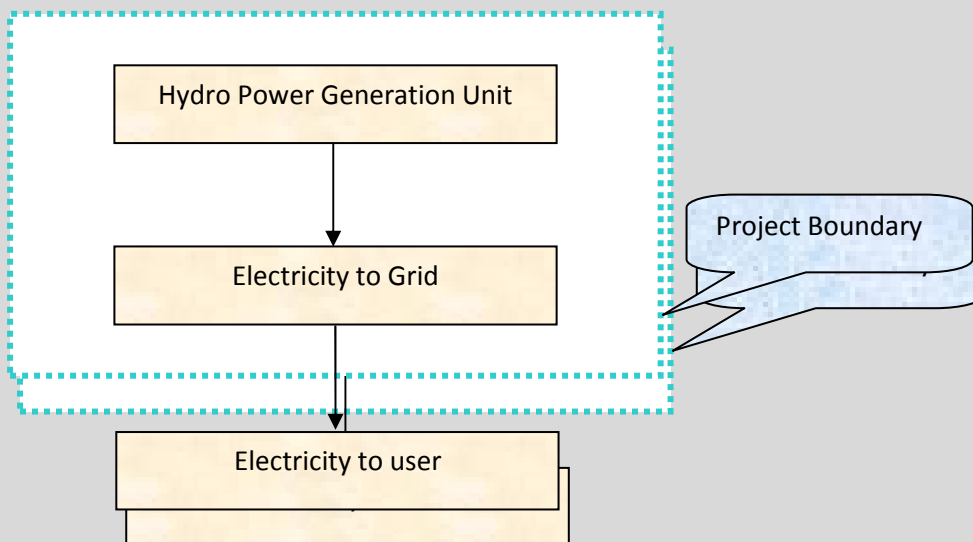
**SECTION B. Implementation of project activity****B.1. Description of implemented registered project activity**

&gt;&gt;

The projects 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 equipment 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**

&gt;&gt;

Not Applicable



**F-CDM-MR**

**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



## F-CDM-MR

**SECTION C. Description of monitoring system**

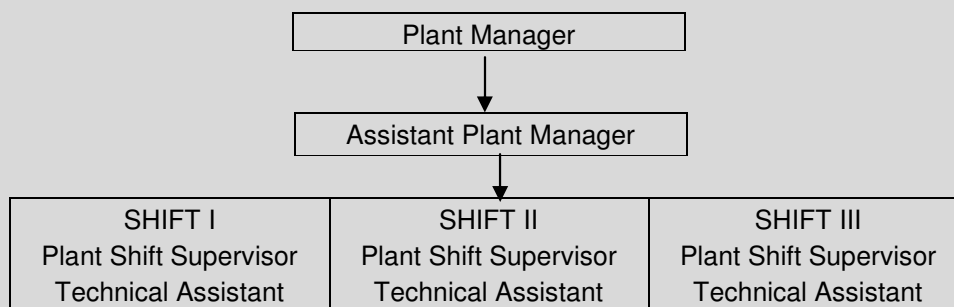
&gt;&gt;

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:-



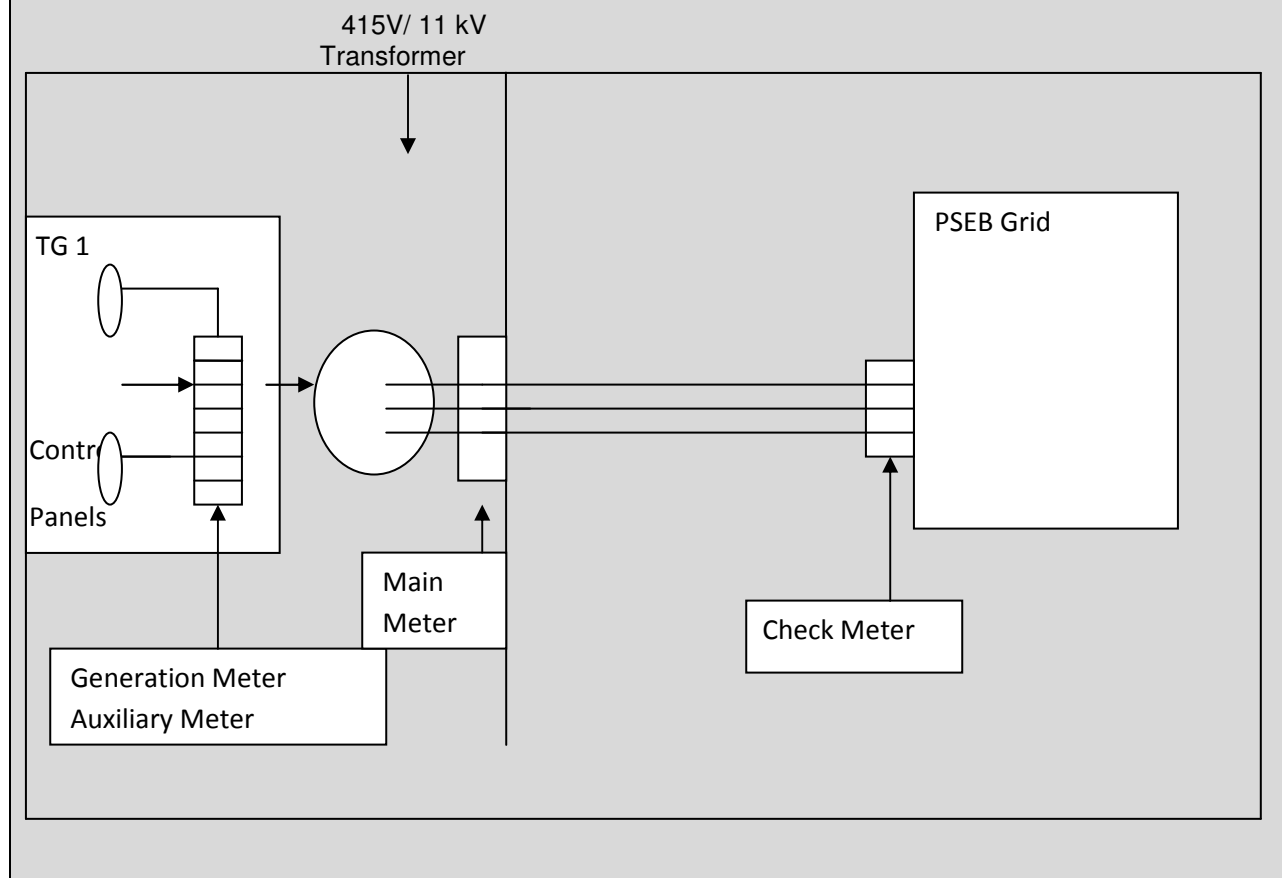
The hourly data is monitored and recorded in the log books by the shift staff comprising of Plant Shift Supervisor and Technical Assistant. The daily data is checked and countersigned by the Assistant Plant Manager. The daily and monthly data is checked and verified by the CDM team leader (plant in-charge) 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.

**F-CDM-MR**

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.

During the current 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, except during the period 22 Dec 2011 to 21 Feb 2012 for MHP Gholian, the main meter was not functional and during this period the check meter for this site was decisive for JMR for export and import reading and billing.

**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>	EF <sub>grid</sub> /EF <sub>CM</sub>
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 <sub>OM</sub> ) and the Build Margin Emission Factor (EF <sub>BM</sub> ).
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

Data / Parameter:	EG <sub>export, y</sub>					
Unit:	MWh					
Description:	Electricity exported by the project activity in year y					
Measured/ Calculated / Default:	Measured					
Source of data:	Joint Meter Reading					
Value(s) of monitored parameter:						
	Khanpur	Sudhar	Akhara	Gholian	Channowal	Total
	6,160.323	6,015.100	5,629.114	4,636.362	4,798.219	27,239.118
	The current monitoring period covers the period from 28 Dec 2011 (i.e. date of registration of the project under					

**F-CDM-MR**

	<p>CDM and also the start date of crediting period) to 30 Nov 2012. As the part JMR for the month of December 2011 from 28/12/2011 to 31/12/2011 is not available, PP is not claiming emission reduction for the four days of December 2011.</p> <p>Also closing day JMR for Nov 2012 has been taken on 03 Dec 2012 for Khanpur, Sudhar &amp; Akhara and on 01 Dec 2012 for Gholian &amp; Channowal, Hence, the gross generation for 01 Dec 12 to 03 Dec 2012 for Khanpur, Sudhar &amp; Akhara and gross generation for 01 Dec 2012 for Gholian &amp; Channowal as recorded at plant site from the Gross Generation meters have been deducted from the energy exported for the month of Nov 2012.</p>					
Monitoring equipment:	Main Meters					
	<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*
	Period in service during the monitoring period	28/02/2012 to 30/11/2012	25/02/2012 to 30/11/2012	25/01/2012 to 30/11/2012	21/02/2012 to 30/11/2012	01/03/2012 to 30/11/2012
	Calibration frequency	2 year	2 year	2 year	2 year	2 year
	Date of calibration and validity	23/12/2011 (valid till 22/12/2013) 27/06/2012 (valid till 26/06/2014)	19/12/2011 (valid till 18/12/2013) 22/06/2012 (valid till 21/06/2014)	23/12/2011 (valid till 22/12/2013) 22/06/2012 (valid till 21/06/2014)	19/12/2011 (valid till 18/12/2013) 19/06/2012 (valid till 18/06/2014)	19/12/2011 (valid till 18/12/2013) 19/06/2012 (valid till 18/06/2014)



## F-CDM-MR

	*					
	<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	± 0.50%	± 0.50%	± 0.50%	± 0.50%	± 0.50%
	Serial number	07348791	07348774	07348776	3174965	5293343
	Period in service during the monitoring period	28/12/2011 to 28/02/2012	28/12/2011 to 25/02/2012	28/12/2011 to 25/01/2012	28/12/2011 to 21/02/2012	28/12/2011 to 01/03/2012
	Calibration frequency	2 year	2 year	2 year	2 year	2 year
	Date of calibration and validity	18/10/2011 (valid till 17/10/2013) 03/01/2012 (valid till 02/01/2014)	01/08/2011 (valid till 31/07/2013) 18/01/2012 (valid till 17/01/2014)	29/07/2011 (valid till 28/07/2013) 18/01/2012 (valid till 17/01/2014)	07/09/2011 (valid till 06/09/2013)	07/09/2011 (valid till 06/09/2013)
	Check Meters					
	<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**
	Period in service during the monitoring period	28/02/2012 to 30/11/2012	25/02/2012 to 30/11/2012	25/01/2012 to 30/11/2012	22/02/2012 to 30/11/2012	01/03/2012 to 30/11/2012

**F-CDM-MR**

	Calibration frequency	2 year	2 year	2 year	2 year	2 year
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**						
	<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	± 0.50%	± 0.50%	± 0.50%	± 0.50%	± 0.50%
	Serial number	07348781	07348749	07348783	4187460	4223072
	Period in service during the monitoring period	28/12/2011 to 28/02/2012	28/12/2011 to 25/02/2012	28/12/2011 to 25/01/2012	28/12/2011 to 21/02/2012	28/12/2011 to 01/03/2012
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Measuring/ Reading/ Recording frequency:	Continuous monitoring and Monthly recording					
Calculation method (if applicable):	Not Applicable					
QA/QC procedures:	The electricity exported by APGPL is monitored through monthly joint meter readings of energy meters installed at grid interconnection point.					

**F-CDM-MR**

	Joint Meter Readings are based on the main meters 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. The data are archived on paper and electronically.																	
Data / Parameter:	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><tr><td>Khanpur</td><td>Sudhar</td><td>Akhara</td><td>Gholian</td><td>Channowal</td><td>Total</td></tr><tr><td>8.708</td><td>9.630</td><td>12.244</td><td>7.472</td><td>9.239</td><td>47.293</td></tr></table> <p>The current monitoring period covers the period from 28 Dec 2011 (i.e. date of registration of the project under CDM and also the start date of crediting period) to 30 Nov 2012. As the part JMR for the month of December 2011 from 28/12/2011 to 31/12/2011 is not available, PP is not claiming emission reduction for the four days of December 2011.</p> <p>Also closing day JMR for Nov 2012 has been taken on 03 Dec 2012 for Khanpur, Sudhar &amp; Akhara and on 01 Dec 2012 for Gholian &amp; Channowal, Hence, the gross generation for 01 Dec 12 to 03 Dec 2012 for Khanpur, Sudhar &amp; Akhara and gross generation for 01 Dec 2012 for Gholian &amp; Channowal as recorded at plant site from the gross generation meters have been deducted from the energy exported for the month of Nov 2012.</p>						Khanpur	Sudhar	Akhara	Gholian	Channowal	Total	8.708	9.630	12.244	7.472	9.239	47.293
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8.708	9.630	12.244	7.472	9.239	47.293													
Monitoring equipment:	Main Meters																	



## F-CDM-MR

	<table><tr><th>Particulars</th><th>Khanpur</th><th>Sudhar</th><th>Akhara</th><th>Gholian</th><th>Channowal</th></tr><tr><td>Type</td><td>L&amp;T Bidirectional Trivector Meter</td><td>L&amp;T Bidirectional Trivector Meter</td><td>L&amp;T Bidirectional Trivector Meter</td><td>L&amp;T Bidirectional Trivector Meter</td><td>L&amp;T Bidirectional Trivector Meter</td></tr><tr><td>Accuracy class</td><td>± 0.20%</td><td>± 0.20%</td><td>± 0.20%</td><td>± 0.20%</td><td>± 0.20%</td></tr><tr><td>Serial number</td><td>11069548*</td><td>11071246*</td><td>11071253*</td><td>11071244*</td><td>11071251*</td></tr><tr><td>Period in service during the monitoring period</td><td>28/02/2012 to 30/11/2012</td><td>25/02/2012 to 30/11/2012</td><td>25/01/2012 to 30/11/2012</td><td>22/02/2012 to 30/11/2012</td><td>01/03/2012 to 30/11/2012</td></tr><tr><td>Calibration frequency</td><td>2 year</td><td>2 year</td><td>2 year</td><td>2 year</td><td>2 year</td></tr><tr><td>Date of calibration and validity</td><td>23/12/2011 valid till 22/12/2013) 27/06/2012 valid till 26/06/2014)</td><td>19/12/2011 valid till 18/12/2013) 22/06/2012 valid till 21/06/2014)</td><td>23/12/2011 valid till 22/12/2013) 22/06/2012 valid till 21/06/2014)</td><td>19/12/2011(valid till 18/12/2013) 19/06/2012(valid till 18/06/2014)</td><td>19/12/2011 valid till18/12/2013) 19/06/2012 valid till18/06/2014)</td></tr></table>	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	11069548*	11071246*	11071253*	11071244*	11071251*	Period in service during the monitoring period	28/02/2012 to 30/11/2012	25/02/2012 to 30/11/2012	25/01/2012 to 30/11/2012	22/02/2012 to 30/11/2012	01/03/2012 to 30/11/2012	Calibration frequency	2 year	2 year	2 year	2 year	2 year	Date of calibration and validity	23/12/2011 valid till 22/12/2013) 27/06/2012 valid till 26/06/2014)	19/12/2011 valid till 18/12/2013) 22/06/2012 valid till 21/06/2014)	23/12/2011 valid till 22/12/2013) 22/06/2012 valid till 21/06/2014)	19/12/2011(valid till 18/12/2013) 19/06/2012(valid till 18/06/2014)	19/12/2011 valid till18/12/2013) 19/06/2012 valid till18/06/2014)
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	<table><tr><th>Particulars</th><th>Khanpur</th><th>Sudhar</th><th>Akhara</th><th>Gholian</th><th>Channowal</th></tr><tr><td>Type</td><td>L&amp;T Bidirectional Trivector Meter</td><td>L&amp;T Bidirectional Trivector Meter</td><td>L&amp;T Bidirectional Trivector Meter</td><td>L&amp;T Bidirectional Trivector Meter</td><td>L&amp;T Bidirectional Trivector Meter</td></tr><tr><td>Accuracy class</td><td>± 0.50%</td><td>± 0.50%</td><td>± 0.50%</td><td>± 0.50%</td><td>± 0.50%</td></tr><tr><td>Serial number</td><td>07348791</td><td>07348774</td><td>07348776</td><td>3174965</td><td>5293343</td></tr><tr><td>Period in service during the monitoring period</td><td>28/12/2011 to 28/02/2012</td><td>28/12/2011 to 25/02/2012</td><td>28/12/2011 to 25/01/2012</td><td>28/12/2011 to 21/02/2012</td><td>28/12/2011 to 01/03/2012</td></tr></table>	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	± 0.50%	± 0.50%	± 0.50%	± 0.50%	± 0.50%	Serial number	07348791	07348774	07348776	3174965	5293343	Period in service during the monitoring period	28/12/2011 to 28/02/2012	28/12/2011 to 25/02/2012	28/12/2011 to 25/01/2012	28/12/2011 to 21/02/2012	28/12/2011 to 01/03/2012												
	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	± 0.50%	± 0.50%	± 0.50%	± 0.50%	± 0.50%																																					
	Serial number	07348791	07348774	07348776	3174965	5293343																																					
Period in service during the monitoring period	28/12/2011 to 28/02/2012	28/12/2011 to 25/02/2012	28/12/2011 to 25/01/2012	28/12/2011 to 21/02/2012	28/12/2011 to 01/03/2012																																						



## F-CDM-MR

	Calibration frequency	2 year	2 year	2 year	2 year	2 year
	Date of calibration and validity	18/10/2011 valid till 17/10/2013) 03/01/2012 valid till 02/01/2014)	01/08/2011 valid till 31/07/2013) 18/01/2012 valid till 17/01/2014)	29/07/2011 valid till 28/07/2013) 18/01/2012 valid till 17/01/2014)	07/09/2011 valid till 06/09/2013)	07/09/2011 valid till 06/09/2013)
	Check Meters					
	<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**
	Period in service during the monitoring period	28/02/2012 to 30/11/2012	25/02/2012 to 30/11/2012	25/01/2012 to 30/11/2012	22/02/2012 to 30/11/2012	01/03/2012 to 30/11/2012
	Calibration frequency	2 year	2 year	2 year	2 year	2 year
	Date of calibration and validity	23/12/2011 valid till 22/12/2013) 27/06/2012 valid till 26/06/2014)	19/12/2011 valid till 18/12/2013) 22/06/2012 valid till 21/06/2014)	23/12/2011(valid till 22/12/2013) 22/06/2012(valid till 21/06/2014)	19/12/2011(valid till 18/12/2013) 19/06/2012(valid till 18/06/2014)	19/12/2011 valid till 18/12/2013) 19/06/2012 valid till 18/06/2014)
	**					
	<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	± 0.50%	± 0.50%	± 0.50%	± 0.50%	± 0.50%

**F-CDM-MR**

	Serial number	07348781	07348749	07348783	4187460	4223072
	Period in service during the monitoring period	28/12/2011 to 28/02/2012	28/12/2011 to 25/02/2012	28/12/2011 to 25/01/2012	28/12/2011 to 21/02/2012	28/12/2011 to 01/03/2012
	Calibration frequency	2 year	2 year	2 year	2 year	2 year
	Date of calibration and validity	18/10/2011 valid till 17/10/2013) 10/02/2012 valid till 09/02/2014)	01/08/2011 valid till 31/07/2013) 18/01/2012 valid till 17/01/2014)	29/07/2011 valid till 28/07/2013) 18/01/2012 valid till 17/01/2014)	07/09/2011(valid till 06/09/2013)	07/09/2011 valid till 06/09/2013)
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 of each of five sites. Joint Meter Readings are based on the main meters 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. The data are archived on paper and electronically.					
Data / Parameter:	EG <sub>Net, y</sub>					
Unit:	MWh					
Description:	Net electricity exported to the Grid/Licensee in year y					





## F-CDM-MR

Measured/ Calculated / Default:	Calculated																	
Source of data:	Joint Meter Reading																	
Value(s) of monitored parameter:	<table><tr><th>Khanpur</th><th>Sudhar</th><th>Akhara</th><th>Gholian</th><th>Channowal</th><th>Total</th></tr><tr><td>6,151.615</td><td>6,005.470</td><td>5,616.870</td><td>4,628.890</td><td>4,788.980</td><td>27,191.825</td></tr></table> <p>The current monitoring period covers the period from 28 Dec 2011 (i.e. date of registration of the project under CDM and also the start date of crediting period) to 30 Nov 2012. As the part JMR for the month of December 2011 (from 28/12/2011 to 31/12/2011 is not available), PP is not claiming emission reduction for the four days of December 2011.</p> <p>Also closing day JMR for Nov 2012 has been taken on 03 Dec 2012 for Khanpur, Sudhar &amp; Akhara and on 01 Dec 2012 for Gholian &amp; Channowal, Hence, the gross generation for 01 Dec 12 to 03 Dec 2012 for Khanpur, Sudhar &amp; Akhara and gross generation for 01 Dec 2012 for Gholian &amp; Channowal as recorded at plant site from the gross generation meters have been deducted from the energy exported for the month of Nov 2012.</p>						Khanpur	Sudhar	Akhara	Gholian	Channowal	Total	6,151.615	6,005.470	5,616.870	4,628.890	4,788.980	27,191.825
Khanpur	Sudhar	Akhara	Gholian	Channowal	Total													
6,151.615	6,005.470	5,616.870	4,628.890	4,788.980	27,191.825													
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 monitored 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, v}</math>). The net energy 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:	The data will be kept for 2 years after the end of crediting period or the last issuance of CERs for this project activity,																	



## F-CDM-MR

	whichever occurs later. The data are archived on paper and electronically.					
Data / Parameter:	EG <sub>Gross, y</sub>					
Unit:	MWh					
Description:	Gross electricity generation by the project activity in year y					
Measured/ Calculated / Default:	Measured					
Source of data:	Plant records					
Value(s) of monitored parameter:	Khanpur	Sudhar	Akhara	Gholian	Channowal	Total
	6,466.117	6,410.873	5,877.039	4,994.587	5,042.224	28,790.840



## F-CDM-MR

Monitoring equipment:	<b>Particulars</b>	<b>Khanpur</b>	<b>Sudhar</b>	<b>Akhara</b>	<b>Gholian</b>	<b>Channowal</b>
	Type	Unit 1: EI-Measure Unit 2: EI-Measure	Unit 1: EI-Measure Unit 2: EI-Measure	Unit 1: EI-Measure Unit 2: EI-Measure	EI-Measure	EI-Measure
	Accuracy class	±0.50%	±0.50%	±0.50%	±0.50%	±0.50%
	Serial number	Unit 1: 10440TM0309 Unit 2: 1204TM0309	Unit 1: 34122TM0309 Unit 2: 1214TM0309	Unit 1: 8221TM0309 Unit 2: 34125TM0309	1210TM0309	1215TM0309
	Calibration frequency	Annually	Annually	Annually	Annually	Annually
	Calibrations during monitoring period	09/09/2011 (valid till 08/09/2012) 07/03/2012 (valid till 06/03/2013)	09/09/2011 (valid till 08/09/2012) 07/03/2012 (valid till 06/03/2013)	09/09/2011 (valid till 08/09/2012) 07/03/2012 (valid till 06/03/2013)	09/09/2011 (valid till 08/09/2012) 07/03/2012 (valid till 06/03/2013)	09/09/2011 (valid till 08/09/2012) 07/03/2012 (valid till 06/03/2013)
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,					



## F-CDM-MR

	whichever occurs later. The data are archived on paper and electronically.					
<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:	Plant Records					
Value(s) of monitored parameter:	<b>Khanpur</b>	<b>Sudhar</b>	<b>Akhara</b>	<b>Gholian</b>	<b>Channowal</b>	<b>Total</b>
	60.579	62.215	64.517	46.270	47.695	281.276
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	±0.50%	±0.50%	±0.50%	±0.50%	±0.50%
	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	09/09/2011 (valid till 08/09/2012) 07/03/2012 (valid till 06/03/2013)	09/09/2011 (valid till 08/09/2012) 07/03/2012 (valid till 06/03/2013)	09/09/2011 (valid till 08/09/2012) 07/03/2012 (valid till 06/03/2013)	09/09/2011 (valid till 08/09/2012) 07/03/2012 (valid till 06/03/2013)	09/09/2011 (valid till 08/09/2012) 07/03/2012 (valid till 06/03/2013)
Measuring/ Reading/ Recording frequency:	Continuous monitoring and Hourly recording					

**F-CDM-MR**

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 meters were 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. 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	27,239.118
B	Energy Imported		MWh	47.293
C	Net Saleable Energy	$C = A - B$	MWh	27,191.825
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>	21,837

**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>	21,837	NIL	NA	21,837

**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	Item	Values estimated in ex-ante calculation of registered PDD
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Emission reductions or GHG removals by sinks (t CO <sub>2</sub> e)	21,851	21,837	-	-
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**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 for the equivalent time period.

**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
Emission reductions or GHG removals by sinks (t CO <sub>2</sub> e)	21,837	NA

**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 (MWh)**

Billing Month	Year	Khanpur	Sudhar	Akhara	Gholian	Channowal	Total
Dec (Since 28/12)	2011	71.481	80.969	66.663	55.385	46.455	320.953
Jan	2012	524.389	529.899	488.618	400.960	412.406	2,356.272
Feb	2012	600.141	693.509	572.485	522.750	534.180	2,923.065
Mar	2012	795.777	713.582	650.399	596.950	600.034	3,356.742
Apr	2012	246.735	235.526	207.090	145.800	136.641	971.792
May	2012	593.830	592.529	551.196	467.080	445.631	2,650.266
Jun	2012	703.490	622.956	641.562	512.780	525.501	3,006.289
Jul	2012	689.460	667.485	642.717	587.500	611.633	3,198.795
Aug	2012	765.960	774.073	743.660	613.583	635.242	3,532.518
Sep	2012	778.860	797.398	711.782	556.000	560.970	3,405.010
Oct	2012	319.224	339.527	301.357	261.249	254.266	1,475.623
Nov	2012	376.770	363.420	299.510	274.550	279.265	1,593.515
<b>Total Energy Generated</b>		<b>6,466.117</b>	<b>6,410.873</b>	<b>5,877.039</b>	<b>4,994.587</b>	<b>5,042.224</b>	<b>28,790.840</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 (MWh)**

Billing Month	Year	Khanpur	Sudhar	Akhara	Gholian	Channowal	Total
Dec (Since 28/12)	2011	0.649	0.729	0.768	0.708	0.582	3.436
Jan	2012	3.950	4.474	4.633	3.675	3.596	20.328
Feb	2012	2.478	3.469	3.709	2.822	2.374	14.852
Mar	2012	3.080	3.288	4.160	3.640	2.042	16.210
Apr	2012	3.025	4.332	4.652	2.755	1.566	16.330
May	2012	6.131	8.064	7.685	5.339	5.411	32.630
Jun	2012	8.504	8.424	8.608	6.196	6.980	38.712
Jul	2012	8.160	7.968	8.271	5.839	7.548	37.786
Aug	2012	8.905	8.439	9.080	5.574	6.997	38.995
Sep	2012	8.874	6.913	7.075	4.716	5.676	33.254
Oct	2012	3.970	3.814	3.674	2.788	3.326	17.572
Nov	2012	2.853	2.301	2.202	2.218	1.597	11.171
<b>Total Auxiliary Energy Consumption</b>		<b>60.579</b>	<b>62.215</b>	<b>64.517</b>	<b>46.270</b>	<b>47.695</b>	<b>281.276</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 (MWh)

Billing Month	Year	Energy Exported						Energy Imported						Net Saleable Energy
		Khanpur	Sudhar	Akhara	Gholian	Channowal	Total	Khanpur	Sudhar	Akhara	Gholian	Channowal	Total	
Dec	2011	-	-	-	-	-	-	-	-	-	-	-	-	-
Jan	2012	508.210	504.520	474.782	376.787	400.540	2,264.839	0.040	0.040	1.810	0.087	0.260	2.237	2,262.602
Feb	2012	581.450	663.862	559.493	496.176	520.020	2,821.001	0.090	1.791	0.174	1.809	0.133	3.997	2,817.004
Mar	2012	772.021	681.153	632.449	567.885	578.841	3,232.349	1.748	0.115	0.215	0.103	1.765	3.946	3,228.403
Apr	2012	238.153	223.807	200.912	137.125	130.783	930.780	2.225	2.961	4.198	1.857	2.517	13.758	917.022
May	2012	572.165	561.184	533.069	438.638	427.702	2,532.758	0.124	0.261	0.394	0.238	0.500	1.517	2,531.241
Jun	2012	676.433	589.972	619.288	480.456	503.207	2,869.356	0.264	0.349	0.551	0.413	0.330	1.907	2,867.449
Jul	2012	662.315	633.058	620.421	550.657	585.934	3,052.385	0.696	0.465	0.545	0.314	0.273	2.293	3,050.092
Aug	2012	735.074	734.677	718.158	570.873	604.769	3,363.551	0.497	0.434	0.521	0.304	0.260	2.016	3,361.535
Sep	2012	746.774	757.201	688.436	516.723	534.515	3,243.649	0.230	0.141	0.172	0.100	0.114	0.757	3,242.892
Oct	2012	306.393	322.960	291.981	243.145	242.711	1,407.190	1.922	2.228	2.452	1.494	2.105	10.201	1,396.989
Nov	2012	361.335	342.706	290.125	257.897	269.197	1,521.260	0.872	0.845	1.212	0.753	0.982	4.664	1,516.596
Total in (MWh)		6,160.323	6,015.100	5,629.114	4,636.362	4,798.219	27,239.118	8.708	9.630	12.244	7.472	9.239	47.293	27,191.825



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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
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		