




## Validation report form for CDM project activities

(Version 02.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the validation report form for CDM project activities" at the end of this form.

## VALIDATION REPORT

<b>Title of the project activity</b>	Renewable Power Project by Emami Power Ltd
<b>Version number of the validation report</b>	02
<b>Completion date of the validation report</b>	06/10/2017
<b>Version number of PDD to which this report applies</b>	02
<b>Date when PDD was uploaded for global stakeholder consultation</b>	24/04/2017
<b>Project participant(s)</b>	Emami Power Limited
<b>Host Party</b>	India
<b>Estimated annual average GHG emission reductions or net removals in the crediting period (tCO<sub>2</sub>e)</b>	31,689 tCO <sub>2</sub> e per annum
<b>Sectoral scope(s) and selected methodology(ies)</b>	Methodology: - ACM0002/ Version 17.0, EB 89, "Grid-connected electricity generation from renewable sources" & Sectoral Scope 1: Energy Industries (renewable - /non renewable sources)
<b>Name of DOE</b>	 LGAI Technological Center, S.A. (LGA Tech. Center S.A)
<b>Name, position and signature of the approver of the validation report</b>	Juan Sendin Caballero, Applus LGAI Managing Director

## SECTION A. Executive summary

The main purpose of this project activity is to generate clean form of electricity through renewable solar energy source. Emami Power Ltd is the project participant of the proposed project activity. The project activity involves installation of 20 MW AC (22.5 MWp DC) solar power project Villages: Udelhedi, Naharpur, Mannakhedi, Kumrada, Tehsil: Roorkee District: Haridwar. The project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 31,689 tCO<sub>2</sub>e per year, thereon displacing 32,412 MWh/year amount of electricity from the generation-mix of power plants connected to the Indian grid, which is mainly dominated by thermal/fossil fuel based power plant.

The details of the project and the state of installation are mentioned in the table:-

Project Name	Participant	Capacity in MW	Connection with Grid	State	Usage of Electricity
Emami Power Ltd.		20 MW (AC)	Indian Grid	Uttarakhand	Sale to Grid

The project activity is the installation of an environmentally safe and sound technology since there are no GHG emissions associated with the electricity generation. The design lifetime of the solar project is 25 years (As per the Manufacturer specifications). The same is acceptable to the assessment team.

The project is located in the state of Uttarakhand.

**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 ACM0002/ Version 17.0, EB 89, "Grid-connected electricity generation from renewable sources". The validation was based on the requirements in the Validation and Verification Standard (VVS version 09)

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.

Once Applus+ LGAI receives the PDD, it has been made publicly available on the UNFCCC website, which initiates a 30 days global stakeholder consultation (GSC) process. The details of the GSC are included in this report.

**Validation Process:** The project assessment is based on the "Clean Development Mechanism Validation and Verification Standard version 09.0 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.

Once the project is made available for the global stakeholder consultation process, 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.

### **Appointment of the assessment team**

According to the sectoral scopes / technical area and experiences in the sectoral or national business environment, Applus+ LGAI has composed a project validation team in accordance with the appointment rules in Applus+ LGAI. The composition of assessment team has to be approved by the Applus+ LGAI ensuring that the required skills are covered by the team. The four qualification levels for team members that are assigned by formal appointment rules as below:

Leader Auditor (LA)

Auditor (A)  
Auditor Trainee (T)  
Technical Experts I  
Technical Review (TR)

It is required that the sectoral scope / technical area related to the methodology has to be covered by the assessment team.

The detail regarding the assessment team is provided below in section B.1 and B.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 has been done. A complete list of all documents and evidence material reviewed is included in Appendix 3 of this report.

### **Follow-up interviews**

A site visit is conducted by Applus+ LGAI performed interviews, telephone conferences, and physical site inspection 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+ LGAI's positive conclusion on the project design document. The Corrective Action Requests and Clarification Requests raised by Applus+ LGAI were resolved during communications between the Client and Applus+ LGAI to guarantee the transparency of the validation process, the concerns raised and responses given are summarized in Appendix 4 below.

The final PDD version 02 submitted by PP 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+ LGAI has performed a validation of the "Renewable Power Project by Emami Power Ltd". The validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria, e.g. ACM 0002 version 17, 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+ LGAI with sufficient evidence to determine the fulfilment 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+ LGAI for registration with the UNFCCC.

Applus+ LGAI 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 CO<sub>2</sub> emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the investment 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 31,689tCO<sub>2e</sub> per year, thereon displacing 32,412 MWh/year amount of electricity.

The validation has been performed following the requirements of the latest version of the CDM VVS version 09 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 review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader/Technical expert	OR	DAS	SUKANTA	TRUE QUALITY CERTIFICATIONS PRIVATE LIMITED	YES	YES	YES	YES

### B.2. Technical reviewer and approver of the validation report

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	Shen	Simon	Applus+ LGAI

## SECTION C. Means of validation

### C.1. Desk review

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

### C.2. On-site inspection

Duration of on-site inspection: 17-18/06/2017				
No.	Activity performed on-site	Site location	Date	Team member
1.	Assessment team checked the implementation of the project, Baseline emission, and emission reduction calculation, technical description of the	Uttarakhand	17-18/06/2017	Mr. Sukanta Das

	project and Onsite Monitoring practice.			
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### C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Lohariwala	Ankita	PP representative	17/06/2017	Same as mentioned in section C.2 of the FVR	Mr. Sukanta Das
2	Tiwari	Nitin	PP representative	17/06/2017	Same as mentioned in section C.2 of the FVR	Mr. Sukanta Das
3	Rana	Aditya	Villager	18/06/2017	Local Stakeholder consultation meeting	Mr. Sukanta Das
4	Singh	Bupendra	Villager	18/06/2017	Local Stakeholder consultation meeting	Mr. Sukanta Das

### C.4. Sampling approach

The assessment team didn't apply any sampling approach for the project activity. The site visit was conducted for the complete solar project implemented in the locations/site as mentioned in the PDD.

### C.5. Clarification requests, corrective action requests and forward action requests raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Global stakeholder consultation	0	0	0
Approval	0	01	0
Authorization	0	0	0
Contribution to sustainable development	0	0	0
Modalities of communication	0	01	0
Project design document	0	03	0
Description of project activity	0	0	0
Application of selected baseline and monitoring methodology and selected standardized baseline			
- Applicability of methodology and standardized baseline	0	0	0
- Deviation from methodology	0	0	0
- Clarification on applicability of methodology, tool and/or standardized baseline	0	0	0
- Project boundary	0	00	0
- Establishment and description of baseline scenario	0	0	0
- Demonstration of additionality	0	01	0
- Emission reductions	0	01	0
- Monitoring plan	0	00	0
Duration and crediting period	0	0	0
Environmental impacts	0	0	0
Local stakeholder consultation	0	01	0
Others (please specify)	01		
<b>Total</b>	<b>01</b>	<b>08</b>	<b>0</b>

**SECTION D. Validation findings****D.1. Global stakeholder consultation**

<b>Means of validation</b>	The UNFCCC web page is checked to confirm the GSC comments. <a href="https://cdm.unfccc.int/Projects/Validation/DB/DPLK8HYZ2OYAET7NMJG1V6FG9PHQNP/view.html">https://cdm.unfccc.int/Projects/Validation/DB/DPLK8HYZ2OYAET7NMJG1V6FG9PHQNP/view.html</a>
<b>Findings</b>	No Findings raised during the validation process.
<b>Conclusion</b>	No comments received during the global stakeholder consultation process.

**D.2. Approval**

<b>Means of validation</b>	The Approval is provided by the Indian DNA (Ministry of Environment and Forest, Govt of India). Assessment team checked the HCA supplied by the project participant and also cross checked the same from the web site ( <a href="http://www.cdmindia.gov.in/">http://www.cdmindia.gov.in/</a> ). The HCA confirms the approval of Indian DNA which is the party to Kyoto protocol and confirms that project is vide by the guideline of CDM
<b>Findings</b>	During the validation process a CAR was raised regarding the approval issue from one of the party involved in the project as per the requirement of VVS version 09. The detail CAR 1 is mentioned below in appendix 4 of this report
<b>Conclusion</b>	Assessment team confirms that the project is approved from Indian DNA and thus the same is in line with VVS version 09. The HCA confirms that <ol style="list-style-type: none"> <li>1. The Party is a Party to the Kyoto Protocol</li> <li>2. Participation is voluntary;</li> <li>3. the proposed project activity contributes to the sustainable development of the country;</li> <li>4. HCA refers to the precise proposed project activity title in the PDD being submitted for registration.</li> <li>5. HCA is unconditional with respect to above items and thus acceptable to the assessment team.</li> </ol>

**D.3. Authorization**

<b>Means of validation</b>	The Authorisation is provided by the Indian DNA (Ministry of Environment and Forest, Govt of India). Assessment team checked the HCA supplied by the project participant and also cross checked the same from the web site ( <a href="http://www.cdmindia.gov.in/">http://www.cdmindia.gov.in/</a> ). The HCA confirms the authorisation of Indian DNA which is the party to Kyoto protocol and confirms that project is vide by the guideline of CDM
<b>Findings</b>	During the validation process a CAR was raised regarding the approval issue from one of the party involved in the project as per the requirement of VVS version 09. The detail CAR 1 is mentioned below in appendix 4 of this report
<b>Conclusion</b>	Assessment team confirms that the project is authorised from Indian DNA and thus the same is in line with VVS version 09. The HCA confirms that <ul style="list-style-type: none"> <li>• The Party is a Party to the Kyoto Protocol</li> <li>• Participation is voluntary;</li> <li>• the proposed project activity contributes to the sustainable development of the country;</li> <li>• HCA refers to the precise proposed project activity title in the PDD being submitted for registration.</li> <li>• HCA is unconditional with respect to above items</li> </ul>

**D.4. Contribution to sustainable development**

<b>Means of validation</b>	The Approval is provided by the Indian DNA (Ministry of Environment and Forest, Govt of India). Assessment team checked the HCA supplied by the project participant and also cross checked the same from the web site ( <a href="http://www.cdmindia.gov.in/">http://www.cdmindia.gov.in/</a> ). The HCA confirms the approval of Indian DNA which is the party to Kyoto protocol and confirms that project is vide by the guideline of
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	CDM. The HCA confirms that the project will contribute to the sustainable development.
<b>Findings</b>	During the validation process a CAR was raised regarding the authorisation issue from one of the party involved in the project as per the requirement of VVS version 09. The detail CAR 1 is mentioned below in appendix 4 of this report
<b>Conclusion</b>	<p>Assessment team confirms that the project is authorised from Indian DNA and thus the same is in line with VVS version 09.</p> <p>The HCA confirms that</p> <ul style="list-style-type: none"> <li>the Party is a Party to the Kyoto Protocol</li> <li>Participation is voluntary;</li> <li>the proposed project activity contributes to the sustainable development of the country;</li> <li>HCA refers to the precise proposed project activity title in the PDD being submitted for registration.</li> </ul> <p>HCA is unconditional with respect to above items.</p> <ul style="list-style-type: none"> <li>The project activity is in line with sustainable development policies of the country and national regulation / policy on Environmental Protection, Electricity and Non- Conventional Energy. Nevertheless in the Host Country Approval, it is stated that the project participant (PP) has to comply with the following conditions:</li> <li>PP shall not sell the CERs to any agency /company/ organization which purchases the CERs using ODA Funds</li> <li>PP shall inform the national CDM Authority regarding all transaction details of CERs including the name and address of the party to which CERs were sold within 30 days of transfer of the CERs</li> <li>PP shall furnish expeditiously any information, during the lifetime of the project as requested by the National CDM Authority.</li> <li>PP shall obtain all statutory clearances and other approvals as required from the competent authorities for setting up of the project</li> <li>All transaction shall be subject to supervision of the Executive Board of the CDM, under the authority and guidance of the COP/MOP</li> <li>This approval is not transferable. The authority reserved the rights to revoke this Host Country Approval if the conditions stipulated in this approval are not complied with to the satisfaction of the National CDM Authority.</li> </ul> <p>All the above conditions are met and same is checked by the assessment team from the host country approval number 4/7/2016-CC-dated 08/02/2017 and found correct.</p>

#### D.5. Modalities of communication

<b>Means of validation</b>	Assessment team checked the MOC supplied by the project participant and found that the latest form applicable in the UNFCCC web site is used and signing authority has the power to sign the same on behalf of PP
<b>Findings</b>	Assessment team raised concern regarding the MOC signing and supporting document. The detail of the same is mentioned as CAR 2 in this report and the same is closed successfully
<b>Conclusion</b>	Assessment team checked the supporting MOC dated 29/06/2017 signed and the declaration that MOC is signed by the approved person on behalf of the organisation. The same is as per the requirement of VVS version 09 and thus assessment team confirm that the MOC is correct and accurate.

#### D.6. Project design document

<b>Means of validation</b>	The guideline for completing CDM form version 08 for Large scale project activity is checked by the assessment team
<b>Findings</b>	The PDD version 01 submitted to the DOE is not in compliance with CDM form version 08 for project activity in some sections. As a corrective measure CAR 03, 04, 05 were raised during the validation process. Please refer appendix 4 of this report for detail of NC raised and the closure.
<b>Conclusion</b>	CAR 03, 04 and 05 were closed based on revision in the PDD and in compliance with CDM form version 08 for large scale project activity. The PDD version 02 is thus acceptable to the assessment team.

**D.7. Description of project activity**

<b>Means of validation</b>	<p>The main purpose of this project activity is to generate clean form of electricity through renewable solar energy source. Emami Power Ltd is the project participant of the proposed project activity. The project activity involves installation of 20 MW AC (22.5 MWp DC) solar power project Villages: Udelhedi, Naharpur, Mannakhedi, Kumrada, Tehsil: Roorkee District: Haridwar. The project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 31,689tCO<sub>2</sub>e per year, thereon displacing 32,412MWh/year amount of electricity from the generation-mix of power plants connected to the Indian grid, which is mainly dominated by thermal/fossil fuel based power plant.</p> <p>The details of the project and the state of installation are mentioned in the table:-</p>				
	<b>Project Participant Name</b>	<b>Capacity in MW</b>	<b>Connection with Grid</b>	<b>State</b>	<b>Usage of Electricity</b>
	Emami Power Ltd.	20 MW (AC)	Indian Grid	Uttarakhand	Sale to Grid
	<p>The project activity is the installation of a new grid-connected renewable power plant/unit and this is not a CPA that has been excluded from a registered CDM PoA as a result of erroneous inclusion of CPAs.</p> <p>The technical details were checked by the assessment team from the details available from the manufacturers (2<sup>nd</sup> party)</p> <p>The commissioning of the project activity is already achieved as confirmed by the assessment team during the validation site visit.</p> <p>The detail of commissioning is below:</p>				
	<b>Project Participant Name</b>	<b>Latitude</b>	<b>Longitude</b>	<b>Date of Commissioning</b>	
	Emami Power Limited	N 29° 45' 11.18"	E 77° 49' 18.76"	30/03/2017	
	<p>The technical specification of the project is as below and confirm by the assessment team from Manufacturer specification and onsite visit:</p>				
	<b>Technical detail of the equipment</b>	<b>Remark</b>			
	Technology	Multi Crystalline Silicon solar cell based modules			
	Make of Solar photovoltaic module	Hanwah Solar, China			
Module Capacity	315W and 320W				
No. of modules	320W : 52680 number and 315W: 17920 number; Total capacity of the plant – 22.5024MWp				
Inverter Make	ABB, Bangalore				
Capacity of Inverter	1000kW				
Total Number of Invertors	20 Units				
Transformer	0.380-0.380/33KV, three windings; Rating : 2.1MVA Quantity: 20 numbers				
Technical & Operational Lifetime	25 years				
<p>As per the glossary of CDM terms version 09, the capacity of the project is above 15 MW type I small scale project activity and thus assessment team confirms that the project is large scale project activity. The technology being employed is well proven, safe &amp; sound. No technology transfer to host party is there due to project activity.</p>					
<b>Findings</b>	No findings are raised related to the project activity				
<b>Conclusion</b>	The project activity description, capacity limitation and de-bundling criteria are checked and found correct by the assessment team. The PDD mentions all the criteria properly and found correct by the assessment team.				



## D.8. Application of selected baseline and monitoring methodology and selected standardized baseline

### D.8.1. Applicability of methodology and standardized baseline

<b>Means of validation</b>	<p>The assessment team has validated the documentation referred to in the 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 PDD is correctly quoted and interpreted. The assessment team has also cross-checked the information provided in the PDD with the documentation other than from the PDD based on the local and sectoral knowledge of the assessment team. Following documentation has been reviewed by the assessment team:</p> <ol style="list-style-type: none"> <li>1. Site visit</li> <li>2. Interview with the concerned person mentioned in this report</li> <li>3. Technical detail analysis of the power plant from the documents submitted by the manufacturer.</li> </ol> <p>The assessment of the project's compliance with the applicability criteria of ACM 0002 version 17 are documented in detail in section B.2 of the PDD.</p>
<b>Findings</b>	<p>Applicability criteria were explained properly as per the requirement of the applied approved methodology. No NC was raised during the validation process.</p>
<b>Conclusion</b>	<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 installation of a new grid connected solar power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant) and hence this criterion is applicable.</p> <p>Applicability 2: The proposed project activity is an installation of a new grid connected solar power plant and hence this condition is met.</p> <p>Applicability 3: The project does not involve any capacity additions, retrofits or replacements and therefore this condition is not applicable</p> <p>Applicability 4: The project activity is a grid connected solar power project and not a hydro power plant. Therefore, these criteria are not applicable for the project activity.</p> <p>Applicability 5: The project activity is a grid connected solar power project and not a hydro power plant. Therefore, these criteria are not relevant to the project activity.</p> <p>Applicability 6: The project activity is a grid connected solar power project and not a hydro power plant. Therefore, these criteria are not relevant to the project activity.</p> <p>Applicability 7: The project activity is installation of a new grid connected solar power project and does not involve switching from fossil fuel to renewable energy and hence this criterion is not relevant to the project activity.</p> <p>&amp;</p> <p>This is a solar power plant and not a biomass fired plant and hence this applicability criterion is not applicable to the project activity.</p> <p>Applicability 8: The project activity is a new grid connected solar power plant and not a retrofits, replacement or capacity additions and therefore this criterion is not applicable to the project activity.</p> <p><b><u>Applicability conditions of “Tool to calculate the emission factor for an electricity system”</u></b></p> <ul style="list-style-type: none"> <li>• OM, BM and CM are estimated using the tool under section B.6.1 of the PDD for calculating baseline emissions.</li> <li>• The project activity is grid connected and thus emission factor is calculated and thus OM, BM and CM are estimated using the tool under section B.6.1</li> </ul>

	<p>of the PDD for calculating baseline emissions.</p> <ul style="list-style-type: none"> <li>The project activity is located in India, a non-Annex I country. Therefore, this criterion is not applicable for the project activity.</li> <li>The project activity is a grid connected solar power project and not a hydro power plant. Therefore, this criterion is not applicable for the project activity.</li> </ul> <p>Applus+ LGAI confirms that the application of the baseline methodology is transparent and conservative, and confirms that the chosen baseline and monitoring methodology i.e. ACM 0002 version 17 is applicable to the project activity.</p>
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#### D.8.2. Deviation from methodology

<b>Means of validation</b>	ACM 0002 version 17 and PDD version 01 is checked by the assessment team
<b>Findings</b>	No NC (= Non conformity) was raised during the validation process
<b>Conclusion</b>	The deviation of the methodology is not a requirement as the project activity fulfils the requirement of the applied methodology ACM 0002 version 17

#### D.8.3. Clarification on applicability of methodology, tool and/or standardized baseline

<b>Means of validation</b>	ACM 0002 version 17 and PDD version 01 is checked by the assessment team
<b>Findings</b>	No NC (= Non conformity) was raised during the validation process
<b>Conclusion</b>	All the tools are mentioned as per the latest version available in UN web page during the submission to DOE for GSC process.

#### D.8.4. Project boundary

Means of validation	The project boundary as depicted in the PDD version 01 is checked during the validation site visit and also during the interview with the plant official.			
Findings	No CAR raised for the project activity.			
Conclusion	The spatial extent of project boundary diagram (including the metering system) referred by the methodology is now mentioned in the PDD as per the requirement of applied methodology and thus the same is acceptable to the assessment team. The below table mentions the emission source:			
		Sources	GHGs involved	Description
	Baseline Emissions	INDIAN Grid	CO <sub>2</sub>	Carbon Dioxide
	Project Emissions	NA	NA	NA

#### D.8.5. Establishment and description of baseline scenario

<b>Means of validation</b>	The baseline scenario as depicted in the PDD version 01 is checked during the validation site visit and also during the interview with the plant official.
<b>Findings</b>	No findings were raised.
<b>Conclusion</b>	<p>Being a grid connected solar energy generation project, PP developed the project based on the Methodology ACM 0002 version 17. As per methodology <i>If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:</i></p> <p>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</p> <p>As per VVS version 09, "where the baseline scenario is not prescribed in the approved methodology, the DOE shall assess the list of identified credible alternatives to the project activity in the PDD selected to determine the most</p>

	<p>realistic baseline scenario.” Thus, PDD should mention the credible alternatives to the project activity in order to determine the most realistic baseline scenario. As the selected small scale methodology clearly mention the baseline scenario and the same has been opted in this project, therefore, no further analysis on baseline is required.</p> <p>Validation Team, therefore, concludes that the PDD conforms to the guidance given by EB via VVS version 09</p>
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#### D.8.6. Demonstration of additionality

<b>Means of validation</b>	<p>The cost of solar panels, electricity tariff, O&amp;M cost, depreciation, de-rating, salvage value and tax rate have been checked with DPR, purchase order, tariff order, Income Tax Act 1961, Power purchase agreement, third party PLF report and financial analysis sheet. During the validation site visit validation team interviewed the personal and confirms that the input parameters considered is appropriate and correct.</p>
<b>Findings</b>	<p>CAR 07 was raised during the validation process and closed successfully. For detail regarding the CAR, please refer APPENDIX 4.</p>
<b>Conclusion</b>	<p>During conceptualization of the project activity, board of directors of the project proponents considered the CDM revenue to improve the project financials. During the board meeting dated 10<sup>th</sup> October 2015 for board of Directors decided that they would consider CDM revenue for their project activity. In continuation to the board decision, PP issued the respective purchase order for the supply of Solar Panels.</p> <p>As per the “Guidelines on the demonstration and assessment of prior consideration of the CDM, EB 62 Annex 13 and VVS version 09 Para 115, as the start date of the project is after 2<sup>nd</sup> August 2008 , PP needs to intimate DNA and UNFCCC regarding the serious CDM consideration. Assessment team checked the intimations to DNA and UNFCCC and found the intimation was done within 180 days of project start date which is the (LOA) placed.</p> <p>Moreover, as per ‘Glossary of CDM terms (Version 09)’, “earliest real action for this project activity was taken on 31/10/2016 which is the Letter of Acceptance issued to Manufacturer for erection and installation of solar Panels in the state of Uttarakhand. Hence, this date has been treated as the start date of the project activity.</p> <p>In the above background Validation Team concludes that the additionality justification regarding the serious CDM consideration given by the project developer is in accordance with the requirements derived from VVS version 09.</p> <p>PDD mentioned that the project would not be economically or financially feasible without the revenue from the sale of certified emission reductions (CERs). The claim of the project developer has been assessed by the Validation Team through the following steps:</p> <p>i. <u>Suitability of investment analysis, financial indicator and benchmark:</u></p> <p>Project developer had demonstrated that the financial returns of the proposed CDM project activity would be insufficient to justify the required capital investment as per VVS version 09. In the web hosted PDD version 01 for global stake holder consultation process PP has adopted a conservative approach to identify the benchmark for the project activity. The project is earning revenue from the installation of the project activity. Thus simple cost analysis is not appropriate. Also in the absence of the project activity grid electricity would have been the obvious choice for the Project which requires no investment. Hence comparison analysis is also not appropriate for the project activity. Therefore, benchmark analysis is used for the project activity as per project type and decision making context. Therefore, the Expected return on equity is considered appropriate benchmark. Accordingly, the post tax Equity IRR has been considered as the relevant financial indicator for the project activity.</p> <p>PP identified the benchmark using As per Para 20 of EB85, Annex 12 (=Available at the time of Investment decision), “The values in the table in Appendix may also be used, as a simple default option”. However, since RBI (Reserve Bank of India, India Central Bank) provides forecast inflation for 10 years, the project investor has calculated benchmark using 10 year as benchmark for the project The WPI median inflation forecast for 10 years are added to the default values for the project participant as per the requirement of EB85, Annex 12</p>

The benchmark has been computed in the following manner:

Appendix A in EB85, Annex 12 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = **11.10%**

The Required return on equity (benchmark) was computed in the following manner:

Nominal Benchmark<sup>1</sup> =  $\{(1 + \text{Real Benchmark}) * (1 + \text{Inflation rate})\} - 1$

Where:

- Default value for Real Benchmark = 11.10% (as per Appendix of EB85, Annex 12)

- Inflation Rate forecast for by Reserve Bank of India (RBI) (i.e. Central Bank of India) for India & in case where RBI Inflation forecast was not available Average Inflation rate forecast for India has been sourced from IMF web site.

Appendix A in EB85, Annex 12 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = **11.10%**

Inflation Forecast for India as per RBI website<sup>2</sup>:

Since RBI publishes the inflation forecast for 5 years and 10 years, PP has considered the maximum 10 year inflation considering the renewable crediting period of total 21 years.

Project Participant	Inflation Forecast WPI Mean value from RBI- 10 year	Benchmark
Emami Power Limited.	3.6%	15.10%

Thus benchmark of **15.10%** has been selected for this project activity.

As a conservative approach, benchmark of 15.10% has been selected for this project activity and thus the same is deemed appropriate and acceptable to the assessment team.

b)Parameters and assumptions used:

The project activity is a renewable source of electricity generation and supplies the electricity to the INDIAN Electricity grid. The key parameters which determine the Equity IRR of the project activity are project cost, PLF and profitability estimates.

In the revised PDD version 02, the project cost is based on the DPR (=Detailed project report) dated 15<sup>th</sup> September 2015. DPR report has been submitted to validation team. The cost of Panel is 75 MN/MW which is the normal price in the region and is acceptable to the assessment team. The DPR were available during decision making and financial profitability of the project was decided based on this DPR. Validation team checked the DPR of the project activity and found that consideration of the project cost in revised PDD version 02 is correct and it is in line with EB85, Annex 12 as well as in compliance to VVS version 09. Hence, the project cost consideration is justified.

In India, infrastructure projects are generally entitled to a debt equity ratio of 70:30. However, depending on the relationship of the client with the bank, its credit rating and collaterals offered, banks consider higher debt equity ratio also. The debt equity ratio for the project is 70:30. Assessment team checked the DPR and found that the ratio of Debt to equity was considered correctly for the present validation condition.

The profitability of the project, which forms the basis for IRR calculation is based on installed capacity, PLF, electricity tariff, O&M cost, depreciation and taxation. The installed capacity is based on the capacity of solar panels, which is evidenced by the DPR subsequently.

c)Assessment of Plant Load Factor (PLF):

<sup>1</sup> As per Pg. 320 of Corporate Finance, Second Edition of Aswath Damodaran

<sup>2</sup> <https://www.rbi.org.in/Scripts/PublicationsView.aspx?id=16696>

PP considered the Plant load factor from a third party engineering company, for expected electricity generation estimation. They are contracted by the PPs for this project. PP has submitted the copies of the PLFs estimation report to the assessment team. The value of PLF as mentioned in PLF report (=prepared by Urvis Dave: 3<sup>rd</sup> party engineering company) is used for IRR and ER calculation.

Validation team assessed the PLF assessment report and the actual electricity generation and found correct. Same 3<sup>rd</sup> party PLF report has been used in the financials and the emission reduction calculation. PLF estimation by 3<sup>rd</sup> party engineering company is in line with Para 3 (b) Annex 11, EB 48 and acceptable to the assessment team.

d)Assessment of Electricity Tariff:

The tariff is considered from DPR dated 15<sup>th</sup> September 2015 available to the PP at the time of decision making.

Validation team assessed the tariff and found that same value was available during decision making and in conformity with guidance Appendix of EB85, Annex 12. Furthermore, assessment team has also checked the actual tariff in the power purchase agreement signed for further substantiation as these values are available during the validation stage. The vales as considered for the financial additionality determination are same as the values mentioned in power wheeling agreement

e)Assessment of O& M cost:

PP considered the O&M cost from the DPR. The DPR has been used in the financial calculation as same was available during decision making and hence applicable. According to Appendix of EB85, Annex 12, the cost should be based on the input parameters available at the time of decision making and the PP has submitted DPR supporting this consideration. Therefore, considering the above assessment, validation team concluded that the O&M cost considered from respective DPR in the computation of financial indicator is in conformity with guidance Appendix of EB85, Annex 12.

f)Assessment of Tax computation:

The project developer has adopted book depreciation rates as per Schedule XIV of the Companies Act, 1956 for computing book profit and Income Tax Act 1961 stipulated for income tax calculation, which are in conformity with the accepted accounting principles adopted by the company and income tax laws in the host country. The block of assets has been computed for depreciation purpose as per the accepted accounting principles. Tax liability has been calculated as per the income tax rules and the rulings given. In computing the income tax liability, the project developers have considered Tax holiday (u/s 80IA of the Income Tax Act, 1961). Accelerated depreciation on plant and machinery is also sourced from IT act. The tax rates assumed corresponds to the tax rate prevailing at the time of taking decision (conformity to EB85, Annex 12). Hence, these assumptions are appropriate during decision making context.

g)Cross checking parameters:

The cost of Solar Panels, electricity tariff, O&M cost, depreciation, salvage value and tax rate have been checked with DPR, tariff order, Income Tax Act, power purchase agreement.

The DPR value has been used in the financial calculation as same was available during decision making and hence applicable. According to Appendix of EB85, Annex 12, the O&M cost should be based on the input parameters available at the time of decision making and the PP have submitted DPR supporting this consideration. There is no difference in the value used for O&M in the IRR sheet and the DPR. The same is acceptable to the assessment team

The project developer has adopted book depreciation rates as per Schedule XIV of the Companies Act, 1956 for computing book profit and Income Tax Act 1961 stipulated for income tax calculation, which are in conformity with the accepted accounting principles adopted by the company and income tax laws in the host country.

The tariff is considered from DPR report available to the PP at the time of decision making

The documents supporting the financial calculations, in the opinion of Validation Team, are therefore authentic and conform to the guidance given by EB. CARs and CLs were raised as non-conformities and they were either set right or clarified. With the corrections having been incorporated, the input costs considered conform to guidance on investment analysis issued by EB. All the input parameters considered in computation, the basis, correctness and appropriateness thereof are checked and found correct. Please refer CAR 07 for detail analysis.

h)Assessment of correctness of computation:

The assessment involved checking the data input taken from DPR, power purchase agreement, tariff order, adoption of correct accounting principle and arithmetical accuracy. Validation Team checked the documents and ensured that appropriate input has been taken in the project cost and projections. Based on the CARs and CLs, corrections were incorporated or issues were clarified. The arithmetical accuracy was also found to be correct.

The equity IRR has been computed for a period of 25 years (=Operational lifetime of the project (for solar), which is the life time of the project and is in conformity with the Appendix of EB85, Annex 12. As required by Appendix of EB85, Annex 12 the expected realization on the sale of assets at the end of the operating life has been taken as salvage value in the terminal year. In computing the IRR, the project developer has taken into account profit after tax, depreciation tax shield and salvage value (in the terminal year). The principle adopted conforms to the accepted accounting and taxation principles.

Validation team also confirms that rest of the input parameters are considered appropriately and are in line with guidance Appendix of EB 92 Annex 05. Therefore, from the above arguments/justifications it is evident that the project is not business as usual scenario and requires CDM benefits to sustain.

**Detail analysis of the input parameters:**

Name of the parameter	Value of the parameter- Considered for IRR calculation	DOE assessment
Project Cost	75Mn/ MW based on DPR dated 15/09/ 2015	<p>The proposed CDM project activity has considered the project cost as INR 75 million per MW based on DPR dated 15/09/2015 prepared for the project activity. The DPR was available to PP at the time of investment decision. Based on actual EPC contract/purchase order, the project cost is INR 68 million per MW. The actual project cost is reduced by 9.33% of DPR project cost which is within 10% of sensitivity analysis and there is no any impact on IRR with actual project cost. Since the actual project cost is absolute and there is no possibility of further reduction, the assessment of project cost is confirmed to be correct.</p> <p>The DOE has also checked the actual cost of other ongoing under validation projects of year 2014 to 2016 (having actual project cost in the range of INR 63 to 77.66 million per MW) and found that actual cost of current proposed project activity is within range. The difference in actual project cost is due to time difference, manufacturer, different EPC contractor, negotiation skills of individual PP etc.</p> <p>DOE has checked the UNFCCC web site for recently registered projects having Investment Analysis for project cost comparison purpose; however DOE have not found any recently CDM registered project activity using the same technology.</p> <p>However, assessment team checked further on UN web site and found that</p>

		<p>UN 7103 Solar project was commissioned on March 2012 and its project cost is INR 145.1 million per MW. The other available registered projects have been checked by DOE and found that UN10150 project have considered project cost INR 91.55 million per MW (15/07/2012 Investment decision) and UN10177 project considered the INR 143.2 Million Per MW (2010 Investment Decision). These projects are of older duration than current proposed project activity, hence that cost is higher than proposed project cost. Based on sectoral scope expert and local knowledge, the project cost considered as per DPR for the proposed project activity is found to be appropriate. Also since the actual cost is available to DOE and IRR is still within benchmark and thus the same is acceptable.</p>
<b>Auxiliary Consumption</b>	0.25% of generation based on DPR dated 15/09/2015	<p>The proposed CDM project activity has considered the auxiliary consumption as 0.25% of generation based on DPR dated 15/09/2015 prepared for the project activity.</p> <p>The DPR value was available to PP at the time of investment decision.</p> <p>The DOE has checked the negligible quantity of auxiliary consumption from CERC (=Central Electricity Regulatory commission, Govt of India) tariff order "Determination of Benchmark Capital Cost Norm for Solar PV power projects and Solar Thermal power projects applicable during FY 2015-16" dated 31/03/2015. The order mentioned that "From the experiences of JNNSM phase I, it has been observed that auxiliary consumption is very miniscule in the case of Solar PV power plant". Thus it indicates that the solar PV projects have some auxiliary consumption, though commission has decided not to consider auxiliary consumption (being the negligible amount).</p> <p>Though this value of parameter is negligible, the PP has considered the same as per DPR and hence DOE has accepted the same. DOE has checked that even after neglecting auxiliary consumption, there is no any negative or adverse impact on additionality. The IRR is within benchmark for base case and also for sensitivity analysis.</p>
<b>Annual Panel Degradation</b>	0.7% per year based on DPR dated 15/09/2015	<p>The proposed CDM project activity has considered the annual panel degradation as 0.7% per year based on DPR dated 15/09/2015 prepared for the project activity. The DPR value was available to PP at the time of investment decision.</p> <p>The DOE has further checked the article "Comprehensive study of performance degradation of field-mounted photovoltaic modules in India" (<a href="http://onlinelibrary.wiley.com/doi/10.1002/ese3.150/pdf">http://onlinelibrary.wiley.com/doi/10.1002/ese3.150/pdf</a>)</p> <p>As per this study "the survey reported that the average degradation rate for crystalline silicon modules is 0.8–0.9% per year whereas it is around 1% per year for thin film modules. Also Manufacturers recommends solar panels with a power output or performance warranty that usually guarantees 80% production at 25 years. Thus 20% reduction in power for 25 years. Hence, consideration of 0.7% per year degradation for 25 years life is conservative and hence accepted by the assessment team.</p> <p>Also based on a 2012 NREL (<a href="http://www.nrel.gov/docs/fy12osti/51664.pdf">National Renewable Energy Laboratory</a>) study ("Photovoltaic Degradation Rates—An Analytical Review") that found solar panels degrade about 0.5% to 3% each year, barring any equipment issues. <a href="https://www.nrel.gov/docs/fy12osti/51664.pdf">https://www.nrel.gov/docs/fy12osti/51664.pdf</a> and hence panel manufacturers guarantees 80% production at 25 years. Thus consideration of 0.7% degradation is appropriate.</p>
<b>O&amp;M cost and Escalation in the</b>	O&M cost as INR1.1 million	<p>The proposed CDM project activity has considered O&amp;M cost as INR1.1 million per MW and the Escalation in the operational expenses (%) as 5.72% per year based on DPR dated 15/09/2015 prepared for the project activity. The DPR value was available to PP at the time of investment decision.</p> <p>The DOE has checked the publically available source i.e. CERC (=Central</p>

	<b>operational expenses (%)</b>	per MW and the Escalation in the operational expenses (%) as 5.72% per year based on DPR dated 15/09/2015	<p>Electricity Regulatory Commission, Govt of India) tariff order “Determination of Benchmark Capital Cost Norm for Solar PV power projects and Solar Thermal power projects applicable during FY 2015-16” dated 31/03/2015, which states that O&amp;M expense norm for solar PV power project as INR 1.3.Million/MW for FY 2015-16 has been considered. Thus consideration of INR 1.1 Million/MW with 5.72% escalation is appropriate.</p> <p>The O&amp;M cost has been considered as sensitivity parameter and threshold limit for O&amp;M expenses is INR 0.08 million per MW which is unlikely scenario. The actual O&amp;M contract has been checked by DOE and found that per MW O&amp;M expenses are INR 0.8 Million per MW with 5% escalation. With actual O&amp;M expenses and its escalation, the IRR is well below benchmark of project activity. Hence DOE has accepted the same.</p>
	<b>Land lease expenses</b>	INR 0.0078 Million per year based on DPR dated 15/09/2015	<p>The proposed CDM project activity has considered the land lease expenses as INR 0.0078 Million per year based on DPR dated 15/09/2015 prepared for the project activity. The DPR value was available to PP at the time of investment decision.</p> <p>The DOE has checked the actual lease agreement for the project activity and actual lease is INR 0.085 Million per Acre, thus considering the 97 Acre land lease, the actual lease cost is comes to be INR 8.245 Million per year.</p> <p>The DPR considered the escalation in land lease cost as 3%, however as per actual lease agreement the escalation is 3% till 10<sup>th</sup> year, 4% for 11<sup>th</sup> to 15<sup>th</sup> year, 5% for 16<sup>th</sup> to 20<sup>th</sup>year , 6% for 21<sup>st</sup> to 25<sup>th</sup> Year. Thus considered land lease expenses are accurate and conservative</p>
	<b>Insurance cost</b>	0.5% of total project cost based on publically available Uttarakhand Electricity Regulatory Commission order dated 23/07/2015	<p>The PP has considered the insurance cost for the proposed project activity as 0.5% of total project cost based on publically available Uttarakhand Electricity Regulatory Commission order dated 23/07/2015. <a href="http://www.uerc.gov.in/ordersPetitions/orders/Misc/2015/July15/Order%20dated%2023.07.2015%20on%20revision%20of%20solar%20tariff.pdf">http://www.uerc.gov.in/ordersPetitions/orders/Misc/2015/July15/Order%20dated%2023.07.2015%20on%20revision%20of%20solar%20tariff.pdf</a>.</p> <p>The DOE has further cross checked the CERC Tariff order dated 03/03/2015 in the matter of “Determination of Benchmark Capital Cost Norm for Solar PV power projects and Solar Thermal power projects applicable during FY 2015-16”. This order has considered the insurance cost as 0.5% of total project cost. <a href="http://www.cercind.gov.in/2014/draft_reg/Petition%20No%20SM%20005%202015.pdf">http://www.cercind.gov.in/2014/draft_reg/Petition%20No%20SM%20005%202015.pdf</a>.</p> <p>Hence the insurance cost considered for the project activity is appropriate. DOE has analysed the IRR calculation with no insurance cost, and found that equity IRR is well below the Benchmark.</p>
	<b>Loan interest rate</b>	13% based on DPR dated	<p>The PP has assumed the loan interest rate as 13% based on DPR dated 15/09/2015 prepared for the project activity.</p> <p>The DOE has further cross checked the publically available Uttarakhand Electricity Regulatory Commission order dated 23/07/2015 which considered</p>



	15/09/2015 prepared for the project activity.	<p>the loan interest rate as 13%. Thus loan interest rate considered for project activity is .</p> <p><a href="http://www.uerc.gov.in/ordersPetitions/orders/Misc/2015/July15/Order%20dated%2023.07.2015%20on%20revision%20of%20solar%20tariff.pdf">http://www.uerc.gov.in/ordersPetitions/orders/Misc/2015/July15/Order%20dated%2023.07.2015%20on%20revision%20of%20solar%20tariff.pdf</a></p> <p>DOE analysed the IRR with 10% reduction in interest rate and observed that with 10% reduction in interest rate, the IRR is well below benchmark of project activity.</p> <p>The DOE has checked the loan sanction letter for the project activity and found that loan interest rate as 11.45% has been sanctioned. With this actual interest rate, equity IRR is below benchmark limit.</p>
<b>Loan tenure</b>	13.5 years (54 quarters) based on DPR dated 15/09/2015 prepared for the project activity	<p>The PP has assumed the loan tenure as 13.5 years (54 quarters) based on DPR dated 15/09/2015 prepared for the project activity.</p> <p>The DOE has checked the loan sanction letter for the project activity and found that loan has been sanctioned with 6 months moratorium period and 13 years equal repayment. Thus Loan tenure is found to be appropriate by DOE.</p> <p>The DOE has further cross checked the publically available Uttarakhand Electricity Regulatory Commission order dated 23/07/2015 which considered the loan tenure as 12 years. The order mentioned that "Normative period of loan repayment shall be taken as 12 years". The consideration of more loan tenure period is conservative as it increases the IRR as compared with lower loan tenure. Thus loan tenure period considered for project activity is considered as appropriate.</p> <p><a href="http://www.uerc.gov.in/ordersPetitions/orders/Misc/2015/July15/Order%20dated%2023.07.2015%20on%20revision%20of%20solar%20tariff.pdf">http://www.uerc.gov.in/ordersPetitions/orders/Misc/2015/July15/Order%20dated%2023.07.2015%20on%20revision%20of%20solar%20tariff.pdf</a>.</p> <p>The DOE has checked the IREDA's (<a href="#">Indian Renewable Energy Development Agency Ltd.</a>) Financing Norms &amp; Schemes _ July 2014, which gives the standard norms for renewable projects like Minimum Promoter Contribution, Quantum of loan &amp; Maximum Debt Equity Ratio, moratorium and loan repayment period. The document stated as 70:30 debt equity ratio, repayment period as 10-15 years and moratorium period as 6 months (2 quarters) to 1 year (4 quarters)</p> <p><a href="http://www.ireda.gov.in/writereaddata/Financing%20Norms%20%20Schemes%20_%2026%2007%202014.pdf">http://www.ireda.gov.in/writereaddata/Financing%20Norms%20%20Schemes%20_%2026%2007%202014.pdf</a></p>
<b>Moratorium period</b>	Moratorium period as 2 quarters based on DPR dated 15/09/2015 prepared for the project activity	<p>The PP has assumed the moratorium period as 2 quarters based on DPR dated 15/09/2015 prepared for the project activity.</p> <p>The DOE has checked the actual loan sanction letter for the project activity and found that loan has been sanctioned with 6 months moratorium period and 13 years equal repayment.</p> <p>Thus moratorium period is found to be appropriate by DOE. The DOE has checked the IREDA's Financing Norms &amp; Schemes _ July 2014, which gives the standard norms for renewable projects like Minimum Promoter Contribution, Quantum of loan &amp; Maximum Debt Equity Ratio, moratorium and loan repayment period. The document stated as 70:30 debt equity ratio, repayment period as 10-15 years and moratorium period as 6 months (2 quarters) to 1 year (4 quarters).</p> <p><a href="http://www.ireda.gov.in/writereaddata/Financing%20Norms%20%20Schemes%20_%2026%2007%202014.pdf">http://www.ireda.gov.in/writereaddata/Financing%20Norms%20%20Schemes%20_%2026%2007%202014.pdf</a></p>
<b>Plant depreciation</b>	The project	The project activity has considered the 90% of cost for depreciation and 10% are considered as salvage value. This is standard accounting practise in India. The same has been checked by DOE as per CERC Renewable Energy

	activity has considered the 90% of cost for depreciation and 10% is considered as salvage value	<p>Tariff regulations(<a href="http://www.cercind.gov.in/2015/regulation/Noti18.pdf">http://www.cercind.gov.in/2015/regulation/Noti18.pdf</a> ) the Salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the Capital Cost of the asset. Hence DOE has accepted the same.</p> <p>The PP is availing the accelerated depreciation for the proposed project activity and hence 80% depreciation rate has been accepted by DOE as per IT act. The same rate has been confirmed from income tax rules of India.</p> <p><a href="http://www.incometaxindia.gov.in/charts%20%20tables/depreciation%20rates.htm">http://www.incometaxindia.gov.in/charts%20%20tables/depreciation%20rates.htm</a></p>
<b>Tariff</b>	INR 5.74 per KWh	<p>Uttarakhand Government had invited the request for proposal for Grid Connected SPV Power projects through tariff based competitive bidding Process under Type-1 of Uttarakhand Solar Energy Policy-2013. As per terms and condition of request for proposal, "Bidder are required to quote levelled tariff for 25 years only in the price bid, UREDA (=Uttarakhand Renewable Energy Development Agency) will not entertain different tariff for every year, any bid with different tariff will be considered disqualified". In this competitive bidding process, the bidder has to offer levelled tariff for 25 years. The tariff should be constant and there shall be no escalation during the contractual period.</p> <p>PP has considered the levelled tariff rate as INR 5.74 per KWh for 25 years for this bidding process, Thus PP was one of the successful bidder through this process and the tariff rate offered by Emami Power Ltd was INR 5.74 per KWh. Hence the tariff rate considered for the IRR calculation was constant for 25 years of project activity. The same tariff rate was considered while preparation of the DPR and this tariff rate was available to PP at the time of investment decision. Hence consideration of this tariff is appropriate for IRR calculation.</p> <p>This tariff rate was further checked from the signed Power Purchase Agreement between PP and State electricity board which clearly mentioned the tariff rate of INR 5.74 per KWh for 25 years. Thus constant tariff rate of INR 5.74 per KWh is considered for 25 years.</p> <p>Hence, Tariff considered as appropriate and no escalation is envisaged for this parameter.</p>
<b>PLF</b>	18.50 % as per DPR dated 15/09/2015 and third party report dated 08/03/2016	<p>PP considered the Plant load factor from DPR available to the PP at the time of investment decision.</p> <p>Moreover, third party engineering company, for expected electricity generation estimation is contracted by the PPs for this project. PP has submitted the copies of the PLFs estimation report to the assessment team. The value of PLF as mentioned in PLF report/DPR (=prepared by Urvis Dave: 3<sup>rd</sup> party engineering company) is used for IRR and ER calculation.</p> <p>Validation team assessed the PLF assessment report and the DPR and found that the PLF values are same. Same 3<sup>rd</sup> party PLF report has been used in the financials and the emission reduction calculation. PLF estimation by 3<sup>rd</sup> party engineering company is in line with Para 3 (b) Annex 11, EB 48 and acceptable to the assessment team</p>
<b>Tax compu</b>	Income tax	The project developer has adopted book depreciation rates as per Schedule XIV of the Companies Act, 1956 for computing book profit and Income Tax

<b>tation</b>	rate: 30%  MAT: 18.50 %  Service tax: 15%  Surcharge: 15%  Education cess: 3%	Act 1961 stipulated for income tax calculation, which are in conformity with the accepted accounting principles adopted by the company and income tax laws in the host country i.e. INDIA. Tax liability has been calculated as per the income tax rules and the rulings given. In computing the income tax liability, the project developers have considered Tax holiday (u/s 80IA of the Income Tax Act, 1961). Accelerated depreciation on plant and machinery is also sourced from IT act. The tax rates assumed corresponds to the tax rate prevailing at the time of taking decision. Hence, these assumptions are appropriate during decision making context and thus acceptable to the assessment team.
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#### Sensitivity analysis:

The Guidance on Appendix of EB85, Annex 12 requires the robustness of the conclusion arrived at to be proved through a sensitivity analysis by varying the critical assumptions to a reasonable variation. The project developer has identified Plant Load Factor (PLF), Project cost, Electricity tariff and O&M cost as critical assumptions. These critical parameters constitute more than 20% of either total project costs or total project revenues. The sensitivity analysis reveals that even under more favourable conditions, the IRR without CDM revenue would not cross the benchmark return as given in the following table:

<b>Variation %</b>	<b>-10%</b>	<b>Normal</b>	<b>10%</b>	<b>Breaching Value</b>
PLF	5.33%	8.67%	12.38%	16.35%
O&M	9.37%	8.67%	7.96%	-92.50%
Project Cost	12.00%	8.67%	6.26%	-16.57%
Tariff Rate	5.61%	8.67%	12.64%	16.35%

- The PLF is considered from the third party engineering company for the long duration data. The probability of the PLF going higher than 10% is highly unrealistic and thus the PLF considered under the project activity is assessed to be appropriate.
- The sensitivity analysis reveals that O&M will breach the benchmark at negative values and is hypothetical case. Since the O&M cost is subject to escalation (as evidence by the O&M agreement) and also subject to inflationary pressure, any reduction in the O&M costs is highly unlikely. Hence, the reduction in the O&M cost is highly unlikely.
- The actual power purchase agreement is signed between state electricity board and project participant and available to the PP at this stage of validation for 25 Years. However, the increase or decrease of tariff is highly unlikely.
- Estimated Project Cost for financial analysis is considered from DPR. However, if we consider the actual cost of the project even then the benchmark is not breached.

The results of sensitivity analysis show that even with a variation of +10% & -10% in Project Cost, O&M cost, PLF and Tariff Rate Equity IRR is significantly lower than the benchmark. And it is evident from the results given above; the project remains additional even under the most favourable

conditions.

Moreover, Annex 3 of the EB 22 states that national and/or sectoral policies and circumstances have to be accounted for when considering the baseline scenario. Paragraph 7(a) states that, only those national and/or sectoral policies or regulations under paragraph 6(a), i.e., type E+ policy that increase GHG emissions, that have been implemented before adoption of the Kyoto Protocol by the COP (decision 1/CP.3, 11 December 1997), shall be taken into account when developing a baseline scenario. The Electricity Act of 2003 promoted cogeneration and generation of electricity from renewable sources of energy by providing suitable measures for connectivity with the grid and sale of electricity (Refer Section 86(1) of Electricity Act 2003). Therefore, it could be seen that the provincial and sectoral policies are E- i.e., policies that decrease GHG emissions and are after November 2001. Hence the baseline scenario of electricity generation by grid connected fossil fuel dominated power plants is in accordance with Annex 3 of EB 22.

The baseline mentioned in Section D.8.5 above is in compliance with all the applicable regulatory policies and laws. Additionally, the Project Participant is under no compulsion to opt for any particular technology or even a renewable mode of power generation. There is no governmental body or EB policy which requires a particular kind of fuel to be chosen and there is no legal requirement to which the above alternative does not conform.

**Demonstration of Parallel and continuing actions as per the 'Guidelines on the demonstration and assessment of prior consideration of the CDM' Annex 13 to EB 62 and Para 114-116 of VVS version 09.**

The decision to invest in the project activity was taken at Board Meeting of project investors. The board resolution acknowledged that the project does not generate enough returns and CDM revenue is considered in the cash flows to generate extra revenue for the project.

As per Para 114-116 of VVS version 09 it is mentioned that serious CDM consideration for the project having start date after 2<sup>nd</sup> August 2008 will be considered if the intimation to UNFCCC and DNA is received within 180 days of project start date.

Assessment team checked the UN web site (<https://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html>) and found that intimation letter were send within 180 days of project start date and thus confirms that PP considered CDM seriously. In line with the above guidance, project investors have intimated the UNFCCC and host party DNA i.e. National CDM Authority (NCDMA) of its intention to seek CDM for the proposed project activity in a defined F-CDM form within 180 days of the project start date i.e. on 31/10/2016. The project start date is 31/10/2016 and intimation is done on 24/11/2016. Assessment team also checked the email send to UNFCCC and DNA regarding the project activity. The details regarding project participant is checked from the prior consideration form send to UNFCCC and DNA. Acknowledgement email received dated 25/11/2016 from UNFCCC is also checked and found appropriate. Hence, it can be clearly established that CDM was seriously considered in the decision to proceed with the proposed project activity.

The above IRR calculations are also in line with latest methodological tool "Investment Analysis" Version 7 (EB92 Annex 5) dated 04/11/2016, except the default value of cost of equity which is revised as 11.06%. Since this value was not available to PP at the time of investment decision, above investment analysis was done with default value as per EB85 Annex 12.

If latest default value is considered for benchmark calculation, the benchmark becomes as 15.06%, and project is still remains additional with this benchmark.

**Common Practice analysis:**

The common practice analysis is proved by following points as per the requirement of Methodological tool "Common Practice", version 03.1 EB84, Annex 7<sup>3</sup>:

1. Applicable Geographical Area (Para 9): The Uttarakhand state has been considered as the applicable geographical area for this project. PP had considered the state of Uttarakhand geo-

<sup>3</sup><https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-24-v1.pdf>

graphical area due to regulatory regime since applicable power tariff structure for renewable energy projects is unique for all the states across national boundary of India; which is based on Electricity Act 2003 (EA 2003), section 82 which clearly mentions *“Every State Government shall, within six months from the appointed date, by notification, constitute for the purposes of this Act, a Commission for the State to be known as the (name of the State) Electricity Regulatory Commission”* Appropriateness of the same has been checked and confirmed from EA 2003 (<http://www.cercind.gov.in/08022007/Act-with-amendment.pdf/40/>).

Furthermore, following significant points on the State specific policy & regulatory framework on the renewable energy projects with special emphasis to solar power projects have been validated:

- Electricity Act 2003 (EA 2003) has changed the legal and regulatory framework for the renewable energy sector in India. The EA 2003 mandates policy formulation to promote renewable sources of energy by the federal government, the State governments and the State Electricity Regulatory Commissions (=SERCs) within their jurisdictions.
- The Electricity Act 2003 introduced some enabling provisions conducive to accelerated development of grid connected renewable energy sources. Under Section 61(h), promotion of cogeneration and generation of electricity from renewable sources of energy has been made the explicit responsibility of SERCs, which are bound by law to take these considerations into account while drafting their terms and conditions for tariff regulations. Nearly all SERCs have issued their tariff regulations incorporating suitable clauses, which will enable them to provide a preferential treatment to renewable energy (RE) during the tariff determination process. The SERCs determine the tariff for all renewable energy projects across the States, and the state-owned power Distribution Companies (DISCOMs) ensure grid connectivity to the renewable energy project sites.
- EA 2003 has initiated the adoption of the National Tariff Policy, 2006 as one of the key policies, National Tariff Policy (2006) framed under the Section 3 of the EA 2003. As per the excerpt from National Tariff Policy, 2006; pursuant to provisions of section 86(1)I of the EA 2003, the Appropriate Commission shall fix a minimum percentage for purchase of energy from such sources taking into account availability of such resources in the region and its impact on retail tariffs. Such percentage for purchase of energy should be made applicable for the tariffs to be determined by the SERCs latest by April 1, 2006.
- As mandated under section 86(1)I of the Electricity Act (2003), by June 2012, 26 SERCs had fixed quotas (in terms of % of electricity being handled by the power utility) to procure power from renewable energy sources. The mandate, which is called a Renewable Purchase Specification (RPS), varies from 0.5% to 14% in various states over varying time-scales. Few states have come out with technology specific RPSs. Besides, the state regulators determine the tariff for all RE projects in the states and ensure connectivity to the grid through extension of power evacuation from the RE project sites.
- At present thirteen SERCs have declared preferential feed-in tariffs (FITs) for purchase of electricity generated from solar power projects established in respective states, which varies from state to state in India. All the SERCs have adopted a 'cost plus' methodology to fix the feed-in tariff, which varies across the states depending upon the state resources, project cost and more importantly the tariff regulations of SERCs. Solar power related tariff policies in different states also has difference in regulatory and policy incentives. Several states have implemented fiscal and financial incentives for renewable energy generation, including; energy buy back (i.e. a guarantee from an electricity company that they will buy the renewable power produced); preferential grid connection and transportation charges and electricity tax exemptions.

Therefore the investment climate for the renewable energy projects varies from State to State within

India due to state specific local policy & regulatory framework as outlined by the State Electricity Regulatory Commissions of the respective state. This difference in investment condition leads to essential distinction among solar energy projects between different States of the host country India.

Thus, the specific geographical area i.e. state of Uttarakhand for the common practice analysis of the proposed project activity is considered and thus the same is acceptable to the assessment team.

2. Measure (Para 10): The project activity reduces greenhouse gas emissions by generating electricity using renewable energy source-solar. Therefore, the project activity falls under the following measure:
  - (b) Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies.
3. Output (Para 11): The project activity produces electricity. Therefore, electricity is considered as output of the project activity.
4. Different Technologies (Para 12): The project activity uses solar energy for producing electricity and hence as per Para 12(a), the technologies which use energy source/ fuel other than solar will be considered as the different technologies for the project activity.

The step wise approach to provide common practice analysis as per the guideline is as follows:

**Step (1):** Capacity or output range as +/-50% of the total design capacity

Range	Capacity	Unit
+50%	30	MW
Capacity of the proposed project activity	20	MW
-50%	10	MW

The +/- 50% range as selected for the proposed project activity is accurate.

**Step (2):** Uttarakhand state of India has been considered applicable geographical (explained above) area as a default, for the common practice analysis of project activity. All power plants generating electricity from solar energy within the capacity range of 10 MW to 30 MW and having commercial operations date before project activity start date (31/10/2016) have been considered. The power generation plants identified in this step are only solar power projects.

Numbers of Similar projects identified , which fulfil above-mentioned conditions are

**N<sub>solar</sub> = 01**

**Step (3):** CDM project activities which have got registered or are under validation have been excluded in this step. Assessment team checked the same from [cdm.unfccc.int](http://cdm.unfccc.int). After excluding the registered and under validation projects the total number of projects,

**N<sub>all</sub> = 1**

**Step (4):** As per the tool on Common Practice, different technologies are technologies that deliver the same output and differ by at least one of the following:

- i. Energy Source/Fuel
- ii. Feed stock
- iii. Size of installation (power capacity)
  - Micro
  - Small
  - Large
- iv. Investment climate in the date of the investment decision, inter alia:
  - Access to technology;
  - Subsidies or other financial flows;
  - Promotional policies

- Legal regulations
- v. Other features, inter alia:
  - Nature of the investment

The project activities have been separated from the different technologies on the basis of the Investment climate in the date of the investment decision

Investment climate in the date of the investment decision: The project activity involves electricity generation from solar. There are different state electricity board regulatory policy, hence each state have different tariff order. Since project activity is located in Uttarakhand state, the all projects located in Uttarakhand state are considered for common practise analysis under  $N_{diff} = 0$

**Ndiff = 0**

**Step (5):**  $F = 1 - N_{diff}/N_{all}$  and  $N_{all} - N_{diff}$  representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.

Calculate  $F = 1 - N_{diff}/N_{all}$   
 $F = 1 - (0/1) = 1$

As,

ii.  $F = 1$ ; is greater than 0.2

ii.  $N_{all} - N_{diff} = 1$ ; is not greater than 3

The project activity does not satisfy second condition. Hence, project activity is not a common practice.

The analysis clearly demonstrates that project activity is not a common practice within the sector in the applicable geographical area. Therefore, it can be concluded that the project activity is additional and requires CDM revenues to alleviate the investment barrier to the project activity

#### D.8.7. Emission reductions

<b>Means of validation</b>	The emission reduction sheet, CEA database and PDD version 2 is checked by the assessment team.
<b>Findings</b>	CAR 06 was raised during the validation process. The revision in the PDD leads to the closure of CARs. Please refer appendix 4 of this report.
<b>Conclusion</b>	<p>The baseline emissions as discussed in section B.6.1 will include emissions that would have occurred in the absence of the project activity. The emission reduction calculation has been done as per the LSC methodology ACM 0002 version 17.</p> <p>Baseline Emission (Bey):</p> $BE_y = EG_{PJ,y} * EF_{grid,CM,y} \text{-----}(1)$ <p>Where</p> <p><math>BE_y</math> = Baseline Emissions in year y; (tCO<sub>2</sub>)</p> <p><math>EG_{PJ,y}</math> = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh)</p> <p><math>EF_{grid,CM,y}</math> = Grid emission factor (MWh/tCO<sub>2</sub>)</p> <p>PP has estimated the baseline energy generation considering the capacity of the project activity, yearly generation hour and plant load factor.</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 11.0 which is sourced from CEA, 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>



For estimating the operating margin emission factor, PP calculated ex-ante Simple Operating Margin (OM). As per the "Tool to calculate the emission factor for an electricity system" version 11.0<sup>4</sup>: for grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation. Hence, PP considered the weighted average of latest net electricity generation and import of electricity and associated emission from CEA. The value of operating margin considered as 0.9941tCO<sub>2</sub> /MWh and the value of build margin as 0.9285tCO<sub>2</sub> /MWh (based on the latest one year data). The weighting for both operating margin is taken as 0.75 and build margin as 0.25 for wind/solar power generation projects. Validation team checked the estimation procedure and considered data and found transparent and conservative. Emission factor of the project considered is mentioned below:

$EF_{grid, y} = 0.9777 \text{ tCO}_2\text{e/MWh}$  and it is fixed ex ante for the crediting period.

Considering this process, combined margin emission factor has been considered and same value is confirmed correct. The baseline emission for the project is described below

Project Investor's Name	Capacity	PLF (%)	Generated Power (MWh) p.a	Baseline Emission Factor (tCO <sub>2</sub> /MWh)	Baseline Emissions (tCO <sub>2</sub> /year)
Emami Power Limited.	20	18.5%	32,412	0.9777	31,689

#### **Project Emissions:**

For most renewable power generation projects activities  $PE_y = 0$ . As per applied methodology only emission associated with the fossil fuel combustion, emission from operation of geo-thermal power plants due to release of non-condensable gases, emission from water reservoir of Hydro should be accounted for the project emission. Since the project activity is a solar power project and hence project emission is zero

Hence  $PE_y = 0$

#### **Leakage Emissions:**

No Leakage emissions are considered. The main emission potentially giving rise to leakage in the context of electrical sector projects is emission arising due to activities arising such as power plant construction and upstream emission from fossil fuel use (e.g. extraction, processing, and transport). These emission sources are neglected.

Hence,  $LE_y = 0$

#### **Emission Reductions:**

The project activity reduces carbon dioxide emissions through displacement of grid electricity generation with predominantly fossil fuel based power plants<sup>4</sup> 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 ( $PE_y$ ) and emissions due to leakage ( $LE_y$ ), as per the formulae given below:

$$ER_y = BE_y - PE_y - LE_y$$

Where,

$BE_y$  = Baseline emissions in the year  $y$  in tCO<sub>2</sub>e

$PE_y$  = Project emissions in the year  $y$ .

$LE_y$  = Emissions due to leakage in the year  $y$ .

<sup>4</sup>[http://www.cea.nic.in/power\\_sec\\_reports/general\\_review/0304/tables.pdf](http://www.cea.nic.in/power_sec_reports/general_review/0304/tables.pdf)



	<p>Here,</p> <p><math>PE_y = 0</math> for the project activity as per the methodology.</p> <p><math>LE_y = 0</math> for the project activity.</p> <p>Therefore, <math>ER_y = BE_y</math>.</p>
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### D.8.8. Monitoring plan

<b>Means of validation</b>	Assessment team checked the monitoring practice onsite and also checked the guideline of UERC ( <a href="http://www.uerc.gov.in/">http://www.uerc.gov.in/</a> )
<b>Findings</b>	No CAR raised during the validation process.
<b>Conclusion</b>	<p><b><u>Parameters determined ex-ante:</u></b></p> <p>Baseline emission factor of INDIAN Grid is establish ex-ante based on Tool to calculate the grid emission factor, using a combined approach consisting 75 % operating margin and 25 % build margin. The emission coefficient from official data published in Central Electricity Authority (CEA) CO<sub>2</sub> Baseline database available to the project participant at the time of submission of PDD for validation and global stakeholder's consultation process. CEA is an official source of Ministry of Power, Government of India have worked out baseline as CO<sub>2</sub> baseline database. The assumption were verified by the validation team and found to be correct.</p> <p><b><u>Parameters determined ex-post:</u></b></p> <p>The parameters monitored ex-post involves net electricity supplied to the grid (calculated from electricity exported and imported) to the Indian grid by the project activity.</p> <p>As per the registered PDD (version 02), the Monthly Meter Reading Reports provided by State electricity grid operators are the source of the monthly values of electricity exported and imported by the project activity. The net is then calculated from export and import. The DOE will use the same source for verification of emission reductions. As per the applied methodology ACM 0002 version 17 "Monitoring shall consist of metering the net electricity supplied by the project activity to the grid. Measurement results shall be cross-checked with records for sold electricity/electricity invoices".</p> <p>Electricity export to the grid and import from the grid is metered by main and check tri-vector energy meters. The main meter reading is taken jointly on a fixed day of every month for the preceding month at the delivery point and signed by the representatives of state utility and O&amp;M personnel. In the event of failure of main meter, the check meter will be used in monitoring the electricity data. The agency is experienced in the monitoring system and is managing O&amp;M of numerous other solar farm projects. The validation team therefore is of the opinion that the project participant through the O&amp;M agency is capable of implementing the monitoring plan in the context of the project activity.</p> <p>Calibration of all the meters is done by state electricity board officials as per the industry standards. However, the calibration will be done once in a 5year<sup>5</sup>. The energy meter recording the export and import from the grid at substation is under the control and supervision of state electricity board officials. Similarly O&amp;M contractor is responsible for monitoring of the generation data at CMS.</p> <p>It is reported that the data will be kept for 2 years following the end of the crediting period.</p> <p>The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the site visit.</p>

<sup>5</sup>[http://powermin.nic.in/whats\\_new/pdf/Metering\\_Regulations.pdf](http://powermin.nic.in/whats_new/pdf/Metering_Regulations.pdf), page 12

**D.9. Duration and crediting period**

<b>Means of validation</b>	The PDD version 02 is checked by the assessment team
<b>Findings</b>	No findings raised
<b>Conclusion</b>	PDD version 02 mentions renewal crediting period and the same is acceptable to the assessment team. The length of the crediting period is 7 years.

**D.10. Environmental impacts**

<b>Means of validation</b>	The guideline provided by MOEF is checked by the assessment team <a href="http://envfor.nic.in/legis/eia/so1533.pdf">http://envfor.nic.in/legis/eia/so1533.pdf</a>
<b>Findings</b>	NA
<b>Conclusion</b>	The project activity is expected to have positive impacts and no significant adverse environmental impacts are foreseen. Since, the project activity is an electricity generation from renewable source (i.e. solar energy) therefore no negative impact are envisaged. There is no mandatory legal requirement for carrying out an environmental impact assessment in the host country. The Ministry of Environment and Forests (MoEF), Government of India (GOI) notification <sup>6</sup> dated September 14, 2006 regarding the requirement of Environment Impact Assessment (EIA) studies states that any project developer in India needs to file an application to the Ministry of Environment and Forests (including a public hearing and an EIA) in case the proposed industry or project is listed in a predefined list. The list includes thirty nine project activities that require EIA studies. The solar power projects are not included in this list and thus an EIA study is not required.

**D.11. Local stakeholder consultation**

<b>Means of validation</b>	The local stakeholder consultation MOM, attendance sheet is checked by the assessment team. During the validation site visit assessment team also interviewed some of the stakeholder present during the meeting with PP.
<b>Findings</b>	Assessment team raised concern regarding the stakeholder consultation meeting and supporting document. The detail of the same is mentioned as CAR 09 in this report and the same is closed successfully
<b>Conclusion</b>	<p>As per the CDM requirements, it is necessary to invite the relevant stakeholders, before the validation process starts. Moreover, the start date of the project is 31/10/2016 and stakeholder consultation meeting took place on 09/09/2016 which is before the start date of the project activity which fulfill the requirement of Para 78 of project standard version 09. The DOE checked the relevance of the dates during the validation site visit.</p> <p>All the stakeholders have been invited through public notice (dated 01/09/2016) to attend the stakeholders meeting. The local stakeholders' consultation meeting was attended by local persons including local villagers, local vendors and technology suppliers.</p> <p>The stakeholders identified by the project participant were local villagers who are the major population of the particular area, local communities and gram panchayat (Village head), WTG supplier, project proponent representatives, O&amp;M Team and other people involved in the project. Validation team verified the list of participants who attended the stakeholder meeting and feedback questionnaire and confirms the stakeholders identified are relevant. Validation team verified the list of participants who attended the stakeholder meeting and feedback questionnaire and confirms the stakeholders identified are relevant. The validation team also verified the minutes of meeting to note that no negative comments were received and the same was cross checked with the information obtained during follow up interviews with the stakeholder's.</p> <p>Moreover, as per Para 164 of VVS version 09, DOE enquired with the MOEF (Host country DNA) dated 21/06/2017, regarding any stakeholder comments received for this particular project activity. DOE waited for 14 days and no comments received from MOEF. Based on the guideline and directive of Para 164, DOE concluded that Stakeholder consultation is in line with the requirement of this Para 164 and hence</p>

<sup>6</sup><http://envfor.nic.in/legis/eia/so1533.pdf>

	conclude that Local stakeholder consultation was conducted properly.
	Thus Validation team is of the opinion that the stakeholder meeting was adequate and appropriate.

## SECTION E. 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

## SECTION F. Validation opinion

Applus+ LGAI has performed a validation of the “Renewable Power Project by Emami Power Ltd”. The validation was performed on the basis of UNFCCC criteria and host country criteria, as well as criteria, e.g. ACM 0002 version 17, 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+ LGAI with sufficient evidence to determine the fulfilment 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+ LGAI for registration with the UNFCCC.

Applus+ LGAI 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 CO<sub>2</sub> emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the investment barriers 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 31,689 tCO<sub>2e</sub> per year, thereon displacing 32,412 MWh/year amount of electricity.

The validation has been performed following the requirements of the latest version of the CDM VVS version 09 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
CM	Combined Margin
CMS	Central Monitoring system
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
EB	Electricity Board
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming potential
PP	Project Participant
PPA	Power purchase agreement
PLF	Plant Load factor
RBI	Reserve Bank Of India
UERC	Uttarakhand Electricity regulatory commission
SERC	State Electricity regulatory commission

## Appendix 2. Competence of team members and technical reviewers

1. Mr. Sukanta DAS, has done M. SC in (Electronics and Photonics) and M. Tech in (Energy technology) from Tezpur Central University/ Indian Institute of technology Bombay in India respectively. He is a certified lead auditor for ISO 14001 EMS LA and ISO 9001 QMS LA from International registry for Certified Auditors (IRCA) and Certified Lean Management practitioner from Quality Council of India (QCI). He has more than eight years of working experience at TUV NoRD/ Re-consult/CRA/APPLUS certifications under various categories of projects stating from Renewable to waste to supercritical projects. He was JI/ CDM Lead Assessor in TUV NoRD and was involved in more than 100 CDM validation and verifications activities in Gold Standard, VCS, CDM projects as a team leader/technical reviewer / validator / verifier covering the sectoral scope 1, 13 technical areas 1.2/1.1/13.1. Currently he is associated with True Quality Certifications Private Limited and is empanelled with APPLUS certification to carry out GHG audit.
2. Meng (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 3.5 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	PLF assessment study report for the project activity	PLF report from Urvish Dave (=As per annex 11 EB 48) dated 08/03/2016	Project participant
3	NA	Technical specifications of solar Panels generators from manufacturers	Manufacturer technical specifications	Project participant
4	NA	Board decision for serious CDM consideration	Board meeting dated 10 <sup>th</sup> October 2015 for investment into the project.	Project participant
5	NA	Intimation to UNFCCC	<p>Prior consideration emails for the project. Also checked from UN web site</p> <p><a href="https://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html">https://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html</a></p> <p>Acknowledgement email received dated 25/11/2016 from UNFCCC</p>	Project participant
6	NA	<p>Webhosted PDD for GSC comment-version 01</p> <p>Final PDD based on which opinion is provided- version 02</p>	<p>24/04/2017</p> <p>30/06/2017</p>	Project participant
7	NA	Financial Calculation sheet- version 01	30/06/2017	Project participant
8	NA	<p>Emission reduction calculation sheet-version 01</p> <p>Emission reduction calculation sheet-version 02</p>	<p>24/04/2017</p> <p>30/06/2017</p>	Project participant
9	NA	DPR for the project activity	DPR dated 15 <sup>th</sup> September 2015	Project participant
10	NA	The operational lifetime of the project activity from the manufacturer(=Technical specifications)	Manufacturer technical specifications	Project participant
11	NA	<p>The stakeholder consultation process documents:</p> <ul style="list-style-type: none"> <li>List of attendee</li> <li>Minutes of meeting</li> <li>Feedbacks from the stakeholders</li> </ul>	MOM and attendance sheet of the meeting	Project participant
12	NA	ACM 0002 version 17: ACM0002/ Version 17.0, EB 89, "Grid-connected electricity generation from renewable sources	UNFCCC CDM web site	UNFCCC
13	NA	<p>UERC order <a href="http://www.uerc.gov.in/">http://www.uerc.gov.in/</a></p> <p>RBI: Reserve Bank of India</p>	Reference link is provided.	Independent Search

		<a href="http://www.rbi.org.in">www.rbi.org.in</a>  Ministry of Environment and forest: <a href="http://www.envfor.nic.in">www.envfor.nic.in</a>  UNFCCC <a href="http://www.cdm.unfccc.int">www.cdm.unfccc.int</a>  CEA: Central electricity authority <a href="http://www.cea.nic.in">www.cea.nic.in</a>  Income tax act 1961 <a href="http://law.incometaxindia.gov.in/DIT/">http://law.incometaxindia.gov.in/DIT/</a>		
14	NA	Tools/ guidelines used in the project activity <ul style="list-style-type: none"> <li>• Clarification on national and/or sectoral policies Para 27 EB 55</li> <li>• Guidelines for the reporting and validation of Plant Load Factor Annex 11 EB 48</li> <li>• Guidelines on the demonstration and assessment of Prior Consideration of the CDM EB 62 Annex 13</li> <li>• Tool to determine the remaining lifetime of the project activity in line with Annex 15 EB 50</li> <li>• Tool to calculate project or leakage CO2 emissions from fossil fuel combustion, Version 2, EB 41</li> <li>• Tool to calculate the emission factor for an electricity system version 03</li> <li>• Glossary of CDM terms version 09</li> </ul>	UNFCCC CDM web site	UNFCCC
15	NA	Letter of ODA from the PP	ODA letter dated 29 June 2017	Project Participant
16	NA	Host country approval	HCA letter dated 08 /02/2017	Project Participant
17	NA	Modalities of Communication	MOC dated 29/06/2017	Project Participant
18	NA	Commissioning Certificates for the project activity	Commissioning Certificates dated 30/03/2017	Project Participant

19	NA	Letter of Acceptance	31/10/2016	Project participant
20	NA	EPC contract signed between PP and Manufacturer	05/01/2017	Project participant
21	NA	Power Purchase agreement signed between PP and State Electricity Board	31/03/2016	Project participant

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

**Table 1 CL from this validation**

<b>CL ID</b>	01	<b>Section no.</b>	CDM requirement	<b>Date:</b> 24/06/2017
<b>Description of CL</b>				
The Project Participant is requested to provide documentation to confirm there is no public funding of the proposed CDM project activity.				
<b>Project participant response</b>				<b>Date:</b> 30/06/2017
The project activity does not involve any public funding for the project activity. The PP declaration for no involvement of official development assistance is submitted to DOE.				
<b>Documentation provided by project participant</b>				
PP Declaration for no involvement of ODA for the project activity.				
<b>DOE assessment</b>				<b>Date:</b> 06/07/17
ODA declaration is checked by the assessment team and found correct. CAR is thus closed.				

**Table 2 CAR from this validation**

<b>CAR ID</b>	01	<b>Section no.</b>	CDM requirement	<b>Date:</b> 24/06/2017
<b>Description of CAR</b>				
In accordance with CDM Project Standard, Version 09.0 (Project Standard), the APPLUS Project Team requires a letter of approval provided by the DNA - National CDM Authority (NCDMA) Ministry of Environment & Forests, for the Party involved in the proposed Project Activity. The APPLUS Project Team requests letter of approval when available, and before the request for registration can be submitted.				
<b>Project participant response</b>				<b>Date:</b> 30/06/2017
The Host Country Approval having reference number 4/7/2016-CC dated 08/02/2017 has been submitted to DOE.				
<b>Documentation provided by project participant</b>				
Host Country Approval having reference number 4/7/2016-CC dated 08/02/2017				
<b>DOE assessment</b>				<b>Date:</b> 06/07/2017
Host country Approval having reference number 4/7/2016-CC dated 08/02/2017 is checked by the assessment team and found correct. CAR is thus closed.				

<b>CAR ID</b>	02	<b>Section no.</b>	CDM requirement	<b>Date:</b> 24/06/2017
<b>Description of CAR</b>				
In accordance with the Project Standard Version 09.0, the APPLUS Project Team requests that the Project Participant submit the Modalities of Communication (MoC) statement. Corrective action is sought and requisite document need to be submitted				
<b>Project participant response</b>				<b>Date:</b> 30/06/2017
The modalities of communication signed on 29/06/2017 is submitted to DOE				
<b>Documentation provided by project participant</b>				
Modalities of Communication signed by PP on 29/06/2017				
<b>DOE assessment</b>				<b>Date:</b> 06/07/2017
Modalities of Communication signed by PP on 29/06/2017 and the same is checked by the assessment team and found correct. CAR is this closed.				

<b>CAR ID</b>	03	<b>Section no.</b>	A.1	<b>Date:</b> 24/06/2017
<b>Description of CAR</b>				
In accordance with the Attachment "Instructions for filling out the project design document form for Large-scale CDM project activities" at the end of "Project design document form for large scale CDM project activities", the APPLUS Project Team has the following observation:				
<ol style="list-style-type: none"> <li>1. The version of tool referred in section A.1 is not provided.</li> <li>2. The sectoral scope(s) and type of the project activity has not been mentioned in section A.1 of PDD.</li> <li>3. The terminology "Project Proponent" is not correct as per "Glossary CDM terms". Please check the same throughout the PDD.</li> <li>4. The document related to technical lifetime is not provided to the DOE for solar technology</li> </ol>				
Corrective action is sought for the above queries and requisite documents needs to be submitted.				
<b>Project participant response</b>				<b>Date:</b> 30/06/2017
<ol style="list-style-type: none"> <li>1. The version of tools are mentioned in section A.1 of revised PDD</li> <li>2. The sectoral scope and type of project is mentioned in revised PDD.</li> <li>3. The correct terminology "Project Participant" is mentioned in revised PDD</li> <li>4. The evidence for technical lifetime is submitted to DOE. The third party DPR, PPA clearly indicates that lifetime of project activity is 25 years</li> </ol>				
<b>Documentation provided by project participant</b>				
Revised PDD version 02 dated 30/06/2017				
Evidence for technical lifetime of project activity				
<b>DOE assessment</b>				<b>Date:</b> 06/07/2017
The revision regarding tools, sectoral scope and type of project now forms the part of section A.1 of the revised PDD version 02. The technical life time is checked from third party DPR and PPA and claim made by PP is found appropriate. CAR is thus closed.				

<b>CAR ID</b>	04	<b>Section no.</b>	A.2	<b>Date:</b> 24/06/2017
<b>Description of CAR</b>				
During the desk review APPLUS team observed that the geographical map addressing the project activity site is missing in the PDD. Corrective action is sought in this regard.				
<b>Project participant response</b>				<b>Date:</b> 30/06/2017
The section A.2 of PDD is revised with inclusion of Google map for the project activity				
<b>Documentation provided by project participant</b>				
Revised PDD version 02 dated 30/06/2017				
<b>DOE assessment</b>				<b>Date:</b> 06/07/17
The geographical map now forms the part of revised PDD version 02. CAR is thus closed.				

<b>CAR ID</b>	05	<b>Section no.</b>	A.3	<b>Date:</b> 24/06/2017
<b>Description of CAR</b>				
The Section A.3 of the PDD is not in accordance with the GUIDELINES FOR COMPLETING THE PROJECT DESIGN DOCUMENT FORM in following manner.				
<ol style="list-style-type: none"> <li>1. The description of the "Technologies and/or measures" in Section A.3 does not include a list of the facilities, systems and equipment that will be installed by the project activity.</li> </ol>				
The Project Participants are requested to revise the PDD to include the required information.				
<b>Project participant response</b>				<b>Date:</b> 30/06/2017



The section A.3 of PDD is revised with mention of technical specifications of the project activity	
<b>Documentation provided by project participant</b>	
Revised PDD version 02 dated 30/06/2017	
<b>DOE assessment</b>	<b>Date:</b> 06/07/17
Revision is carried out in section A.3 of the PDD version 02. CAR is thus closed.	

<b>CAR ID</b>	06	<b>Section no.</b>	B.4	<b>Date:</b> 24/06/2017
<b>Description of CAR</b>				
In order to confirm that Data Source used for calculation of grid emission factor is the latest available data at the time of PDD webhosting, the assessment team request that the Project Participant mention the date of publication of CEA data for Grid Emission Factor in the table in Section B.4 of the PDD.				
Moreover, Emission reduction sheet is not submitted to the DOE. Corrective action is sought for the same.				
<b>Project participant response</b>				<b>Date:</b> 30/06/2017
The project activity has referred the latest CEA database version 11 which was published on April 2016 and same was available to PP at the time of PDD submission to DOE for validation purpose. The publication period for CEA database version 11 is mentioned in revised PDD.				
The ER estimation sheet along emission factor calculation is submitted to DOE.				
<b>Documentation provided by project participant</b>				
Revised PDD version 02 dated 30/06/2017				
ER estimation and EF calculation excel sheet				
<b>DOE assessment</b>				<b>Date:</b> 06/07/17
The CEA database detail available to the PP at the time of PDD submission to DOE is now referred by PP in section B.4 of the revise PDD version 02. CAR is thus closed.				

<b>CAR ID</b>	07	<b>Section no.</b>	B.5	<b>Date:</b> 24/06/2017
<b>Description of CAR</b>				
During the desk review of the PDD and onsite visit document verifications, APPLUS team observed following inconsistency in the additionality determination :				
<ol style="list-style-type: none"> <li>1. Following documents are missing and thus the IRR calculation is reserved: <ol style="list-style-type: none"> <li>a. PLF reports</li> <li>b. All the input value (e.g. Offer letters, Loan sanction if any, Insurance etc )</li> </ol> </li> <li>2. Prior consideration document is not submitted to the DOE</li> <li>3. IRR calculation is reserved as no IRR sheets are provided</li> <li>4. Common Practice analysis supporting documents.</li> </ol>				
Corrective action is sought in the PDD section B.5 and supporting documentation is requested for further analysis.				
<b>Project participant response</b>				<b>Date:</b> 30/06/2017
<ol style="list-style-type: none"> <li>1. The third party PLF report is submitted for PLF of project activity. The DPR available to PP at the time of decision made was referred for IRR calculations. The DPR is submitted to DOE.</li> <li>2. The prior consideration from along with e mail to UNFCCC and acknowledgement from UNFCCC are submitted to DOE</li> <li>3. The revised IRR excel spreadsheet along with reference of all input assumptions is submitted to DOE.</li> <li>4. The revised excel spreadsheet for common practice analysis is submitted to DOE. The references have been mentioned in excel sheet to determine the similar projects in the Uttarakhand state.</li> </ol>				
<b>Documentation provided by project participant</b>				
Third Party PLF report and DPR for the project activity				

Prior consideration notification form and e mail communication with UNFCCC	
Revised IRR excel sheet	
Revised common practise analysis excel sheet	
<b>DOE assessment</b>	<b>Date:</b> 06/07/17
Following are the observations of the DOE:	
<ol style="list-style-type: none"> <li>1. Third party PLF report and DPR is checked by the assessment team and found correct. CAR is thus closed</li> <li>2. The prior consideration from along with e mail to UNFCCC and acknowledgement from UNFCCC is checked by the assessment team and found correct. CAR is thus closed</li> <li>3. The IRR sheets are checked and the revised values are sourced with appropriate documents. CAR is thus closed</li> <li>4. The common practice analysis sheet is checked and found correct by the assessment team. CAR is thus closed</li> </ol>	
Based on the revision of the IRR sheets and revised PDD, CAR is thus closed.	

<b>CAR ID</b>	08	<b>Section no.</b>	E	<b>Date:</b> 24/06/2017
<b>Description of CAR</b>				
During the desk review related to stakeholder consultation following observation is made by the APPLUS project team:				
<ol style="list-style-type: none"> <li>1.The stakeholder documentation is also not provided to the DOE</li> <li>2. The site photograph of LSHC meeting is not provided to the DOE.</li> </ol>				
Corrective action is this sought for the same.				
<b>Project participant response</b>				<b>Date:</b> 30/06/2017
The supporting documents for stakeholder consultation are submitted to DOE. The site photograph are also submitted to DOE.				
<b>Documentation provided by project participant</b>				
Public Notice, Minutes of Meeting, List of Attendees, questionnaire during LSHM meeting. The site photograph				
<b>DOE assessment</b>				<b>Date:</b> 06/07/17
The stakeholder meeting documents are checked and found correct by the assessment team. The stakeholder discussion now forms the part of revised PDD version 02. CAR is thus closed.				