

86 MW HYDRO PROJECT IN HIMACHAL PRADESH



Document Prepared By EKI Energy Services Limited

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The purpose of the project activity is to generate electricity by using the renewable energy source (water) for a grid system at village Jari, Kullu District, Himachal Pradesh, India. The project activity displaces electricity and greenhouse gases (GHG) emissions currently produced by thermal fossil fuel-burning facilities. The generated electricity by the project activity is being exported to the PTC (Power Trading Company) India Ltd.

The Unit 2 (43 MW) of project activity was commissioned on 05th July 2001, followed by Unit 1 (43 MW) on 09th July 2001.

The project is a grid connected hydel power plant which is run of the river type with a small reservoir. It involved construction of a barrage across Malana Nallah, 3 Km downstream of Malana village, a head regulator, a de-silting basin storage reservoir to divert water draft of 21 cumecs through a 3.2 Km long headrace tunnel, ending in a 5 m diameter surge shaft. A pressure shaft conveys water through a 2.2 m diameter surface penstock to 2 Pelton turbines, each of capacity 43 MW totaling to 86 MW plant capacity, housed in a surface powerhouse. Generated electricity is fed into NEWNE grid, which has been made by synchronizing Northern, Eastern, Western and North Eastern Grids (NEWNE) of India (now a part of the Indian grid).

The total GHG emission reductions in this monitoring period is 666,460 tCO_{2e}.

1.2 Sectoral Scope and Project Type

According to the categorization system of the Clean Development Mechanism, which is part of Green House Gas (GHG) program that has been approved by the VCS board, the project is categorized as:

Type I: Renewable energy projects

Category ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources

Reference: Consolidated baseline methodology for grid-connected electricity generation from renewable sources ACM-0002, Version: 12.3.0¹, 11th May 2012, EB 67

Tools referred:

- Combined tool to identify the baseline scenario and demonstrate additionality²- Version-4.0
- Tool for the demonstration and assessment of additionality³- Version-6.0

Sectoral Scope: 01, Energy industries (renewable/ non-renewable sources)

The specified project is not a part of any grouped project.

1.3 Project Proponent

¹ https://cdm.unfccc.int/EB/archives/meetings_12.html#66 As per revalidated VCS PD, applied methodology version is ACM0002 Version 12.1.0. However, due to editorial change methodology version has been updated by CDM EB from ACM0002 Version 12.1.0 to ACM0002 Version 12.3.0. Hence, updated in the MR which is in line with Para 13 of EB 61 annex 25.

² https://cdm.unfccc.int/EB/archives/meetings_11.html#66

³ https://cdm.unfccc.int/EB/archives/meetings_11.html#65

Organization name	Malana Power Company Limited
Contact person	Mr. O.P. Ajmera
Title	Chief Executive Officer
Address	Bhilwara Towers, A-12, Sector -1, Noida-201301, Uttar Pradesh, India
Telephone	+91-120- 4390300
Email	opajmera@lnjbhilwara.com

1.4 Other Entities Involved in the Project

Organization name	EKI Energy Services Limited
Role in the project	Project Consultant
Contact person	Mr. Manish Dabkara
Title	MD & CEO
Address	Office No. 201, EnKing Embassy, Plot No. 48, Scheme No. 78, Part II, Vijay Nagar, Indore – 452010, Madhya Pradesh, India.
Telephone	+91-731-4289086
Email	manish@enkingint.org

1.5 Project Start Date

The start date of the project is 5th July 2001, which is the commissioning date of the project activity.

1.6 Project Crediting Period

Credit Period: 10 years and 0 month; Renewal twice

1st Crediting Period: 5th July 2001 – 4th July 2011; (VCU got issued for entire period)

2nd crediting period: 5th July 2011 - 4th July 2021

1.7 Project Location

The project is located at Jari village in district Kullu of Himachal Pradesh around 25 Km from Bhunter. The Project activity is uniquely identified as Malana Hydro Project in the region. The nearest railway station from the project site is Kiratpur Sahib, about 198 Km from Bhunter. Bhunter has airport and is well connected to Delhi.

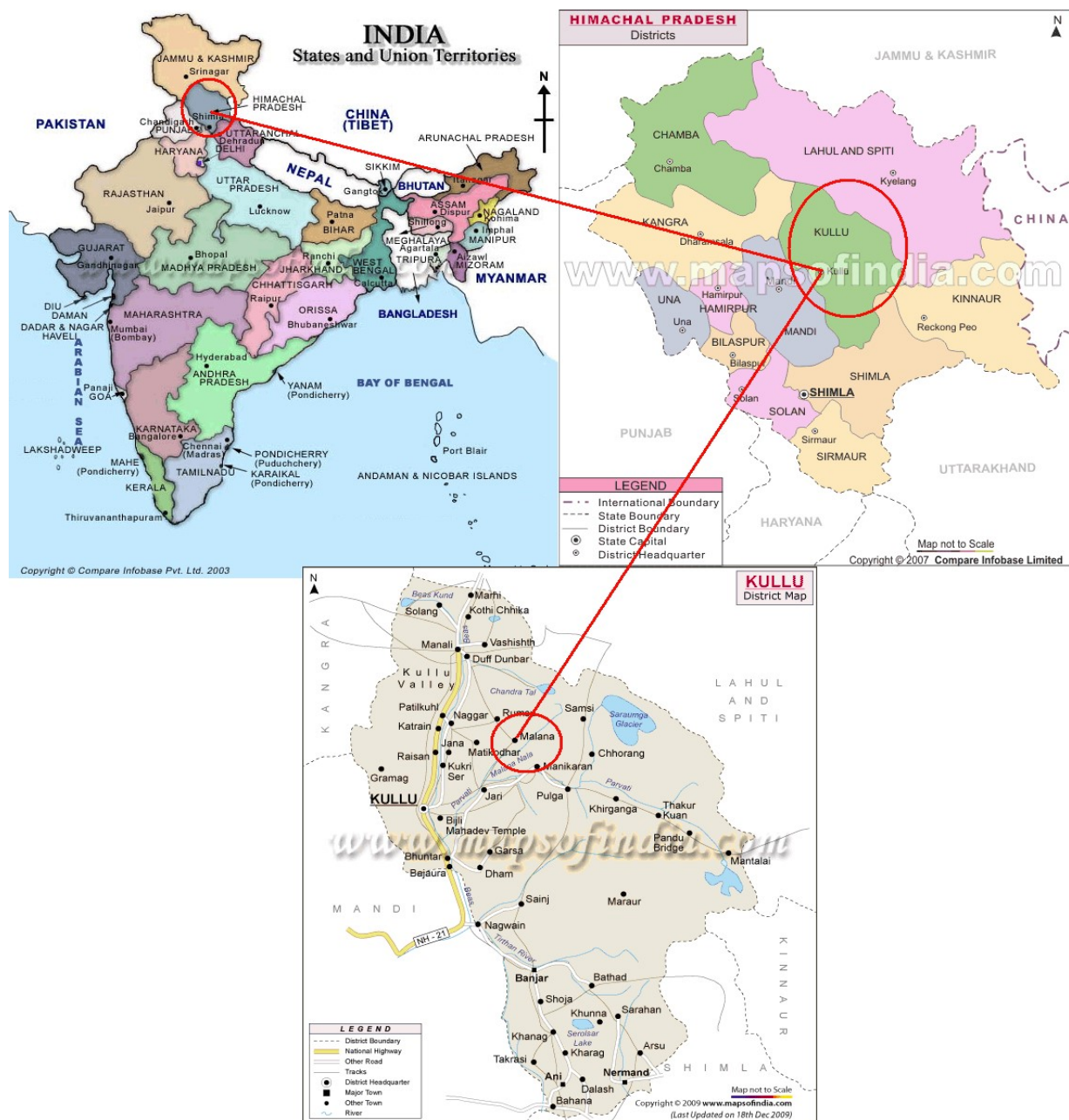
Coordinates of the Barrage:

Latitude: 32° 2' 24" N; Longitude - 77° 15' 4" E

Coordinates of Power House:

Latitude - 32° 0' 12" N; Longitude - 77° 14' 30" E

For the project activity, the project boundary is from the diversion site to the point of power supply to nearest substation, where the project proponent has full control.



1.8 Title and Reference of Methodology

Title: Consolidated baseline methodology for grid-connected electricity generation from renewable sources

Reference: Approved consolidated baseline methodology; ACM0002, Version 12.3.0⁴. 11th May 2012, EB 67

⁴ https://cdm.unfccc.int/EB/archives/meetings_12.html#66 As per revalidated VCS PD, applied methodology version is ACM0002 Version 12.1.0. However, due to editorial change methodology version has been updated by CDM EB

Tools referred:

- Combined tool to identify the baseline scenario and demonstrate additionality⁵- Version-4.0
- Tool for the demonstration and assessment of additionality⁶- Version-6.0

1.9 Other Programs**Emission Trading Programs and Other Binding Limits**

Net GHG emission reductions or removals generated by the Project are not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions in any Emission Trading program or other binding limits.

Other forms of Environmental Credit

The Project has no intend to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

Participation under other GHG programs

The project activity has been registered under I-REC mechanism. The PP has claimed I-REC from the project. The details for the period, during which I-REC has been claimed/issued, is provided in the table below.

Duration	Volume claimed/issued
01/01/2016 to 31/12/2016	315,567
01/01/2017 to 30/06/2017	119,495
01/10/2017 to 30/11/2017	32,618
01/01/2018 to 31/05/2018	49,287
01/01/2019 to 24/06/2019	116,601

The issuing statement from I-REC is available to PP and has also been provided to DOE as a supporting for the above information.

The current VCS monitoring period is from 01-March-2015 to 31-December-2018. During the current monitoring period, the durations during which I-REC has been issued, has been excluded for the VCU calculations.

1.10 Sustainable Development**Contribution to sustainable development:**

Ministry of Environment and Forests, has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. The project contributes to sustainable development using the following ways.

Social well-being: The project helped in generating employment opportunities during the construction and operation phases. The project activity also lead to development in infrastructure in the

from ACM0002 Version 12.1.0 to ACM0002 Version 12.3.0. Hence updated in the MR which is in line with Para 13 of EB 61 annex 25.

⁵ https://cdm.unfccc.int/EB/archives/meetings_11.html#66

⁶ https://cdm.unfccc.int/EB/archives/meetings_11.html#65

region like development of roads and also may promote business with improved power generation.

Economic well-being: The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits. The project activity also help to reduce the demand supply gap in the state.

Technological well-being: The successful operation of project activity lead to promotion of hydro based power generation and would encourage other entrepreneurs to participate in similar projects.

Environmental well-being: Hydro being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Since the project activity is a hydro power project, it also helps in avoiding significant amount of GHG emissions and specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities.

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

Unit 2 (43 MW) of project activity was commissioned on 05th July 2001, followed by Unit 1 (43 MW) on 09th July 2001. Since then, the project is under operation at full capacity of 86 MW.

Project activity was under operation during the current monitoring period as well.

There is no exchange of equipment during the monitoring period. There is no event occurred during this monitoring period, which may have impact on the applicability of the methodology as well as emission reduction.

2.2 Deviations

2.2.1 Methodology Deviations

No deviation is taken during the current monitoring period.

2.2.2 Project Description Deviations

No deviation is taken during the current monitoring period.

2.3 Grouped Project

The specified project is not a part of a grouped project.

2.4 Safeguards

2.4.1 No Net Harm

Not applicable.

2.4.2 Local Stakeholder Consultation

As per VCS Guidelines, this section is not mandatory as the project is already registered and DOE Contract for validation was prior to 19/04/2017. There were no other major comments or protest raised by the stakeholders and they were totally in support for setting up of these kinds of projects in the region.

As a part of continuous feedback from stakeholders, the PP also placed a grievance register onsite where-in, the stakeholders can put down their complain and the same if found genuine are addressed immediately.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data / Parameter	EF _{BM,grid, y}
Data unit	tCO ₂ /MWh
Description	The Build Margin emission factor for year 2009-10 of NEWNE grid (now a part of the Indian grid)
Source of data	CEA CO ₂ Baseline Database, version 06
Value applied:	0.812
Justification of choice of data or description of measurement methods and procedures applied	Calculated using the latest version of the "Tool to calculate the emission factor for an electricity system".
Purpose of the data	Baseline emission calculation
Comments	Latest available value for 2009-10 was used.

Data / Parameter	EF _{OM,grid, y}
Data unit	tCO ₂ /MWh
Description	The Operating Margin emission factor of NEWNE grid (now a part of the Indian grid)
Source of data	CEA CO ₂ Baseline Database, version 06
Value applied:	0.994
Justification of choice of data or description of measurement methods and procedures applied	Calculated using the latest version of the "Tool to calculate the emission factor for an electricity system".
Purpose of the data	Baseline emissions
Comments	CEA CO ₂ Baseline Database for most recent three years at the time of revalidation

Data / Parameter	EF _{CM,grid, y}
Data unit	tCO ₂ /MWh
Description	The Emission factor of the NEWNE grid (now a part of the Indian grid)

Source of data	Calculated as the weighted average of the build margin emission factor and operating margin emission factor (with 50/50 weights to OM and BM)				
Value applied:	0.858				
Justification of choice of data or description of measurement methods and procedures applied	Calculated using the latest version of the "Tool to calculate the emission factor for an electricity system".				
Purpose of the data	The values are taken from the database developed by Central Electricity Authority (CO ₂ Baseline database for the Indian power sector, Version 6.0). The database is Government of India's official publication based on the 'Tool to calculate the emission factor for an electricity system'.				
Comments	<table border="1"> <tr> <td>BM</td><td>0.812</td></tr> <tr> <td>OM</td><td>0.994</td></tr> </table>	BM	0.812	OM	0.994
BM	0.812				
OM	0.994				

3.2 Data and Parameters Monitored

Data / Parameter	EG _y
Data unit	MWh
Description	Net Electricity supplied to the NEWNE grid (now a part of the Indian grid) by the project activity during the year y
Source of data	Meters installed at three locations, at generation point, plant sent out point and at Bajaura Substation, accurately monitors electricity supplied to the grid. Joint Meter readings taken at all three stations have been used to achieve the parameter EG _y .
Description of measurement methods and procedures to be applied	This is calculated value and formula for the same is given below under section of calculation method.
Frequency of monitoring/recording	-
Value monitored	776,771.30 MWh
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Calculation of Baseline emission
Calculation method	-
Comments	This is calculated value and formula for the same is given below under section of calculation method

Data / Parameter	EG _{Gen,Malana}
Data unit	MWh
Description	Energy generated by Malana Hydro Power project at the Generation point.
Source of data	Joint Meter Reading (JMR) by State Electricity Board (SEB)

Description of measurement methods and procedures to be applied	Meter installed at the generation point is used to record this parameter. SEB take the reading on monthly basis and issue the JMR.
Frequency of monitoring/recording	Monitoring Frequency : Continuous Recording Frequency : Monthly
Value monitored	790,096.28 MWh
Monitoring equipment	Type : Electricity Meter Accuracy Class of meters : 0.2 %
QA/QC procedures to be applied	Meters are maintained by state electricity board. These meters are calibrated once in three year and the records maintained by state electricity department.
Purpose of the data	Calculation of Baseline emissions
Calculation method	-
Comments	-

Data / Parameter	EG_{Malana}
Data unit	MWh
Description	Energy supplied by the Malana Hydro Power Project to the Malana transmission line at Malana Yard.
Source of data	Calculated
Description of measurement methods and procedures to be applied	This is calculated value and formula for the same is given below under section of calculation method.
Frequency of monitoring/recording	As per actual data
Value monitored	786,756.66 MWh
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Calculation of Baseline emissions
Calculation method	-
Comments	-

Data / Parameter	EG_{Toss}
Data unit	MWh
Description	The units/ Energy supplied by the Toss Hydro Power Project to the Malana transmission line at Malana Yard
Source of data	Monthly meter readings issued by HPSEB
Description of measurement methods and procedures to be applied	Meter installed at the Malana yard is used to record this parameter
Frequency of monitoring/recording	Monitoring Frequency : Continuous Recording Frequency: Monthly

Value monitored	183,120.20 MWh
Monitoring equipment	Type : Electricity Meter Accuracy Class of meters: 0.2%
QA/QC procedures to be applied	Meters are maintained by state electricity board. These meters are annually calibrated and the records maintained by state electricity department.
Purpose of the data	Calculation of Baseline emission
Calculation method	-
Comments	-

Data / Parameter	EG_{M&T}
Data unit	MWh
Description	Total Energy sent out both Malana and Toss hydro power project to the Malana transmission line at Malana yard.
Source of data	Joint Meter Reading (JMR) by SEB
Description of measurement methods and procedures to be applied	Meter installed at the Malana yard is be used to record this parameter.
Frequency of monitoring/recording	Monitoring Frequency : Continuous Recording Frequency : Monthly
Value monitored	969,876.86 MWh
Monitoring equipment	Type : Electricity Meter Accuracy Class of meters : 0.2 %
QA/QC procedures to be applied	Meters are maintained by state electricity board. These meters are annually calibrated and the records maintained by state electricity department.
Purpose of the data	Calculation of Baseline emission
Calculation method	-
Comments	-

Data / Parameter	EG_{Aux, Malana}
Data unit	MWh
Description	Auxiliary consumption by Malana hydro power project
Source of data	Calculated
Description of measurement methods and procedures to be applied	This is calculated value and formula for the same is given below under section of calculation method
Frequency of monitoring/recording	-
Value monitored	3,339.62 MWh
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Calculation of Baseline emission

Calculation method	-
Comments	-

Data / Parameter	EG_{Bajoura, M&T}
Data unit	MWh
Description	Energy injected at Bajoura substation by both Malana & Toss hydro power project
Source of data	Joint Meter reading issued by SEB
Description of measurement methods and procedures to be applied	Meter installed at the Bajoura substation is used to record this parameter
Frequency of monitoring/recording	Monitoring Frequency : Continuous Recording Frequency: Monthly
Value monitored	961,851.09 MWh
Monitoring equipment	Type : Electricity Meter Accuracy Class of meters : 0.2 %
QA/QC procedures to be applied	Meters are maintained by state electricity board. These meters are annually calibrated and the records maintained by state electricity department.
Purpose of the data	Calculation of Baseline emission
Calculation method	-
Comments	-

Data / Parameter	L_{Transmission}
Data unit	MWh
Description	Total transmission losses between Malana yard and Bajoura substation
Source of data	Calculated
Description of measurement methods and procedures to be applied	This is calculated value and formula for the same is given below under section of calculation method.
Frequency of monitoring/recording	-
Value monitored	8,025.76 MWh
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Calculation of Baseline emission
Calculation method	-
Comments	-

Data / Parameter	L_{Malana}
Data unit	MWh
Description	Share of losses of Malana hydro power project

Source of data	Calculated
Description of measurement methods and procedures to be applied	This is calculated value and formula for the same is given below under section of calculation method
Frequency of monitoring/recording	-
Value monitored	6,645.73 MWh
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Calculation of Baseline emission
Calculation method	-
Comments	-

Data / Parameter	L_{Toss}
Data unit	MWh
Description	Share of losses of Toss hydro power project
Source of data	Calculated
Description of measurement methods and procedures to be applied	This is calculated value and formula for the same is given below under section of calculation method.
Frequency of monitoring/recording	-
Value monitored	1,380.028 MWh
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	Calculation of Baseline emission
Calculation method	-
Comments	-

Data / Parameter	AP_J
Data unit	m ²
Description	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full
Source of data	Project site
Description of measurement methods and procedures to be applied	Measured from topographical surveys, maps, satellite pictures, etc
Frequency of monitoring/recording	Yearly
Value monitored	18,250 m ²

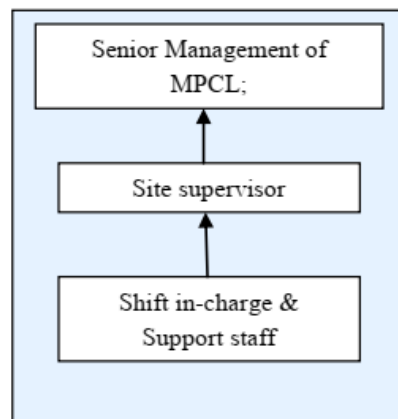
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	-
Calculation method	-
Comments	-

Data / Parameter	CapPJ
Data unit	W (Watt)
Description	Installed capacity of the hydro power plant after the implementation of the project activity
Source of data	Project site
Description of measurement methods and procedures to be applied	Determine the installed capacity based on recognized standards
Frequency of monitoring/recording	Yearly
Value monitored	86,000,000 W
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of the data	-
Calculation method	-
Comments	-

3.3 Monitoring Plan

Project Management Plan:

A team is constituted with participation from relevant departments. People are trained on CDM concept and monitoring plan. This team is responsible for data collection and archiving. This team meets periodically to review CDM project activity check data collected, emissions reduced etc. On a weekly basis, the monitoring reports is checked and discussed by the seniors and team members/managers. In case of any irregularity observed, it is being informed to the concerned person for necessary actions. On monthly basis, these reports are forwarded at the management level.



Senior Management of MPCL/Technical Head: Overall responsibility of compliance with the CDM monitoring plan.

Site Supervisor: Responsibility for completeness of data, reliability of data (calibration of meters), and monthly report generation

Shift In-charge: Responsibility of daily report generation

Data Monitoring:

The methodology requires monitoring of the following:

- Electricity generation from the project activity

Energy supplied to Grid

The energy supplied to grid is measured using electricity meters located at Bajaura substation. The net electricity supplied is measured as

$$EG_y = \text{Total Generation} - \text{Auxiliary Consumption} - \text{Transmission Losses}$$

In the current practice another hydroelectric power project (Toss) was allowed to utilise the Malana –Bus for sending out the generated electricity. A common meter is now being used to measure the electricity being sent out by Malana and Toss collectively at Malana Yard

Since there is a common meter for measuring the electricity sent out from Malana Bus Bar, hence now the calculation of auxiliary consumption and transmission losses are based on combined energy sent out & combined energy injected at Bajaura Sub Station. The calculation for auxiliary consumption and transmission losses for Malana HEP is described in the section 3.2 of the MR. Calculation is based on the authenticated Letter issued by HPSEB, 12 October, 2009.

Gross generation at Malana is being measured by meter at generation point. The source of values taken for this parameter is the Joint Meter Reading (JMR). Energy sent out by Toss is measured by meter at the Toss incoming line, the meter readings are recorded and maintained by HPSEB. The total energy sent out by Malana and Toss combined is measured by meter at Malana Bus, the source for these values is the JMR. The total energy injected at Bajoura substation by Malana and Toss combined is measured by meter at Bajoura substation. Auxiliary consumption and the share of transmission loss by Malana are calculated as per formula given in section 3.2. The total energy injected by Malana at Bajaura substation is calculated by subtracting the auxiliary consumption and Malana's share of transmission loss from the Gross generation by Malana.

Completeness

For Electricity generation data: The project activity install the latest state-of-art monitoring and control equipment that measure, record, report, monitor and control various key parameters. Real time data collection happen using these control systems. An hourly log of data also prepared by the shift in-charge. A daily report of aggregation of these data also prepared. Parameters monitored are the total power generated, power exported to the grid and auxiliary power consumed (other parameters like head availability, grid issues; frequency etc is also maintained hourly in the log).

Reliability

For electricity generation data: automatic control meters for power generation and exports is regularly maintained. The regular plant operating & maintenance procedures are also include process of regular meter testing, calibration & maintenance. All these meters are calibrated & tested before installation and the calibration of meters is done once in three year at Government of India certified Lab.

Actual power generation data is also metered using power output meter at the substation. The billing invoices for the power sold and meter readings could be used to validate the data accuracy.

Frequency

The measurement is recorded and monitored on a continuous basis. An hourly log is prepared by the shift in-charge. At the end of the day, hourly data is aggregated in a daily report. The meters to be provided are of 0.2% accuracy class.

Training

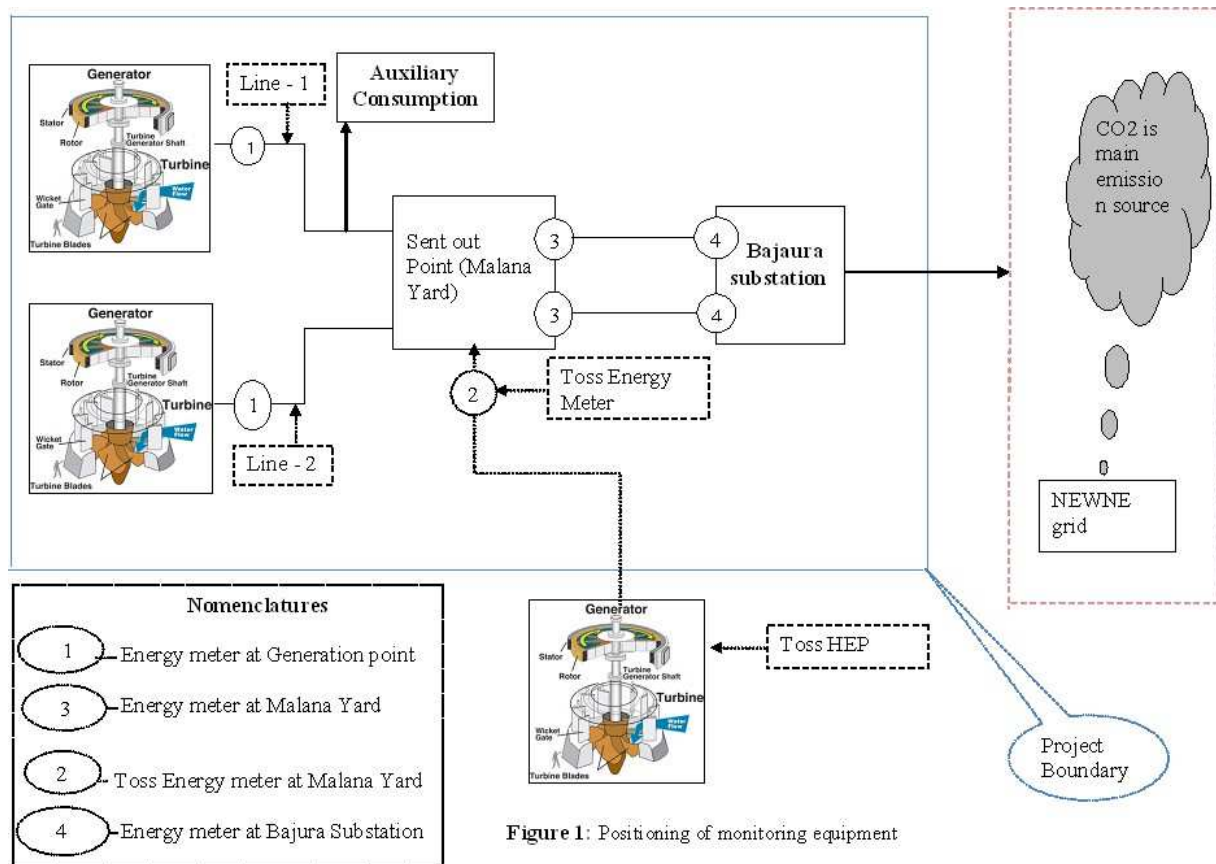
Training needs have been identified in project document; however the group is already operating a plant in Manikaran valley & experienced staff is available for plant O&M.

Report generation on monitoring

After verification of the data and due diligence on correctiveness, if required, an annual report on monitoring and estimations is maintained and record to this effect is maintained for verification.

Internal audits of VCS project compliance

A VCS audit is carried out to check the correctness of procedures and data monitored by the internal auditing team entrusted for the work. Report on internal audits done, faults found and corrective action taken is maintained and kept for external auditing.



4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

The baseline is the MWh produced by the renewable generating unit multiplied by an emission coefficient (measured in tCO₂equ/MWh) calculated in a transparent and conservative manner as:

$$BE_y = EF_y \times EG_y$$

Where,

BE_y: Baseline emissions due to displacement of electricity during year y in tons of tCO₂e

EG_y: Electricity supplied to the grid by the project activity during the year y in MWh,

EF_y: CO₂ baseline emission factor for the electricity displaced due to the project activity in during the year y in tons CO₂/MWh

Grid Emission Factor

The GEF is fixed ex-ante in the PD as given below:

Parameter	Value
OM	0.994

BM	0.812
CM	0.858

Therefore, $EF_y = 0.858 \text{ tCO}_2/\text{MWh}$

Baseline Emissions

Formula for Baseline emissions as discussed is

$$\begin{aligned}
 BE_y &= EG_y * EF_y \\
 &= 776,771.30 * 0.858 \\
 &= 666,460 \text{ tCO}_2\text{e}
 \end{aligned}$$

4.2 Project Emissions

Since, the proposed project activity is a renewable energy project which generates electricity using hydro power; no anthropogenic emissions by sources of greenhouse gases within the project boundary are identified.

Hence $PE_y = 0$

4.3 Leakage

No anthropogenic greenhouse gases by sources outside the project boundary that are significant, measurable and attributable to the project activity are identified. Hence, no leakage is considered from the project activity. In addition, project proponents confirm that the renewable energy technology is not equipment transferred from another activity. Hence, no leakage calculation is required.

Therefore, as specified in ACM0002, project participants do not need to consider leakage. Hence, $LE_y = 0$.

4.4 Net GHG Emission Reductions and Removals

$$ER_y = BE_y - PE_y$$

BE_y = Baseline Emissions

PE_y = Project emissions

Therefore, Net GHG Emission Reductions and Removals are calculated as follows:

$$\begin{aligned}
 ER_y &= 666,460 - 0 \\
 &= 666,460 \text{ tCO}_2\text{e}
 \end{aligned}$$

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2015	281,727	0	0	281,727
2017	166,408	0	0	166,408
2018	218,325	0	0	218,325
Total	666,460	0	0	666,460

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 485,389 tCO₂e, whereas actual emission reductions achieved are 666,460 tCO₂e, which is approximately 37% higher than the estimated emission reductions.

Annex-1: Calibration and Meter Details

The details of the calibrations of the Energy Meters have been provided in the table below.

Meter Serial No.	Accuracy Class	Meter Make	Location of the Meter	Date of calibration	Due date of calibration
KRB00282	0.2 s	Secure	Malana G-1 Main Meter	19-08-2014	18-08-2015
HPU05820 ⁷				17-08-2015	16-08-2016
				12-08-2016	11-08-2017
				10-08-2017	09-08-2018
				08-08-2018	07-08-2019
KRB00281	0.2 s	Secure	Malana G-1 Check Meter	19-08-2014	18-08-2015
HPU06253 ⁸				17-08-2015	16-08-2016
				12-08-2016	11-08-2017
				10-08-2017	09-08-2018
				08-08-2018	07-08-2019
AB0014A	0.2 s	Secure	Malana G-2 Main Meter	19-08-2014	18-08-2015
HPU05821 ⁹				17-08-2015	16-08-2016
				12-08-2016	11-08-2017
				10-08-2017	09-08-2018
				08-08-2018	07-08-2019
KRB00279	0.2 s	Secure	Malana G-2 Check Meter	19-08-2014	18-08-2015
AB0013A ¹⁰				17-08-2015	16-08-2016
				12-08-2016	11-08-2017
				10-08-2017	09-08-2018
				08-08-2018	07-08-2018
HPU06254 ¹¹	0.2 s	Secure	Malana Line-1 Main Meter	19-08-2014	18-08-2015
AB0006A				17-08-2015	16-08-2016
				12-08-2016	11-08-2017
				10-08-2017	09-08-2018
				08-08-2018	07-08-2019
HPU05987 ¹²	0.2 s	Secure	Malana Line-1 Check Meter	19-08-2014	18-08-2015
AB0010A				17-08-2015	16-08-2016
				12-08-2016	11-08-2017
				10-08-2017	09-08-2018
				08-08-2018	07-08-2019
AB0011A	0.2 s	Secure	Malana Line 2 Main Meter	19-08-2014	18-08-2015

⁷ The old Main Meter with SL. No. KRB00282 was replaced with the new Main Meter with SL. No. HPU05820, which was calibrated and installed on 12-08-2016.

⁸ The old Check Meter with SL. No. KRB00281 was replaced with the new Main Meter with SL. No. HPU06253, which was calibrated and installed on 08-08-2018.

⁹ The old Main Meter with SL. No. AB0014A was replaced with the new Main Meter with SL. No. HPU05821, which was calibrated and installed on 12-08-2016.

¹⁰ The old Check Meter with SL. No. KRB00279 was replaced with the new Check Meter with SL. No. AB0013A, which was calibrated and installed on 17-08-2015.

¹¹ The old Check Meter with SL. No. HPU06254 was replaced with the new Check Meter with SL. No. HPU06254, which was calibrated and installed on 08-08-2018.

¹² The old Main Meter with SL. No. AB0006A was replaced with the new Main Meter with SL. No. HPU05987, which was calibrated and installed on 10-08-2017.

				17-08-2015	16-08-2016
				12-08-2016	11-08-2017
HPU05988 ¹³				10-08-2017	09-08-2018
				08-08-2018	07-08-2019
AB0005A	0.2 s	Secure	Malana Line-2 Check Meter	19-08-2014	18-08-2015
				17-08-2015	16-08-2016
				12-08-2016	11-08-2017
				10-08-2017	09-08-2018
				08-08-2018	07-08-2019
KRB09865	0.2 s	Secure	Bajaura Line-1 Main Meter	19-08-2014	18-08-2015
				17-08-2015	16-08-2016
				12-08-2016	11-08-2017
				10-08-2017	09-08-2018
				08-08-2018	07-08-2019
AB0001A	0.2 s	Secure	Bajaura Line-1 Check Meter	19-08-2014	18-08-2015
				17-08-2015	16-08-2016
				12-08-2016	11-08-2017
				10-08-2017	09-08-2018
				08-08-2018	07-08-2019
AB0002A	0.2 s	Secure	Bajaura Line-2 Main Meter	19-08-2014	18-08-2015
				17-08-2015	16-08-2016
				12-08-2016	11-08-2017
HPU05989 ¹⁴				10-08-2017	09-08-2018
				08-08-2018	07-08-2019
AB0003A	0.2 s	Secure	Bajaura Line-2 Check Meter	19-08-2014	18-08-2015
				17-08-2015	16-08-2016
				12-08-2016	11-08-2017
				10-08-2017	09-08-2018
				08-08-2018	07-08-2019
AB0013A	0.2 s	Secure	Spare Meter	19-08-2014	18-08-2015
AB0007A	0.2 s	Secure	Spare Meter	19-08-2014	18-08-2015
KRB06956	0.2 s	Secure	Spare Meter	16-08-2015	15-08-2016
HPU05821	0.2 s	Secure	Spare Meter	16-08-2015	15-08-2016
HPU05820	0.2 s	Secure	Spare Meter	16-08-2015	15-08-2016

¹³ The old Main Meter with SL. No. AB0011A was replaced with the new Main Meter with SL. No. HPU05988, which was calibrated and installed on 10-08-2017.

¹⁴ The old Main Meter with SL. No. AB0002A was replaced with the new Main Meter with SL. No. HPU05989, which was calibrated and installed on 10-08-2017.