



Monitoring report form for CDM project activity
(Version 09.0)

Complete this form in accordance with the instructions attached at the end of this form.

MONITORING REPORT

Title of the project activity	Vanala Small Scale Hydropower Project		
UNFCCC reference number of the project activity	4576 ¹		
Version number of the PDD applicable to this monitoring report	05		
Version number of this monitoring report	01		
Completion date of this monitoring report	14/01/2022		
Monitoring period number	02		
Duration of this monitoring period	01/07/2012 to 30/05/2021 (Both dates are included)		
Monitoring report number for this monitoring period	NA		
Project participants	Him Urja Private Limited		
Host Party	India		
Applied methodologies and standardized baselines	AMS I.D.-Grid connected renewable electricity generation(version 16)		
Sectoral scopes	1: Energy industries (renewable - / non-renewable sources)		
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013 until 31 December 2020	Amount achieved from 1 January 2021
	19,547 tCO ₂ e	293,437 tCO ₂ e	8,789 tCO ₂ e
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	406,019 (t CO ₂ e)		

¹ <https://cdm.unfccc.int/Projects/DB/SGS-UKL1300101472.3/view>

SECTION A. Description of project activity

A.1. General description of project activity

The Vanala Small Scale hydropower project is a 15 MW run of the river type small hydroelectricity generation project located on river Nandakini in Chamoli district of state Uttaranchal. The project involves installation of two horizontal Francis turbines generating sets of 7.5 MW each for hydroelectricity generation.

The project proponent Him Urja Private Limited, by generation of renewable electricity, contributes towards reduction of GHG emissions that would have occurred by generation of equivalent amount of electricity in the fossil fuel based regional grid.

Total emission reductions achieved in this monitoring period: During the reported monitoring period 01/07/2012 to 30/05/2021 (Both dates are included) the project activity has generated 400,516 MWh of electricity thereby reducing 321,773 tCO₂e into the atmosphere.

A.2. Location of project activity

Host Party (ies):

India

Region/State/Province etc.:

Uttarakhand

City/Town/Community etc:

District- Chamoli, Village- Vanala

Details of physical location, including information allowing the unique identification of this small-scale project activity:

The project is located near Nandprayag, about 200 km from Rishikesh on Haridwar – Badrinath Dham National Highway. The project is located on Nandakini River which is a major tributary of Alaknanda River which originates from river Ganga.

The geographical coordinates of the project activity are as follows:

	WEIR SITE	POWER HOUSE
LATITUDE (N)	30° 16'	30° 17'
LONGITUDE (E)	79° 25'	79° 23'
ELEVATION (masl)	1202.5	1056.0

The project site can be accessed from the Nand Prayag Highway. The nearest road head is Vanala- Kandai village road at 0.2 km. The Nand Prayag highway is situated at a distance of 10 km from project site. The nearest Rail head is at Rishikesh (BG) – 205 km and the nearest Airport is at Dehradun – 250 km.



A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
India (host Party)	Him Urja Private Limited ...	No

A.4. References to applied methodologies and standardized baselines

Type I: Renewable Energy Projects

Category –A.M.S I.D: Grid connected renewable electricity generation, version 16, EB 54.

Title: Grid connected renewable electricity generation (AMS I.D. version 16 – EB 54)

Reference: Indicative simplified baseline and monitoring methodologies for small-scale CDM project activity categories

A.5. Crediting period type and duration

Type of crediting period	Fixed
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Crediting period	01/06/2011 to 30/05/2021
Length of the Crediting Period	10 years
Monitoring period	01/07/2012 to 30/05/2021
Length of the Monitoring Period	3256 days

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

The hydro power plant had been successfully commissioned by Him Urja Private Limited (HUPL) and was registered by CDM Executive Board of UNFCCC on 29th March 2011 (UNFCCC Ref No. 4576) using approved small-scale methodology - "Grid connected renewable electricity generation" (AMS-I. D Version 16). The project activity has been in operation continuously (with outages – forced & planned) since its commissioning.

The project involves electricity generation by conversion of kinetic energy of the water current into electrical energy through installation of a turbine generator system. Specifications of the critical project equipment and structure are detail below

Turbine	
Type	Horizontal Francis
Number of turbines	2.0
Capacity	7.5 MW each
Manufacturer	Jyoti Limited

Generator	
Type	3 phase Synchronous type, vertical shaft, brushless/ fully excitation type
Number of generators	2.0
Rated output	7500 kw
Rated voltage	11 kv
Frequency	50 Hz
Rated output	750 Rpm
Manufacturer	Jyoti Limited

Diversion Weir

The diversion weir is a permanent raised weir with under sluice to flush out the riverbed load near intake.

Desilting Tank

A single basin with two chambers, each half the required settling capacity and dividing wall in between

Powerhouse

The powerhouse is located at about 800m east of Kandai Bridge. It is a reinforced concrete structure that will house the machine floor, control section and all the mechanical and electrical equipment's.

B.2. Post-registration changes

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

No deviation from registered monitoring plan or applied methodology

B.2.2. Corrections

There have not been any corrections to project information or parameters fixed at validation during the current monitoring period

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

There has not been any change in the start date of the crediting period.

B.2.4. Inclusion of monitoring plan

There is no inclusion of Monitoring Plan for this Monitoring Period

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

There is no permanent change for this monitoring plan.

B.2.6. Changes to project design

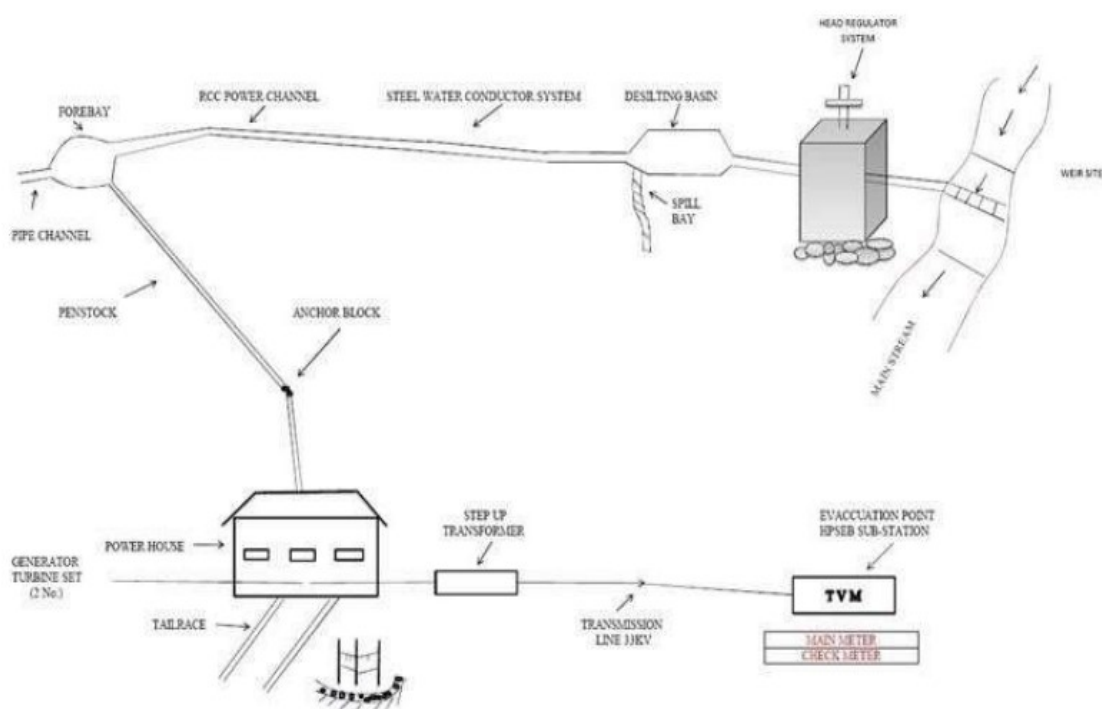
There is no change in project design for this monitoring period.

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

Not Applicable

SECTION C. Description of monitoring system

The monitoring diagram below shows the Diversion Weirs, Desilting Tank, Power house and the Transmission Lines used in the Project Activity:



The net saleable electricity to the grid by the project activity is calculated as the difference between the total electricity exported (EG_{export}) and the total electricity imported (EG_{import}).

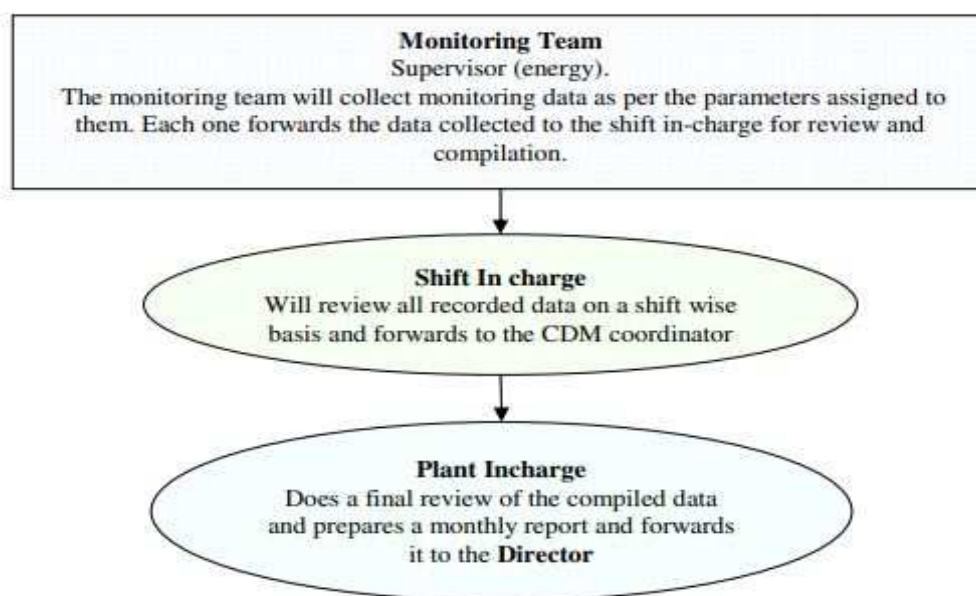
For calculating the EG_{export} and EG_{import} , a main meter is installed. The meter readings are monitored and recorded at the end of each shift by the shift in charge. The meter readings are monitored and recorded at the end of each shift by the shift in charge. Additionally, a check meter is also installed; readings from this meter is used to check accuracy of the main meter.

If during the checks, the main meter or the check meter is found to be exceeding the permissible limits of error, the same would immediately be calibrated or replaced with the spare tested/calibrated meter.

Further, the meters are tested, calibrated, and certified by a recognized Testing House/Laboratory, after every six months. Spare duly tested and calibrated meters of same accuracy as the main meter/check meter are kept as back up for use as and when required.

The monthly bills raised for payments against net saleable electricity are also archived and used to cross- check EG_y calculated using meter readings of EG_{export} and EG_{import} .

The monitoring team at the floor level consisting of monitoring supervisors are assigned the responsibility of monitoring and recording of parameters for their corresponding shifts. At the end of each shift, the recorded data are reviewed and compiled by the Shift in charge. In case of any irregularity observed, necessary action is taken immediately. The compiled reports are then forwarded to the plant in-charge. On monthly basis, the reports are prepared and forwarded to the senior management after final review and compilation by the CDM coordinator. The following organization structure is present to operate the project activity:



The onus of reviewing, storing and archiving of information in a suitable manner lies on the plant in charge. The plant in charge will undertake periodic verifications and onsite inspections to ensure the quality and reliability of the data collected and would take necessary steps in case any abnormality is observed. The plant in charge will also review the data collected and suggest corrective actions wherever required.

These monthly bills raised against net saleable electricity will be preserved for at least two years after the end of the crediting period. HUPL shall also archive the complete metering data at

generation end and all the data would be preserved for at least two years after the end of the crediting period.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	EF_{CO₂,grid}
Unit	tCO ₂ /MWh
Description	Ex- ante CO ₂ emission factor for the northern regional grid
Source of data	Baseline Carbon Dioxide Emission Database, version 4.0, given by Central Electricity Authority, CEA
Value(s) applied	0.8034
Choice of data or measurement methods and procedures	The ex-ante emission factor is calculated as combined margin using data provided by CEA which is a statutory organisation under Ministry of Power which collects and records the data concerning the generation, transmission, trading, distribution, and utilization of electricity.
Purpose of data/parameter	To calculate baseline emission
Additional comments	-

Data/Parameter	EF_{OM}
Unit	tCO ₂ /MWh
Description	Ex-ante Simple operating margin for calculation of grid emission factor
Source of data	Baseline Carbon Dioxide Emission Database, version 4.0, given by Central Electricity Authority, CEA
Value(s) applied	1.0090
Choice of data or measurement methods and procedures	The ex-ante simple operating margin has been calculated as the full generation weighted average for most recent three years using data provided by CEA which is a statutory organization under Ministry of Power which collects and records the data concerning the generation, transmission, trading, distribution and utilization of electricity.
Purpose of data/parameter	To calculate baseline emission
Additional comments	-

Data/Parameter	EF_{BM}
Unit	tCO ₂ /MWh
Description	Ex-ante Build margin for calculation of ex-ante grid emission factor
Source of data	Baseline Carbon Dioxide Emission Database, version 4.0, given by Central Electricity Authority
Value(s) applied	0.5977
Choice of data or measurement methods and procedures	The ex-ante build margin has been calculated based on the most recent information available on plants using option 1 of ACM0002 version 06, page 9, using data provided by CEA which is a statutory organisation under Ministry of Power which collects and records the data concerning the generation, Transmission, trading, distribution and utilization of electricity.
Purpose of data/parameter	To calculate baseline emission
Additional comments	-

D.2. Data and parameters monitored

Data/Parameter	EG_{BL,y}
Unit	MWh
Description	Net electricity delivered to the grid at the interconnection point
Measured/calculated/default	Calculated as the difference of (EG_{export}) and (EG_{import})
Source of data	Monthly bills for net saleable electricity raised by HUPL.
Value(s) of monitored parameter	400,516
Monitoring equipment	Not Applicable as this is a calculated parameter
Measuring/reading/recording frequency	Monthly
Calculation method (if applicable)	Difference of (EG_{export}) and (EG_{import}). The data will be calculated and recorded. Records of monthly electricity sales bills will be used as evidence for net power exported to grid
QA/QC procedures	This is a calculated figure hence no QA/QC procedures are required
Purpose of data/parameter	To calculate emissions during monitoring period
Additional comments	The data recorded would be stored for crediting period + 2 years

Data/Parameter	EG_{export}
Unit	MWh
Description	Total electrical energy exported by the project activity
Measured/calculated/default	Measured parameter
Source of data	Joint Meter Readings, Plant log books
Value(s) of monitored parameter	424,653.905
Monitoring equipment	Energy meters installed at the interconnection point.
Measuring/reading/recording frequency	The total electricity exported to the grid is measured continuously by the energy meters installed at the interconnection point. The joint meter readings of the meters are recorded at the end of every month. The monitoring data would be recorded in the plant log books.
Calculation method (if applicable)	Not applicable
QA/QC procedures	In order to ensure the highest levels of accuracy in the monitoring procedures, the main meter and the check meter used for the monitoring are checked for accuracy 15 days before the synchronization. The main meter and the check meter would be calibrated after every six months. Each such meters shall be deemed to be working satisfactorily so long as the errors are within the IS of said accuracy class. Spare duly tested and calibrated meters of same accuracy would be kept as back up for use as and when required.
Purpose of data/parameter	For calculation of the Net electricity exported to the grid
Additional comments	The data recorded would be stored for crediting period + 2 years

Data/Parameter	EG_{import}
Unit	MWh

Description	Total electricity energy imported by the project activity
Measured/calculated/default	Measured parameter
Source of data	Joint Meter Readings, Plant log books
Value(s) of monitored parameter	247.70
Monitoring equipment	Energy meters installed at the interconnection point.
Measuring/reading/recording frequency	The total electricity imported from the grid is measured continuously by the energy meters installed at the interconnection point. The joint meter readings of the meters will be recorded at the end of every month. The monitoring data would be recorded in the plant log books.
Calculation method (if applicable)	Not applicable
QA/QC procedures	In order to ensure the highest levels of accuracy in the monitoring procedures, the main meter and the check meter used for the monitoring are checked for accuracy 15 days before the synchronization. The main meter and the check meter would be calibrated after every six months. Each such meters shall be deemed to be working satisfactorily so long as the errors are within the IS of said accuracy class. Spare duly tested and calibrated meters of same accuracy would be kept as back up for use as and when required.
Purpose of data/parameter	For calculation of the Net electricity exported to the grid
Additional comments	The data recorded would be stored for crediting period + 2 years

D.3. Implementation of sampling plan

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No sampling plan has been used for this project activity.

SECTION E. Calculation of emission reductions or net anthropogenic removals

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

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In reference to the registered PDD, the baseline emissions are the product of the electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor.

$$BE_y = EG_{BL,y} * EFCO_{2,grid,y}$$

Here:

BE_y = Baseline Emissions in the year y (tCO_2 / year)

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

$EF_{CO_2,grid}$ = CO_2 emission factor of the grid in year y (tCO_2/MWh)

Year	$EG_{BL,y}$ Quantity of net electricity generated in the year y (MWh)	$EFCO_{2,grid,y}$ Emission factor of the grid in year y (tCO_2/MWh)	BE_y Baseline Emissions in year y (tCO_2)
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01/07/2012 to 31/12/2012	24,331.08	0.8034	=19,547(Round down Value)
01/01/2013 to 31/12/2020	365,244.92	0.8034	=293,437(Round down Value)
01/01/2021 to 31/05/2021	10,940.20	0.8034	=87,89(Round down Value)
Baseline emissions achieved			= 321,773

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

Project emissions due to the project activity within the project boundary are nil, the project being a renewable hydroelectric power project.

E.3. Calculation of leakage emissions

As per the registered PDD, leakage estimation are only required if renewable energy technology is equipment transferred from another activity, or if the existing equipment is transferred to another activity. As no equipment is transferred from another activity, neither is existing equipment being transferred to another activity, hence, leakage emissions need not be accounted.

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

	Baseline GHG emissions or baseline net GHG removals (t CO ₂ e)	Project GHG emissions or actual net GHG removals (t CO ₂ e)	Leakage GHG emissions (t CO ₂ e)	GHG emission reductions or net anthropogenic GHG removals (t CO ₂ e)			
				Before 01/01/ 2013	From 01/01/ 2013 until 31/12/ 2020	From 01/01/ 2021	Total amount
Total	321,773	0	0	19,547	293,437	8,789	321,773

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 ₂ e)	Amount estimated ex ante for this monitoring period in the PDD (t CO ₂ e)
321,773	406,019

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

Considering the annual average emission reductions as per the registered PDD which is 45,515 tCO₂e per year, the number of days covered during the current monitoring period comes out to be 3256 days, based upon which the estimated emission reductions attributed to this monitoring period comes out to be 406,019 tCO₂e. The detailed calculation can be referred from the emission reduction sheet.

E.6. Remarks on increase in achieved emission reductions

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 is 406,019 tCO₂e, whereas actual emission reductions achieved are 321,773 tCO₂e, which is approximately -20.75 % lower than the estimated emission reductions. The generation of electricity depends upon many other climatic conditions, and not within the control of the project participant.

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

The project activity remained within the limit of small-scale project activity in each year of the crediting period as the project capacity is less than the limit of small scale CDM Project activity.

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
09.0	8 October 2021	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 03.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN).
08.0	6 April 2021	Revision to: <ul style="list-style-type: none"> • Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).
07.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
06.0	7 June 2017	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 01.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Make editorial improvements.
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.

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