



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

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

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	5 MW Solar PV Power Plant by AEPL (UNFCCC Ref. no. 9610) ¹
Number and duration of the next crediting period	2 nd renewable crediting period 12/04/2020 to 11/04/2027
Version number of the validation report	01
Completion date of the validation report	22/06/2020
Version number of PDD to which this report applies	4.0
Project participants	Fortum Amrit Energy Private Limited EKI Energy Services Limited
Host Party	India
Applied methodologies and standardized baselines	AMS-I.D. ver. 18 - Grid connected renewable electricity generation Standardized baseline: Not applicable
Mandatory sectoral scopes	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	8,597 tCO ₂ e
Name and UNFCCC reference number of the DOE	LGAI Technological Center, S.A. (Applus+ Certification) UNFCCC Ref. No.: E-0032
Name, position and signature of the approver of the validation report	Mr. Juan Sendín Caballero Applus+ Certification Business Unit Managing Director Signature: 

¹ <https://cdm.unfccc.int/Projects/DB/BVQI1365743425.03/view>

SECTION A. Executive summary

Fortum Amrit Energy Private Limited envisages implementation of a 5 MW Solar PV based technology-based power project in Village-Gulabpura in Bhilwara District in the state of Rajasthan. This project aims at providing electricity to the state electricity grid through effective utilization of renewable resource which, in the case of the project activity, is solar power. The project was commissioned on 01/02/2012

The main purpose of the project activity is to generate electrical energy through sustainable means using solar power resources and to contribute to climate change mitigation efforts. In the absence of the project activity, the electricity thus supplied would have been generated through fossil fuel based thermal power plants. The project activity thus contributes to reduction in specific emissions (emissions of pollutant) including GHG emissions. The project activity is also responsible for sustainable economic growth and conservation of environment through use of solar energy as a renewable source. Total projected annual electricity generation from total 68,760 solar PV module installed using thin film CdTe technology are 9,128 MWh/year. The annual estimated GHGs emissions reductions from this project activity is 8,597tCO₂e.

As the proposed activity is a Greenfield activity and in the absence of the project activity 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 in the grid

Validation Scope: The scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology AMS-I.D. ver. 18. The validation was based on the requirements in the CDM validation and verification standard for project activities, version 02.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design document.

Validation Process: The project assessment is based on the “CDM validation and verification standard for project activities, version 02 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the CDM project activity are appointed.

The members of the assessment team carried out:

- I A desk review of the project design documentation;
- II Follow-up interviews with project stakeholders;
- III The resolution of outstanding issues and the issuance of the final validation report and opinion.

The prepared validation report and other supporting documents then undergo an internal quality control at the HQ (Accredited office) before being submitted to the CDM-EB.

In order to ensure transparency, assumptions must be clear and stated explicitly and background material must also be referenced. Applus+ Certification has developed a specific Checklist customized for the project. The checklist demonstrates, in a transparent manner, the project criteria (requirements), discussion on each criterion by the assessment team, and the results from validating the identified criteria.

Appointment of the assessment team

According to the applicable sectoral scope / technical area and experience in the sectoral or national business environment, Applus+ Certification has composed an assessment team in compliance with the Contract Review and Assessment Team appointment rules in the internal Quality Management System of Applus+ Certification as well as in compliance with the applicable requirements in the Accreditation Standard.

The composition of the Assessment Team has been approved by Applus+ Certification during the Contract Review process ensuring that the required skills and capabilities are covered.

The qualification levels for Assessment Team members that are assigned by aforementioned appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A).
- Technical Expert (TE).
- Technical Reviewer (TR).
- Any of the above mentioned roles in training (iT, e.g. AiT for auditor in training).

The Sectoral Scope / Technical Area required knowledge linked to the applied methodology(ies) is covered by the Assessment Team as shown below:

Name	Role	SS Coverage	TA Coverage	Financial aspect	Host country experience
Mr. Pankaj Kumar	LA/TE	YES	YES	YES	YES
Mr. Simon Shen	TR	YES	YES	YES	NA

The complete list of CVs is included as Appendix 2 of this report.

Document review

The Project Design Document submitted by the Client was reviewed against the approved methodology and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources like 3rd party Government documents has been done. A complete list of all documents and evidence material reviewed is included in Appendix 3 of this report.

Follow-up interviews

As site visit not conducted in line with para 30 of VVS-PA, Ver. 02, Applus+ Certification performed interviews, telephone conferences, and interview with project stakeholders to confirm selected information and to resolve issues identified in the document review. The detail is provided in section C.2 and C.3 of this report.

Resolution of Clarification and Corrective Action Request

The objective of this phase of the validation was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for Applus+ Certification positive conclusion on the project design. The Corrective Action Requests and Clarification Requests raised by Applus+ Certification were resolved during communications between the Client and Applus+ Certification to guarantee the transparency of the validation process, the concerns raised and responses given are summarized in Appendix 4 below.

The final PDD version 4.0 submitted by PP on 15/06/2020 serves as the basis for the final assessment presented. Additional changes to the project during the validation process are not considered to be significant with respect to the main CDM objectives. The two CDM main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Internal quality control

As final step of a validation of the final documentation including the validation report and the checklist have to undergo an internal quality control by the technical review committee, i.e. each report has to be finally approved either by the head of the technical review committee or the deputy. In case one of these two

persons is part of the assessment team approval can only be given by the other one to avoid any conflict of interest.

After confirmation of the PP the validation opinion and relevant documents are submitted to the EB through the UNFCCC web-platform.

Conclusion

Applus+ Certification has performed a validation for renewal of crediting period (RCP) of the “5 MW Solar PV Power Plant by AEPL”. The RCP validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria, e.g. AMS-I.D version 18, given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided Applus+ Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The project will hence be recommended by Applus+ Certification for registration with the UNFCCC.

Applus+ Certification has received a confirmation from the host Party that the project activity assists it in achieving sustainable development.

By displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the positive list of renewable project demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of annual emission reductions of 8,597 tCO₂e

The validation of renewal of crediting period has been performed following the requirements of the latest version of the CDM validation and verification standard for project activities, version 02 and on the basis of the contractual agreement. The single purpose of this report is its use during the registration process as part of the CDM/ UNFCCC project cycle.

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.	Lead Auditor/ Technical Expert	OR	KUMAR	PANKAJ	True Quality Certifications Private Limited- Outsourced entity	YES	n/a	YES	YES

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	EI	Shen	Simon	Applus+ Certification
2.	Approver	IR	Sendín Caballero	Juan	Applus+ Certification

SECTION C. Means of validation**C.1. Desk/document review**

The details of the document observed during desk review /validation process are listed below in Appendix 3 of this report.

C.2. On-site inspection

As per the requirement of Para 30 of CDM validation and verification standard for project activities, version 02, Para (a) since the emission reduction estimated is less than 100,000 tCO_{2eq}, assessment team didn't conducted site visit for 2nd renewal of registered PA (UNFCCC reference number: 9610). To validate the PA design, eligibility criteria, monitoring & management practices as mentioned in the PDD; assessment team has conducted telephonic interviews with PP in compliance with para 31 of VVS for project activities, Ver. 2.0. After telephonic interviews with concerned PP representative; assessment team concluded that the design of PA is same as envisaged in 1st CP. There is no change in the eligibility of PA design or operation and monitoring practices as mentioned in the registered PA of 1st CP which can alter the applicability or additionality of the project activity/methodology applied i.e. AMS.I.D version 18. Assessment team therefore of the opinion that project is will be implemented as described in the registered PDD for 1st crediting period and no change is envisaged for the proposed 2nd crediting period.

Date of site visit : NA				
No.	Activity performed on-site	Site location	Date	Team member
NA	NA	NA	NA	NA

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Rai	Vivek	PP representative	12/06/2020	PA design, monitoring & management practices of the PDD, eligibility criteria of applied methodology Relevance of baseline scenario.	Mr. Pankaj Kumar
2.	Das	Kingshuk	Consultant			

C.4. Sampling approach

The assessment team did not apply any sampling approach for the project activity.

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	00	02	00
Application and selection of methodologies and standardized baselines	00	00	00
Validity of original baseline or its update	00	00	00

Estimated emission reductions or net anthropogenic removals	00	01	00
Validity of monitoring plan	00	00	00
Crediting period	00	00	00
Project participants	00	00	00
Post-registration changes	00	00	00
Others (EIA)	00	00	00
Total	00	03	00

SECTION D. Validation findings

D.1. Compliance with PDD form

Means of validation	Assessment team checked the PDD version 11 forms supplied by the project participant and found that the latest form applicable in the UNFCCC web site is used for the presentation of the PDD.			
Findings	CAR 01 and 02 was raised during the validation process and closed successfully.			
Conclusion	The PDD mentions all the criteria as detailed out in PDD form version 11.0 properly and found correct by the assessment team.			
	The project activity is grid-connected solar power generation to produce clean electricity by utilizing solar energy. The total capacity of the project activity is 5 MW. The project activity employs thin film CdTe technology based solar photovoltaic module of First Solar make and inverter of capacity 800 kVA of SMA make. The project activity will supply the generated electricity to NEWNE (Indian Power Grid of India). Solar power is renewable energy and can be used continuously without depletion of raw material used for power generation.			
	Assessment team also checked the commissioning details on 01/02/2012 and found the same to be correct. The actual commissioning date checked from the 3rd party Government documents and found to be accurate.			
	The technical details for the revision of Crediting period were checked by the assessment team from the details available from the manufacturers and also during telecon with PP. The details are as below:			
	For the project activity, the project proponent has procured the Solar PV modules from First Solar. Total no. of modules installed are 68,760. The salient features of the technology employed are:			
	Type of solar photovoltaic modules	Thin Film		
	Make of solar photovoltaic modules	First Solar		
	Model of PV modules	FS-377	FS-380	FS-382
	Capacity of each photovoltaic modules	77.5 Wp	80.0 Wp	82.5 Wp
	Number of units of each type	40,558	22,344	5,873
	Number of solar PV modules installed	68,760		
	Type of inverters	Central		
	Make of inverters	SMA		
	Capacity of each inverter	800 kVA		
	Total capacity of solar power project	5.00 MW		
	Assesment team also checked the feeder details of the connected power plant during the telephonic interview and documents shared with PP. Based on review of documents provided and affirmation provided by PP, DoE found the detail as mentioned in the PDD is correct. The detail of the feeder and connected sub-station is as below:			

CDM REPORT FORM

Power evacuation:

The direct current from the photo voltaic modules is converted into alternating current by the inverters. This exportable power is stepped up to 33kV by three 2000 KVA, 33KV/415V transformer (manufactured by Kirloskar) which is located in the 33kV plant switchyard and paralleled with the 220/132/33kV substation at Gulabpura Village.

During telecon with PP representative and site personnel, it was confirmed that there is no change in monitoring procedure since 1st CP and found to be correct.

Assessment team checked the geographical coordinate of the project activity with GPS meter and cross checked the same with the google Map. The latitude and longitude as mentioned in the registered PDD for 1st crediting period is found correct. The details are as below:

The exact project location is as under:

Latitude	Longitude	District	Village
25° 51' 35.53" North	74° 39' 25.56" East	Bhilwara	Village- Gulabpura

No post registration changes is envisaged for the 2nd CP as the project is implemented as per the registered PDD of 1st CP and in continuous operation apart from scheduled maintenance (as per manufacturer specification) and thus there is no scenario observed which can alter the requirement of the methodology. The project activity complies with the applicability criteria of the small scale CDM Project activity category. The capacity of the proposed project is 5 MW, which is less than the maximum qualifying Type I capacity of 15 MW. Thus the project qualifies as small scale project. There is no change in installed capacity of the project as mentioned in registered PDD for 1st CP. The same is checked by the assessment team during telecon with PP and document review and found correct.

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

Means of validation	<p>The assessment team has validated the documentation referred to in the revised PDD for renewable of crediting period and verified the documentation content for verifying the justification of the applicability of the methodology AMS-I.D version 18 and confirmed that the documentation referred to in the PDD is correctly quoted and interpreted. The assessment team has also cross-checked the information provided in the registered PDD of 1st CP with the documentation other than from the PDD based on the local and sectoral knowledge of the assessment team.</p> <p>Following documentation has been reviewed by the assessment team:</p> <ul style="list-style-type: none"> - Telephonic interview with PP representative and site personnel. - Interview with the concerned person mentioned in this report - Technical detail analysis of the power plant from the documents submitted by the manufacturer. - Commissioning certificates of the turbines <p>The assessment of the project's compliance with the applicability criteria of AMS-I.D version 18 are documented in detail in section B.2 of the PDD.</p>
Findings	Applicability criteria were explained properly as per the requirement of the applied approved methodology for the present crediting period.
Conclusion	<p>The applied baseline methodology is justified as it has been demonstrated that the proposed project activity is:</p> <p>Applicability 1: The project activity is a Renewable Energy Project i.e. Solar Power Project which falls under applicability criteria option 4(a) i.e., "Install a Greenfield plant;". Hence the project activity meets the given applicability criterion.</p> <p>Applicability 2: The 1st and 3rd option of Table of AMS I.D. Version 18, is</p>

	<p>applicable.</p> <p>Applicability 3: The project is installation of new solar based electricity generation plants (not addition to existing system). Option (a) is applicable.</p> <p>Applicability 4: The project is solar power project and thus the criterion is not applicable to this project activity.</p> <p>Applicability 5: The project activity is 5 MW solar electricity generation. Unit does not co-fire fossil fuels. Hence the criterion is not applicable to the project activity.</p> <p>Applicability 6: The Project activity is a renewable solar energy project and is not a combined heat and power system. Hence the criteria is not applicable to the project activity</p> <p>Applicability 7: The project activity is Greenfield and there is no existing power generation facility at the site. Hence the criteria is not applicable to the project activity</p> <p>Applicability 8: Not applicable, the solar project is a Green field project activity and this project is not the enhancement or up gradation project.</p> <p>Applicability 9: The Project activity is a renewable solar power project and is not a landfill gas, waste gas, waste water treatment and agro-industries projects or recovered methane emissions project. Hence the criteria is not applicable to the project activity</p> <p>Applicability 10: The Project activity is a renewable solar power project and is not a biomass project. Hence the criterion is not applicable to the project activity.</p> <p><u>Applicability conditions of “Tool to calculate the emission factor for an electricity system”</u></p> <ul style="list-style-type: none"> • OM, BM and CM are estimated using the tool for calculating baseline emissions. • The project activity is grid connected and thus emission factor is calculated and thus OM, BM and CM are estimated using the tool for calculating baseline emissions. • The project activity is located in India, a non-Annex I country. Therefore, tool is applicable for the project activity. • The project is a Solar power project and there is no involvement of biofuels. Therefore, this criterion is not applicable for the project activity. <p>(Applus+ Certification) confirms that the application of the baseline methodology is transparent and conservative and confirms that the chosen baseline and monitoring methodology i.e. AMS-I.D. version 18.0 is applicable to the project activity.</p> <p>The total installed capacity of project activity is 5 MW which is applicable as per small scale project activities methodology AMS-I.D. version 18.0. The project capacity will be always remain the same and hence the project activity will always be small scale project activity throughout the 2nd crediting period and thereafter.</p>
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D.3. Validity of original baseline or its update

Means of validation	The baseline scenario as depicted in the PDD version 4.0 is checked during the validation by means of telecon with PP and also during the interview with the plant official.
Findings	The baseline is selected as per the requirement of the approved methodology AMS-I.D version 18 for the present Crediting period.
Conclusion	Assessment team referred “Methodological tool (EB 66, Annex 47) “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)” and VVS version 02 for the project activity” to check the originality of the baseline. Following are the

observation of the assessment team regarding selected baseline for the project activity in this present 2nd renewable crediting period:

Step 1.1 (EB 66, Annex 47): Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies

The baseline for the project activity is the electricity delivered to the grid by the project activity which 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 project activity is claiming the emission reductions from the net exported electricity to the grid only. In absence of project activity this quantity of electricity would have been generated from the electricity grid mix (mainly fossil fuel). The Government of India enacted the Electricity Act in the year 2003 to harmonize and rationalize the provisions in the then existing laws. The Act consolidated the laws relating to generation, transmission, distribution, trading and use of electricity. With the Enactment of the act, the then existing laws viz, The Indian Electricity Act 1910, The Electricity Supply Act, 1948 and The Electricity Regulatory Commissions Act, 1998 were repealed. The Electricity Act 2003 was in force at the time of the completion of the baseline study during first crediting period.

The baseline remains unchanged for the present crediting period since there is no policy been revised and/or is currently in force as well, therefore the baseline scenario is still in compliance with all the relevant mandatory national and/or sectoral policies.

Step 1.2 (EB 66, Annex 47) : Assess the impact of circumstances

There are no new circumstances that can impact the original baseline. The baseline emission factor value is however updated based on the current data available for the grid.

Step 1.3 (EB 66, Annex 47): Assess whether the continuation of the use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested

As explained in step 1.2, the baseline scenario was the electricity import/generation from the power plants connected to the electricity grid. Therefore this condition is not applicable to the project activity.

Step 1.4(EB 66, Annex 47): Assessment of the validity of the data and parameters

This step stipulates that “Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated, except if the emission factors, values or emission benchmarks are based on the historical situation at the site of the project activity prior to the implementation of the project and cannot be updated because the historical situation does not exist anymore as a result of the CDM project activity.”

The project chosen **ex-ante default value i.e. Emission Factor**. As per the Guidance given in Tool the emission factor is updated as follows:

1. The operating margin is calculated as per the latest version of CEA (Version 15) available to the project participant. The operating margin calculation is checked by the assessment team and found correct.
2. The build margin is considered from CEA database version 15 as per “Tool to calculate the emission factor for electricity system” version 07. The value considered is checked by the assessment team and found correct
3. The Combined margin calculation is carried out as per “Tool to calculate the emission factor for electricity system” version 07. The value considered

	<p>is checked by the assessment team and found correct</p> <p>The emission factor is fixed ex-ante and thus will be used for the complete 2nd renewable crediting period and for entire verification conducted under 2nd renewable crediting period.</p> <p>Application of Steps 1.1, 1.2, 1.3 and 1.4 confirmed that the current baseline is valid for the Second crediting period but data and parameters needs to be updated. Therefore step 2 is used</p> <p>Step 2.1: Update the current baseline This step is applicable since the Steps 1.1, 1.2, 1.3 and/or 1.4 showed that the current baseline needs to be updated. As evident from the explanation provided above the baseline scenario remains unchanged.</p> <p>Updated the baseline emissions based on the latest approved version of the methodology applicable to the project activity for the subsequent crediting period, without reassessing the baseline scenario.</p> <p>Step 2.2: Update the data and parameters The updated Data and/or parameter are followed for estimating the baseline emissions</p> <p>Hence as per AMS I.D. version 18.0 (latest Methodology), the baseline of the project is as follows:</p> <p><i>Project activity is the installation of a Greenfield power plant, the baseline scenario is 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, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".</i></p> <p>The above selected baseline is correct and thus applicable to the project activity and in line with approved methodology</p>
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D.4. Estimated emission reductions or net anthropogenic removals

Means of validation	The emission reduction sheet, CEA database version 15.0 (Latest applicable) and PDD version 04 is checked by the assessment team.
Findings	CAR 03 was raised related to inconsistency in emission factor value which successfully closed during validation.
Conclusion	<p>The baseline emissions as discussed in section B.6.1 of the PDD, ver. 4.0, will include emissions that would have occurred in the absence of the project activity. The emission reduction calculation has been done as per the AMS I.D. version 18.0</p> <p>Baseline Emission (BE_y):</p> $BE_y = EGBL_y \times EF_{grid,CM,y}$ <p>Where:</p> $BE_y = \text{Baseline emissions in year } y \text{ (t CO}_2\text{/yr)}$ $EGBL_y = \text{Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year } y \text{ (MWh/yr)}$ $EF_{grid,CM,y} = \text{Combined margin CO}_2 \text{ emission factor for grid connected power generation in year } y \text{ calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO}_2\text{/MWh)}$ <p>PP has estimated the baseline energy generation considering the capacity of the project activity, yearly generation hour and plant load factor The project activity involves installation of 5 MW grid connected solar power plant in the state of</p>

	<p>Rajasthan. Validation team assessed the technical specification of the promoters of the project activity, Commissioning certificate and found that installed capacity of this project activity is correct.</p> <p>Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin (OM) and build margin (BM) factors according to the procedure prescribed in the “Tool to calculate the emission factor for an electricity system” version 07.0 which is sourced from CEA version 15.0, Govt. of India and forms the part of emission reduction calculation. The baseline emission factor calculation is checked by the validation team and found that the calculation is transparent and conservative.</p> <p>$BE_y = 9,128 * 0.9419 = 8,597 \text{ tCO}_{2e}$</p> <p>Project Emissions: As per the latest applied methodology for solar power project $PE_y = 0$.</p> <p>Leakage Emissions: As per the Methodology requirement Leakage emission is not applicable for solar power project.</p> <p>Emission Reductions: The project activity reduces carbon dioxide emissions through displacement of grid electricity generation with predominantly fossil fuel based power plants² by renewable electricity. The emission reduction (ER_y) due to project activity during a given year y is calculated as the difference between baseline emissions (BE_y), project emissions (PE_y) as per the formulae given below:</p> <p>$ER_y = BE_y - PE_y - LE_y$</p> <p>$ER_y = 8,597 \text{ t CO}_{2e} - 0 \text{ t CO}_{2e}$</p> <p>$ER_y = 8,597 \text{ (Rounded Down)}$</p>
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D.5. Validity of monitoring plan

Means of validation	Assessment team checked the monitoring practice onsite and also checked the requirement of AMS-I.D version 18 and procedure mentioned in the registered PDD of 1 st CP.
Findings	No findings were raised in this section during validation
Conclusion	<p>Parameters determined ex-ante:</p> <ol style="list-style-type: none"> $EF_{\text{grid,OM},y} = (0.9622 \text{ tCO}_2/\text{MWh})$ = Operating Margin emissions factor for grid connected power generation in year y calculated using the latest version of “Tool to calculate the emission factor for an electricity system version 07.” $EF_{\text{grid, OM, y}}$ is computed using the Simple Operating margin CO₂ emission factor. Simple Operating margin CO₂ emission factor is calculated from 3-year generation weighted average using data for the years 2016-2017, 2017-2018 & 2018-19 CO₂ emissions per unit net electricity generation of all power plants serving the system, not including low-cost / must-run. This is in agreement with the guidance provided in the Tool to calculate the emission factor for an electricity system. The value is considered from CEA version 15. The value is fixed ex-ante for the entire duration of 2nd crediting period. As the value is sourced from CEA (publicly available document) no further analysis is required $EF_{\text{grid,BM},y} = (0.8811 \text{ tCO}_2/\text{MWh})$ Build Margin emissions factor for grid connected power generation in year y calculated using the latest version of “Tool to calculate the emission factor version 07 for an electricity system.

Build margin emission factor is the generation-weighted average emission factor of all power plants m during the most recent year y for which generation data is available. **The value is considered from CEA version 15.** The value is fixed ex-ante for the entire duration of 2nd crediting period. As the value is sourced from CEA (publicly available document) no further analysis is required

3. **EF_{grid,CM,y} := (0.9419 tCO₂/MWh)** Combined Margin emissions factor for grid connected power generation in year y calculated using the latest version of “Tool to calculate the emission factor for an electricity system version 07.” Combined Margin is computed using the official data sources and is in-line with the guidance provided in the tool. **The value is considered from CEA version 15.** 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 (%) = 75%

W_{BM} = Weighting of build margin emissions factor (%) = 25%

The above weighing is as per “Tool to calculate the emission factor for an electricity system”, version 07.0.0 for other projects (Solar in this case) and for second crediting period. The value is fixed ex-ante for the entire duration of 2nd crediting period. As the value is sourced from CEA (publicly available document) no further analysis is required.

Parameters determined ex-post:

EG_{BL,y} = Quantity of electricity exported to the grid as a result of the implementation of the CDM project activity in year y

The value for the parameter will be sourced from the primary source i.e. invoices for sale of power. The primary source will be used for emission reduction calculation for the entire duration of 2nd CP. The practice is as per the 1st CP registered PDD and approved methodology. The Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y is the difference between the measured quantities of the grid electricity export and the import. The electricity export and import will be measured continuously using energy meter installed at the site and the readings will be recorded in the presence of the state utility. The PP will prepare invoices on a monthly basis based on the quantity of net electricity supplied to the grid. The monthly data will be considered for calculating the annual net electricity exported to the grid by the project activity during the year y .

Accepted industry standard : National standard as described in the Power Purchase Agreement.

Measurement equipment : Energy meters Calibration frequency : once in 3 years Accuracy of the meters : 0.2 class

Measurement interval : continuous measurement, monthly recording

The energy meters installed are microprocessor based tri-vector meter. The meters will be calibrated once in 3 years. The data will be archived electronically for a minimum of two years after the end of the crediting period or the last issuance of CERs for this project activity, whichever occurs later.

The energy meters (type: tri-vector) are having accuracy class of 0.2s. The monthly JMR is taken by the representative of PP & State Utility. The meters are approved, tested & sealed by the State Utility. The meters are in the custody of State Utility.

	<p>The calibration of all the meters will be undertaken at required intervals (once in three years³) and faulty meters will be duly replaced immediately. The meter accuracy class and calibration interval is under purview of state electricity board and PP do not have any control on it. DoE confirmed that apportioning procedure is under control of state electricity board and PP do not have any control on it. In the absence or delay in meter calibration — appropriate guideline will be applied to confirm the conservativeness of emission reductions.</p> <p>The Invoice will be used for cross check the Net electricity value and thus is per the requirement of Methodology and registered PDD of 1st CP. The same practice is followed onsite as mentioned in registered PDD of 1st CP and thus it is acceptable to the DOE.</p>
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D.6. Crediting period

Means of validation	The crediting period is checked as per UN home page (reference number : 9610 and discussion with Client.
Findings	No finding raised during validation
Conclusion	This is 2 nd renewable crediting period and the duration is 7-year renewable (2 nd CP duration: 12/04/2020- 11/04/2027). As per para 412 (v) of VVS, Ver. 2.0, the next crediting period of the project activity commences on the day immediately after the expiration of the current crediting period. As first crediting period ending on 11/04/2020, 2 nd crediting period starts on 12/04/2020 for 7 years.

D.7. Project participants

Means of validation	The project participant names were checked from UN homepage https://cdm.unfccc.int/Projects/DB/BVQI1365743425.03/view		
Findings	No findings raised		
Conclusion	Following are the details of PP (host country) and Annex 1 country. The same is correct and in line with PDD registered under 1st Crediting period as well as MOC obtained from UN home page. The details are true for the 2 nd Crediting period as well.		
	Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
	India (Host)	Fortum Amrit Energy Private Limited (Private entity)	No
	Australia (Other party involved)	EKI Energy Services Limited (Private entity)	No

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 ⁴	N	NA	NA
Corrections	N	NA	NA
Change to the start date of the crediting period	N	NA	NA
Inclusion of a monitoring plan	N	NA	NA

³ In accordance with the small scale CDM guidelines

(http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06.pdf)

⁴ 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).

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Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	N	NA	NA
Changes to the project design	N	NA	NA
Changes specific to afforestation and reforestation project activities	N	NA	NA

SECTION E. Internal quality control

As final step of a validation of the final documentation including the Renewable crediting period validation report and the checklist have to undergo an internal quality control by the technical review committee, i.e. each report has to be finally approved either by the head of the technical review committee or the deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one to avoid any conflict of Interest.

SECTION F. Validation opinion

Applus+ Certification has performed a validation of the "5 MW Solar PV Power Plant by AEPL". The validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria, e.g. AMS-I.D version 18, given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided Applus+ Certification with sufficient evidence to determine the fulfillment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria. The project will hence be recommended by Applus+ Certification for registration with the UNFCCC.

Applus+ Certification has received a confirmation from the host Party that the project activity assists it in achieving sustainable development.

By displacing fossil fuel-based electricity with electricity generated from a renewable source, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the positive list of renewable project demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of annual emission reductions of 8,597 tCO₂e.

The validation has been performed following the requirements of the latest version of the CDM validation and verification standard for project activities, version 02 and on the basis of the contractual agreement. The single purpose of this report is its use during the registration process as part of the CDM/UNFCCC project cycle.

Appendix 1. Abbreviations

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CMS	Central Monitoring system
CP	Crediting period
CM	Combined Margin
CMS	Central Monitoring system
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
ER	External Resource
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming potential
RVPNL	Rajasthan Vidyut Prasaran Nigam Limited
RRECL	Rajasthan Renewable Energy Corporation Limited
IR	Internal Resource
OR	Outside resource
OEM	Original Equipment manufacturer
OM	Operating Margin
PP	Project Participant

Appendix 2. Competence of team members and technical reviewers

1. **Mr. Pankaj Kumar** worked as team leader – Bihar for South Asia Climate Proofing and Growth Development(CPGD) – Climate Change Innovation Programme (CCIP) supported by DFID that seeks to mainstream climate change resilience into planning and budgeting at the national and sub-national level in India,Pakistan, Nepal, Afghanistan and Bangladesh. Pankaj Kumar has worked previously with IL&FS Infrastructure Development Corporation and BUIDCO(Bihar Urban Infrastructure Development Corporation), Govt. of Bihar as Environmental Specialist for WB & ADB funded projects. Prior to this, he worked with Carbon Check (UNFCCC accredited DoE), Johannesburg, RSA as Team Leader for validation, verification of around 100 GHG projects in Asia, Africa, USA, Asia Pacific & Americas. Pankaj is accredited Lead Auditor, Validator, Verifier and Technical Expert for Sectoral Scope/Technical Area – 1.1, 1.2, 3.1 & 13.1 by UNFCCC DoE (Designated Operational Entity), APPLUS, Spain. He is also member of task force on climate change & human health, Health Department, GoB and on roster of UNICEF WASH experts.He is an experienced, qualified and result oriented Environment Professional having more than 14 yrs. of relevant experience in Climate Change (Mitigation & Adaptation), Environmental Due Diligence, Disaster Risk Reduction, Validation and Verification of GHG project under CDM, Verified Carbon Standard, Gold Standard & Social Carbon Standard, Brazil. He provides technical support for environmental investigative, consultative and remedial projects involving air, water and soil, Waste management, EIA, Environmental Compliance, ISO 14001, OHSAS 18001, GHG accounting (ISO 14064) and Carbon foot printing.Pankaj Kumar is Masters in Environment Management from Forest Research Institute (University), I.C.F.R.E, Dehradun, which is Centre of Excellence in South East Asia for Forestry education & research and PGDEL from National Law School of India University, Bangalore (India).

2. **Mr. Simon Shen** (Master Degree in Thermal Energy Engineering, Bachelor Degree in Environmental Engineering) is a Lead Auditor appointed by Applus+ LGAI for the GHG project assessment. He is based in Shanghai. He has several years of work experience in environmental protection field. Before he joined Applus+ LGAI, he had been worked for TÜV SÜD as a GHG Validator/Assessment team and ISO 9001/14001 Lead Auditor for 5 years.

Appendix 3: Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	NA	Contract of the project participant with the DOE	Contract document signed between PP and DOE	Project participant
2	NA	Technical specifications of solar power plant and other equipments	Manufacturer technical specifications	Project participant
3	NA	1st PDD version 03 PDD based on which opinion is provided- Version 4.0	05/06/2020 15/06/2020	Project participant
4	NA	Estimated Emission reduction calculation sheet- version 01	05/06/2020	Project participant
5	NA	AMS.I.D version 18	UNFCCC CDM web site	UNFCCC
6	NA	Ministry of Environment and forest: www.envfor.nic.in UNFCCC www.cdm.unfccc.int CEA: Central electricity authority www.cea.nic.in	Reference link is provided.	Independent Search
7	NA	Tools/ guidelines used in the project activity: <ul style="list-style-type: none"> Clarification on national and/or sectoral policies Para 27 EB 55. Tool to determine the remaining lifetime of the project activity in line with Annex 15 EB 50. Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion, Version 3. Tool to calculate the emission factor for an electricity system version 07. 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). 	UNFCCC CDM web site	UNFCCC
8	NA	Commission Certificate for solar Power plant	Commissioning certificate as provided by 3 rd party	Project participant
9	NA	Modalities of communication dated 16/05/2018	UNFCCC CDM web site	UNFCCC

10	NA	Reg.CDM-PDD, ver. 03 dated 26/03/2013 of first crediting period		
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Appendix 4: Clarification requests, corrective action requests and forward action requests

Table 1. CL from this validation

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

Table 2 CAR from this validation

CAR ID	01	Section no.	D.7	Date: 10/06/2020
Description of CAR				
In sec. A.4 of the PDD, name of party involved and project participant is not consistent with MoC dated 16/05/2018 available on UNFCCC interface.				
Project participant response				Date: 15/06/2020
The table in section A.4 of the PDD has now been updated and is made consistent with the latest MoC available at the UNFCCC interface.				
Documentation provided by project participant				
Revised PDD, version-4.				
DOE assessment				Date: 18/06/2020
PP has now updated the names of project participants and parties involved in sec. A.4 of revised PDD, Ver. 4.0 dated 15/06/2020 in line with MoC available on UNFCCC interface. Comment closed.				

CAR ID	02	Section no.	D.1	Date: 10/06/2020
Description of CAR				
No description provided in sec. D.2 of the PDD. Corrective action required.				
Project participant response				Date: 15/06/2020
The description is now provided in section D.2 of the PDD.				
Documentation provided by project participant				
Revised PDD, version-4.				
DOE assessment				Date: 18/06/2020
PP has now provided description in sec. D.2 of revised PDD, Ver. 4.0 dated 15/06/2020. Comment closed.				

CAR ID	03	Section no.	D.4	Date: 10/06/2020
Description of CAR				
3. On page 18 of PDD, in sec. B.6.1, value of combined margin emission factor is not correct. Corrective action required				
4. In sec. B.6.2, value of combined margin emission factor is incorrect. Corrective action needed.				
Project participant response				Date: 15/06/2020
1. In page 18, the value of combined margin emission factor is now mentioned correctly.				
2. In section B.6.2, the value of combined margin emission factor is now corrected.				
Documentation provided by project participant				
Revised PDD, version-4.				
DOE assessment				Date: 18/06/2020
1. In sec. B.6.1, value of combined margin emission factor corrected in revised PDD, Ver. 4.0 dated 15/06/2020. Comment closed.				
2. In sec. B.6.2 of revised PDD, ver. 4.0 dated 15/06/2020, value of combined margin emission factor corrected. Comment closed.				

Table 3. FAR from this validation

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

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> 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		