



Monitoring report form
(Version 05.1)

MONITORING REPORT

Title of the project activity	7 MW Bundled Hydro power project at Himachal Pradesh of Raajratna Energy Holdings Pvt. Ltd	
UNFCCC reference number of the project activity	9111	
Version number of the monitoring report	05	
Completion date of the monitoring report	10/10/2016	
Monitoring period number and duration of this monitoring period	First monitoring period 01/01/2013 to 31/10/2015 (both days included)	
Project participant(s)	M/s Raajratna Energy Holdings Pvt Ltd	
Host Party	India	
Sectoral scope(s)	01 - Energy Industries (renewable / non-renewable sources)	
Selected methodology(ies)	AMS.I.D "Grid connected renewable electricity generation" version 17	
Selected standardized baseline(s)	NA	
Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD	64,508 tCO _{2e}	
Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	0 tCO _{2e}	64,508 tCO _{2e}

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

>>

(a) Purpose of the project activity and the measures taken for GHG emission reductions or net GHG removals by sinks;

The purpose of the project activity is to generate power using renewable energy source (hydro) and export the same to the Himachal Pradesh state grid. The 5 MW Belij project is a run of the river scheme on Belij Nallah, which is a tributary of river Ravi. The electricity generated is evacuated to the Himachal Pradesh state grid through connective to the nearest substation. The estimated annual gross electricity generation is 24.81 GWh, and the estimated electricity supplied to the grid is 23.445 GWh annually, after taking auxiliary consumption, transformation losses and transmission losses into account.

(b) Brief description of the installed technology and equipment;

The project activity generates 5 MW of electricity using hydro electric technology and is located at Belij, Chamba district, Himachal Pradesh, India (hereafter referred to as Belij Project or Project Activity), being developed by Belij Hydro Power Private Limited. The project initially was planned as two projects, as one 5 MW Belij and 2 MW Gehra, together resulting in a total of 7 MW bundled small hydropower project. The Belij Project was being developed by Belij Hydro Power Private Limited and the Gehra Project was being implemented by Gehra Hydro Power Private Limited. However due to various constraints and technical difficulties in executing the Gehra Project, the Board of Directors of Gehra Hydro Power Private Limited (GHPPL) decided not to implement the Project. Hence, though the project title indicates 7 MW, the actual implemented capacity was only 5 MW and the same is the sole activity under this project. The project title has not been revised as it was approved by the host country DNA.

The project activity exports the power to NEWNE grid of India. In the absence of the current zero emission hydro project, the equivalent amount of electricity would have been generated by power plants in the grid mix and results in GHG emissions. The project activity reduces the same by the way of exporting the green power to the grid, hence, the NEWNE grid forms the baseline for this project activity for determination of emission reductions.

(c) Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.);

The project activity start date is 23/02/2009 and the same has been commissioned on 17/06/2012. The project activity has been registered under CDM on 24/12/2012 and the start date crediting period is 01/01/2013.

(d) Total GHG emission reductions or net GHG removals by sinks achieved in this monitoring period.

During the monitoring period 01/01/2013 to 31/10/2015 (34 months) the project activity has exported a total of 76,800 MWh of electricity and as a result, reduced a total of 64,508 tCO_{2e} GHG emissions in to the atmosphere.

A.2. Location of project activity

>>

(a) Host Party; India

(b) Region/state/province, etc.; Himachal Pradesh, Northern region

(c) City/town/community, etc.; Chamba District

(d) Physical/geographical location - Hibra Village

The power house of the project can be approached through the Chamba-Bharmour state highway; this is about 32 km from Chamba and 161 km from Pathankot.

Particulars	Geographical Coordinates of Power House	Geographical Coordinates of Weir
Longitude	76° 32' 22.7" E	76° 34' 75.5" E
Latitude	32° 47' 90.0" N	32° 49' 25.3" N

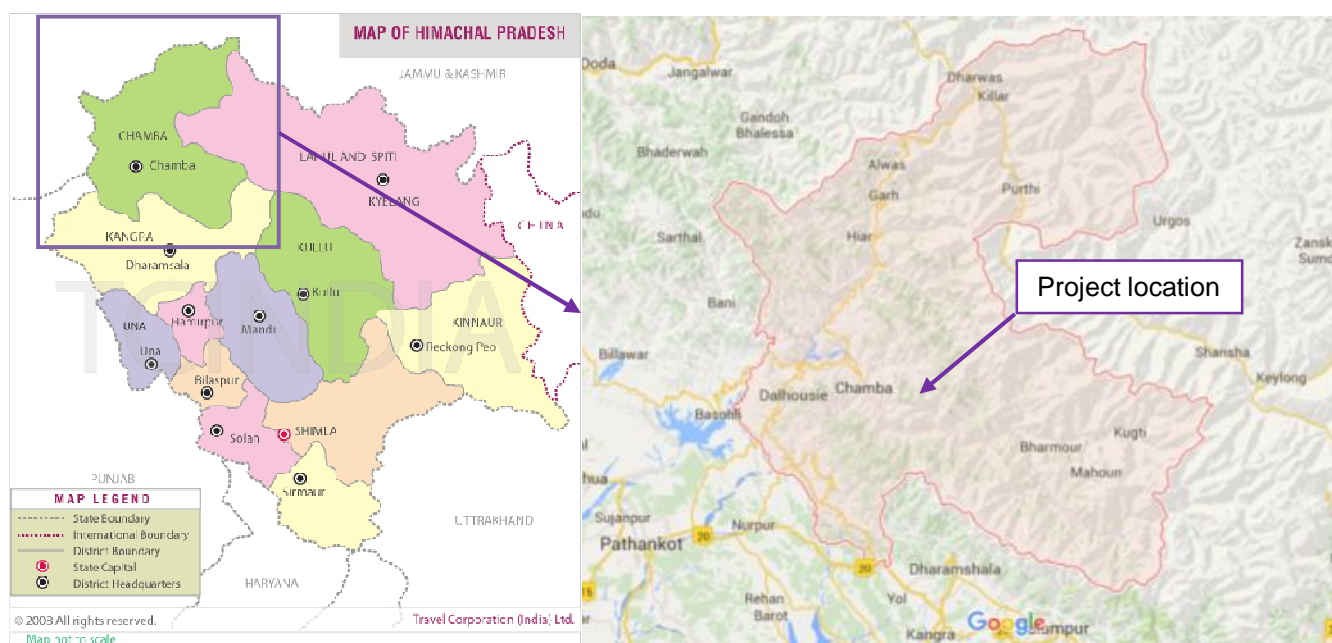


Fig: Map of Himachal Pradesh state, Chamba district and project location

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 whether the Party involved wishes to be considered as project participant (yes/no)
India (host)	Private entity: M/s Raajratna Energy Holdings Pvt Ltd	No.

A.4. Reference of applied methodology and standardized baseline

>>

1.

(a) The applied methodology: AMS.I.D "Grid connected renewable electricity generation", Version 17; Sectoral scope - 01

(b) Tools: "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" Version 02

(c) No applied standardized baselines have been used in the project activity

2. Reference to UNFCCC CDM website –

AMS.I.D - <http://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK>

Tool - <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf>

A.5. Crediting period of project activity

>>

The project activity opted for fixed crediting period for 10 years. The start date of the crediting period is 01/01/2013.

The current monitoring period starts from 01/01/2013 to 31/10/2015 (including both days), a total of 34 months (or 1034 days).

A.6. Contact information of responsible persons/entities

>>

The entity as indicated in the Appendix 1 is the project participant for project for this project activity. The details of the entity responsible for completing the CDM-MR-FORM as below:-

Jimmy Sah
Infinite Solutions
611, Chetak Centre Main,
RNT Marg, Indore, (M.P.)
India - 452002
Email: jimmy@infisolutions.org
Phone: 0731- 4050174
www.infisolutions.org

The person/entity mentioned above is not project participant(s).

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

>>

Project activity consists of 5 MW hydro electric project activity, which was successfully commissioned on 17/06/2012. The project is in continuous operation till date. All the physical and technical features of the project are implemented and is in operation as described in the registered PDD.

The project diverts Belij nala inflows by constructing a trench weir. The project activity generates electricity by the diverted water from the weir and channels them through penstock to feed 2 number of pelton turbines connected to generating units of 2.50 MW each in the power house. The project activity equipment technical specifications are provided below:

S. No	Particulars	Belij
1	Hydrology	
a	Stream	Belij
b	Tributary	Ravi River
c	Design discharge	3.325 cumecs (m ³ /sec)
2	Penstock	
a	Type	Circular, surface, steel
b	Length	360 m
3	Power house	
A	Type	Surface
B	Installed capacity	2 x 2.5 MW = 5 MW

C	Gross head	225.087 m
D	Net head	221.25 m
E	Generating unit	Pelton turbine
F	Gross Energy Generated	24.81 GWh
G	Transmission Losses (4.5%), Transformation Loss (0.5%) & Auxiliary Power Consumption (0.5%)	1.36 GWh
H	Electricity Supplied to the Grid after consideration of the Transmission Losses (4.5%) Transformation loss (0.5%) and Auxiliary Power (0.5%) (GWh)	23.445 GWh

Technical specifications of Turbine	
Rated Net Head	221.50m
Design Flow	3.20m ³ /s
Rated Power	2.500MW @ 1.33Cumecs 2.500MW + 20% COL @ 1.61Cumecs
Runner Bucket PCD	1200mm
Rated Speed	500 RPM
Runaway Speed	871.1RPM
Technical specifications of Generator	
Capacity	2.500 MW + 20% COL
Voltage Output	6600V
Rated Speed	500RPM
Frequency	50Hz
Power Factor	0.85 Lag
Configuration	Horizontal

No events or situations happened during the reported monitoring period which can alter the applicability of the applied methodology.

There are several plant shutdowns during the monitoring period. However, there are only few shutdowns, which were 24 hours or more and details of the same are provided under Annex II.

B.2. Post-registration changes

B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

>>

There is no request for deviation applied during this monitoring period.

B.2.2. Corrections

>>

There is a minor correction proposed by project participants during this first verification. The geographical co-ordinates of the project have been corrected from the registered PDD to the co-ordinates mentioned in the MR. There are no changes to the project activity, design or emission reductions, expect the correction to co-ordinates.

The details of the previous and corrected project co-ordinates are provided below for reference:

Particulars	Registered PDD		Proposed correction	
	Geographical Coordinates of Power House	Geographical Coordinates of Weir	Geographical Coordinates of Power House	Geographical Coordinates of Weir
Longitude	76°23'51" E	76° 20' 0.42" E	76° 32' 22.7" E	76° 34' 75.5" E
Latitude	32°29'33" N	32° 32' 15.4" N	32° 47' 90.0" N	32° 49' 25.3" N

The PDD of the project has been updated to reflect the above correction and submitted for verification and approval.

B.2.3. Changes to start date of crediting period

>>

There is no change proposed in the start date of crediting period.

B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

>>

Not applicable as registered PDD includes monitoring plan.

B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

>>

No permanent changes from registered monitoring plan, applied methodology or applied standardized baseline are proposed or applicable.

B.2.6. Changes to project design of registered project activity

>>

Not applicable

B.2.7. Types of changes specific to afforestation or reforestation project activity

>>

Not applicable

SECTION C. Description of monitoring system

>>

The monitoring plan is developed in accordance with the modalities and procedures for CDM project activities and is for grid-connected small hydroelectric project implemented in Himachal Pradesh, India. The monitoring plan, which is implemented by the project proponent describes about the monitoring organisation, parameters to be monitored, monitoring procedure, quality assurance, quality control procedures, data storage and archiving.

The authority and responsibility for monitoring, measurement, reporting and reviewing of the data rests with the project proponent. The identified persons are placed as in charge for GHG monitoring activities and necessary reporting to the management. The personnel appointed by the

PP at the project site are well qualified and experienced in operation of similar projects and are equipped with required skills and expertise.

Monitoring procedure:

The project electricity export and import monitoring is carried out based on the Energy Meter Reading taken at the Jarangala Sub-station of HPSEB Limited. One Set of Main and Check Meters are provided for each of the two feeders that supply electricity to the substation. The accuracy Class of the Meters and the associated equipments is 0.2s Class as per the requirements.

The common transmission line has been constructed by 3 project developers, the project proponent being one of the developers. From the power house of each project, the power is drawn to the common pooling station by separate transmission lines. At the common transmission line separate check meters (before pooling point) are installed to measure the quantum of power being injected by each project. From the common pooling station the power is evacuated through common transmission line to Jarangala sub station where HPSEB meters are installed.

The transmission losses from common pooling station to Jarangala sub-station are borne by the 3 project developers in proportion to the energy injected into the common transmission line by each project. In this regard, a separate agreement is being entered into by the 3 project developers. The transmission losses are quantified as follows:

Transmission Losses = (Power sent out by single project to the Pooling Station) / (Sum of the Power sent out by all projects) * (Sum of the power sent out by all projects - Power Received at Jarangal Sub Station)

The Billing of the project is based on the Energy Meter Reading taken at the Jarangala Sub-station of HPSEB Limited. One Set of Main and Check Meters are provided for each of the Circuits. The accuracy Class of the Meters and the associated equipments is 0.2s Class as per the CEA Metering regulations of 2006.

HPERC has accepted the PP's above said proposal and has given the approval for the same.

At the Common Pooling Station, meters were provided in the incoming feeders from each of the Project. The accuracy class of Meters and the associated equipments is 0.2s Class.

The monitoring plan includes monitoring of energy parameters such as energy export to the HPSEB grid system, and energy import to the project activity from grid. The transmission losses are calculated by HPSEB based on the formula presented above and the same is included in the Joint Meter Reading Report.

Monitoring equipment comprises of energy meters, which monitor the energy fed by the plant to HPSEB grid system by the proposed project. In accordance with the PPA, project proponents have to install two energy meters one is main meter and the other is check meter. Project proponent has calibrated both the meters according to the procedures laid down by PPA.

Methodology adopted for determining baseline emission factor is the Combined Margin (Including Imports) of the generating mix in the NEWNE grid system, which represents the intensity of carbon emissions of the grid system. The baseline emission factor is fixed ex-ante for all the years of the crediting period using the official data published by the Central Electricity Authority for the NEWNE grid for the year 2008-09.

QA & QC Procedures

The project employs latest state of art microprocessor based high accuracy monitoring and control equipment that measure, record, report, monitor and control of various key parameters of the project. These monitoring and controls are the part of the Control Systems of hydroelectric plant. Necessary standby meters or check meters as required are installed, to operate in standby mode or when the main meters are not working. All meters are calibrated and sealed as per industry practices at regular intervals. Records of calibration certificates are maintained for verification. Hence, high quality is ensured with the above parameters. Sales records are used and kept for checking the consistency of the recorded data.

The calibration of the Main/ Check Meters and the associated metering system is checked once in every 6 months as per the relevant clauses of the PPA.

Data Recording and Storage

For measuring the delivery/import of energy by the project at the interconnection point, one set of Main Meter and Check Meter, are provided by the project proponent and the HPSEB, respectively, at the interconnection point. Representatives of both the project proponent and HPSEB signs the document which contain all details such as the equipment data, calibration status, previous reading, current reading, export, import, net billable units, date and time of recording etc. This document called as Joint Meter Reading Sheet is used as a basic document for monitoring and verification of the net energy exported to the grid. HPSEB pay the project proponent based on this document. The above document will be kept at safe storage for verification of emission reductions generated from the project activity. Supporting documents such as receipts of payments released by HPSEB will also be kept in safe storage for later verification by an independent third party. The period of storage will be 2 years after the end of crediting period or till the last issuance of CERs for the project activity whichever occurs later.

SECTION D. Data and parameters

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

Data/parameter:	$EF_{grid,OM,y}$
Unit	tCO _{2e} /MWh
Description	The Operating Margin emission factor of NEWNE Grid
Source of data	Central Electricity Authority (CEA) Baseline Carbon Dioxide Emission database version 5.0 dated November 2009
Value(s) applied)	1.0049
Choice of data or measurement methods and procedures	The value used is fixed ex-ante as average of the last three years of the Operating margin provided by Central Electricity Authority (CEA) Baseline Carbon Dioxide Emission database version 5.0 dated November 2009
Purpose of data	Calculation of grid emission factor
Additional comments	-

Data/parameter:	$EF_{grid,BM,y}$
Unit	tCO _{2e} /MWh
Description	The Build Margin emission factor of NEWNE grid
Source of data	Central Electricity Authority (CEA) Baseline Carbon Dioxide Emission database 5.0 dated November 2009
Value(s) applied)	0.6751
Choice of data or measurement methods and procedures	The value used is fixed ex-ante as recent most Build margin provided by Central Electricity Authority (CEA) Baseline Carbon Dioxide Emission database version 5.0 dated November 2009
Purpose of data	Calculation of grid emission factor
Additional comments	-

Data/parameter:	$EF_{CO_2,grid,y} = EF_{grid,CM,y}$
Unit	tCO _{2e} /MWh

Description	The grid CO ₂ emission factor in year y
Source of data	Calculated
Value(s) applied)	0.8400
Choice of data or measurement methods and procedures	The value has been calculated as $0.5 \cdot EF_{\text{grid,OM}, y} + 0.5 \cdot EF_{\text{grid,BM}, y}$ and fixed ex-ante
Purpose of data	Calculation of baseline emissions and emission reductions
Additional comments	-

Data/parameter:	D _{HSD}
Unit	kg/lt
Description	Density of HSD
Source of data	Central Electricity Authority (CEA) CO ₂ database version 5 dated November 2009. (www.cea.nic.in)
Value(s) applied)	0.83
Choice of data or measurement methods and procedures	The data is considered from the available authentic national data source due to absence of the authentic measurement procedures by PP. This is fixed ex-ante for the entire crediting period.
Purpose of data	Calculations of project emissions
Additional comments	-

Data/parameter:	EF _{CO₂,i,y}
Unit	kgCO ₂ e/TJ or tCO ₂ e /TJ
Description	Emission Factor of HSD
Source of data	IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Value(s) applied)	74800 or 74.8
Choice of data or measurement methods and procedures	Table 1.4, Chapter 1, Volume 2, 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Purpose of data	Calculations of project emissions
Additional comments	IPCC Default Value and the same will be updated as per the latest IPCC default value

D.2. Data and parameters monitored

Data/parameter:	EG _{Bly}
Unit	MWh
Description	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)
Measured/calculated/default	Measured and calculated
Source of data	Joint Meter Readings and Annexure "A" Calculation of net saleable Energy Based in IPP's Meter reading
Value(s) of monitored parameter	76800
Monitoring equipment	Electronic Tri-vector Meters (TVM)
Measuring/reading/recording frequency:	Continuous measurement, monthly recording and summarized annually

Calculation method (if applicable):	<p>The project electricity export and import monitoring is carried out based on the Energy Meter Reading taken at the Jarangala Sub-station of HPSEB Limited. One Set of Main and Check Meters are provided for each of the two feeders that supply electricity to the substation. The accuracy Class of the Meters and the associated equipments is 0.2s Class as per the requirements.</p> <p>A common transmission line has been constructed by 3 project developers, the project proponent being one of the developers. From the power house of each project the power is drawn to the common pooling station by separate transmission lines. At the common transmission line separate meters (before pooling point) are installed to measure the amount of power being supplied by each project. From the common pooling station the power was evacuated through the common transmission line to Jarangala sub station, where HPSEB meters are installed. The transmission losses from common pooling station to Jarangala substation were borne by the 3 project developers in proportion to the energy injected into the common transmission line by each project. In this regard a separate agreement is being entered into by the 3 project developers.</p> <p>The JMRs of the project activity reflect all the above indicated arrangement and procedure followed to arrive at net energy exported by the project activity and the other two involved projects.</p> <p>The Annexure "A" Calculation of net saleable Energy Based in IPP's Meter reading to the JMR also contains the transmission losses which are calculated by HPSEB. The difference between the electricity exported and the electricity imported and the transmission losses gives the "Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity" All the calculations are submitted to HPSEB for approval and processing of payment, on monthly basis.</p> <p>The monitoring parameter being 'Quantity of net electricity supplied to the grid', the export values approved by HPSEB, provided under the JMR for billing purpose are considered final, as mentioned in the PDD.</p> <p>There were delays in the calibration of JMR meters during the months of June 2013, December 2013, December 2014 and June 2015. Hence, in line with the 'Appendix. Calibration of VVS version 09', correction factor of 0.2% (as the meters are of 0.2S class) has been applied. As a result, export has been reduced by 0.2% and import has been increased by 0.2% for the entire listed months conservatively, In addition, the transmission losses have been applied on the corrected net energy export, in line with the JMR requirements. The complete calculations of correction factor application are provided transparently in the emission reduction sheet submitted along with this MR.</p>
QA/QC procedures:	<p>The energy meters installed at HPSEB substation for both the feeders are calibrated as per the requirements of the PPA. The calibration certificates of the meters are provided. The data on net electricity exported to the grid can be cross-checked with the invoices raised by the PP to HPSEB, Further, for the billing purpose, readings from the main meter were considered. However, readings from check meter were to be considered only when the main meter is not functioning or error is beyond accuracy limit. However, no such event occurred during the current monitoring period. Further, all the readings were taken jointly by HPSEB official and the PP.</p> <p>The calibration details of each meter have been separately provided in a tabular form under Annex I for reference.</p>
Purpose of data:	Calculation of baseline emissions
Additional comments:	-

Data/parameter:	FC _{i,j,y}
Unit	Litre
Description	Quantity of HSD consumed in DG Set in the project activity during the year y

Measured/calculated/default	Measured and calculated
Source of data	Power plant log book/records
Value(s) of monitored parameter	1375
Monitoring equipment	Dip stick
Measuring/reading/recording frequency:	The measurement is carried out during each operation of DG set.
Calculation method (if applicable):	The measurement is done by dip stick after each time usage. The DG set is provided with a separate fuel tank. The level indicators give the consumption of HSD in lt. After each usage (frequency) the tank is again filled to maximum level.
QA/QC procedures:	The Dip stick were calibrated once every year.
Purpose of data:	Calculation of project emissions
Additional comments:	

Data/parameter:	NCV _{i,j,y}
Unit	kcal/kg
Description	Net calorific value of HSD
Measured/calculated/default	Default
Source of data	Central Electricity Authority (CEA) CO ₂ baseline database version 11 dated April 2016. (www.cea.nic.in)
Value(s) of monitored parameter	9975
Monitoring equipment	None – default value considered from CEA CO ₂ baseline data base
Measuring/reading/recording frequency:	Default value considered from latest version (11) of CEA CO ₂ baseline data base
Calculation method (if applicable):	The calorific value as mentioned in the Central Electricity Authority (CEA) CO ₂ baseline database version 11 dated April 2016 (www.cea.nic.in) is 10,500 kcal/kg and considering the delta GCV NCV as 5% as mentioned in CEA CO ₂ baseline data base version 11 the NCV comes out to be 9975 kcal/kg. The data is considered from the available authentic national data source due to absence of the authentic measurement procedures by PP. The value considered is from the latest available version of the data base in line with the monitoring requirements of registered PDD.
QA/QC procedures:	The QA/QC procedures are not under the control of the PP as the data is considered from the available authentic national data source. Further, the latest value as published in the latest version (11) of the Central Electricity Authority (CEA) baseline carbon dioxide emission database published by the host party (India) available at the time of verification is used.
Purpose of data:	Calculation of project emissions
Additional comments:	-

D.3. Implementation of sampling plan

>>

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

>>

As per the applied methodology AMS I D version 17, the baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor.

$$BE_y = EG_{BL,y} * EF_{CO_2,grid,y}$$

Where:

BE_y Baseline Emissions in year y; t CO₂

$EG_{BL,y}$ Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EF_{CO_2,grid,y}$ CO₂ emission factor of the grid in year y (t CO₂/MWh)

Accordingly, the baseline emissions of the project have been calculated below:

$$BE_y = 76800 \text{ (MWh)} * 0.8400 \text{ (tCO}_2\text{e/MWh)} = 64,512 \text{ tCO}_2\text{e}$$

Calculation tables for baseline emissions and emission reductions have been provided in Annexure 1.

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

>>

Though the project is renewable energy based power generation, the project activity uses a DG set on-site, hence the emissions from the DG set are considered as described in the PDD:

$$PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$$

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO_2,i,y}$$

$$PE_{FC,j,y} = 1375 \text{ (l)} * 0.83 \text{ (kg/l)} * 0.0031233 \text{ (tCO}_2\text{e/kg)} = 3.56 \text{ tCO}_2\text{e (considered as 4 conservatively)}$$

Calculations table for project emissions has been provided in Annexure 1.

E.3. Calculation of leakage

>>

No leakage is considered from the project activity as per approved methodology.

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

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	GHG emission reductions or net GHG removals by sinks (t CO ₂ e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
Total	64,512	4	0	0	64,508	64,508

E.5. Comparison of actual emission reductions or net 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 ₂ e)	55,788 (19,693 per annum)	64,508

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

>>

From E.5 above, we can observe that actual emission reduction for the current monitoring is higher than estimated emission reductions in PDD by 15.63%. This is due to various reasons associated with heavy rains & snow, flood inflows in to the river and other climatic reasons, which are beyond the control of PP, resulted in higher power generation by the project activity.

Annex I

Monitoring month	Net energy export (kWh)	Net energy export (MWh)	Grid emission factor (tCO ₂ /MWh)	Baseline emissions (tCO ₂)
Jan-13	748100.00	748	0.84	628
Feb-13	1008200.00	1008	0.84	847
Mar-13	1811300.00	1811	0.84	1521
Apr-13	1820000.00	1820	0.84	1529
May-13	1677619.41	1678	0.84	1409
Jun-13	2074000.44	2074	0.84	1742
Jul-13	2468041.15	2468	0.84	2073
Aug-13	2878846.45	2879	0.84	2418
Sep-13	3147268.17	3147	0.84	2644
Oct-13	2730513.48	2731	0.84	2294
Nov-13	1260193.30	1260	0.84	1059
Dec-13	858606.07	859	0.84	721
Jan-14	505484.63	505	0.84	425
Feb-14	918219.94	918	0.84	771
Mar-14	2635934.97	2636	0.84	2214
Apr-14	2660421.09	2660	0.84	2235
May-14	4057552.72	4058	0.84	3408
Jun-14	3529515.70	3530	0.84	2965
Jul-14	3175969.77	3176	0.84	2668
Aug-14	3614395.80	3614	0.84	3036
Sep-14	2694925.23	2695	0.84	2264
Oct-14	1879918.82	1880	0.84	1579
Nov-14	1295389.86	1295	0.84	1088
Dec-14	968214.39	968	0.84	813
Jan-15	843996.42	844	0.84	709
Feb-15	1418509.99	1419	0.84	1192
Mar-15	3317063.57	3317	0.84	2786
Apr-15	3369087.82	3369	0.84	2830
May-15	2890234.19	2890	0.84	2428
Jun-15	2890917.87	2891	0.84	2428
Jul-15	3059614.87	3060	0.84	2570
Aug-15	3272535.04	3273	0.84	2749
Sep-15	3170307.05	3170	0.84	2663
Oct-15	2149573.63	2150	0.84	1806
Total	76800471.83	76800		64512

Monitoring month	Diesel Consumption (Liters)	Diesel density (kg/liter)	Diesel Consumption (kg)	NCV of diesel (kcal/kg)	Emission factor diesel (tCO ₂ e/TJ)	CO ₂ coefficient (tCO ₂ /kg)	Project emissions (tCO ₂)
Jan-13	0	0.83	0	9975	74.8	0.0031233	0.00
Feb-13	100	0.83	83	9975	74.8	0.0031233	0.26
Mar-13	105	0.83	87.15	9975	74.8	0.0031233	0.27
Apr-13	50	0.83	41.5	9975	74.8	0.0031233	0.13
May-13	100	0.83	83	9975	74.8	0.0031233	0.26
Jun-13	120	0.83	99.6	9975	74.8	0.0031233	0.31
Jul-13	60	0.83	49.8	9975	74.8	0.0031233	0.16
Aug-13	100	0.83	83	9975	74.8	0.0031233	0.26
Sep-13	60	0.83	49.8	9975	74.8	0.0031233	0.16
Oct-13	0	0.83	0	9975	74.8	0.0031233	0.00
Nov-13	120	0.83	99.6	9975	74.8	0.0031233	0.31
Dec-13	100	0.83	83	9975	74.8	0.0031233	0.26
Jan-14	80	0.83	66.4	9975	74.8	0.0031233	0.21
Feb-14	80	0.83	66.4	9975	74.8	0.0031233	0.21
Mar-14	0	0.83	0	9975	74.8	0.0031233	0.00
Apr-14	0	0.83	0	9975	74.8	0.0031233	0.00
May-14	0	0.83	0	9975	74.8	0.0031233	0.00
Jun-14	30	0.83	24.9	9975	74.8	0.0031233	0.08
Jul-14	10	0.83	8.3	9975	74.8	0.0031233	0.03
Aug-14	20	0.83	16.6	9975	74.8	0.0031233	0.05
Sep-14	20	0.83	16.6	9975	74.8	0.0031233	0.05
Oct-14	0	0.83	0	9975	74.8	0.0031233	0.00
Nov-14	0	0.83	0	9975	74.8	0.0031233	0.00
Dec-14	40	0.83	33.2	9975	74.8	0.0031233	0.10
Jan-15	60	0.83	49.8	9975	74.8	0.0031233	0.16
Feb-15	20	0.83	16.6	9975	74.8	0.0031233	0.05
Mar-15	0	0.83	0	9975	74.8	0.0031233	0.00
Apr-15	40	0.83	33.2	9975	74.8	0.0031233	0.10
May-15	60	0.83	49.8	9975	74.8	0.0031233	0.16
Jun-15	0	0.83	0	9975	74.8	0.0031233	0.00
Jul-15	0	0.83	0	9975	74.8	0.0031233	0.00
Aug-15	0	0.83	0	9975	74.8	0.0031233	0.00
Sep-15	0	0.83	0	9975	74.8	0.0031233	0.00
Oct-15	0	0.83	0	9975	74.8	0.0031233	0.00
Total	1375		1141.25				4

Monitoring month	Baseline emissions (tCO ₂)	Project emissions (tCO ₂)	Leakage emissions (tCO ₂)	Emission reductions (tCO ₂)
Jan-13	628	0.00	0	628
Feb-13	847	0.26	0	847
Mar-13	1521	0.27	0	1521
Apr-13	1529	0.13	0	1529
May-13	1409	0.26	0	1409
Jun-13	1742	0.31	0	1742
Jul-13	2073	0.16	0	2073
Aug-13	2418	0.26	0	2418
Sep-13	2644	0.16	0	2644
Oct-13	2294	0.00	0	2294
Nov-13	1059	0.31	0	1058
Dec-13	721	0.26	0	721
Jan-14	425	0.21	0	424
Feb-14	771	0.21	0	771
Mar-14	2214	0.00	0	2214
Apr-14	2235	0.00	0	2235
May-14	3408	0.00	0	3408
Jun-14	2965	0.08	0	2965
Jul-14	2668	0.03	0	2668
Aug-14	3036	0.05	0	3036
Sep-14	2264	0.05	0	2264
Oct-14	1579	0.00	0	1579
Nov-14	1088	0.00	0	1088
Dec-14	813	0.10	0	813
Jan-15	709	0.16	0	709
Feb-15	1192	0.05	0	1191
Mar-15	2786	0.00	0	2786
Apr-15	2830	0.10	0	2830
May-15	2428	0.16	0	2428
Jun-15	2428	0.00	0	2428
Jul-15	2570	0.00	0	2570
Aug-15	2749	0.00	0	2749
Sep-15	2663	0.00	0	2663
Oct-15	1806	0.00	0	1806
Total	64512	4	0	64508

Meter no	Type	Feeder	Make	Class	Meter specifications/Year	Date of calibration	Date of Installation	Date of Removal	Cablibrated by
11068616	Main	1	L&T	0.2S	TVM - ER300P/2011	18-12-2012	21-12-2012	20-06-2013	Power Grid Corporation of India, Northern Region
11069603	Check	1	L&T	0.2S	TVM - ER300P/2011	18-12-2012	21-12-2012	20-06-2013	Power Grid Corporation of India, Northern Region
11068614	Main	2	L&T	0.2S	TVM - ER300P/2011	18-12-2012	21-12-2012	20-06-2013	Power Grid Corporation of India, Northern Region
11068622	Check	2	L&T	0.2S	TVM - ER300P/2011	18-12-2012	21-12-2012	20-06-2013	Power Grid Corporation of India, Northern Region
11070245	Main	1	L&T	0.2S	TVM - ER300P/2011	14-06-2013	20-06-2013	20-12-2013	Power Grid Corporation of India, Northern Region
11070247	Check	1	L&T	0.2S	TVM - ER300P/2011	14-06-2013	20-06-2013	20-12-2013	Power Grid Corporation of India, Northern Region
11069070	Main	2	L&T	0.2S	TVM - ER300P/2011	14-06-2013	20-06-2013	20-12-2013	Power Grid Corporation of India, Northern Region
11068620	Check	2	L&T	0.2S	TVM - ER300P/2011	14-06-2013	20-06-2013	20-12-2013	Power Grid Corporation of India, Northern Region
11069603	Main	1	L&T	0.2S	TVM - ER300P/2011	17-12-2013	20-12-2013	11-06-2014	Power Grid Corporation of India, Northern Region
11068616	Check	1	L&T	0.2S	TVM - ER300P/2011	17-12-2013	20-12-2013	11-06-2014	Power Grid Corporation of India, Northern Region
11068622	Main	2	L&T	0.2S	TVM - ER300P/2011	17-12-2013	20-12-2013	11-06-2014	Power Grid Corporation of India, Northern Region
11068614	Check	2	L&T	0.2S	TVM - ER300P/2011	17-12-2013	20-12-2013	11-06-2014	Power Grid Corporation of India, Northern Region
11070247	Main	1	L&T	0.2S	TVM - ER300P/2011	04-06-2014	11-06-2014	18-12-2014	Power Grid Corporation of India, Northern Region
11070245	Check	1	L&T	0.2S	TVM - ER300P/2011	04-06-2014	11-06-2014	18-12-2014	Power Grid Corporation of India, Northern Region
11068620	Main	2	L&T	0.2S	TVM - ER300P/2011	04-06-2014	11-06-2014	18-12-2014	Power Grid Corporation of India, Northern Region
11069070	Check	2	L&T	0.2S	TVM - ER300P/2011	04-06-2014	11-06-2014	18-12-2014	Power Grid Corporation of India, Northern Region
11069603	Main	1	L&T	0.2S	TVM - ER300P/2011	12-12-2014	18-12-2014	16-06-2015	Power Grid Corporation of India, Northern Region
11068616	Check	1	L&T	0.2S	TVM - ER300P/2011	12-12-2014	18-12-2014	16-06-2015	Power Grid Corporation of India, Northern Region
11068622	Main	2	L&T	0.2S	TVM - ER300P/2011	12-12-2014	18-12-2014	16-06-2015	Power Grid Corporation of India, Northern Region
11068614	Check	2	L&T	0.2S	TVM - ER300P/2011	12-12-2014	18-12-2014	16-06-2015	Power Grid Corporation of India, Northern Region
11070245	Main	1	L&T	0.2S	TVM - ER300P/2011	06-05-2015	16-06-2015	-	Power Grid Corporation of India, Northern Region
11070247	Check	1	L&T	0.2S	TVM - ER300P/2011	06-05-2015	16-06-2015	-	Power Grid Corporation of India, Northern Region
11069070	Main	2	L&T	0.2S	TVM - ER300P/2011	06-05-2015	16-06-2015	-	Power Grid Corporation of India, Northern Region
11068620	Check	2	L&T	0.2S	TVM - ER300P/2011	06-05-2015	16-06-2015	-	Power Grid Corporation of India, Northern Region

Annex – II

PLANT SHUTDOWN DETAILS

Date	Shutdown Hours		Total	Reason for shutdown
	Unit 1	Unit 2	Hrs	
05-01-2015	24.00	13.08	13.08	Transmission Line Faulty
06-01-2015	24.00	24.00	24.00	Transmission Line Faulty
07-01-2015	24.00	24.00	24.00	Transmission Line Faulty
08-01-2015	24.00	16.50	16.50	Transmission Line Faulty
29-07-2014	22.83	23.17	22.83	Grid Failure
30-07-2014	24.00	24.00	24.00	Grid Failure
31-07-2014	24.00	24.00	24.00	Grid Failure
06-02-2014	1.47	24.00	1.47	Grid Failure
07-02-2014	24.00	24.00	24.00	Transmission Line Faulty
08-02-2014	24.00	24.00	24.00	Transmission Line Faulty
09-02-2014	7.67	24.00	7.67	Transmission Line Faulty
14-02-2014	24.00	24.00	24.00	Transmission Line Faulty
15-02-2014	24.00	24.00	24.00	Transmission Line Faulty
16-02-2014	24.00	24.00	24.00	Transmission Line Faulty
17-02-2014	22.72	24.00	22.72	Transmission Line Faulty
01-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
02-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
03-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
04-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
05-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
06-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
07-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
08-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
09-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
10-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
11-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
12-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
13-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
14-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
15-01-2014	24.00	24.00	24.00	Transmission Line Faulty due to snow
16-01-2014	23.38	24.00	23.38	Transmission Line Faulty due to snow
21-12-2013	13.23	24.00	13.23	Grid Failure
22-12-2013	24.00	24.00	24.00	Transmission Line Faulty due to snow
23-12-2013	24.00	24.00	24.00	Transmission Line Faulty due to snow
24-12-2013	24.00	24.00	24.00	Transmission Line Faulty due to snow
25-12-2013	24.00	24.00	24.00	Transmission Line Faulty due to snow
26-12-2013	24.00	24.00	24.00	Transmission Line Faulty due to snow
27-12-2013	24.00	24.00	24.00	Transmission Line Faulty due to snow
28-12-2013	24.00	24.00	24.00	Transmission Line Faulty due to snow
29-12-2013	24.00	24.00	24.00	Transmission Line Faulty due to snow
30-12-2013	24.00	24.00	24.00	Transmission Line Faulty due to snow
31-12-2013	24.00	24.00	24.00	Transmission Line Faulty due to snow
01-05-2013	24.00	24.00	24.00	Grid Failure Jarangala Sub Station
02-05-2013	24.00	24.00	24.00	Grid Failure Jarangala Sub Station
03-05-2013	24.00	24.00	24.00	Grid Failure Jarangala Sub Station
04-05-2013	24.00	24.00	24.00	Grid Failure Jarangala Sub Station
05-05-2013	24.00	24.00	24.00	Grid Failure Jarangala Sub Station
06-05-2013	17.05	24.00	17.05	Grid Failure Jarangala Sub Station
29-01-2013	24.00	24.00	24.00	Machine Outage
30-01-2013	24.00	24.00	24.00	Machine Outage
31-01-2013	24.00	24.00	24.00	Machine Outage
Total - Hrs	1164	1205	1146	
Total - Days	49	50	48	

Appendix 1. Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	<input checked="" type="checkbox"/> Project participant <input type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	M/s Raajratna Energy Holdings Pvt Ltd
Street/P.O. Box	Plot No. 84, Kavuri Hills Phase II
Building	
City	Hyderabad
State/region	Andhra Pradesh (city now falls under Telangana state)
Postcode	500033
Country	India
Telephone	+91-40-23559922
Fax	+91-40-23559930
E-mail	
Website	
Contact person	
Title	Manager
Salutation	Mr.
Last name	Kumar
Middle name	-
First name	Gautam
Department	Finance
Mobile	+91 9963319900
Direct fax	+91-40-23110775
Direct tel.	-
Personal e-mail	gautamkumar@ksk.co.in

Project participant and/or responsible person/ entity	<input type="checkbox"/> Project participant <input checked="" type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	M/s Infinite Solutions
Street/P.O. Box	RNT Marg,
Building	611, Chetak Centre Main,
City	Indore
State/region	Madhya Pradesh
Postcode	452002
Country	India
Telephone	+91-731-4050174
Fax	-
E-mail	jimmy@infisolutions.org
Website	www.infisolutions.org
Contact person	
Title	General Manager
Salutation	Mr.
Last name	Sah
Middle name	-
First name	Jimmy
Department	Sustainability
Mobile	+91 9644130430
Direct fax	-
Direct tel.	+91-731-4050174
Personal e-mail	jimmy@infisolutions.org

- - - - -

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
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 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		