



**Monitoring report form for CDM project activity**  
**(Version 08.0)**

**MONITORING REPORT**

<b>Title of the project activity</b>	7 MW Bundled Hydro power project at Himachal Pradesh of Raajratna Energy Holdings Pvt. Ltd		
<b>UNFCCC reference number of the project activity</b>	9111		
<b>Version number of the PDD applicable to this monitoring report</b>	04		
<b>Version number of this monitoring report</b>	01		
<b>Completion date of this monitoring report</b>	10/08/2021		
<b>Monitoring period number</b>	third monitoring period		
<b>Duration of this monitoring period</b>	01/12/2018 – 31/12/2020 (including both days)		
<b>Monitoring report number for this monitoring period</b>	NA		
<b>Project participants</b>	M/s Raajratna Energy Holdings Pvt Ltd First Climate Markets AG		
<b>Host Party</b>	India		
<b>Applied methodologies and standardized baselines</b>	AMS-I.D. Grid connected renewable electricity generation - Version 17.0 Selected standardized baseline: N/A		
<b>Sectoral scopes</b>	1 : Energy industries (renewable - / non-renewable sources)		
<b>Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period</b>	<b>Amount achieved before 1 January 2013</b>	<b>Amount achieved from 1 January 2013 until 31 December 2020</b>	<b>Amount achieved from 1 January 2021</b>
	0	49,024 <sup>1</sup>	0
<b>Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD</b>	41,113 <sup>2</sup>		

<sup>1</sup> Detail Calculation has been provided in ER Sheet.

<sup>2</sup> Please refer section E.5 of the MR to refer the detailed calculation.

## **SECTION A. Description of project activity**

### **A.1. General description of project activity**

>> The main purpose of the project activity is to generate electrical energy through sustainable means using hydel power resources, the generated green electricity will contribute to climate change mitigation efforts. This project activity is a small-scale hydro project. Raajratna Energy Holdings Pvt Ltd is the project investors for this project activity. The project will replace anthropogenic emissions of greenhouse gases (GHG's), thereon displacing amount of electricity from the generation-mix of power plants connected to the Indian electricity grid, which is mainly dominated by thermal/ fossil fuel-based power plant.

The project activity involves generation of electricity by using the available hydro potential in the tributaries of the Ravi River and exporting the generated electricity to the Himachal Pradesh State Electricity Board (hereafter referred to as HPSEB). The project activity consists of 5 MW small hydropower plant 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. Belij project is a run of the river scheme on Belij Nallah, which is a tributary of river Ravi. Belij Nallah joins river Ravi on right bank just downstream of Hibra village, Chamba district, Himachal Pradesh. The electricity generated is evacuated to the grid after matching the voltage level at generation (6.6 kV) to that of the substation (33kV). The estimated annual gross electricity generation is 24.81 GWh, and the estimated electricity supplied to the grid will be 23.445 GWh annually, after taking auxiliary consumption, transformation losses and transmission losses into account. The electricity generated will be fed into HPSEB substation at Karian which is connected to the Grid.

The project is CDM registered dated 24/12/2012 and the start date is 23/02/2009. The project has been commissioned on 17/06/2012. At the time of webhosting the CDM PDD for the Global stakeholder comment process the PP intended to develop the proposed CDM project activity as 7 MW bundled small hydropower project (hereafter referred to as the bundled project or project activity) located at Himachal Pradesh, India. The bundled hydro power project consisted of the Belij project and 2 MW small hydropower plant located at Gehra, Chamba district, Himachal Pradesh, India (hereafter referred to as Gehra 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. The same PDD was submitted to the host country approval and subsequently the Host Country approval was granted to the 7 MW Bundled Project activity consisting of the Belij Project located in Hibra Village, Chamba district and the Gehra project located in the Gehra Village, Chamba district.

However, considering the technical implementation difficulties of the construction Gehra Project, the Board of Directors of Gehra Hydro Power Private Limited (GHPPL) has passed a resolution not to implement the Gehra Project. Thus, GHPPL has not placed the Equipment Supply contract or EPC contract for the Gehra Project. Hence the PDD is subsequently revised to include only the Belij project.. The project title has not been revised as it was approved by the host country DNA

The project activity is the installation of a new grid-connected renewable power plant/unit and this is not a CPA that has been excluded from a registered CDM PoA as a result of erroneous inclusion of CPAs.

## A.2. Location of project activity

>> The project is located at Hibra Village in the Chamba District, Himachal Pradesh. 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. The power house is situated on the right bank of Belij Nala at an elevation of 1217.00 m.



Project Activity

S. No	Particulars	Geographical Coordinates of Power House	Geographical Coordinates of Weir
1	Longitude	76°32'22.7" East	76° 34' 75.5" East
2	Latitude	32°47'90" North	32° 49' 25.3" North

The nearest airport to the project activity is in Gaggal (District. Kangra) and the nearest rail station is Pathankot.

## A.3. Parties and project participants

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
Germany	First Climate Markets AG	No

## A.4. References to applied methodologies and standardized baselines

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Methodology: AMS I.D Version 17.0

Title: Grid connected renewable electricity generation.

### References:

Reference has been taken from the list of the small-scale CDM project activity categories contained in Appendix B of the simplified M&P for small-scale CDM project activities.

### Tool's reference:

- Tool to calculate the emission factor for an electricity system (version 02)

- ii. Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion" Version 02

**References:** <https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTFQQOFQQH4SBK>

#### A.5. Crediting period type and duration

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Type of Crediting Period : Fixed

Crediting Period : 01/01/2013 - 31/12/2022

Length of the current crediting period: 10 years and 0 months

### SECTION B. Implementation of project activity

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

>> Belij Project is a mini hydel power projects is a run of scheme on Belij Nallah (of 5 MW capacity), which is a tributary of river Ravi, Belij nallah joins river Ravi on right bank just downstream of Hibra village in district Chamba, Himachal Pradesh. Belij nala is diverted by constructing a trench weir. The diverted inflows will be carried through conveyance channel to a surface de silting tank, which will be designed to exclude all silt particles. The silt free inflows will be carried through cut and cover channel and D-shaped head race tunnel up to fore bay. The inflows will be lead to surface power house through penstock to feed 2 Nos. of Pelton turbines driven generating units of 2.50 MW each.

S. No	Particulars	Belij
1	<b>Hydrology</b>	
a	Stream	Belij
b	Tributary	Ravi River
c	Design discharge	3.325 cumecs (m <sup>3</sup> /sec)
2	<b>Penstock</b>	
a	Type	Circular, surface, steel
b	Length	360 m
3	<b>Power house</b>	
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 consideraiton of the Transmission Losses (4.5%) Transformation loss (0.5%) and Auxiliary Power (0.5%) (GWh)	23.445 GWh

Technical Characteristics of Turbine	
Rated Net Head	221.50m
Design Flow	3.20m <sup>3</sup> /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 Characteristics of Generator
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Capacity	2.500 MW + 20% COL
Voltage Output	6600V
Rated Speed	500RPM
Frequency	50Hz
Power Factor	0.85 Lag
Configuration	Horizontal

The project activity utilizes hydropower for electricity generation, which falls into the category of renewable energy. Since the capacity of the project is 5 MW, and will be constant during the Crediting Period i.e. with no capacity addition, not exceeding the threshold installed capacity of 15 MW; the project activity can be regarded as a small-scale CDM project activity. The power generated is exported to the HPSEB grid.

## **B.2. Post-registration changes**

### **B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents**

>> Not Applicable

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

>> The corrections are already approved by the UNFCCC on 30/12/2016 (ref No: PRC-9111-001).

### **B.2.3. Changes to the start date of the crediting period**

>> Not Applicable

### **B.2.4. Inclusion of monitoring plan**

>> Not Applicable

### **B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents**

>> Not Applicable

### **B.2.6. Changes to project design**

>> Not Applicable

### **B.2.7. Changes specific to afforestation or reforestation project activity**

>> Not Applicable

## **SECTION C. Description of monitoring system**

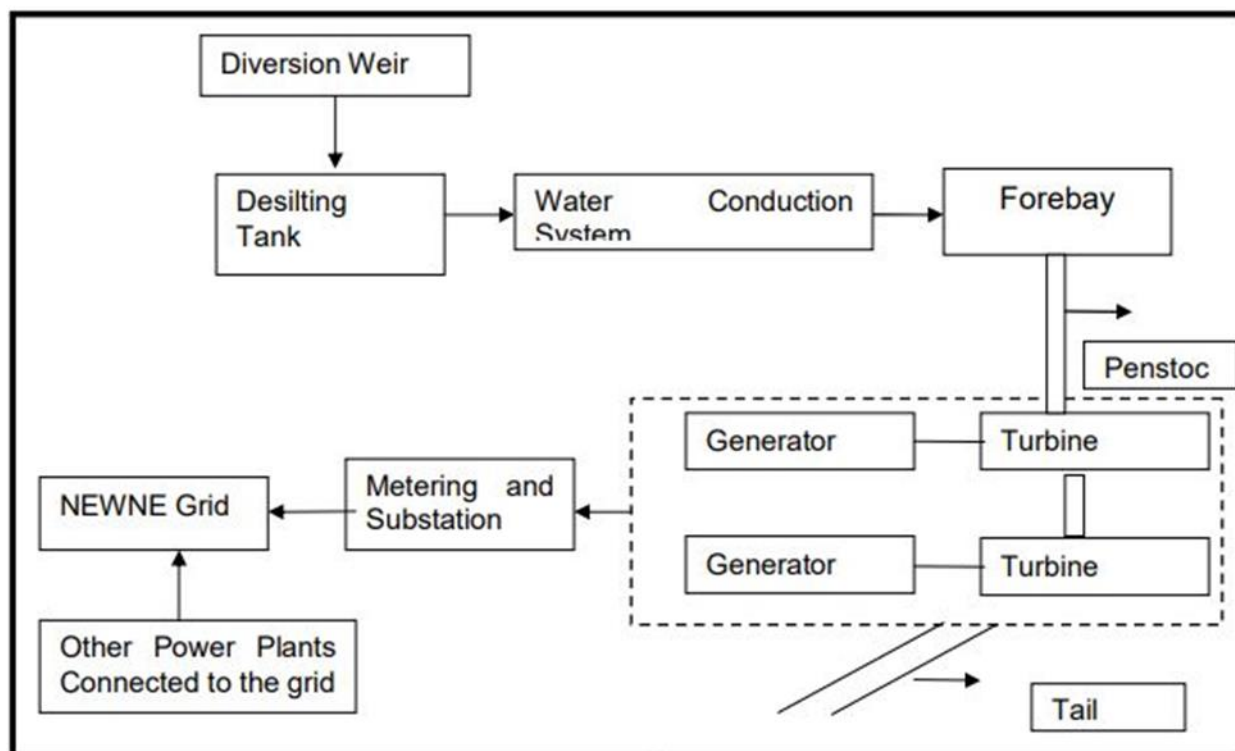
>>

The monitoring plan is developed in accordance with the modalities and procedures for CDM project activities and is proposed for grid-connected hydel power project/ unit being implemented in Himachal Pradesh, India. The monitoring plan, implemented by the project participant describes about the monitoring organisation, parameters to be monitored, monitoring practices, quality assurance, quality control procedures, data storage and archiving.

The Billing of the project is based on the Energy Meter Reading taken at the Karian Sub-station of HPSEB Limited. The Jarangala Substation has been replaced with Karian Substation on 24-April-2020. The disconnection certificate along with the connection certificate of the change of substation has been submitted.

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.

At the Common Pooling Station, one main and one check meter is provided in the incoming feeder from each of the Project. The accuracy class of Meters and the associated equipments is 0.2s Class.



### Project Management

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data rests with the Board of Directors. The Boards may delegate the same to a competent person identified for the purpose. The identified person will be the in charge of GHG monitoring activities and necessary reports will be submitted to the management or it's Committee for review.

### Monitoring Requirements

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

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 will be 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 will be evacuated through common transmission line to Karian sub station where HPSEB meters are installed.

The transmission losses from common pooling station to Karian sub station will be 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 will be 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 Karian Sub Station)

The Billing of the project is based on the Energy Meter Reading taken at the Karian 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.

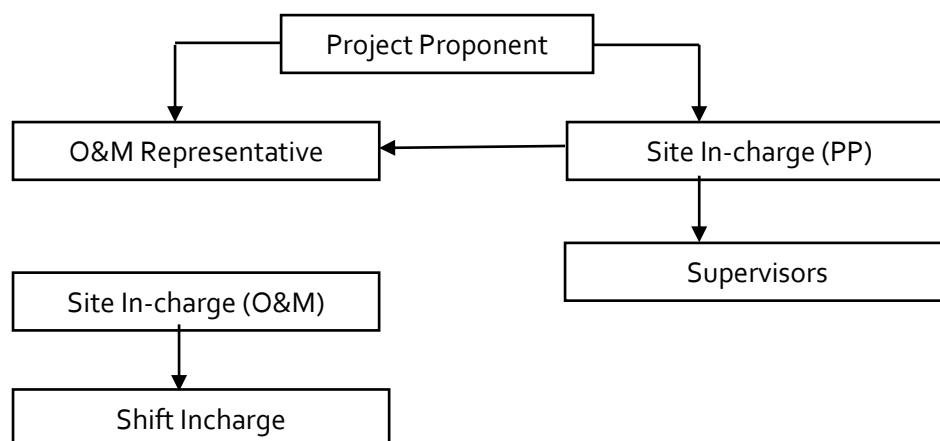
At the Common Pooling Station, one main and one check meter is provided in the incoming feeder from each of the Project. The accuracy class of Meters and the associated equipment's is 0.2s Class.

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 will 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 will calibrate 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 grid system, which will represent 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 grid for the year 2018-19.

The monitoring team will composed the following staff:



**Responsibilities of Site Incharge (PP):** Overall functioning and maintenance of the project activity, the Site incharge shall coordinate with the O&M operator as well as the site supervisors.

**Responsibilities of O&M Representative:** Co-ordination between Site incharge of the O&M operator as well as the project participant and further report to PP head office.

**Responsibilities of Site In-charge (O&M Operator):** Responsibility for maintaining the data records, ensures completeness of data, and reliability of data (calibration of equipment) as well as data recording for all the parameters.



**Responsibilities of Shift In-charge:** Responsibility for day to day data collection and maintains day to day monitored data.

**Data archiving policy:** All monitored data will be archived electronically for a period of two years after the end of the crediting period or the last issuance of CERs, whichever occurs later.

**Data Measurement:** Projects activity comprises of installation Energy meters at a Pooling Substation prior to the Delivery point.

### **QA & QC Procedures**

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

The calibration of the Main/ Check Meters and the associated metering system shall be 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, shall be provided by the project proponent and the HPSEB, respectively, at the interconnection point. Representatives of both the project proponent and HPSEB will sign the document which will 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 will be used as a basic document for monitoring and verification of the net energy exported to the grid. HPSEB will 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**

<b>Data/parameter</b>	EF <sub>grid,OM</sub> , y
<b>Unit</b>	tCO <sub>2</sub> e/MWh
<b>Description</b>	Operating Margin Emission Factor of Indian Grid
<b>Source of data</b>	Central Electricity Authority (CEA) Baseline Carbon Dioxide Emission database version 5.0 dated November 2009
<b>Value(s) applied</b>	1.0049
<b>Justification of the choice of data or description of measurement methods and procedures actually applied</b>	The data are obtained from "CO <sub>2</sub> Baseline Database for Indian Power Sector" version 5.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
<b>Any comment</b>	-

<b>Data/parameter</b>	EF <sub>grid,BM</sub> , y
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Unit	tCO <sub>2</sub> e/MWh
Description	Build Margin Emission Factor of Indian Grid
Source of data	Calculated from CEA database, Version 5.0
Value(s) applied	0.6751
Justification of the choice of data or description of measurement methods and procedures actually applied	The value used is calculated ex-ante as recent most Build margin provided by Central Electricity Authority (CEA) Baseline Carbon Dioxide Emission database version 5.0 dated November 2009
Any comment	-

<b>Data/parameter</b>	$EF_{CO_2,grid,y} = EF_{grid,CM,y}$
Unit	tCO <sub>2</sub> e/MWh
Description	Combined Margin Emission Factor of Indian Grid
Source of data	Calculated from CEA database, Version 5
Value(s) applied	0.8400
Justification of the choice of data or description of measurement methods and procedures actually applied	Calculated as per "Tool to calculate the emission factor for an electricity system,". The data is obtained from "CO <sub>2</sub> Baseline Database for Indian Power Sector" version 5.0, published by the Central Electricity Authority, Ministry of Power, Government of India. The value has been calculated as $0.5 * EF_{grid,OM,y} + 0.5 * EF_{grid,BM,y}$
Any comment	Used for emission reduction calculation. The same is fixed ex-ante for the entire crediting period

<b>Data/parameter</b>	D <sub>HSD</sub>
Unit	kg/lt
Description	Density of HSD
Source of data	Central Electricity Authority (CEA) CO <sub>2</sub> database version 5 dated November 2009. (www.cea.nic.in)
Value(s) applied	0.83
Justification of the choice of data or description of measurement methods and procedures actually applied	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.
Any comment	-

<b>Data/parameter</b>	EF <sub>HSD</sub>
Unit	tCO <sub>2</sub> e/TJ
Description	Density of HSD
Source of data	Emission Factor of HSD Source of data used: IPCC Default Value, Table 1.4, Chapter 1, Volume 2, 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Value(s) applied	74800 or 74.8
Justification of the choice of data or description of measurement methods and procedures actually applied	Table 1.4, Chapter 1, Volume 2, 2006 IPCC Guidelines for National Greenhouse Gas Inventories

Any comment	IPCC Default Value and the same will be updated as per the latest IPCC default value
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## D.2. Data and parameters monitored

Data / Parameter	EG <sub>Bly</sub>
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)
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	58,365 MWh
Calculation method (if applicable)	<p>There is a main meter and a check meter of accuracy class 0.2s at the project plant site. These meters are also referred as plant meters and are bi-directional electrical meters. The electricity exported as well as electricity imported by the project activity is recorded on a monthly basis at the plant site by representatives of PP and HPSEB authorities. This recorded sheet is signed by the representatives of the PP and is called Joint Meter Readings or JMR. 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 the representative of HPSEB as detailed in the section B.7.2. 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" The transmission losses are indicated in the Annexure "A" Calculation of net saleable Energy Based in IPP's Meter reading provided to the PP by HPSEB.</p> <p>Measurement equipment : Energy meters  Accuracy of the meters : 0.2s  Measurement interval : Continuous measurement, monthly recording</p>
QA/QC procedures	Meters will be calibrated prior to synchronization of the project and then recalibrated every 6 months. The calibration certificates of the meters will be stored. 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 will be considered. However, readings from check meter will be considered only when the main meter is not functioning or error is beyond accuracy limit. Further, all the readings will be taken jointly by HPSEB official and the PP.
Any comment	The data will be archived physical and electronically for a minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later

Data / Parameter	FC <sub>i,j,y</sub>
Unit	Litre
Description	Quantity of HSD consumed in DG Set in the project activity during the year y
Source of data	Power Plant Log Book
Value(s) of monitored parameter	765
Calculation method (if applicable)	The measurement is done by dip stick after each time usage. The DG set will have a separate fuel tank. The level indicators give the consumption of HSD in lts. After each usage (frequency) the tank is again filled to maximum level.
Measuring/reading/recording frequency	The Dip stick will be calibrated once every year.
QA/QC procedures	-
Purpose of data	The Data/Parameter is required to calculate the baseline emission

Additional comment	The data will be archived physical and electronically for a minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later
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Data / Parameter	NCVi,y
Unit	kcal/kg
Description	Net calorific value of HSD
Source of data	Central Electricity Authority (CEA) CO2 database version 5 dated November 2009. (www.cea.nic.in)
Value(s) of monitored parameter	9975
Calculation method (if applicable)	The calorific value as mentioned in the Central Electricity Authority (CEA) CO2 database version 5 dated November 2009. (www.cea.nic.in) is 10,500 kcal/kg and considering the Delta GCV NCV as 5% as mentioned in CEA CO2 Baseline Data base Version 5 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 appropriateness of the values will be checked annually by comparing the same with the latest version of the Central Electricity Authority (CEA) Baseline Carbon Dioxide Emission database published by the host party (India).
Measuring/reading/recording frequency	-
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 of the Central Electricity Authority (CEA) Baseline Carbon Dioxide Emission database published by the host party (India) available at the time of verification will be used.
Purpose of data	The Data/Parameter is required to calculate the project emission
Additional comment	Applicable as option B as specified in the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" Version 02 is used to calculate the project emissions

### D.3. Implementation of sampling plan

>> No sampling process is involved, hence not applicable

## SECTION E. Calculation of emission reductions or net anthropogenic removals

### E.1. Calculation of baseline emissions or baseline net removals

>> In the baseline, there whereas baseline Emissions for electricity supplied by project activity,  $BE_y$  is calculated as:

$$\begin{aligned}
 BE_y &= EG_{BL,y} * EF_{CO_2,grid,y} \\
 &= 58,365 * 0.84 \\
 &= 49,026 \text{ tCO}_2 \text{ (rounded down)}
 \end{aligned}$$

Where,

$BE_y$  : Baseline Emissions in year y; tCO<sub>2</sub>

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

$EF_{CO_2,Grid,Y}$ : CO<sub>2</sub> emission factor of the grid in year y (t CO<sub>2</sub>/MWh)

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

&gt;&gt;

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:

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

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}$$

$$PE_{FC,i,y} = 765 \text{ (l)} \times 0.83 \text{ (Kg/l)} \times 0.0031233 \text{ (tCO}_2\text{/kg)}$$

$$= 2.00 \text{ tCO}_2 \text{ (rounded up)}$$

**E.3. Calculation of leakage emissions**

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

**E.4. Calculation of emission reductions or net anthropogenic removals**

	Baseline GHG emissions or baseline net GHG removals (t CO <sub>2</sub> e)	Project GHG emissions or actual net GHG removals (t CO <sub>2</sub> e)	Leakage GHG emissions (t CO <sub>2</sub> e)	GHG emission reductions or net anthropogenic GHG removals (t CO <sub>2</sub> e)			
				Before 01/01/2013	From 01/01/2013 until 31/12/2020	From 01/01/2021	Total amount
<b>Total</b>	49,026	2.00	0	0	49,024	0	49,024

**E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD**

Amount achieved during this monitoring period (t CO <sub>2</sub> e)	Amount estimated ex ante for this monitoring period in the PDD (t CO <sub>2</sub> e)
49,024	41,113

**E.5.1. Explanation of calculation of “amount estimated ex ante for this monitoring period in the PDD”**

>> The project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 19,693 tCO<sub>2</sub>e per annum

The monitoring period is 01/12/2018 to 31/12/2020 i.e. 762 days

It is to be noted here that as per the estimated emission reduction to be achieved from the project activity for the current monitoring period

$$= 19,693 \times 762 \text{ (days)} / 365$$

$$= 41,113 \text{ tCO}_2\text{e}$$

whereas actual emission reductions achieved are 49,024 tCO<sub>2</sub>e, which is approximately 19.24% greater than the estimated emission reductions.

**E.6. Remarks on increase in achieved emission reductions**

>> The overall increase in PLF is 19.24%. The PLF varies each year depending on the flow and availability of water during various seasons. The higher PLF does not lead to crossing the

benchmark value for IRR. The benchmark value would be breached only when the PLF values increases by 22.9 %.

**E.7. Remarks on scale of small-scale project activity**

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The project activity utilizes hydropower for electricity generation, which falls into the category of renewable energy. Since the capacity of the project is 5 MW, and will be constant during the Crediting Period i.e. with no capacity addition, not exceeding the threshold installed capacity of 15 MW; the project activity can be regarded as a small-scale CDM project activity

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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
08.0	6 April 2021	Revision to: <ul style="list-style-type: none"> <li>• Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).</li> </ul>
07.0	31 May 2019	Revision to: <ul style="list-style-type: none"> <li>• Ensure consistency with version 02.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN);</li> <li>• Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period;</li> <li>• Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes;</li> <li>• Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods;</li> <li>• Make editorial improvements.</li> </ul>
06.0	7 June 2017	Revision to: <ul style="list-style-type: none"> <li>• Ensure consistency with version 01.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN);</li> <li>• Make editorial improvements.</li> </ul>
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> <li>• Include provisions related to delayed submission of a monitoring plan;</li> <li>• Provisions related to the Host Party;</li> <li>• Remove reference to programme of activities;</li> <li>• Overall editorial improvement.</li> </ul>
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> <li>• Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0));</li> <li>• Include provisions related to standardized baselines;</li> <li>• Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1;</li> <li>• Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>;</li> <li>• Editorial improvement.</li> </ul>
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.

<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 GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, 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).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: monitoring report		