



**Verified Carbon
Standard**

KISHANGANGA HYDROELECTRIC PROJECT



MPCON Ltd.

Project Title	Kishanganga Hydroelectric Project
Version	04
Report ID	1891-03
Date of Issue	27-March-2024
Project ID	1891
Monitoring Period	01-April-2021 to 30-June-2022 (Including first and last dates)
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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Kishanganga Hydroelectric Project is a Greenfield 330 MW capacity run-of-the-river hydro power project located in Bandipora District of Jammu & Kashmir state of India. The hydel energy generated from the power plant is evacuated to the State Grid System which is part of Indian grid, which is predominantly fossil fuel based. The energy from the hydropower plant is a cleaner form of energy and displaces electricity that would otherwise be generated using fossil fuel sources in the Indian grid.

The project got fully commissioned on 30-March-2018 and has been in operation since then. The expected operational lifetime of the project is 35 years. The detailed phase wise commissioning dates are mentioned in section 3.1 of this monitoring report. The project was registered at VCS (Project I.D. 1891¹).

During the current monitoring period of 1-April-2021 to 30-June-2022, the project has supplied 2,177,170 MWh of electricity to the Indian Grid, and thus contributing to the GHG reductions of 1,986,885 tCO_{2e}.

The audit history of the project is as follows

Audit Type	Period	Program	VVB Name	Number of years
Joint Validation and 1 st Verification 1	13-Mar-2018 to 31-May-2019	VCS	Earthhood Services Private Limited	1 Year, 2 Month & 18 days
Verification 2	01-June-2019 to 31-Mar-2021	VCS	LGA Technological Center, S.A. (Applus+ Certification)	1 Years, 10 Months
Verification 3	1-April-2021 to 30-June-2022	VCS	LGA Technological Center, S.A. (Applus+ Certification)	1 Year & 3 Month
Total	13-Mar-2018 to 30-June-2022	VCS		4 Year, 3 Month & 18 days

¹ <https://registry.verra.org/app/projectDetail/VCS/1891>

1.2 Sectoral Scope and Project Type

The project activity falls under the following Sectoral scope and Project Type:

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

Project Type : I - Renewable Energy Projects

Methodology : ACM0002: Grid-connected electricity generation from renewable sources- Version 19.0²

The project is not a grouped project activity.

1.3 Project Proponent

Organization name	NHPC Limited
Contact person	Dr. Avinash Kumar
Title	DGM (Environment), R & D Division.
Address	NHPC Limited, NHPC Office Complex, Sector 33, Faridabad - 121003, Haryana, India
Telephone	+91-0129-2278421
Email	cdm-env@nhpc.nic.in

1.4 Other Entities Involved in the Project

Organization name	MPCON Ltd
Role in the Project	Project consultant
Contact person	Mr Manoj Mishra
Title	Chief Manager
Address	Ground Floor, Rajiv Gandhi Bhawan-2, 35, Shyamla Hills, Bhopal -462002
Telephone	0755-4909829,2666556
Email	operationscc.mpcon@mpconsultancy.org

²

https://cdm.unfccc.int/filestorage/5/8/I/58IAGB7SZUDE02VN6LYM30K41HFPRQ/EB100_repan06_ACM0002.pdf?t=SzR8cnJvZHN4fDAn2FoLcGnBwZDSIX4YA9Te

1.5 Project Start Date

Project Start Date: 13-March-2018, which is the date of commissioning of the first turbine.

1.6 Project Crediting Period

Crediting Period : 13-March-2018 to 12-March-2028

Type of crediting period : Renewable

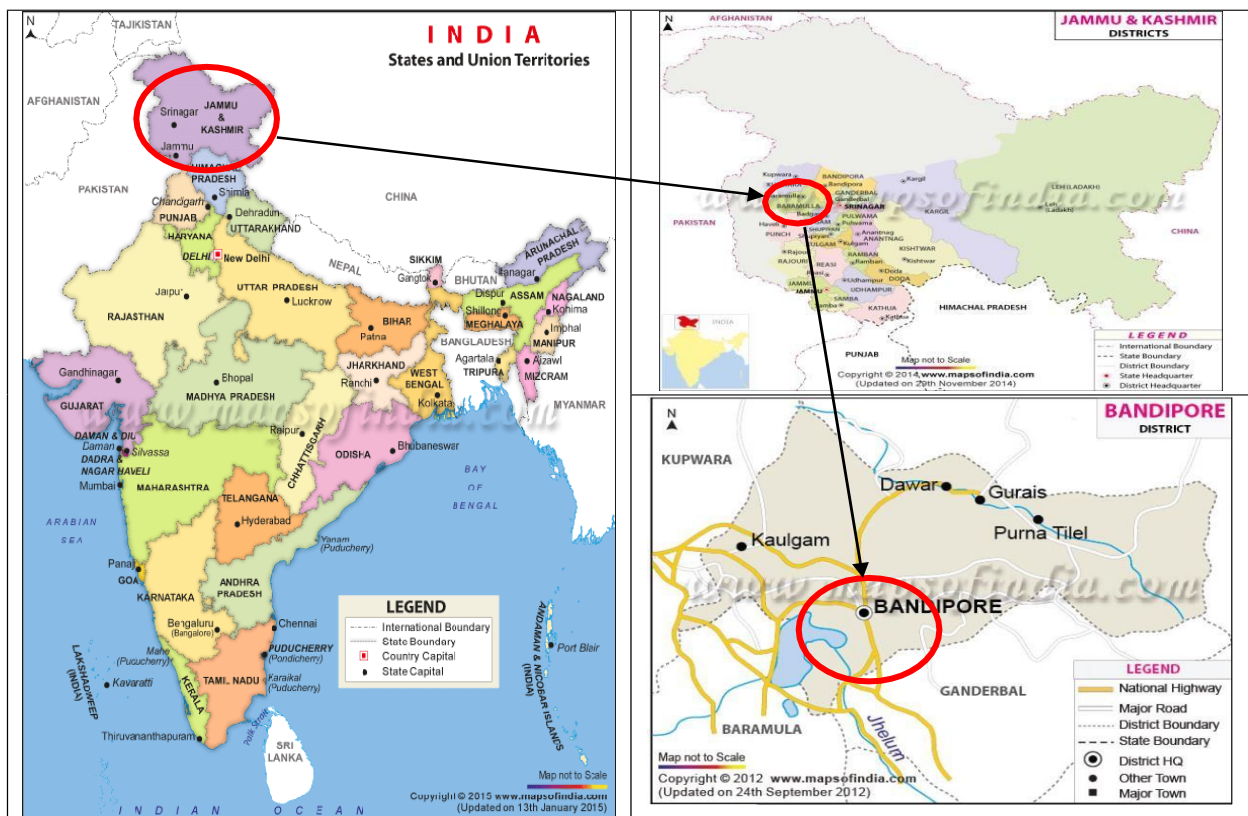
Length of crediting period : 10 years

1.7 Project Location

The hydro power project is located in Bandipora District of Jammu & Kashmir state of India. Geo-coordinates of the project location are:

Dam site	Latitude- 34° 39' 00" N, Longitude- 74° 45' 08" E
Power Station site:	Latitude- 34° 28' 17" N, Longitude- 74° 38' 28" E

The map below shows the exact location of the project activity:



1.8 Title and Reference of Methodology

Project Type	: Type-I: Renewable Energy Projects
Methodology	: ACM0002
Title	: Grid-connected electricity generation from renewable sources
Version No.	: Version 19.0 ³
Reference	: CDM Methodology

The methodology refers to following CDM Tools:

- Tool to calculate the emission factor for an electricity system - Version 07.0 (EB 100, Annex 04)⁴
- Methodological Tool- Tool for the demonstration and assessment of additionality – Version 07.0.0 (EB 70, Annex 08)⁵

1.9 Participation under other GHG Programs

The project has neither been registered nor seeking registration under any other GHG programs. The project activity is not participating in any other GHG program.

1.10 Other Forms of Credit and Supply Chain (Scope 3) Emissions

Emission Trading Programs and other Binding Limits:

The project is not participating in other emission trading programs. The project participant confirmed that net GHG emission reductions or removals generated during this monitoring period have not been used for any compliance under any programs or mechanisms.

Other forms of Environmental Credit:

The project activity neither has nor intends to generate any other form of GHG related environmental credit for GHG emission reductions or removals claimed under the VCS Program. The initial project activity is neither has nor intends to generate any other form of GHG related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

Supply Chain (Scope 3) Emissions: Not applicable, as this project is not related to supply chain

³

https://cdm.unfccc.int/filestorage/5/8/I/58IAGB7SZUDEO2VN6LYM30K41HFPRQ/EB100_repan06_ACM0002.pdf?t=cHR8cnJvZHZ0fDDA8P7PwJljpB7bhOBwqcnw

⁴

<https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

⁵

<https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v7.0.0.pdf>

1.11 Sustainable Development Contributions

The several sustainable development activities have been carried out during the current monitoring period are mentioned below:

For SDG- 7: Through this grouped project activity, it has contributed towards SDG-7 i.e., Affordable and clean energy by setting up of 330 MW capacity run-of-the-river hydro power project .

For SDG- 4: NHPC Limited, along with technology supplier has provided two training related to technical and soft skills to its staff & other team members during the current monitoring period. The details of training is provided in Annexure 1 of this report.

For SDG- 13: NHPC Limited is committed to work for mitigation of climate change by generating electricity using clean energy sources. In this current monitoring period, project has achieved GHG emission reductions of 1,986,885 tCO_{2e}.

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	7.2	7.2.1: Renewable energy share in the total final energy consumption	Implemented activities to increase	About 2,177,170 MWh renewable electricity has been supplied to Indian grid during the reported period that helps to increase the renewable energy share in the energy mix.	Overall, approx. 4,656,473 MWh (751,127 + 1,728,176+ 2,177,170) of renewable electricity would be supplied to Indian grid throughout the project lifetime that helps to increase the renewable energy share in the energy mix.
2)	4.4	4.4.1: Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill	Implemented activities to increase	Together with the technology supplier, the Project organize 2 training during the current monitoring period. Training related to technical and soft skills.	Overall, various trainings would be provided during project lifetime.
3)	13.0	Total greenhouse gas emissions per year	Implemented activities to increase	By supplying 2,177,170 MWh of clean electricity to Indian grid, the project avoided release of 1,986,885 tCO ₂ e in to the atmosphere during the reporting period.	Overall, would prevent the release of 4,249,490 tCO ₂ e (685,478 + 1,577,127+ 1,986,885) into the atmosphere throughout the project lifetime.

2 SAFEGUARDS

2.1 No Net Harm

The project does not involve any potential negative environmental and socio-economic impacts and hence this criterion is not applicable to this project activity.

2.2 Local Stakeholder Consultation

As a part of ongoing communication with stakeholders, a dedicated visitor registers cum grievance register has been placed at the project site and accessible to stakeholders to provide their feedback on the project. During the current monitoring period, no grievances has been received.

Stakeholder meetings was organized at the time of registration. The details of same can be referred from registered PD MR for the Project weblink (Project I.D. 1891⁶).

During the current monitoring period, no any grievances received during the current monitoring period; therefore, no any mitigation measures are required. Copy of grievance register have been submitted to DOE.

2.3 AFOLU-Specific Safeguards

This is not applicable, as the project is not a AFOLU Project

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

Project is already commissioned & fully operational. The details of commissioning are as follows

Project Name	Unit No.	Turbine Capacity	Location	Commissioning Date ⁷
Kishanganga Hydroelectric	I	110 MW	Bandipora; Jammu & Kashmir	13-Mar-2018
	II	110 MW	Bandipora; Jammu & Kashmir	21-Mar-2018

⁶ <https://registry.verra.org/app/projectDetail/VCS/1891>

⁷ <https://cea.nic.in/wp-content/uploads/2020/04/qly98.pdf>

Project	III	110 MW	Bandipora; Jammu & Kashmir	30-Mar-2018
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During current monitoring period (01-April-2021 to 30-June-2022), There is a change in other entity as per registered VCS PD. Details of other entity & respective deviation has been provided in section 3.2.2 of this monitoring report. The applied deviation doesn't have any impact on the project applicability, baseline scenario, additionality etc.

Salient Features:

KISHANGANGA H. E. PROJECT (3 x 110 MW), J&K

SALIENT FEATURES

1	LOCATION	
	State	Jammu & Kashmir
	District	Bandipora
	River	Kishanganga
	Dam site	Gurez valley
	Latitude	34°39'00"
	Longitude	74°45'08"
	Power House site	Near village Kralpora, Bandipora
	Latitude	34°28'17"
	Longitude	74°38'28"
2	HYDROLOGY	
	Catchment area	1815 km ²
	Max. Observed flood	990 cumec
	Probable Max. flood	2000 cumec
	Avg. Annual run-off	3103 Mcum
	Annual rainfall	676 mm
	Annual snowfall	1206 mm
3	RESERVOIR	
	Full Reservoir level	2390.0m
	Max. Reservoir level	2390.0m
	MDDL	2384.5m
	Gross storage upto FRL	18.35Mcum
	Dead storage capacity	10.80Mcum
	Live storage capacity	7.55 Mcum
4	DAM	

	Type	CFRD
	Max. height above deepest river bed	37m
	EL. of Top of dam	2395.0m
5	SPILLWAY	
	Design flood	2000 cumec
	Type	Chute Spillway
	Crest elevation of gated spillway	2370.00m
	No. of gates	3
	Energy dissipation	Flip bucket
6	DIVERSION TUNNEL	
	Number	1
	Size	9.5m dia
	Shape	Horse shoe
	Length	569m
	Diversion capacity	1000 cumecs
7	INTAKE	
	Invert level	El 2378.80
8	HEAD RACE TUNNEL	
	Number	1
	Size and Shape	6.24m Horse Shoe Shape (DBM) /5.2 m dia., Circular (TBM)
	Length	23.2 km (14.75km TBM & 8.45km DBM) Approx.
	Design discharge	58.40 cumec
9	HRT ADITS	
	No. & Length	Three – 224m, 659m & 262m
10	SURGE SHAFT	
	Dia.	17.75 m

	Height	109.66m
	Type	Restricted orifice
11	PRESSURE SHAFT	
	No. & type	One circular, Inclined, steel lined
	Diameter	4.0m, trifurcating into three 2.30m dia., horizontal branches at bottom
	Length	1020m
12	POWER HOUSE COMPLEX	
	Type	Underground, two caverns
	Installed capacity	330 MW
	No. of units	3
	Power house cavity	113m x 21.3m x 46.5m
	Transformer hall cavity	75m x 15m x 15.2m
	Type of turbine	Pelton wheel
	Design Max. Gross head	670.82m
	Rated net head	646m
	Tail water level	
	For 1 unit operation	1711.18m
	For 2 unit operation	-
	For 3 unit operation	1714.15m
13	TAIL RACE SYSTEM	
	Tunnel Portion	
	Tunnel Portion type	Horse shoe
	Length	903m Approx.
	Diameter	5.0m

	Open channel	Length 36m Approx.
14	SWITCHYARD	
	Size & Location	191m x 115m Near Kralpora village
15	POWER GENERATION	
	Installed capacity	330 MW
	Annual design energy generation	1712.96Gwh

Estimated life time of the project:	35 years
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The total capacity of the project activity is 330 MW and the power produced displaces an equivalent amount of power from the grid, which is fed mainly by fossil fuel fired power plants. Hence, it results in reduction of GHG emissions. During the current monitoring period, no any event occurred that impact the GHG emission reduction or removals and monitoring practices

3.2 Deviations

3.2.1 Methodology Deviations

Not Applicable, as there are no methodological deviations applied during current monitoring period.

3.2.2 Project Description Deviations

Project description deviations applied during current monitoring period

Deviation 1:

During current monitoring period (01-April-2021 to 30-June-2022), There is a change in other entity as per registered VCS PD. The details for other entity involved for the current monitoring period is mentioned below-

Organization name	MPCON Ltd
Role in the Project	Project consultant
Contact person	Mr Manoj Mishra
Title	Chief Manager
Address	Ground Floor, Rajiv Gandhi Bhawan-2, 35, Shyamla Hills, Bhopal -462002

Telephone	0755-4909829,2666556
Email	operationscc.mpcon@mpconsultancy.org

The applied deviation doesn't have any impact on the project applicability, baseline scenario, additionality etc.

3.3 Grouped Projects

This is not applicable, as the project is not a grouped project

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,OM,y}$
Data unit	tCO ₂ /MWh
Description	Operating Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 14, December 2018 ⁸
Value applied	0.9610
Justification of choice of data or description of measurement methods and procedures applied	Calculated as per "Tool to calculate the emission factor for an electricity system, version 07.0.0" as 3-year generation weighted average using data for the years 2015-16, 2016-17 & 2017-18. The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 14.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	$EF_{grid,BM,y}$
Data unit	tCO ₂ /MWh
Description	Build Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 14, December 2018
Value applied	0.8644
Justification of choice of data or description of	Calculated as per "Tool to calculate the emission factor for an electricity system, version 07.0.0" as 3-year generation weighted average using data for the years 2017-18. The data are obtained from "CO ₂ Baseline

⁸https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver14.pdf

measurement methods and procedures applied	Database for Indian Power Sector” version 14.0, published by the Central Electricity Authority, Ministry of Power, Government of India.
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO ₂ /MWh
Description	Combined Margin CO ₂ emission factor in year y
Source of data	Calculated from CEA database, Version 14, December 2018
Value applied	0.9126
Justification of choice of data or description of measurement methods and procedures applied	The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ Where: $EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/MWh) $EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (tCO₂/MWh) W_{OM} = Weighting of operating margin emissions factor (%) = 50% W_{BM} = Weighting of build margin emissions factor (%) = 50%
Purpose of Data	For the calculation of the Baseline Emission
Comments	This parameter is fixed ex-ante for the entire crediting period.

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{PJ,y}$
Data unit	MWh
Description	Quantity of electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Deviation Settlement Account statement issued by NRPC ⁹
Description of measurement methods and procedures to be applied	Data Type: Measured Monitoring equipment: Energy Meters are used for monitoring Recording Frequency: Continuous monitoring and Monthly recording from Energy Meters, Summarized Annually Archiving Policy: Paper & Electronic Calibration frequency: 5 years Electricity exported by the project to the grid at project site switch yard is the actual generation recorded and monitored by the metering system installed at the project site switch yard.

⁹Northern Regional Power Committee

	The metering system comprises of three individual special energy meters (SEMs) (acts as standby meters) installed at the power station, for each generating unit. These are connected via four transmission lines of 220 kV, each having its own SEM meter (main meter and check meter). In case, anyone transmission line is not in service than complete load is shifted to other transmission line which is in operation. The energy meters are special energy meters which are installed and sealed by the Power Grid Corporation of India Limited in the presence of the representatives of the power producer. The check meter are used during the period, when the main metering system is not in service. Further in case of failure of both main meter and check meter, sum of the net electricity generation recorded by three individual special energy meters (SEMs) and individual auxiliary meters shall be used for accounting and billing purpose.
Frequency of monitoring/recording	Continuous measurement and at least monthly recording
Value monitored	2,177,170
Monitoring equipment	Special Energy Meters (SEMs) of 0.2s accuracy class
QA/QC procedures to be applied	Energy meters are calibrated once in a five year. As per registered VCS PD & MR, all meters were installed in 2018 by PGCIL, however testing/calibration of the energy meters was done in 2015. The calibration validity of meters was till 2020. There was a delay in calibration covering the present monitoring period (01-April-2021 to 30-June-2022). The calibration of the energy meters is not under the control of PP. and hence there was a delay in calibration. The Power Grid Corporation of India Limited (PGCIL) has a full control of the energy meters. The calibration is done only when the PGCIL representatives find any discrepancy in the meter readings, not at regular intervals. The meters & calibration details are provided in Section 4.3 of this Monitoring Report. The energy meters are in the custody of the distribution network and the distribution network takes the call based on their requirement.
Purpose of the data	Calculation of Baseline emissions
Calculation method	NA
Comments	The data would be archived electronically and maintained for the entire crediting period plus two years.

4.3 Monitoring Plan

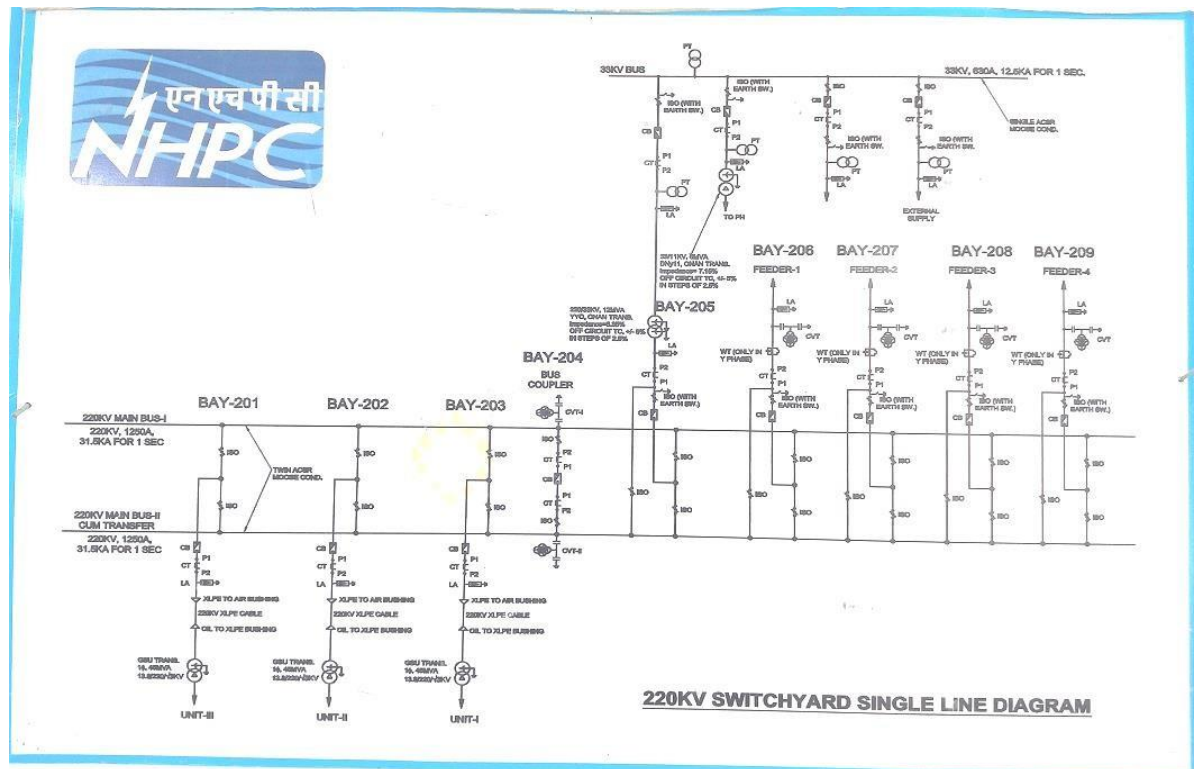
The project proponents at the power station have a procedure to ensure proper monitoring of the VCS project activity. The project activity has installed monitoring and control equipment that measure, record, report, monitor and control various key parameters.

The methodology requires monitoring of the net electricity supplied from the project activity.

The proponent maintains complete and accurate records and all other data required for the purpose of proper administration and operation of the hydro power plant. The data is kept for at least 2 years after the end of the crediting period.

1. **Purpose** - The purpose of monitoring the project is to assess the annual emission reductions in tonnes of CO₂ that the project activity has achieved.
2. **Data to be reported** - EG_{PJ,y} Quantity of net electricity generation supplied by the project plant
3. **Source of Data** - The net electricity supplied to the grid is directly sourced from “Deviation Settlement Account statement” issued by “Northern Regional Power Committee (NRPC), Ministry of Power, Govt of India
4. **Meter Details:**

The metering system comprises of three individual special energy meters (SEMs) (acts as standby meters) installed at the power station switch yard, for each generating units for monitoring and recording of electricity generation through individual unit after transformation losses. These 3 units are further connected to 4 feeders via four transmission lines of 220 kV. In order to monitor auxiliary power consumption, separate meter of same technical specification is installed at power station switch yard.



Each feeder line having one set of energy meters (main meter and check meter) installed at the power station switch yard for measurement and recording the electricity supplied to the grid by the project activity. All the meters are of accuracy class 0.2s, installed and sealed by the Power Grid Corporation of India Limited.

Installed Meters & Calibration Details

As per registered VCS PD & MR¹⁰, all meters were installed in 2018 by PGCIL, however testing/calibration of the energy meters was done in 2015. The calibration validity of meters was till 2020¹¹. There was a delay in calibration covering the present monitoring period (01-April-2021 to 30-June-2022). The calibration of the energy meters is not under the control of PP. and hence there was a delay in calibration. The Power Grid Corporation of India Limited (PGCIL) has a full control of the energy meters. The calibration is done only when the PGCIL representatives find any discrepancy in the meter readings, not at regular intervals.

As per the CDM validation and verification standard for project activities, Version 03.0, if the calibration is delayed, the following conservative approach need to be followed: “Applying the maximum permissible error of the energy meter to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration, if the results of the delayed calibration do not show any errors in the measuring equipment, or if the error is smaller than the maximum permissible error.”

The latest calibration for all the meters was done in 2023. As the % error indicated in the calibration reports is within the limits of Maximum Permissible Error (MPE) +/- 0.2%, thus Factor for delayed calibration aka (1-0.2%) has been applied to the values of energy generation from 01-April-2021 to 30-June-2022 (the end of the crediting period).

The energy meter details along with calibration details are given below:

Meter ID no-	Make	Place of Installation	Meter Sr.No.	Meter type	Accuracy Class	Installed On	Date of testing/calibration	Result
KG-01	Elster	220 kV Amarga rh-1	NR-3292-A	Main	0.2s	Feb-2018	17/11/2015 - 16/11/2020 16/09/2023 - 15/09/2028	Error is within the limits
KG-02	Elster		NR-3314-A	Check	0.2s		17/11/2015 - 16/11/2020 16/09/2023 - 15/09/2028	
KG-03	Elster	220 kV Amarga rh-2	NR-3504-A	Main	0.2s		17/12/2015 - 16/12/2020 13/09/2023 - 12/09/2028	
KG-04	Elster		NR-3236-A	Check	0.2s		05/10/2015 - 04/10/2020 Not Available	
	Schneider		WR-2169-A ¹²	Check	0.2s	Jun-2022	13/06/2022 - 12/06/2027	
KG-05	Elster	220 kV Wagoora-1	NR-3241-A	Main	0.2s	Feb-2018	05/10/2015 - 04/10/2020 13/09/2023 - 12/09/2028	
KG-06	Elster		NR-3243-A	Check	0.2s		05/10/2015 - 04/10/2020 13/09/2023 - 12/09/2028	
KG-07	Elster	220 kV Wagoora-2	NR-3245-A	Main	0.2s		05/10/2015 - 04/10/2020 Not Available	
	Schneider		WR-2167-	Main	0.2s	Jun-2022	13/06/2022 - 12/06/2027	

¹⁰ <https://registry.terra.org/app/projectDetail/VCS/1891>

¹¹ According to No. 502/70/CEA/DP&D In exercise of the powers conferred by sub-section (1) of section 55 and clause (e) of section 73 read with sub-section (2) of section 177 of Electricity Act, 2003 “Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006” and subsequent amendments clause 18 (1), (2) and (3), para number 18 of Calibration and periodical testing of meters need to be calibrated at least once in five years.

¹² The meter number NR-3236-A was replaced with the meter WR-2169-A on 13/06/2022 since that meter was faulty.

			A ¹³				
KG-08	Elster		NR-3247-A	Check	0.2s	Feb-2018	05/10/2015 - 04/10/2020 13/09/2023 - 12/09/2028
KG-09	Elster	GT-1 (220kV)	NR-3258-A	Stand by	0.2s		05/10/2015 - 04/10/2020 15/09/2023 - 14/09/2028
KG-10	Elster	GT-2 (220kV)	NR-3288-A		0.2s		17/11/2015 - 16/11/2020 15/09/2023 - 14/09/2028
KG-11	Elster	GT-3 (220kV)	NR-3291-A		0.2s		17/11/2015 - 16/11/2020
	Elster		NR-3493-A ¹⁴			Feb-2020	15/02/2020 - 14/02/2025
KG-12	Elster	220 kV Aux Transformer (220kV /33kv)	NR-3325-A		0.2s	Oct-2018	17/11/2015 - 16/11/2020 16/09/2023 - 15/09/2028

5. **Monitoring times and periods** - The data is monitored on a continuous basis but are recorded on a monthly basis with the energy meters installed at the site.
6. **Data Accuracy** - As per clause 4.0, Metering Arrangement of the Power Purchase Agreement (PPA) the metering arrangement including its installation, testing, maintenance and collection transportation and processing of data required for energy exchange shall be governed as per the notification/ directives issued/or to be issued by Central Electricity Regulatory Commission and as per relevant provisions contained in IEGC as amended from time to time. The Central Electricity Authority (CEA) notification regarding Installation and Operation of meters regulations, 2006, says that meters are required to be tested once in 5 years (refer clause 18 of the guideline). Thus, the meters recording the electricity exported are calibrated at least once 5 years.
7. **Emission Reduction Calculation Approach** - The emission reductions are calculated as a product of the net electricity generated from the project activity and the combined margin emission factor. The calculation approach is explained in detail under section 3 of registered VCS PD document.
8. **Monitoring roles and responsibilities:** A project team would be constituted for the monitoring of the project. This team is responsible for data collection and archiving. The team met periodically to review the data collected as per monitoring plan. In case of any irregularity observed by any of the team members, it is informed to the concerned person for necessary actions to be taken. No any irregularity observed for current monitoring period. The following is the team structure for project monitoring:
 - a. **Unit Head:** Overall responsibility of compliance with the monitoring plan.
 - b. **Power Plant In-charge:** Responsibility for completeness of data, reliability of data (calibration of meters), and monthly report generation.
 - c. **Shift In-charge:** Responsibility of daily report generation from the SCADA system/ log- book

¹³The meter number NR-3245-A was replaced with the meter WR-2167-A on 05/03/2022 since that meter was faulty

¹⁴The meter number NR-3291-A was replaced with the meter NR-3493-A on 15/02/2020 since that meter was faulty.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

As per registered PD, Baseline emission is $BE_y = EG_{PJ,y} * EF_{grid,CM,y}$

Where:

BE_y : Baseline emissions in year y (tCO₂e/yr)

$EG_{PJ,y}$: Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the VCS project activity in year y (MWh/yr)

$EF_{grid,CM,y}$: Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO₂e/MWh)

Based upon monitoring values:

$$\begin{aligned} BE_y &= 2,177,170 * 0.9126 \\ &= 1,986,885 \text{ tCO}_2\text{e (round down values)} \end{aligned}$$

5.2 Project Emissions

Not Applicable, since emissions from the project activity is zero as per ACM0002 methodology. Hence, $PE_{FF,y} = 0$

5.3 Leakage

Not Applicable, since leakage emissions from the project activity is zero as per ACM0002 methodology. Hence, $LE_y = 0$

5.4 Net GHG Emission Reductions and Removals

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)
01-April-2021 to 31-December-2021	1,126,677	0	0	1,126,677

01-Januray 2022 to 30-June-2022	860,209	0	0	860,209
Total	1,986,885	0	0	1,986,885

<u>Ex-ante emissions reductions/removals</u>	<u>Achieved emissions reductions/removals</u>	<u>Percent difference</u>	<u>Justification for the difference</u>
01-April-2021 to 31-December-2021 1,177,789	1,126,677	-4.34%	The total achieved Emission Reductions is 1.51% higher than amount estimated ex ante for this monitoring period. The variation is mainly due to higher water availability and less shut down hours of the project activity, compared to expected or estimated in registered VCS PD. Also, as per the sensitive analysis in the registered VCS PD, Project IRR crosses the benchmark if generation is increased by more than 91.99%. Thus, the project activity still remains additional.
01-Januray 2022 to 30-June-2022 779,482	860,209	10.36%	
Total 1,957,270	1,986,885	1.51%	

APPENDIX I: TRAINING DETAILS

Details of Training Programme organized during the period from 01.04.2021 to 30.06.2022 at Kishanganga Power Station				
Trg. Prog. Name	NO. OF PARTICIPANTS	From	To	Agency Name
MANAGING WORK STRESS FOR SUPERIOR PERFORMANCE	15	14-02-2022	16-02-2022	UDAAN
GENERAL SAFETY AWARENESS, ELECTRICAL SAFETY AND BASIC FIRE SAFETY	15	28-03-2022	30-03-2022	CBIP

for the
23/01/2023
GSM (IG)