	Validation report form for renewal of crediting period for CDM project activities **(Version 03.0)**

BASIC INFORMATION	
Title and UNFCCC reference number of the project activity	4.5 MW Sechi grid-connected hydro electric project in Himachal Pradesh. UNFCCC ref. No- 9167
Number and duration of the next crediting period	Number: 02 Crediting Period: 28/12/2019 to 27/12/2026
Version number of the validation report	2.1
Completion date of the validation report	13/06/2020
Version number of PDD to which this report applies	08
Project participants	1. Ascent Hydro Projects Ltd (AHPL) 2. Statkraft Markets GmbH 3. WeAct Pty Ltd.
Host Party	India
Applied methodologies and standardized baselines	Selected Methodology: AMS-I.D. - Grid connected renewable electricity generation, version 18 Selected standardized baseline: N/A
Mandatory sectoral scopes	Sectoral scope : 1- Energy industries (renewable - / non-renewable sources
Conditional sectoral scopes, if applicable	NA
Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next crediting period	18,742 tCO$_{2eq}$
Name and UNFCCC reference number of the DOE	Earthood Services Pvt. Ltd. (ESPL) E-0066
Name, position and signature of the approver of the validation report	Dr. Kaviraj Singh Managing Director

SECTION A.   Executive summary

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Earthood Services Private Limited (ESPL) has been contracted by Ascent Hydro Projects Ltd (AHPL) to conduct the validation for renewal of crediting period of the project "4.5 MW Sechi grid-connected hydro electric project in Himachal Pradesh." (UNFCCC Ref. No. 9167), against CDM Project Standard for project activities Version 2/2.2/.

The project activity is run of river Small Hydroelectric Project (SHP) of 4.5 MW installed capacity developed at Sechi khad (stream) in Samej village of Himachal Pradesh. The 4.5 MW Sechi SHP comprises of two units of 2.25 MW with an annual average generation of 22.885 GWh. The connection point with the grid for Sechi SHP, is Jhakri Substation, which is at a distance of 4.5 kilometres from the project site.

The project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 18,742 tCO_2e per year, thereon displacing 21,093 MWh/year 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. Total estimated GHG emission reductions for the chosen 7 year renewable crediting period will be 131,194 tCO_2e.

Scope of Validation

The scope of the services provided by Earthood Services Private Limited for the project is to perform validation of the renewable of crediting period for the project activity. The scope of validation is to assess the claims and assumptions made in the revised project design document (PDD) against the UNFCCC criteria, including but not limited to, CDM PS, CDM VVS, applied methodology and other relevant rules and requirements established for CDM project activities.

Validation Process

The validation process is undertaken by the validation team that involves the following:
- the desk review of documents and evidence submitted by the project participant in the context of the reference CDM rules and guidelines issued by CDM EB,
- undertaking site visit, interview or interactions with the representative of the project participant,
- reporting audit findings with respect to clarifications and non-conformities and the closure of the findings, as appropriate and
- preparing a draft validation report for renewable of crediting period complying with the CDM requirements

An independent Technical Review team reviews the validation report prepared by the validation team. The final validation report that is accepted by Technical Reviewer is then approved on behalf of Earthood Services Private Limited and processed further as per CDM procedures.

Conclusion

The review of the revised PDD, supporting documentation and subsequent follow-up actions (onsite visit and interviews) has provided Earthood with sufficient evidence to determine the fulfilment of stated criteria.

Earthood is of the opinion that the project activity "4.5 MW Sechi grid-connected hydro electric project in Himachal Pradesh.(UNFCCC ref. No- 9167)" as described in the final PDD version 08 dated 26/04/2020 meets all relevant requirements of CDM, meets host country criteria and has correctly applied methodology AMS I.D (version 18)/2.4/. Therefore, the project is being recommended to CDM EB for its renewable of crediting period.

SECTION B. **Validation team, technical reviewer and approver**

B.1. **Validation team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader/ Methodology Expert (AMS – I.D)/ Technical Expert (TA 1.2)/Local Expert	OR	Ahirwar	Vivek Kumar	Climensys Pvt. Ltd.	Y	N	Y	Y

B.2. **Technical reviewer and approver of the validation report for RCP**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Garg	Shreya	Central Office
2.	Technical Expert (TA 1.2)	IR	Garg	Shreya	Central Office
3.	Approver	IR	Singh	Kaviraj	Central Office

SECTION C. **Means of validation**

C.1. **Desk/document review**

The validation for the renewal of crediting period is performed primarily as a document review of the project design document version (final) 08 dated 26/04/2020. The cross checks between information provided in the revised CDM PDD and information from sources other than those used, if available, the team's sectoral or local expertise and, if necessary, independent background investigations. The details of the documentation reviewed during the validation are provided under Appendix 2 of this report.

C.2.   On-site inspection

On-site inspection has not been done for validation of renewal crediting period. In accordance with paragraph 30 of CDM VVS for PAs version 02.0, the DOE must conduct an on-site inspection at validation for the proposed CDM project activity if:

(a) Its estimated annual average of greenhouse gas (GHG) emission reductions or net anthropogenic GHG removals is more than 100,000 t CO2 eq; or

(b) There is pre-project information that is relevant to the requirements for registration of the project activity and may not be traceable after the registration.

Since both the cases (a&b) are not applicable for the project activity, hence the site visit has not been conducted. In line with the guidelines provided under paragraph 31 of CDM VVS for PAs version 02.0, alternative means are used and it is justified that they are credible and sufficient for validation.

In order to confirm the project implementation, the assessment team has verified the commissioning certificates/3.2/ and power purchase agreement/3.3/ signed by the project proponent with state utility for the project activity and concluded that the capacity of the project (including the capacity of individual turbines), location, monitoring system, data recording and calibration responsibility is consistent with the same mentioned in the revised PDD/1.2/.

Based on the above assessment it can be considered that project implementation would remain the same in the next crediting period as described in the revised PDD/1.2/.

Duration of on-site inspection: DD/MM/YYYY to DD/MM/YYYY				
No.	Activity performed on-site	Site location	Date	Team member
1.	Not applicable, as mentioned above			

C.3.   Interviews

The site visit for the project location is not concluded by the assessment team, however, a telephonic interview was conducted and the following stakeholders were interviewed.

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Sharma	Rajesh	Sr. Engineer, AHPL	02/11/2019	Project Activity Description, implementation and operation of the project. Procurement Records & Consumption, Bill & Energy Bills/Records.	Vivek Kumar Ahirwar
2.	Borah	Deepjyoti	CDM Consultant	02/11/2019	ER Calculation, Monitoring Plan, Monitoring Frequency	Vivek Kumar Ahirwar

C.4.   Sampling approach

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Not applicable

C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	-	CAR#01	-
Application and selection of methodologies and standardized baselines	-	-	-
Validity of original baseline or its update	-	-	-
Estimated emission reductions or net anthropogenic removals	-	-	-
Validity of monitoring plan	-	CAR#02	-
Crediting period	-	-	-
Project participants	-	CAR#03	-
Post-registration changes	-	-	-
Others (please specify)	-	-	-
Total	**00**	**03**	**0**

SECTION D. Validation findings

D.1. Compliance with PDD form

Means of validation	The PDD form used is CDM-PDD-FORM version 11/2.5/, which was the appropriate form, and the version available at the time of validation. All the sections of the form were filled as per the guidelines and gave all the relevant details.
Findings	CAR 1 raised and closed successfully.
Conclusion	The revised PDD has been found to be completed using the valid version of the PDD form. The information that is transferred in the current version of the revised PDD is materially the same as that in the registered PDD and in line with the para 403 of the VVS for PA version 02/2.1/

D.2. Application and selection of methodologies and standardized baselines

Means of validation	Through document review and telephonic interview, the assessment team reassessed the applicability of baseline, monitoring methodology and standardized baseline in the methodology based on the knowledge of the project from the initial validation, subsequent verifications and the confirmation from the PP.
	The project was originally registered based on methodology AMS I.D. version 17. The revised PDD applies methodology AMS I.D. Version 18/2.4/. This is appropriate because the methodology AMS I.D. Version 18 is of its latest approved version of methodology applied in the original PDD and is valid at the time of submission of the revised PDD for the renewal of the crediting period; hence it meets the condition that for renewal of the crediting period, the methodology shall not be changed.
	Following tools referred to by the methodology are also applied: - Tool to calculate the emission factor for an electricity system – Version 07.0.0, EB 100 annex 4/2.7/ The methodology and the applied tools are valid as of the finalization of the validation report. The title, reference as well as version number is correctly provided in revised PDD/1.2/ for the renewal of the crediting period. The applicability of the baseline and monitoring methodology is justified in the revised PDD for the renewal of the crediting period. All applicability conditions are completely and correctly included in the revised PDD and the same are demonstrated below :

Sr.No	Criteria	Justification by the Project proponent	Means of validation
1	This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:	The project activity comprises of grid connected	Based on review of PPA/3.3/ and Commissionin

		a. Supplying electricity to a national or a regional grid; or b. Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.		renewable small hydro power generation project. The generated electricity supplied to a regional grid under PPA/3.3/ signed with the state electricity board. Hence, project activity satisfies this applicability criterion 1.a.	g Certificates/3.2 /, Validation Team has confirmed that the Project activity is grid connected renewable small hydro power generation project which supplied the generated electricity to a regional grid under PPA/3.3/ signed with the state electricity board. Therefore, validation team confirms that the para 1 Criteria (a) of AMS-I.D version 18/2.4/ is applicable to the project activity.

	2	Illustration of respective situations under which each of the methodology (i.e. "AMS-I.D.: Grid connected renewable electricity generation", "AMS-I.F.: Renewable electricity generation for captive use and mini-grid" and "AMS-I.A.: Electricity generation by the user) applies is included in the appendix.				As per Table 1 of AMS-I.D ver 18, the project activity fall under project type 1 i.e. project supplies electricity to a national/region al grid. Hence, project activity satisfies this applicability criterion	The Validation team as per Table 1 of AMS-I.D ver 18 found that Project supplies electricity to a national grid. Furthermore, supply of electricity to a national grid has been confirmed from review of PPA/3.3/ and Commissionin g Certificates /3.2/ Therefore, validation team confirms that the para 2 Criteria (a) of AMS-I.D version 18/2.4/ is applicable to

S.No	Project Type	AMS-I.A.	AMS-I.D.	AMS-I.F.
1	Project supplies electricity to a national/region al grid		X	
2	Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)			

		3	Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)						the project activity.
		4	Project supplies electricity to a mini grid1 system where in the baseline all generators use exclusively fuel oil and/or diesel fuel						
		5	Project supplies electricity to household users (included in the project boundary) located in off grid areas						
	3		This methodology is applicable to project activities that: a. Install a Greenfield plant b. Involve a capacity addition in (an) existing plant(s); c. Involve a retrofit of (an) existing plant(s); d. Involve a rehabilitation of (an) existing plant(s)/unit(s); or e. Involve a replacement of (an) existing plant(s).				The project activity installs a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity. Hence, the proposed project activity is a Greenfield plant and satisfies this condition.		The Project activity is Greenfield plant from the CDM registration of project and there is no addition or retrofit or rehabilitation or replacement involve during its operation period from the date of commissioning, the same was confirmed from PPA/3.3/ and Commissioning Certificate/3.2/. The validation team confirms that the para 3 Criteria (a) of AMS-I.D version 18/2.4/

				is applicable to the project activity.
	4	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: a. The project activity is implemented in an existing reservoir with no change in the volume of reservoir; b. The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m²; c. The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m².	The criterion is not applicable to the project activity as the proposed project is a run of river small hydro project.	This section of the methodology is not applicable to the project activity.
	5	If the new unit has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the new unit co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	As explained above, the project activity is a Greenfield run of river small hydro power plant having total installed capacity of 4.5MW. Therefore, this criterion is not applicable.	This section of the methodology is not applicable to the project activity.
	6	Combined heat and power (co-generation) systems are not eligible under this category.	The project is not a combined heat and power plant and hence this criterion is not applicable.	This section of the methodology is not applicable to the project activity.
	7	In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct from the existing units.	The project is a Greenfield project as there is no addition to the existing renewable power generation from the time of commissioning of the project activity and hence this criterion is not applicable to the project activity.	This section of the methodology is not applicable to the project activity.

	8	In the case of retrofit, rehabilitation or replacement, to qualify as a small-scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit shall not exceed the limit of 15 MW.	The project is a Greenfield project as there is no any retrofit or replacement to the existing renewable SHP from the time of commissioning of the project activity and hence this criterion is not applicable.	This section of the methodology is not applicable to the project activity.
	9	In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as "AMS-I.C.: Thermal energy production with or without electricity" shall be explored.	This is not relevant to the project activity as the project involves only hydro power generation. Therefore, this criterion is not applicable.	This section of the methodology is not applicable to the project activity.
	10	In case biomass is sourced from dedicated plantations, the applicability criteria in the tool "Project emissions from cultivation of biomass" shall apply.	This is not relevant to the project activity as the project involves only hydro power generation. Therefore, this criterion is not applicable.	This section of the methodology is not applicable to the project activity.

The applied methodology refers to latest available versions of the following tools;

1. **Tool to calculate the emission factor for an electricity system**

The revised PDD refers and correctly applies the latest version of tool to calculate the emission factor for an electricity system, version 07.0/2.7/.Also the PP has referred the most recent information available as CEA Baseline CO_2 Emission Database version 14 dated December 2018 /3.1/ in final revised PDD version 08 dated 26/04/2020 . The locations of project activity are in the state of Himachal, in India. As per CEA Baseline CO_2 Emission Database/3.1/, the state of Himachal comes under the Indian regional electricity grid in India, the geographic and system boundaries of which are clearly identified; information on the characteristics of the grid is available. Thus, the tool is applicable for the project activity. The stepwise application of Tool and calculation discussed under section D.4 of this validation report.

2. **Tool for the demonstration and assessment of additionality**

This tool is not required to be applied during validation of renewal crediting period.

The assessment team has validated the documentation referred to in the revised PDD and verified the documentation content for verifying the justification of the applicability of the

	methodology and confirmed that the documentation referred to in the revised PDD is correctly quoted and interpreted. The assessment team has also crosschecked the information provided in the revised PDD with the documentation other than from the revised PDD based on the local and sectoral knowledge of the assessment team.
	Thus all the applicability conditions of the applied methodology are confirmed in line with paragraphs 68 of VVS for PAs version 02.0/2.1/. Based on the above discussion, the validation team confirms that the project activity meets all the applicability conditions and all other stipulations of the selected methodology AMS I.D. Version 18.0.
Findings	No non-conformity was observed in this regard. Therefore, no finding was raised
Conclusion	The validation team confirms that the project meets each of the applicability conditions of the methodology; it also meets all the other stipulations and limitations mentioned in the other sections of the applied methodology; the continued validity of the baseline is assessed and the emissions which would be resulted from the baseline scenario are updated at the start of the 2nd crediting period, as per the requirements of AMS I.D. Version 18.0. Therefore, CDM requirements stipulated under VVS for PAs Version 02.0 §§404(b) is satisfied completely.

D.3. Validity of original baseline or its update

Means of validation	In according to VVS for PAs version02.0§§404, The assessment team reviewed the updated PDD/1.2/, and evaluated whether project participants assess and incorporate the impact of national and/or sectoral policies and circumstances existing at the time of requesting renewal of the crediting period on the current baseline GHG emissions, without reassessing the baseline scenario. Where data and parameters used for determining the original baseline that was determined ex ante (and not monitored during the crediting period) are no longer valid, the assessment team identified whether PP update such data and parameters in accordance with the Methodological Tool "*Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period*".
	The validation team confirms that there have been no changes in the relevant national and/or sectoral regulations on implementation of projects to generated electricity from hydro energy and sell to NEWNE grid (which is now a part of Integrated Indian grid) since the previous crediting period.
	On the other hand, the baseline scenario for installation of hydro projects to generated electricity and sell to state/national grid is still valid according to methodology AMS I.D. Version 18.0.
	As demonstrated in the registered PDD, the baseline scenario for the Project is continuous operation of the existing power plants to meet electricity demand. As per AMS I.D. Version 18.0 §§ 19, "*The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid.*" The baseline for the Project remains the same as that in the revised PDD.
	In the absence of project activity, the same amount of electricity would otherwise have been generated by the operation of some grid connected fossil fuel based power plants or newly added generation sources into NEWNE grid (Now part of Indian grid).
	A verifiable description of the baseline scenario has been included in the final revised PDD.
	The information presented in the revised PDD has been validated by an initial document review of all data. Further confirmation has been made based on the telephonic interviews and a review of information from similar projects and/or technologies. The sources referenced in the revised PDD have been quoted correctly. The information was verified against credible sources, such as the following:
	➢ Commissioning Certificates /3.2/

> ➢ Power Purchase Agreement with state electricity board /3.3/
> ➢ CEA guidelines (CO2 Baseline Database for the Indian Power Sector, Version 14.0) /3.1/

The steps from the Methodological Tool "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period "as per CDM VVS for PAs version 02.0 were applied to assess the continued validity of the baseline and/or to update the baseline at the renewal of a crediting period:

Step 1: Assess the validity of the current baseline for the next crediting Period
The CDM PS for PAs (version 02.0) requires assessing and incorporating the impact of new relevant national and/or sectoral policies and circumstances existing at the time of requesting renewal of the crediting period on the current baseline GHG emissions, without reassessing the baseline scenario. The validity of the current baseline is assessed using the following Sub-steps:

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies
There is no legal and regulatory requirement that mandates the production of energy by the chosen technology. Investment in run of river SHP renewable energy projects in the State of Himachal Pradesh and the regional electricity grid is not mandatory. There are no national or local laws or regulations that require this investment to be undertaken, i.e. setting up of small hydro power project. The setting up of small hydro power generation projects is a voluntary activity. Baseline for the project activity is in compliance with relevant mandatory national and sectoral policies.

The assessment team has confirmed that the current baseline as described in the registered PDD is in compliance with the relevant mandatory national & sectoral policies as listed above, there are no national or local laws or regulations.

Based on review of India Electricity Act 2003, there are no national and/or sectoral policies and circumstances that impact the baseline scenario and its associated emissions under AMS I.D. Therefore, the original baseline for of small hydro power generation project under AMS I.D remains the same at the time of registration as mentioned in the validation report at the time of registration.

Step 1.2: Assess the impact of circumstances
The assessment team has verified that the PP has considered the latest available CO_2 Baseline Database (CEA database, version 14)/3.1/ at the time of requesting renewal of the crediting period for establishing the baseline emission factor, which itself considered all the new circumstances. Hence, the new circumstances do not have an impact on the baseline emission.
As per the requirement of the sub-step, it has been assessed that there was no impact of circumstances existing at the time of requesting renewal of the crediting period on the current baseline scenarios. Therefore, it is reasonable to accept that the circumstances have remained the same.

Step 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested
The lifetime of hydro power plant is 35 years /3.2/; hence project equipment's continuously used for electricity generation during the next crediting period without any investment. Therefore, the baseline scenario would not have had required any additional investment for operation.

Step 1.4: Assessment of the validity of the data and parameters
The CEA emission factor calculated ex-ante for the 1st crediting period needs to be updated, as per the valid and latest version of "Tool to calculate the emission factor for an electricity system" /2.7/, the most recent information available should be used to update the emission factor for the 2nd crediting period. Hence, the emission

factor is updated accordingly and appropriately described in the following section D.4 of this report. The PP has applied the CEA database version 14 which is most recent information available for calculation of BM and OM value further used to calculate CM i.e. baseline emission factor for 2nd crediting period. The details have been provided in section D.4 of this report.

Conclusion on step 1:
Validation team confirms that the current baseline is still valid as per methodology AMS I.D. Version 18.0. However the grid emission factor needs to be updated for the subsequent crediting period. The baseline's validity was found acceptable according to the CDM VVS PA version 02.

Step 2: Update the current baseline and the data and parameters

Step 2.1: Update the current baseline
As discussed above the baseline scenario of the project activity is still sustained in the second crediting period, hence reassessment of baseline scenario is not required. The baseline emission factor is updated as per the latest version of CEA CO_2 baseline database available at the time of revised PDD submission for renewal. The approved baseline methodology has been correctly applied to identify a complete list of realistic and credible baseline scenarios, and the identified baseline scenario most reasonably represents that would occur in the absence of the proposed CDM project activity. ESPL considers the baseline scenario is realistic and credible.

In regard to requirement of VVS for PAs version 02.0.§§83, ESPL is able to confirm the following statements:

    a) All the assumptions and data used by the project participants are listed in the revised PDD, including their references and sources;

    b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the revised PDD;

    c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence, and can be deemed reasonable;

    d) Relevant national and/or sectoral policies and circumstances are considered and listed in the revised PDD;

    e) The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario, and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

Step 2.2: Update the data and parameters
The baseline emission factor will be updated ex-ante, as described in section D.4 of this report. The parameters described under step 1.4 were properly updated considering the latest versions of methodology AMS I.D. Version 18.0.

Findings	No non-conformity was observed in this regard. Therefore, no finding was raised
Conclusion	The DOE has accepted and validated the original baseline for this monitoring period in the revised PDD/1.2/. The baseline scenario is found to be valid in accordance with the methodology/2.4/ and VVS for PA version 02/2.1/.

D.4. Estimated emission reductions or net anthropogenic removals

Means of validation	The calculation of the emissions reductions exactly follow the procedures described in the methodology AMS I.D. Version 18 and relevant tool, e.g. the "*Tool to calculate the emission factor for an electricity system*".
	The validation team have assessed the calculation of project emissions, baseline emissions, leakage emissions and emission reductions. Corresponding calculations have been carried out based on calculation spreadsheet. The consistency of the parameters and equations presented in revised PDD, as well as calculation spreadsheet etc., has been compared with the information and requirements presented in the methodology and respective tools.
	The assumptions and data used to determine the emission reductions are listed in the revised PDD and all the sources have been checked. Based on the information reviewed it is confirmed that the sources used are correctly quoted and interpreted

in the revised PDD. The values presented in the revised PDD are considered reasonably based on the documentation and references reviewed and the results of the interviews.

The estimation of the emission reductions are considered correct as the calculations have been reproduced by the assessment team with the attainment of the same results.

The algorithms for the determination of the baseline, project, and leakage are discussed in the following sections.

The GHG emission reductions are calculated applying the updated version of methodology AMS I.D. Version 18

Baseline Emissions:
As per the paragraph 22 of the methodology:
"Baseline emissions include only CO_2 emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants". The baseline emissions are to be calculated as follows:
$$BE_y = EG_{PJ,y} \times EF_{grid,y}$$
Where:
BE_y = Baseline emissions in year y (t CO_2)

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

$$EG_{PJ,y} = EG_{PJ,facility,y} \text{ (for Greenfield projects)}$$

Where,
$EG_{PJ,facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

$EF_{grid,y}$ = Combined margin CO_2 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" (t CO_2/MWh)

The baseline emissions equivalent to tCO_2 due to the project have been calculated as the product of the net electricity supplied to the grid and the grid emission factor as per the combined margin approach described in the 'Tool to calculate the emission factor for an electricity system' . The power produced will be exported to the Indian grid. Hence, the grid emission factor and the corresponding baseline emissions have been calculated for the Indian grid.

The emission factor has been calculated as per methodology AMS I.D. Version 18.0 §§ 23:
"*The Emission Factor shall be calculated in a transparent and conservative manner as follows:*

"A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the 'Tool to calculate the emission factor for an electricity system'."
Option (a) of Para 17 has been considered to calculate the grid emission factor as per the Tool 07 'Tool to calculate the emission factor for an electricity system' version 07 since data is available from an official source.

The latest available version for "Tool to calculate the emission factor for an electricity system" is version 07.0 /2.7/ and the PP has correctly referred to the same in the section B.4 and Appendix 4 of the final revised PDD /1.2/ for determining baseline grid emission factor and it is found to be correct.

In step 1 of Tool; the PP has identified the electricity system is based on the option 1 (under the para 17 of the tool) which is unified Indian Grid system. Therefore, the Indian grid has been correctly identified for the calculation of electricity emission factor, as the project displaces electrical energy from Indian grid, as per the CEA database version 14/3.1/. This CEA database version 14 was published in December 2018 and it was the most recent information available version at the time of submission of the request renewal of the crediting period. This has been found to be in compliance with the "Tool to calculate the emission factor for an electricity system" (version 07.0.0), which states that "If the DNA of the host country has published a delineation of the project electricity system and connected electricity systems, these delineations should be used". Thus, the Project Participant has considered the regional grid that is delineated by the Central Electricity Authority of India which was found to be correct and acceptable. The values of OM and BM have been determined ex-ante as per the CEA database version 14 published on December 2018, which is published by the Ministry of Power, Government of India/3.1/.

In step 2 of the Tool, the PP has considered option I "Only grid power plants are included in the calculation."

Further under step 3, the PP has used the simple operating margin calculation method to determine the operating margin (OM). Validation Team has verified from the CEA database 2018 that the percentage of total grid generation by low-cost/ must-run plants (on the basis of average of five most recent years) for the Indian grid is less than 50% of the total generation. Therefore, it is satisfied the condition stipulated under Para 40 (a) of Tool 07 Version 07, hence the simple OM method (Option a in paragraph 38) has been used as low cost/must run resources constitute less than 50% of total grid generation. As per Tool para 40 -42; The PP has chosen ex-ante option (option a of Para 42 of Tool 07 version 07) for calculation of Simple OM emission factor using a 3-year generation-weighted average, based on the most recent data available at the time of submission of the PDD .

In step 4, the PP has calculated the simple operating margin as per Option B as stipulated under Para 47 (b) of Tool 07 version 07. The PP has considered an average of the latest available three years (at the time of revised PDD submission for validation) i.e. 2015-2016, 2016-17 and 2017-18 for calculation of simple OM emission factor. The value for weighted average operating margin has been validated and used as 0.9610 tCO_2/MWh.

In step 5; the Build margin for the Indian grid is considered as 0.8644 tCO_2/MWh as per "Tool to calculate the emission factor for an electricity system" (Version 07.0, EB 100, Annex 4) para 72 (i.e. as per the provision of the section 6.5 of the tool) where the Option 1 is chosen by PP to calculate the build margin emission factor for the project activity. BM is calculated ex-ante based on the most recent information/data from CEA CO_2 BASELINE DATABASE version 14 dated December 2018 as available at the time of submission of revised PDD for validation and is fixed for the entire crediting period.

In step 6, the combined margin (CM) emission factor is calculated based on option (a) i.e., weighted average CM as accordance to Tool. The weighted average combined margin has been calculated by the PP, considering the 25% weighted for operating margin and 75% for build margin; this is in accordance with the tool which says "All other projects: $W_{OM} = 0.5$ and $W_{BM} = 0.5$ for the first crediting period, and $W_{OM} = 0.25$ and $W_{BM} = 0.75$ for the **second** and third **crediting period**".

The weighted average combined margin emission factor for the project activity comes to 0.88854 tCO_2/MWh. The PP has provided the calculation for the same in the ER calculation sheet and it was validated by the validation team. The baseline emission factor for the electricity system has been calculated on ex-ante basis and will remain fixed for the entire second crediting period.

As per the Tool to calculate the emission factor for an electricity system Version 07.0.0 /2.7/, "*Regional or national average default values* can be used for

calculation of CO_2 Emission Factor *if values are reliable and documented in regional or national energy statistics / energy balances"*. The CEA is the sole authority for publication of such data in India and hence, accepted. The assessment team verified that the parameters are determined ex-ante:

Parameter	Value	Source	Means of Validation
$EF_{grid,OM,y}$ Operating Margin CO_2 emission factor in year y	0.9610 tCO_2/MWh	Baseline Carbon Dioxide Emission Database Version 14 from the Central Electricity Authority (CEA), Ministry of Power, Government of India /3.1/	Verified value against calculated value listed in CEA database version 14 dated December 2018 /3.1/.
$EF_{grid,BM,y}$ Build Margin CO2 emission factor in year y	0.8644 tCO_2/MWh	Baseline Carbon Dioxide Emission Database Version 14 from the Central Electricity Authority (CEA), Ministry of Power, Government of India /3.1/	Verified value against calculated value listed in CEA database version 14 dated December 2018 /3.1/.
$EF_{grid,CM,y}$ Combined margin CO_2 emission factor for the project electricity system.	0.88854 tCO_2/MWh	The Emission factor calculated is based on verified value from Baseline Carbon Dioxide Emission Database Version 14 from the Central Electricity Authority (CEA), Ministry of Power, Government of India /3.1/	The calculation is verified and found to be correct. The value used in calculation has been verified against value of OB and OM listed in CEA database version 14 dated December 2018 /3.1/.

The OM has been determined as the average of the previous 3 years values (2015-16, 2016-17 and 2017-18) mentioned in the CEA database. The value of BM (for year 2017-18) has been identified directly from the CEA database/3.1/. The combined margin emission factor has been arrived at by applying weights of 25% for OM and 75% from BM, as specified in the tool version 07.0.0, §§ 86 (b) for second crediting period for hydro project.

The baseline emissions for the project activity have been calculated as per AMS I.D. Version 18 §§22. The baseline emissions for the project activity have been calculated to be 18,742 tCO_2 per year.

Validation Team confirms that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM project activity and will result in a conservative estimate of the emission reductions.

Estimation of Project Emissions (PE_y):
The project involves hydro power technology which is a renewable energy source. Thus, as per §39 the AMS I.D (version 18)/2.4/ there are no project related emissions associated with the current project.
Thus, $PE_y = 0$.

However, if non-availability of grid during shut-down/ maintenance period of project activity a DG set would be used at project site. In such cases, as per paragraph 40 of AMS-I.D. (version 18) CO_2 emissions from on-site consumption of fossil fuels

due to the project activity shall be calculated using the latest version of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion".

Thus, emission due to combustion of fossil fuels (diesel) usage at the plant site will be calculated by the equation provided below:

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

Where:

$PE_{FC,j,y}$	-	Are the CO_2 emissions from fossil fuel combustion in process j duri
$FC_{i,j,y}$	-	Is the quantity of fuel type i combusted in process j during the year unit/yr);
$COEF_{i,y}$	-	Is the CO_2 emission coefficient of fuel type i in year y (tCO_2/mass
I	-	Are the fuel types combusted in process j during the year y

The CO_2 emission coefficient $COEF_{Diesel,y}$ will be calculated based on net calorific value and CO_2 emission factor of Diesel, as mentioned in option B of Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion.

The PP has provided the Calculation for the estimation of emission due to diesel consumption in the revised PDD. The CO_2 emission coefficient of diesel in the year y ($COEF_{diesel,y}$) = 3.2388 tCO_2/Tonne has been calculated. The quantity of fuel type i combusted in process (i.e. (**DC_y** ; "Diesel consumption by the standby DG set in year *y* (MWh)") will be measured and recorded in plant log book. This parameter is mentioned as monitoring parameter in revised PDD.

For ex ante estimation assumption, the diesel consumption is assumed to be zero. Thus, $PE_y = 0$

Estimation of Leakage Emissions (LEy):
As per para §40 of the applied methodology AMS I.D (version 18), no other leakage emissions are considered. Thus, the leakage is considered as zero.

Emission reductions:
Emission reductions are calculated as follows:
$ER_y = BE_y - LE_y - PE_y$,
where
ER_y = Emission reductions in year y (tCO_2e)
BE_y = Baseline Emissions in year y (tCO_2 e)
LE_y- = Project emissions in year y (tCO_2 e)
PE_y = Leakage emissions in year y (tCO_2 e)

As discussed above $PE_y=0$ and $LE_y=0$, hence
$ER_y = BE_y - 0 - 0$
$ER_y = BE_y$
$ER_y = EG_{PJ,facility,y} \times EF_{grid,y}$

Value of $EG_{PJ,facility,y}$ is estimated to be 21,093 MWh per year ,which is same as in the registered PDD.Hence baseline emission reductions as follows:
BE_y= 21,093 MWh *0.88854 tCO_2e/MWh
    = 18,742 tCO_2e
$ER_y = BE_y$ = 18,742 tCO_2e per year for the selected 7 years crediting period.
Total emission reductions during the Second crediting period are estimated to be 131,194 tCO_2.

Findings	CAR#2 Raised and resolved successfully.
Conclusion	The validation team have assessed the calculations of project emissions, baseline emissions, leakage emissions and emission reductions. Corresponding calculations have been carried out based on calculation spreadsheets. The parameters and

	equations presented in the revised PDD, as well as other applicable documents, have been compared with the information and requirements presented in the methodology and respective tools. The assessment team has compared all the formulae to ensure consistency between those presented in the calculation files and in the revised PDD, methodology, and tools. This is found to be correct.
	
	In general, the validation team is able to confirm the following:
	  ➢ All assumptions and data used by the project participants are listed in the PDD and/or supporting documents, including their references and sources;
	  ➢ All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the revised PDD;
	  ➢ All values used in the revised PDD are considered reasonable in the context of the proposed CDM project activity;
	  ➢ The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, and leakage emissions;
	  ➢ All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the revised PDD.
	
	The validation team confirms that the baseline, the estimated GHG emission reductions in the final revised PDD comply with the applicable requirements in the section 7.5.5 PS for PAs version 02.0, and the valid version of the methodology applicable to the registered CDM project activity.

D.5. Validity of monitoring plan

Means of validation	The assessment team reviewed the revised PDD, checked whether the revised PDD update the monitoring plan section in accordance with all relevant applicable requirements in the CDM PS for PAs. Also verified whether the revised PDD list all data and parameters to be monitored, as required by the applied methodology and whether the monitoring plan explained the operational and management structure, responsibilities and institutional arrangement for data collection/archiving, QA/QC procedures. The project applies the approved consolidated monitoring methodology AMS I.D. Version 18 for Grid connected renewable electricity generation. The monitoring parameter relevant to this project activity described in the applied methodology is: $EG_{PJ,facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh) Since the project activity and non-project activities are connected at state utility substation (Common metering point), hence, in order to calculate the net electricity exported to the grid by the project activity, the state electricity utility uses an apportioning procedure that has been correctly described in section B.7.3 of the revised PDD/1.2/. The apportioning procedure is carried out by the state utility and the PP has no role in this calculation. It was confirmed from the representatives of the O&M provider during the telephonic interview, that the procedure to derive the electricity exported to the grid by each project owner is completely under jurisdiction of the state utility. The registered monitoring plan as described in the revised PDD was implemented and followed during previous crediting period. This was checked from the verification records available on the UNFCCC webpage of this project/1.4/. Hence, it can be assured that the monitoring plan of the registered project is in accordance with the applied methodology. Compliance with the requirement of the methodology, for the parameter $EG_{,y}$ to be monitored ex-post during the 2nd crediting period is demonstrated in the table below: **Parameter 1: Quantity of net electricity supplied to the grid as a result of the**

implementation of the CDM project activity in year y (MWh) $EG_{BL,y}$

Approved Methodology / Revised PDD	Requirement in the applicable methodology and relevant EB documents	Requirement in the registered monitoring plan in the revised PDD	Opinion
Data/Parameter	$EG_{BL,y}$	$EG_{BL,y}$	This is in compliance with the applicable methodology and monitoring plan.
Description	The electricity supplied by the project activity to the grid	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y* (MWh)	This is in compliance with the applicable methodology and monitoring plan.
Measured/Calculated /Default	Measured	Measured	The energy meters (main and check) installed at grid substation in order to directly measure the net electricity supplied to the grid was verified during on-site inspection. Hence this is in compliance with the applicable methodology and monitoring plan.
Source of data	On site measurement	Monthly Joint Meter Readings (JMRs) /3.4/	Specific information is provided. This is in compliance with the applicable methodology and monitoring plan.
Monitoring equipment	Energy meter	Energy meter	This is in compliance with the applicable methodology and monitoring plan.
Measuring/Reading/ Recording frequency	Monthly	Monthly	This is in compliance with the applicable methodology and monitoring plan.

	Calculation method (if applicable)	Applied methodology does not provide any details.	$EG_{BL,y}=$ $EG_{Export} -$ EG_{Import}	Specific information is provided. This value is based on the measured parameter. This is in compliance with the applicable methodology and monitoring plan.
	QA/QC procedures	Applied methodology does not provide any details.	This figure can be cross verified using the Invoices raised by the company and also from the payment received by the company from HPSEB for the month.	Methodology does not provide any specifications; this is as per actual practice. But, this is in line with the general CDM requirements.

Parameter 2: Total Electricity Export to the Grid by the Project Activity in year y (MWh); EG$_{Export}$

Approved Methodology / Revised PDD	Requirement in the applicable methodology and relevant EB documents	Requirement in the registered monitoring plan in the revised PDD	Opinion
Data/Parameter	Not specified	EG$_{Export}$	This is in compliance with the applicable methodology and monitoring plan.
Description	Not Specified	Total Electricity Export to the Grid by the Project Activity in year *y* (MWh)	This is in compliance with the monitoring plan.
Measured/Calculated /Default	Not Specified	Measured	The energy meters (main and check) installed at grid substation in order to directly measure the net electricity supplied to the grid as verified during on-site inspection. Hence this is in compliance with the applicable methodology and monitoring plan.

		Not Specified	Monthly Joint Meter Readings (JMRs)	Specific information is provided. This is in compliance with the applicable methodology and monitoring plan.
	Source of data			
	Monitoring equipment	Not Specified	Energy meter	This is in compliance with the applicable methodology and monitoring plan.
	Measuring/Reading/ Recording frequency	Not Specified	Monitored continuously on a real time basis and recorded monthly basis	This was verified and confirmed that the quantity of electrify export to grid is measured at the main meter and check meter at the substation interconnection point (Grid). Based on interview with PP of project activity; the assessment team confirmed that Monthly joint meter reading of main meters installed at the substation has been taken and signed by authorised officials of AHPL and HPSEB. This is in compliance with the applicable methodology and monitoring plan.
	Calculation method (if applicable)	Not Specified	Measured Parameter	Specific information is provided. This value is based on the measured parameter. This is in compliance with the applicable methodology and monitoring plan.
	QA/QC procedures	Not Specified	For measuring the net energy exported to the grid, one main meter and one check meter, of accuracy class 0.2s, will be maintained. Main meter reading is the basis of billing	Methodology does not provide any specifications; this is as per actual practice. But, this is in line with the general CDM requirements.

	and emission reduction calculations, so long as the meter is found to be within prescribed limits of accuracy during half yearly check. As per the PPA, the calibration of meters shall be done in every six months. Both main and check meters have separate set of CT/PT units to avoid chances of both going out of order simultaneously.

Parameter 3: Total Electricity imported from the Grid by the Project Activity in the year y (MWh); EG_{Import}

Revised PDD / Approved Methodology	Requirement in the applicable methodology and relevant EB documents	Requirement in the registered monitoring plan in the revised PDD	Opinion
Data/Parameter	Not specified	EG_{Import}	This is in compliance with the applicable methodology and monitoring plan.
Description	Not Specified	Total Electricity imported from the Grid by the Project Activity in the year y	This is in compliance with the monitoring plan.
Measured/Calculated /Default	Not Specified	Measured	The energy meters (main and check) installed at grid substation in order to directly measure the electricity import from the grid as verified during on-site inspection. Hence this is in compliance with the applicable methodology and monitoring plan.

		Not Specified	Monthly Joint Meter Readings (JMRs)	Specific information is provided. This is in compliance with the applicable methodology and monitoring plan.
	Source of data			
	Monitoring equipment	Not Specified	Energy meter	This is in compliance with the applicable methodology and monitoring plan.
	Measuring/Reading/ Recording frequency	Not Specified	Monitored continuously on a real time basis and recorded monthly basis	During on-site visit, it was verified and confirmed that the quantity of electrify import from grid is measured at the main meter and check meter at the substation interconnection point (Grid). Based on physical inspection and interview with PP of project activity during on-site visit; the assessment team confirmed that Monthly joint meter reading of main meters installed at the substation has been taken and signed by authorised officials of AHPL and HPSEB. Also, the Joint meter reading is basis for monthly invoice of energy imported from the grid confirmed against JMR. This is in compliance with the applicable methodology and monitoring plan.
	Calculation method (if applicable)	Not Specified	Measured Parameter	Specific information is provided. This value is based on the measured parameter. This is in compliance with the applicable methodology and monitoring plan.

		Not Specified	For measuring the net energy exported & import, one main meter and one check meter, of accuracy class 0.2s, will be maintained. Main meter reading is the basis of billing and emission reduction calculations, so long as the meter is found to be within prescribed limits of accuracy during half yearly check. As per the PPA, the calibration of meters shall be done in every six months. Both main and check meters have separate set of CT/PT units to avoid chances of both going out of order simultaneously.	Methodology does not provide any specifications; this is as per actual practice. But, this is in line with the general CDM requirements.
	QA/QC procedures			

Parameter 4: Diesel consumption by the standby DG set in year y; DC$_y$

Approved Methodology \ Revised PDD	Requirement in the applicable methodology and relevant EB documents	Requirement in the registered monitoring plan in the revised PDD	Opinion
Data/Parameter	Amount of fossil fuel	DC$_y$	This is in compliance with the applicable methodology and monitoring plan.
Description	Amount of fossil fuel used shall be monitored	Diesel consumption by the standby DG set in year *y*	This is in compliance with the applicable methodology and monitoring plan.

	Measured/Calculated /Default	Measured	Measured	This is in compliance with the applicable methodology and monitoring plan.
	Source of data	Log Book	Log Book	More specific information is provided. This is in compliance with the applicable methodology and monitoring plan.
	Monitoring equipment	Not specified	The diesel quantity available in the diesel storage tanks is recorded as initial and final reading as and when used on the basis of level gauge by AHPL in the plant log book.	This is in compliance with the applicable methodology and monitoring plan.
	Measuring/Reading/ Recording frequency	Not specified	Continuously and recorded monthly basis.	This is in compliance with the applicable methodology and monitoring plan.
	Calculation method (if applicable)	Not Applicable as this is a measured parameter	Data Type: Measured & Calculated (a) The diesel quantity available in the diesel storage tanks is recorded as initial and final reading as and when used on the basis of level gauge by AHPL in	This is in compliance with the applicable methodology and monitoring plan.

			the plant log book.	
			2) AHPL also maintain the record of DG set running hours and the kWh generated by the DG set.	
			3) The level gauge has marking of 10 lit (Least Count) up to the 300 Lit (Total Capacity of diesel tank) which is calibrated manually every year.	
			4) The diesel consumption would be recorded in the plant logbook in liters. The values will be converted to tons using a factor 0.86 kg/liters (density of diesel), for the purpose of calculation.	
			5) The diesel will be consumed only in the rare situation only when the power plant is not operational.	
			6) This value is used for project emission calculation.	

	QA/QC procedures	Applied methodology does not provide any details.	The measured data will be cross checked with total diesel procurement using payment receipts.	Methodology does not provide any specifications; this is as per actual practice. But, this is in line with the general CDM requirements.

Parameter 5: Net calorific value of the Diesel in year y; NCV$_{diesel,y}$

Approved Methodology / Revised PDD	Requirement in the applicable methodology and relevant EB documents	Requirement in the registered monitoring plan in the revised PDD	Opinion
Data/Parameter	Not specified	NCV$_{diesel,y}$	This is in compliance with the applicable methodology and monitoring plan.
Description	Not specified	Net calorific value of the Diesel in year y	This is in compliance with the applicable methodology and monitoring plan.
Measured/Calculated /Default	Default	Default	This is in compliance with the applicable methodology and monitoring plan.
Source of data	Not specified	As options a,b & c are not available, the project proponent chooses option d i.e IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories and	More specific information is provided. This is in compliance with the applicable methodology and monitoring plan.

		Not specified	is fixed Ex-ante. This is in accordance to the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" version 02,	
Monitoring equipment		Not specified	Value is fixed by default (IPCC guideline))	This is in compliance with the applicable methodology and monitoring plan.
Measuring/Reading/ Recording frequency		Not specified	Not applicable	This is in compliance with the applicable methodology and monitoring plan.
Calculation method (if applicable)		Not specified	As per the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", any future revision of the IPCC Guidelines should be taken into account. .	This is in compliance with the applicable methodology and monitoring plan.
QA/QC procedures		Applied methodology does not provide any details.	IPCC latest guideline.	Methodology does not provide any specifications; this is as per actual practice. But, this is in line with the general CDM requirements.

Parameter 6: CO₂ emission factor of diesel in year y; EF$_{CO2,diesel,y}$

Revised PDD Approved Methodology	**Requirement in the applicable methodology and relevant EB documents**	**Requirement in the registered monitoring plan in the revised PDD**	**Opinion**

Data/Parameter		Not specified	$EF_{CO2,diesel,y}$	This is in compliance with the applicable methodology and monitoring plan.
Description		Not specified	CO_2 emission factor of diesel in year y	This is in compliance with the applicable methodology and monitoring plan.
Measured/Calculated /Default		Default	Default	This is in compliance with the applicable methodology and monitoring plan.
Source of data		Not specified	As options a,b& c are not available, the project proponent chooses option d i.e IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories and is fixed Ex-ante. This is in accordance to the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" version 02.	More specific information is provided. This is in compliance with the applicable methodology and monitoring plan.
Monitoring equipment		Not specified	Value is fixed by default (IPCC guideline))	This is in compliance with the applicable methodology and monitoring plan.
Measuring/Reading/		Not specified	Not applicable	This is in compliance with

	Recording frequency			the applicable methodology and monitoring plan.
	Calculation method (if applicable)	Not specified	As per the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", any future revision of the IPCC Guidelines should be taken into account. .	This is in compliance with the applicable methodology and monitoring plan.
	QA/QC procedures	Applied methodology does not provide any details.	IPCC latest guideline.	Methodology does not provide any specifications; this is as per actual practice. But, this is in line with the general CDM requirements.

Data management and quality control measures have been confirmed through desk review of the project documents/1.2/ and interview with the PPs representatives. Assessment team confirmed that project does not involve any sampling plan in monitoring of project activity parameters hence section B.7.2 in the revised PDD is not applicable for this project activity.

Implementation of the monitoring plan:
An organizational structure is provided in section B.7.3 of the revised PDD. The functions such as data collection, aggregation, verification, calculation, archiving, as well as the maintenance of equipment's etc. have been defined. Quality assurance and quality control procedures for recording, maintaining and data archiving etc. will be ensured according to CDM EB rules. The calibration of the meter will be implemented as per national standard. An emergency treatment process has been defined in revised PDD when the meter is in malfunction. Data management and quality control system are quoted in revised PDD. The procedures described in the revised PDD have been recognized by the assessment team through document review and interviews with the relevant personnel.

It is confirmed that remaining aspects of monitoring plan like monitoring procedure, metering system, calibration procedure, data recording, monitoring role and responsibility and QA/QC procedure as mentioned in the registered PDD, will remain same during the 2nd crediting period.

The assessment team is able to confirm that the proposed monitoring plan is feasible within the project design.

Findings	No non-conformity was observed in this regard. Therefore, no finding was raised
Conclusion	Validation team confirms that the monitoring plan contains all necessary parameters which have been clearly described in revised PDD /1.2/ and that the means of monitoring described in the plan complies with the requirements of the methodology. In conclusion, based on document review and stakeholder interview, together based on local and sectoral expertise, the assessment team confirms that:

	➢ The monitoring plan of the revised PDD is in compliance with the requirements of the methodology AMS I.D. Version 18. ➢ Monitoring arrangements described in the monitoring plan of the revised PDD are feasible within the project design. ➢ The PP's ability to implement the monitoring plan can be guaranteed. The monitoring plan of the revised PDD is complied with the registered PDD version 5. Validation team is of the opinion that the project participants are able to implement the monitoring plan and the emission reductions achieved can be reported ex-post for verification.

D.6. Crediting period

Means of validation	The assessment team checked whether the revised PDD indicated that the next crediting period commences on the day immediately after the expiration of the current crediting period by means of a document review, use of official sources and telephonic interviews with relevant personnel from project site. The first 7 years renewable crediting period was from 28/12/2012 to 27/12/2019; the Project Participant is applying for a 2nd renewable crediting period, which is 7 years (28/12/2019 – 27/12/2026).
Findings	No non-conformability was observed during assessment for validation of crediting period. Therefore, no finding was raised.
Conclusion	Validation team confirmed that the notification regarding to the request for renewal of Crediting period of the project meets the requirements of paragraph 274 CDM PCP for PAs version 02.0 and the next crediting period of the registered CDM project activity commences on the day immediately after the expiration of the current crediting period. Therefore, CDM requirements stipulated under VVS for PAs Version 02.0 §§412 is satisfied completely.

D.7. Project participants

Means of validation	The assessment team checked whether the names of the project participants included in the revised PDD are consistent with the names of the project participants in the registered PDD by means of desk review and interviews of PPs representative. The project participant in registered PDD is Ascent Hydro Projects Ltd (AHPL) (project owner). The project participant in revised PDD is same as in the registered PDD and indicated in latest version of the MoC statement.
Findings	CAR#3 Raised and resolved successfully
Conclusion	Validation team confirmed that the project participants in the revised PDD are consistent with the actual situation. Therefore, CDM requirements stipulated under VVS for PAs Version 02.0 §§412 a (vi) is satisfied completely.

D.8. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	**Completion date**
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents[1]	N	N/A	N/A
Corrections	N	N/A	N/A
Change to the start date of the crediting period	N	N/A	N/A
Inclusion of a monitoring plan	N	N/A	N/A
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	N	N/A	N/A
Changes to the project design	N	N/A	N/A

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[1] Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

Changes specific to afforestation and reforestation project activities	N	N/A	N/A

SECTION E.   Internal quality control

The draft validation report for renewal of crediting period prepared by the validation team was reviewed by an independent technical review team to confirm if the internal procedures established and implemented by ESPL were duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable CDM rules/requirements. The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of the technical review team were independent of the validation team.

The technical review process may accept or reject the validation opinion or raise additional findings in which case these must be resolved before requesting for registration. The technical review process is recorded in the internal documents of ESPL and the additional findings gets included in the report.

The final report approved by the technical reviewer is authorized by the Managing Director and issued to PP and/or submitted for request for renewal, as appropriate on behalf of ESPL.

SECTION F.   Validation opinion

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Earthood Services Private Limited (ESPL) has performed a validation of renewal of crediting period of the "4.5 MW Sechi grid-connected hydro electric project in Himachal Pradesh" (Ref. No. 9167). The validation was performed on the basis of the updated sections of the revised PDD relating to the baseline, estimated emission reductions and the monitoring plan using the most recent version of baseline and monitoring methodology applicable for the project activity.
The final validation opinion was finalized in accordance with the CDM VVS for PAs version 02.0/2.1/ and the CDM PS for PAs version 02.0/2.2/ including the assessment of:

   a) An impact of new relevant national and/or sectoral policies and circumstances on the baseline taking into account relevant guidance from the Board with regard to renewal of the crediting period at the time of requesting renewal of crediting period;

   b) The correctness of the application of an approved baseline methodology for the determination of the continued validity of the baseline or its update, and the estimation of emission reductions for the applicable crediting period.

The review of the project design documentation and the subsequent follow-up interviews have provided ESPL with sufficient evidence to determine the validity of the original baseline and/or its update through an assessment. The project correctly applies the latest baseline and monitoring methodology AMS I.D. "Grid connected renewable electricity generation", version 18.0/2.4/.

The monitoring plan provides for the monitoring of the project's emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design. It's ESPL opinion that the Coordinating/managing entity are able to implement the monitoring plan and the emission reductions achieved can be reported ex-post for verification.

In summary, it is ESPL opinion that the project activity "4.5 MW Sechi grid-connected hydro electric project in Himachal Pradesh" (Ref. No. 9167), as described in the final revised PDD, version 8 dated 26/04/2020, meets all relevant UNFCCC requirements for the renewal of the crediting period. Therefore, the project is being recommended to CDM EB for request for renewal of crediting period.

Appendix 1. Abbreviations

Abbreviations	Full texts
ABT	Availability Based Tariff
AHPL	Ascent Hydro Projects Limited
AMS	Approved Methodology Small-scale
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM PCP	Clean Development Mechanism Project Cycle Procedure
CDM Pas	Clean Development Mechanism Project Activities
CDM VVS	Clean Development Mechanism Validation and Verification Standard
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CL	Clarification Request
EB	Executive Board
EF	Emission Factor
EPC	Engineering ,Procurement and Construction
ER	Emission Reductions
DOE	Designated Operational Entity
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GOI	Government of India
GoHP	Government of Himachal Pradesh
IPCC	Intergovernmental Panel on Climate Change
JMR	Joint Meter Reading
MP	Monitoring Plan
MR	Monitoring Report
MWh	Megawatt hour
PDD	Project Design Document
PPA	Power Purchase Agreement
PP	Project Participant
PRC	Post Registration Changes
PS	Project Standard
RCP	Renewal Crediting Period
RMP	Revised Monitoring Plan
SHP	Small Hydroelectric Project
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

Competence Statement	
Name	Vivek Kumar Ahirwar
Country	India
Education	B.E. (Mechanical Engineering) M.Tech (Energy Management)

Experience	10 Years +		
Field	Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	ACM0002, AMS.I.D		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert	YES (1.1, 1.2, 13.1)		
Reviewed by	Shreya Garg	**Date**	11/09/2018
Approved by	Anshika Gupta	**Date**	11/09/2018

Competence Statement			
Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	6 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	**Date**	01/03/2018
Approved by	Ashok Gautam	**Date**	01/03/2018

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	**Basic Documents (Monitoring Report, Project Design Documents, Previous Verification Reports)**			
1.1	PP	Registered PDD Version 5	Dated 22/12/2012	PP
1.2	PP	Revised PDD, version 8 (Final)	Dated 26/04/2020	PP
1.3	UNFCCC	Verification Report of the registered CDM project activity for Crediting Period 28/12/2012 to 27/12/2019	-	Other: UNFCCC
1.4	UNFCCC	CDM Project activity view page "4.5 MW Sechi grid-connected hydro electric project in Himachal Pradesh" http://cdm.unfccc.int/Projects/DB/BVQI1356423933.66/view	-	Other: UNFCCC
1.5	BVC	Validation Report for registered PDD	Dated 22/12/2012	Other: UNFCCC
1.6	PP	Emission Reduction Sheet for CP02 version 01	Dated 26/04/2020	PP
1.7	PP	Revised PDD, version 07 (Intermediate version during RCP validation)	Dated 04/11/2019	PP
1.8	PP	Revised PDD, version 06 (Initial version for RCP validation)	Dated 14/05/2019	PP
2.	**References and requirements at UNFCCC/IPCC/etc.**			
2.1	UNFCCC website	Clean Development Mechanism Validation and Verification Standard for Project activity (CDM-VVS for PAs), version 02.0	Dated 29/11/2018	Other: UNFCCC
2.2	UNFCCC website	CDM Project Standard for Project activity (CDM-PS for PAs), version 02.0	Dated 29/11/2018	Other: UNFCCC
2.3	UNFCCC website	CDM Project Cycle Procedure for Project activity (CDM-PCP for PAs), version 02.0	Dated 29/11/2018	Other: UNFCCC
2.4	UNFCCC website	Applied Methodology, AMS I. D. version 18 "Grid connected renewable electricity generation"	Dated 28/11/2014	Other: UNFCCC
2.5	CDM EB	PDD template form	Version 11	Other: UNFCCC
2.6	CDM EB	Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, version 03.0.1, EB 66, Annex 47	02/02/2012	Other: UNFCCC
2.7	CDM EB	Tool to calculate the emission factor for an electricity system	Version 7.0	Other: UNFCCC
3.	**Project implementation information**			
3.1	CEA	CEA CO_2 Baseline Database for the Indian Power Sector Version 14	December 2018	Other
3.2	PP	Commissioning certificates for Date of Commissioning as 01/02/2012 of Unit 1 and Unit 2 of Sechi SHP (2X2.25MW) concluded and issued by Himachal Pradesh State Electricity Board (HPSEB).	01/02/2012	PP
3.3	PP	Power Purchase Agreement dated 25/10/2007 signed between Project Proponent and Himachal Pradesh State Electricity Board (HPSEB)	25/10/2007	PP
3.4	PP	Sample Monthly Joint Meter Readings		PP
4.	**Others**			
4.1	CEA	Central Electricity Authority (Installation and Operation of Meters) Regulations	17/03/2006	Other: CEA

		- Notified on 17/03/2006 No.502/70/CEA/DP&D - AmendmentsNotifiedon26/06/2010No.502/6/2009/ DP&D/D-I (http://www.cea.nic.in/reports/regulation/meter_reg.pdf)		
4.2	Ministry of Power, GOI	The Electricity Act, 2003 (http://www.cercind.gov.in/Act-with-amendment.pdf)	Dated 26/05/2003	Other
4.3	Ministry of Power, GOI	National Electricity Policy,2005 (https://powermin.nic.in/en/content/national-electricity-policy)	Dated 12/02/2005	Other

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1.   CL from this validation

CL ID	N/A	Section no.	N/A	Date : DD/MM/YYYY
Description of CL				
NA				
Project participant response				Date :DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

Table 2.   CAR from this validation

CAR ID	01	Section no.	D.1	Date :03/11/2019
Description of CAR				
The PP is requested to demonstrate changes in track change mode on previous version of the PDD (i.e. registered PDD). The PP is requested to adopt latest version PDD Template form version 11.				
Project participant response				Date :06/11/2019
PP is submitting the track change file separately. PP has revised the PDD for the renewal of second crediting period to adopt the latest version 11 of PDD template.				
Documentation provided by project participant				
Renewal PDD Version 7				
DOE assessment				Date: 12/01/2020
Validation team confirm that PP has submitted revised PDD in track change version of PDD template version 11. Hence acceptable CAR#1 Closed				

CAR ID	02	Section no.	D.5	Date :03/11/2019
Description of CAR				
1. The PP is requested to check the consistency of Combined Margin CO2 emission factor consistent in revised PDD. At some places it's demonstrated as $EF_{grid,y}$ and at some places it's $EF_{grid,CM,y}$ 2. The PP is requested to include link of CEA database version 14 in section B.6.2 in revised PDD.				
Project participant response				Date : 06/11/2019
1. *PP has revised renewal PDD version 7 to maintain the consistency in reporting "Combined Margin CO$_2$ emission factor" nomenclature i.e. "$EF_{grid,CM,y.}$ throughout the revised PDD.* 2. *PP has revised renewal PDD version 7 section B.6.2 to provide link of CEA database version 14.* http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf				

Documentation provided by project participant	
Revised Renewal PDD Version 7, dated 04/11/2019 (in latest CDM PDD template version 11)	
DOE assessment	**Date: 12/01/2020**

1.   Validation team confirm that PP has updated Combined marging CO2 emission factor in revised PDD.
2.   Validation team confirm that PP has included CEA database link in section B.6.2 of revised PDD.

CAR#2 Closed

CAR ID	03	**Section no.**	D.7	**Date :03/11/2019**
Description of CAR				

    1. PP is requested to include contact information of all PPs in Appendix 1.
    2. PP is requested to clarify why Appendix 7 left for purpose, if any post changes has been done please include in Appendix 7.

Project participant response	**Date : 06/11/2019**

    1. The contact information related to Annex 1 Project Participants are included under Appendix 1.
    2. PP has revised Appendix 7 of renewal PDD version 7 to explicitly mention that there is no post registration change has happened during Crediting period 1. Hence, the same is not applicable to the project activity.
    http://www.cea.nic.in/reports/others/thermal/tpece/cdm_co2/user_guide_ver14.pdf

Documentation provided by project participant	
revised PDD Version 7, dated 04/11/2019 (in latest CDM PDD template version 11)	
DOE assessment	**Date: 12/01/2020**

    1. Validation team confirm that PP has included contact information of all PPs in Appendix 1 of revised PDD.
    2. Validation team confirm that PP has revised Appendix 7 and confirm that no post registration change has been done from registered PDD of crediting period 1. Hence acceptable

CAR#3 Closed

Table 3.   **FAR from this validation**

FAR ID	Xx	**Section no.**		**Date: DD/MM/YYYY**
Description of FAR				
NA				
Project participant response				**Date: DD/MM/YYYY**
NA				
Documentation provided by project participant				
NA				
DOE assessment				**Date: DD/MM/YYYY**
NA				

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Document information

Version	Date	Description
03.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM validation and verification standard for project activities" (CDM-EB93-A05-STAN) and version 02.0 of the "CDM project cycle procedure for project activities" (CDM-EB93-A06-PROC); • Make editorial improvements.
02.0	31 October 2017	Revision to align with the requirements of the "CDM validation and verification standard for project activities" (version 01.0).
01.0	23 March 2015	Initial publication.

Decision Class: Regulatory
Document Type: Form
Business Function: Renewal of crediting period
Keywords: crediting period, project activities, validation report