




**Validation report form for  
CDM project activities  
(Version 04.0)**

**BASIC INFORMATION**

<b>Title of the project activity</b>	50 MW Kurnool Solar PV Power Project by M/s Prayatna Developers Pvt. Ltd. at Gani, Kurnool, AP.
<b>Scale of the project activity</b>	<input checked="" type="checkbox"/> Large-scale <input type="checkbox"/> Small-scale
<b>Version number of the validation report</b>	02
<b>Completion date of the validation report</b>	10/08/2020
<b>Version number of the PDD to which this report applies</b>	03
<b>Date when PDD was uploaded for global stakeholder consultation</b>	21/12/2018
<b>Project participants</b>	Prayatna Developers Pvt. Ltd.
<b>Host Party</b>	India
<b>Applied methodologies and standardized baselines</b>	ACM0002, Version 20.0 Title: Grid-connected electricity generation from renewable sources
<b>Mandatory sectoral scopes</b>	1 : Energy industries (renewable - / non-renewable sources)
<b>Conditional sectoral scopes, if applicable</b>	Not Applicable
<b>Estimated amount of annual average GHG emission reductions or GHG removals by sinks</b>	90,081 tCO <sub>2</sub> e
<b>Name and UNFCCC reference number of the DOE</b>	LGAI Technological Center, S.A. (Applus+ Certification) UNFCCC Ref. No.: E-0032
<b>Name, position and signature of the approver of the validation report</b>	Mr. Juan Sendín Caballero <i>Applus+ Certification Business Unit Managing Director</i> Signature: 

## SECTION A. Executive summary

>> The proposed CDM project activity is a renewable solar electricity generation project and supplying power to the Indian Grid. The power generated by the project will be replacing the equivalent amount of electricity from the Indian Grid system of India, which is dominated by fossil fuel based grid connected power plants. The project activity is located at village Gani-Sakunala, in Kurnool district in Andhra Pradesh, India.

The project activity involves the installation of 50 MW<sub>AC</sub> Solar Photovoltaic Project. The project activity is commissioned in two phases, first phase (30 MW) was commissioned on 28/06/2017 and remaining capacity (20 MW) on 15/07/2017. This is checked and confirmed from the commissioning certificates/39/ of the project activity.

### Scope of Validation:

The scope of the validation is defined as an independent and objective review of the project design document, the project baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. Applus+Certification have employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

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

### Validation process:

Applus+Certification assessed and determined whether the proposed implementation and operation of the project activity, and the steps taken to report emission reductions comply with the requirements specified in the CDM M&P, the CDM Validation and Verification Standard for project activity, version 02.0, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques. The validation process consist of the following three phases

- Document review:
- Desk review of the CDM PDD, and other relevant documents
- Follow-up interviews (video con-call) with project stakeholders
- The resolution of outstanding issues and the issuance of the final validation report.

### Conclusion:

LGAI Technological Center, S.A. (Applus+ Certification) has been contracted by Prayatna Developers Pvt. Ltd. to perform a validation of the proposed CDM project activity entitled "50 MW Kurnool Solar PV Power Project by M/s Prayatna Developers Pvt. Ltd. at Gani, Kurnool, AP."

The Validation was performed in accordance with the UNFCCC criteria for the Clean Development Mechanism Validation and Verification Standard for project activity (Version 02.0) and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

In our opinion, the project meets all relevant UNFCCC, CDM criteria and all relevant host country criteria. The project correctly applies methodology ACM0002 version 20.0 "Grid-connected electricity generation from renewable sources". It is demonstrated that the project 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. The total emission reductions from the project are estimated to be 630,571 tCO<sub>2e</sub> over a 7 year crediting period, averaging 90,081 tCO<sub>2e</sub> annually. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given the underlying assumptions do not change.

**SECTION B. Validation team, technical reviewer and approver****B.1. Validation team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Validation findings
1.	Lead Auditor /Technical Expert	OR	Ahirwar	Vivek Kumar	GCEES	Y	NA	Y	Y
2.	Validator	OR	Ahirwar	Vivek Kumar	GCEES	Y	NA	Y	Y
3.	Financial Expert	OR	Ahirwar	Vivek Kumar	GCEES	Y	NA	Y	Y

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

## SECTION C. Means of validation

### C.1. Desk/document review

>> The validation is performed primarily as a document review of the publicly available project design document version 01 dated 15/12/2018, version 02 dated 21/07/2020 and the final version 03 dated 08/08/2020 in particular the applicability of the methodology, the baseline determination, the additionality of the project activity, the starting date of the project, the monitoring plan, the emission reduction calculations provided in the form of a spread sheet. The validation team has checked the statements mentioned in the PDD through review of documents, interviews during video con-call/ contacts with stakeholders.

A complete list of all documents and evidence material reviewed is included in Appendix 3 of this report.

### C.2. On-site inspection

Due to the current situation with the global COVID-19 pandemic scenario and country wide lock down in India, an on-site inspection has not been performed by the assessment team. As per the communication received from CDM Executive Board regarding the relaxation for mandatory site visits by DOEs for a period of three months (23 March to 23 June 2020) and further communication received on 24/06/2020 to extend the relaxation till 31/12/2020, due to COVID-19 pandemic, it is recommended that site visit should be postpone as a result of the COVID-19 pandemic. It is to be noted that the project is shifted from other DoE, hence the PDD was not required to republish at UNFCCC website and site visit could have been conducted after signing the contract.

The assessment team had decided to suspend the physical site visit due country wide lock down in India and travel restrictions from 25/03/2020 onwards and extended up to 30/06/2020.

The DoE has determined that the physical site visit neither be postpone nor conducted in the current circumstances due to COVID-19 pandemic. As recommended by CDM EB/48/ via emails dated 20/03/2020 and 24/06/2020, justification for the approach being followed by the DoE is provided below:

1. The corona virus pandemic is "accelerating" in India and the total number of cases in the country now stands at 1,639, 335 and 35,786 deaths, the Worldometer indicates in its latest data update on 20/07/2020  
(Source: <https://www.worldometers.info/coronavirus/country/india/> )
2. As per the validation contract, timeline for concluding the validation is 11 week from day of signing .Since the contract was signed on 16/04/2020, hence it is likely to breach the timeline site visit postponed for indefinite period and the contract will have to be terminated.
3. Since the estimated annual average of greenhouse gas (GHG) emission reductions for the project activity is 90,081 tCO<sub>2</sub>eq (less than 100,000 tCO<sub>2</sub>eq) and project already commissioned, hence there is no pre-project information that is relevant to the requirements for registration of the project activity and may not be traceable after the registration. Hence in accordance with the paragraph 30, it is not mandatory for the DOE to conduct an on-site inspection at validation for the proposed CDM project activity.
4. The assessment team has risen a FAR during the validation accordance with the guidance provided under paragraph 36 of VVS for PAs version 02.0. The verifying DoE shall review the project implementation in line with the registered PDD, during the first verification of the proposed CDM project activity.

Furthermore travel during the Covid-19 era is risky and considering the advisories issued by national and local authorities:

- i. MP Government Travel Guideline; ( Dated 27/05/2020)  
[http://www.health.mp.gov.in/sites/default/files/2020-05/L.No\\_.706-27-5-2020.pdf](http://www.health.mp.gov.in/sites/default/files/2020-05/L.No_.706-27-5-2020.pdf)
- ii. Government of India, Ministry of Health and Family Welfare; (Dated 27/05/2020)  
[https://www.mohfw.gov.in/pdf/Guidelinesfordomestictravel\(airortrainorinter-statebustravel\).pdf](https://www.mohfw.gov.in/pdf/Guidelinesfordomestictravel(airortrainorinter-statebustravel).pdf)

- iii. Guidelines on preventive measures to contain spread of COVID-19 in workplace settings; Dt: 18/05/2020  
<https://www.mohfw.gov.in/pdf/GuidelinesonpreventivemeasurestocontainspreadofCOVID19inworkplacesettings.pdf>

Considering health and safety a top priority, it is justified to not conduct the physical site visit for validation audit. Since the site visit cannot be postponed but is not conducted due to the COVID-19 pandemic, hence the DOE has used standard auditing techniques for validation as referred to in sections 7.1.3 and 9.1.3 of the VVS for PAs version 02.0.

The source documents/alternative means of validation referred by the assessment team to validate the particular piece of validation are summarized in the below table, however detailed description of the same is provided under relevant sections of this report.

Validation criteria	Means of validation	Validation assessment
Demonstration of prior consideration of the clean development mechanism	<ul style="list-style-type: none"> <li>Email communication with CDM EB and DNA/13/</li> <li>Board resolution /11/</li> <li>CDM Prior consideration website</li> </ul>	Found to be creditable and appropriate
Identification of project type	<ul style="list-style-type: none"> <li>Detailed Project Report (DPR) Prepared by third party/08/</li> <li>Commissioning certificate/39/</li> <li>Power Purchase Agreement (PPA) /40/</li> </ul>	Found to be creditable and appropriate
Description of project activity	<ul style="list-style-type: none"> <li>DPR/08/</li> <li>PPA/40/</li> <li>Commissioning certificate/39/</li> <li>Video conferencing with site personnel and consultant /47/</li> <li>Latest photographs of site office ,online monitoring system, solar panels ,invertors ,transformers and other equipments installed at site indicating technical specifications/47/</li> <li>Video recording of project site /47/</li> </ul>	Found to be creditable and appropriate
Selection of methodologies and standardized baselines	Documents have been verified as described in section D.4.1 of this report.	Found to be creditable and appropriate
Application of methodologies	Documents have been verified as	Found to be creditable and

and standardized baselines	described in section D.4.1 of this report.	appropriate
Project boundary, sources and greenhouse gases	<ul style="list-style-type: none"> <li>• DPR ,PPA /08/ &amp;/40/</li> <li>• Video conferencing with site personnel and consultant /47/</li> <li>• Video recording of project site/47/</li> <li>• DoE prior experience over similar projects registered under CDM /5.2/</li> </ul>	Found to be creditable and appropriate
Baseline scenario	Documents/sources have been verified as described in section D.4.5 of this report.	Found to be creditable and appropriate
Demonstration of additionality	Documents/sources have been verified as described in section D.4.6 of this report.	Found to be creditable and appropriate
Monitoring plan	<ul style="list-style-type: none"> <li>• PPA/40/</li> <li>• Photographs of online monitoring system, energy meters and other monitoring equipments installed at site/47/</li> <li>• Video conferencing with site personnel and consultant/47/</li> </ul>	Found to be creditable and appropriate
Start date, crediting period type and duration	<ul style="list-style-type: none"> <li>• Purchase orders issued by the PP/34/</li> <li>• VVS for PA version 02.0/41/</li> </ul>	Found to be creditable and appropriate
Local stakeholder consultation	<ul style="list-style-type: none"> <li>• Video conversation with local stakeholders /47/</li> <li>• MoM and attendance sheet submitted by the PP/15/ &amp; /16/</li> </ul>	Found to be creditable and appropriate
Approval and authorization	<ul style="list-style-type: none"> <li>• LoA submitted by the PP/05/</li> <li>• Official website of Ministry of Environment and Climate Change, Government of India</li> </ul> (Ref: Section D.9 & D.10 of this report)	Found to be creditable and appropriate
Modalities of communication	<p>MoC and relevant documents submitted by the PP/06/ &amp; /37/</p> <p>( Ref: Section D.11 of this report)</p>	Found to be creditable and appropriate

In addition to the above assessment, in line with the guidance provided under paragraph 36 of VVS for PAs version 02.0, the assessment team has risen a FAR during the validation and accordingly the verifying DoE shall review the project implementation during the first verification of the proposed CDM project activity.

In view of the above consideration the assessment team is able to conclude that the standard auditing techniques used for the project activity are credible and sufficient for the purpose of validation.

Duration of on-site inspection: not applicable				
No.	Activity performed on-site	Site location	Date	Team member
1.	NA			
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### C.3. Interviews

(During the con-call arranged on 07/07/2020)

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Tholety	Mr. Pradeep	PDPL (Site Engineer)	07/07/2020	Description & ownership of the project activity, additionality, seriousness of CDM consideration; Baseline selection, HCA approval. Matters related to PDD and ER sheet, discussion of findings.	Vivek Kumar Ahirwar
2.	Jain	Mr. Deepak	Infinite solutions (Consultant)	07/07/2020	Project implementation, O&M, Training needs, Data logging.	Vivek Kumar Ahirwar

### C.4. Sampling approach

>> Not applicable

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

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Demonstration of prior consideration of the CDM	-	CAR #1	-
Identification of project type	-	-	-
Description of project activity	-	CAR #2	FAR #1
Application and selection of methodologies and standardized baselines	-	-	-
- Application of methodologies and standardized baselines	-	-	-
- Deviation from methodology and/or methodological tool	-	-	-
- Clarification on applicability of methodology, tool and/or standardized baseline	-	-	-
- Project boundary, sources and GHGs	-	-	-
- Baseline scenario	-	-	-
- Demonstration of additionality	-	CAR #3	-
- Estimation of emission reductions or net anthropogenic removals	-	-	-
- Monitoring plan	-	CAR #4	-

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Start date, crediting period type and duration	-	-	-
Environmental impacts	-	-	-
Local stakeholder consultation	-	CAR #5	-
Sustainable development co-benefits	-	-	-
Approval	-	CAR #6	-
Authorization	-	CAR #6	-
Modalities of communication	-	CAR #7	-
Global stakeholder consultation	-	-	-
Others (please specify)	CL #1 (missing documents)	-	-
<b>Total</b>	01	07	01



## SECTION D. Validation findings

### D.1. Demonstration of prior consideration of the CDM

<b>Means of validation</b>	<p>The start date of the project activity is 13/10/2016 and same has been checked from the earliest purchase order/34/ issued for supply of solar PV modules to Mundra Solar PV Limited. This is the earliest date on which the PP has committed to project capital expenditure. This is found to be the earliest real action towards the implementation of the project activity in line with the project start date definition, as mentioned under latest version of Glossary of CDM terms, thus it is accepted.</p> <p>The project activity has also already been implemented. Since the start date of the project activity is 13/10/2016 which is after 2<sup>nd</sup> August 2008, the project participant must inform a host party DNA and UNFCCC secretariat in writing of the commencement of the project activity and their intention to seek CDM status. Such notification must be made within 180 days of the project activity start date, using the standardized form CDM-PC-FORM.</p> <p>The project participant had submitted prior notification of commencement of the project activity and their intention to seek CDM status to the UNFCCC via email on 06/04/2017 /36/. Notification was received by the UNFCCC on 06/04/2017. This was checked and confirmed from the web site <a href="https://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html">https://cdm.unfccc.int/Projects/PriorCDM/notifications/index.html</a>.</p> <p>It is also verified that the email to UNFCCC secretariat (dated 06/04/2017) enclosing prior CDM consideration form was also copied to Indian DNA (Email ID: <a href="mailto:assistant.ncdma@nic.in">assistant.ncdma@nic.in</a>). Hence it is concluded that the PP notified the host party DNA and the UNFCCC within 180 days of start date of the project activity regarding the commencement of the project activity and their intention to seek CDM Status.</p> <p>The PDD was published for international stakeholder consultation (ISHC) on 21/12/2018 i.e. within two years of prior CDM consideration notification, hence further status update was not required to be sent to UNFCCC.</p>
<b>Findings</b>	CAR #1 was raised and resolved.
<b>Conclusion</b>	The validation team is of the opinion that the project participant has seriously considered CDM in their decision to go ahead with the implementation of the project activity. This is in line with paragraph 41 of VVS for PAs version 02.0. This is found to be appropriate and it is accepted.

### D.2. Identification of project type

<b>Means of validation</b>	<p>The installed capacity of the project is 50 MW<sub>AC</sub> that is exceeding the threshold capacity under small-scale project activity (15MW). Thus, the project is correctly identified as large-scale project activity.</p> <p>The PDD has been completed using the latest and valid version of PDD form (version 11.0) /44/ and following instructions there in.</p>
<b>Findings</b>	CAR #1 was raised and resolved.
<b>Conclusion</b>	The validation team is of the opinion that, in line CDM modalities and procedure, the project type is correctly identified as large-scale project activity which is outlined in paragraph 34 of the project standard for project activities version 02.0. It is also confirmed that the valid version of the PDD form has been used to complete the PDD following instructions therein.

### D.3. Description of project activity

<b>Means of validation</b>	<p>The proposed project activity involves the installation of 50 MW<sub>AC</sub> Solar Photovoltaic Project in the state of Andhra Pradesh. There are 5 sub-projects of 10 MW<sub>ac</sub> each are implemented under Jawaharlal Nehru National Solar Mission (JNNSM) Phase-II, Batch-II, Tranche – I, State Specific Bundling Scheme (under DCR Category)</p> <p>This proposed solar power project will reduce the GHG emissions generated by the current generation energy mix in India's Power Grid, which is dominated by fossil fuel based grid connected power plants. The project participant has signed the purchase agreement (PPA) with NTPC Limited /40/, which is a government entity responsible for implementation of grid connected solar PV project under the scheme "National Solar Mission". The National Solar Mission is an initiative of the</p>
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Government of India and State Governments to promote solar power. The mission is one of the several policies of the National Action Plan on Climate Change. Electricity generated by the project activity is being purchased by NTPC Vidyut Vyapar Nigam Limited (NVVN), which is eventually sold to state DISCOM /40/.

The technical specification of the project activity equipment's have been checked through the photographs/47/ of equipments indicating name plate details and are found to be consistent with the purchase orders/34/ raised for the project activity. The start date of the project activity is 13/10/2016, which is date of placement of the first purchase order for supply of solar PV modules to Mundra Solar PV Limited. The project activity is located in Kurnool district, in the state of Andhra Pradesh, in India. The location of the project activity mentioned in the PDD is checked through the Google Map (<https://www.gps-coordinates.net/>), found consistent and it is accepted.

The project description in the section A of the PDD is found to be complete and transparent and the salient features as validated are discussed below:

- The purpose of the proposed project activity is to generate electricity using solar energy, which is a renewable form of energy and supply the generated electricity to the NTPC and ultimately sold to state utility (DISCOM). In the absence of the project activity, the equivalent quantity of power would have been generated by fossil fuel dominated grid connected power plants, resulting in GHG emissions.
- The title of the project activity is "50 MW Kurnool Solar PV Power Project by M/s Prayatna Developers Pvt. Ltd. at Gani, Kurnool, AP."
- Technical specifications of the equipment's i.e solar PV modules, investors and transformers involved in the project activity as reported under section A.3 of the PDD are verified through the DPR/08/ and actual purchase orders issued by the PP to respective suppliers and found to be consistent.
- The annual average gross energy generation of the project is estimated to be 95,073 MWh/year based on the PLF of 22.10%/. The PLF has been verified by the assessment team against the independent third party report prepared by SgurrEnergy India Private Limited (SEI) /08/. It is confirmed that the PLF considered by PP is reasonable and in line with the requirement of CDM EB "guideline for the reporting and validation of plant load factors" /25/.
- The project activity will result in an annual average emission reduction of 90,081 t CO<sub>2</sub> equivalent.
- The project participant has chosen to have a renewable Crediting Period of 7 years

It is found that the project description provided in section A in the PDD/01/ gives clear understanding of the nature of the project activity and its technical aspects, as it sufficiently covers all relevant elements of the project activity. Also, description of the project activity is found to be accurate and complete. It is found to be consistent with the details verified through the actual purchase orders, DPR, commissioning certificates and the photographs of all the equipments indicating technical specification submitted by the project participant. This is found in line with paragraphs 50 of VVS for PAs version 02.0

The final PDD/01/ has been found to be prepared in the latest available PDD form (CDM-PDD-FORM) version 11.0 and is found in accordance with the instructions for completing the project design document form as outlined in the template, thus it is acceptable.

The technical lifetime of the project activity is mentioned as 25 years in section C.2 of the PDD. This is checked and verified from the DPR /08/ (which covers design lifetime of the project activity). This is found to be appropriate and it is accepted.

The project activity neither received any public funding from Annex 1 parties nor diverted ODA for project finance as mentioned in section A.5 of the PDD/01/. This has been confirmed from the loan documents/33/ that clearly indicates debt and equity portion for the project activity. Further, the PP has provided declaration for no ODA/31/. This is found to be appropriate and it is accepted.

The project activity entitled "50 MW Kurnool Solar PV Power Project by M/s

	Prayatna Developers Pvt. Ltd. at Gani, Kurnool, AP.” is a unique title. This has been checked and verified from the UNFCCC/45/. The PDD is providing all required information on the purpose of the project activity, the type of technology used and the contribution of the project activity to the sustainable development which has been found to be acceptable.
<b>Findings</b>	CAR #2 was raised and resolved. However FAR #1 is raised and open.
<b>Conclusion</b>	The validation team conducted document review and video conference with site personnel for this project activity. In view of the same the assessment team is able to confirm that the PDD contains a clear description of the project activity that provides a clear understanding of the precise nature of the project activity. This description is also found to be accurate and complete. The PDD satisfies the requirements of clause 7.4 Of VVS for project activity version 02.0/41/.

#### D.4. Application and selection of methodologies and standardized baselines

##### D.4.1. Application of methodologies and standardized baselines

<b>Means of validation</b>	<p>The project activity applies the approved consolidated baseline and monitoring methodology ACM0002, “Grid-connected electricity generation from renewable sources” version 20.0/23/. The applicability of the methodology is justified through the following paragraphs of the methodology; As per the ACM0002, version 20.0,</p> <p><u>Criteria-1.</u> This methodology is applicable to grid-connected renewable energy power generation project activities that: (a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plants/units; (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s).</p> <p><u>Validation assessment:</u> - The current project activity is a grid-connected renewable power generation. -The connection of the project activity with the grid is substantiated and confirmed by means of the Power Purchase agreement/40/ and the Commissioning certificate/39/. -The project activity is a new solar power plant at the project site where no renewable power plant was operated prior to the implementation of the project activity. The Purchase orders/34/ for the equipment’s involved in the project indicates that the equipment’s (Solar module, Invertors etc) are new and do not involve retrofit and/or modifications. Thus, the criterion is fulfilled by the proposed project activity.</p> <p><u>Criteria-2:</u> The methodology is applicable under the following conditions: (a) The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit; (b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity. <u>Validation assessment:</u> The project activity is the installation of a new solar power plant. This is confirmed through the purchase order/34/ and commissioning certificates/39/. Thus the criterion (a) is applicable and (b) is not applicable for the proposed project activity.</p> <p><u>Criteria-3:</u> The methodology is not applicable to:</p>
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(a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;

(b) Biomass fired power plants/units.

Validation assessment:

The project activity is the installation of a new solar power plant and does not involve switching from fossil fuels to renewable energy sources at the site of the project activity. This is confirmed through the purchase order/34/ and commissioning certificate/39/.

Thus, the criterion is not applicable for the proposed project activity.

Criteria-4:

In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance."

Validation assessment:

The project activity does not involve any capacity additions, retrofits or replacements of an existing facility because it is a Greenfield solar power generation project activity; same has been confirmed from the purchase orders, commissioning certificate and DPR prepared for project activity.

Thus the criterion is not applicable for the proposed project activity.

The project activity is the installation of a solar PV based Power Generation project; it is not a hydro project, thus all conditions related to hydro plants are not applicable to the project activity (and not included in this section).

Thus, it can be concluded that the applied methodology ACM0002, Version 20.0 is applicable to the project activity.

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

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

The PDD/01/ refers and correctly applies the latest version of tool to calculate the emission factor for an electricity system, version 07.0 /18/. Also the PP has referred the CEA Baseline CO<sub>2</sub> Emission Database version 13 dated June 2018 which was the latest available database at the time of PDD submission for validation of the project activity. The location of project activity is in the state of Andhra Pradesh, in India. As per CEA Baseline CO<sub>2</sub> Emission Database/10/, the state of Andhra Pradesh comes under the Indian grid, the geographic and system boundaries of which are clearly identified; information on the characteristics of the grid is available. Thus, the tool is applicable for the project activity.

2. Tool for the demonstration and assessment of additionality

The latest version 7.0.0 of the "Tool for the demonstration and assessment of additionality"/19/ has been used by the PP. Since the additionally tool is included in an approved methodology, additionality tool needs to be applied for the project activity. Also, PP is neither proposing new methodology nor proposing alternative methods to demonstrate additionality for consideration by the Executive Board. Thus it is concluded that the Tool for the demonstration and assessment of additionality is applicable for the project activity.

3. Combined tool to identify the baseline scenario and demonstrate additionality

The PP has used the "Tool to demonstration and assessment of additionality" in demonstration of additionality and the baseline has been developed in accordance with the applied baseline methodology. Hence, the combined tool is not used by the project participant.

4. Tool to calculate project or leakage CO<sub>2</sub> emissions from fossil fuel combustion

Since there is no fossil fuel combustion involved in the project site or in the project boundary, this tool is not applicable to the proposed project activity and not used/applied by the project participant.

<b>Findings</b>	CAR #2 was raised and resolved.
<b>Conclusion</b>	The validation team has concluded that the selected baseline and monitoring methodology has been previously approved by the CDM Executive Board, and is applicable to the Project, which complies with all the applicability conditions therein and the selected version is valid at the time of submission of the proposed project activity for registration. It is also confirmed that the methodology is correctly applied by comparing it with the actual text of the applicable version of the methodology.

#### D.4.2. Deviation from methodology and/or methodological tool

<b>Means of validation</b>	Not applicable
<b>Findings</b>	Not applicable
<b>Conclusion</b>	Not applicable

#### D.4.3. Clarification on applicability of methodology, tool and/or standardized baseline

<b>Means of validation</b>	Not applicable
<b>Findings</b>	Not applicable
<b>Conclusion</b>	Not applicable

#### D.4.4. Project boundary, sources and GHGs

<b>Means of validation</b>	As per the guidelines mentioned in the methodology ACM0002, version 20.0, " <i>The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to</i> ". The project activity will supply electricity to the National Grid. The project boundary includes the solar plant, the metering points and the grid, which has been illustrated in the Section B.3 of the PDD and gives clear understanding of the project boundary; thus it is acceptable. The same has been confirmed during the con-call with site personal and is found to be satisfactory. Furthermore, Applus+ Certification has validated and registered the similar projects under CDM (e.g. UN-10392, 10393, 10403, 10404) and based on prior experience it can be confirmed that the project boundary is appropriately described in the PDD. The consideration, by the PP, of only CO <sub>2</sub> gas for the baseline emissions is conservative and also in line with the methodology. The exclusion of CH <sub>4</sub> & N <sub>2</sub> O in the baseline scenario is appropriate. The project activity involves the generation of electricity using solar energy. Hence, there are no project emissions associated with this project activity. Hence, the exclusion of CO <sub>2</sub> , CH <sub>4</sub> & N <sub>2</sub> O in the project scenario are appropriate. The electricity imported by the project activity will be accounted in the net electricity exported to the grid by the project activity. There are no other sources of project emissions. Hence, the project participant has considered the project emissions as zero for project activity; this is in line with the methodology. The project boundary gives a clear understanding of emission sources related to the baseline scenario. There are no sources attributable to project emissions or leakage emissions, which can contribute more than 1% of overall expected annual emission reductions, and which are not addressed by the applied methodology, involved, as the project activity is electricity generation through solar power. No leakage emissions involved as equipment's were not transferred from another activity or to another activity. The project boundary in section B.3 of the PDD properly explains the physical description of the project activity. Also, it is found that all the components and facilities to mitigate GHG gases are included in the project boundary.
<b>Findings</b>	No non-conformability was observed during assessment for project description. Therefore, no finding was raised.
<b>Conclusion</b>	The validation team is of the opinion that the project boundary has been correctly identified in the PDD in line with paragraphs 69 to 74 of VVS for PAs, version 02.0. Furthermore, all the emission sources and gases have been included in the project boundary and the description in the PDD is accurate and complete, and also that the selected sources and gases are justified for the proposed project activity.

#### D.4.5. Baseline scenario

<b>Means of validation</b>	As the project activity involves the installation of a newly built and grid-connected
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	<p>renewable power plant that exports the generated electricity to the Indian grid system in India, hence, according to the methodology ACM0002 Version 20.0, the baseline scenario is determined properly as:</p> <p><i>“Electricity delivered to the grid by the Project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.</i></p> <p>The approved methodology that is applied prescribes the baseline scenario, and the same has been opted in this project, therefore, no further analysis on baseline is required.</p> <p>The relevant National Acts and regulations pertaining to generation of energy in India are:</p> <ul style="list-style-type: none"> <li>• Electricity Act 2003 /35/</li> <li>• National Electricity Policy 2005 /35/</li> <li>• Tariff Policy 2006 /35/</li> </ul> <p>The above mentioned National Acts and regulations pertaining to generation of energy in India does not influence the choice of fuel used for power generation. There is no legal requirement on the choice of a particular technology for power generation.</p> <p>The latest available version for “Tool to calculate the emission factor for an electricity system” is version 07 /18/ and the PP has correctly referred to the same in the section B.4 of the final PDD for determining baseline grid emission factor and it is found to be correct.</p> <p>The discussion on baseline is comprehensive in the PDD section B.4 and it is in line with the approved consolidated baseline and monitoring methodology ACM0002 version 20.0. Also, the identified baseline for the project activity is the most likely scenario of what would have occurred in the absence of the project activity and is confirmed by TA expert in the team; thus, it is accepted. The project participant has included all sources and references used for baseline determination for the project activity in the PDD/01/ and the identified baseline is justified appropriately by the project participant. The Baseline scenario and baseline emission calculations are found as per ACM0002 version 20.0/23/. The combined margin approach is the ex-ante approach as per tool to calculate the emission factor for an electricity system.</p>
<b>Findings</b>	No non-conformability was observed during assessment regarding identification of baseline scenario. Therefore, no finding was raised.
<b>Conclusion</b>	<p>In accordance with the requirements of paragraph 83 of the VVS for PAs version 02.0, the validation team confirm that:</p> <ul style="list-style-type: none"> <li>(a) All the assumptions and data used by the project participants are listed in the PDD including their references and sources;</li> <li>(b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;</li> <li>(c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;</li> <li>(d) Relevant national and/or sectoral policies, regulations and circumstances are considered and listed in the PDD;</li> <li>(e) The methodology has been correctly applied to identify the most plausible baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.</li> </ul>

#### D.4.6. Demonstration of additionality

<b>Means of validation</b>	<p>For the proposed project activity, the PP has demonstrated investment barrier through step 2 of “Tool for the demonstration and assessment of additionality” (version 07.0.0).</p> <p><b>Investment analysis:</b></p> <p>For the proposed project activity investment analysis approach is applied to demonstrate the additionality using the benchmark analysis method. Post tax equity IRR is identified as the most suitable financial indicator. Since the project gets revenue from the sale of electricity project, hence cannot apply simple</p>
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cost analysis; furthermore investment comparison analysis cannot be applied as the alternative to the project activity is the electricity generated by new and existing grid connected power plants.

The project participant has applied the benchmark analysis method. Since the project proponent is demonstrating the financial unattractiveness of the project and the project cost involves both equity and debt, equity IRR is considered appropriate indicator and the same is found to be appropriate, hence accepted by the assessment team.

#### **Benchmark selection:**

As per paragraph 15 of the 'investment analysis tool' version 10.0,

*"The applied benchmark shall be appropriate to the type of IRR calculated. Local commercial lending rates or WACC are appropriate benchmarks for a project IRR. Required/expected returns on equity are appropriate benchmarks for equity IRR. Benchmarks supplied by relevant national authorities are also appropriate. The DOE shall validate that the benchmarks used are applicable to the project activity and the type of IRR calculation presented."*

As per the above guideline the required/expected returns on equity are appropriate benchmarks for equity IRR.

In accordance with the para 19 of the Investment Analysis tool, version 10.0 /20/,

*'If the benchmark is based on parameters that are standard in the market, the cost of equity should be determined either by: (a) selecting the values provided in Appendix; or by (b) calculating the cost of equity using CAPM. The default values in the Appendix A are based on long term historical returns and therefore may also be applied by projects with a start date prior to the adoption of default values by the Board.'*

#### **Default values for the expected return on equity:**

The project participant considered default values for the expected return on equity of 11.10% as given in the table of Appendix of the Methodological tool – Investment Analysis version 06.0 (EB 85 annex 12) for country India applicable to group 1 projects /21/, which is expressed in real terms. It is to be noted that "Methodological tool – Investment Analysis version 06.0", was the latest version available at the time of decision making, hence referred by the PP.

However in line with the guidelines provided under the paragraph 19 of the Investment Analysis tool, version 10.0(EB105, Annex 06), *"The default values in the Appendix are based on long term historical returns and therefore may also be applied by projects with a start date prior to the adoption of the default values by the Board"*.

Furthermore paragraph 97 of the VVS for PA version 02.0, that recommends the application of latest valid version of "Investment Analysis Tool" for demonstration of additionality, the PP has considered the default values for the expected return on equity of 10.24% as given in the table under Appendix of Investment Analysis tool, version 10.0(EB105, Annex 06) for country India applicable to group 1 projects /20/. The assessment team is of the opinion that the approach followed by the PP for application of default value is conservative and in line with the guidelines provided under paragraph 19 of Investment Analysis tool, version 10.0 & paragraph 97 of the VVS for PA version 02.0, hence accepted.

The project equity IRR calculated is nominal terms as escalation is considered in O&M cost. Accordingly, PP converted the default benchmark which is in real terms into nominal terms by using the following equation:

$$\text{Nominal Benchmark} = (1 + \text{Benchmark real}) \times (1 + \text{Inflation rate}) - 1$$

Where,

Default value for Real Benchmark = 10.24% (as per Appendix of EB105, Annex 06)  
Inflation Rate= forecast for by Reserve Bank of India (RBI) (i.e. Central Bank of India) for India.

#### **Benchmark:**

The assessment team referred the book 'Corporate Finance' 2<sup>nd</sup> edition, by Aswath Damodaran /46/. In page 320 of the book, the same equation is mentioned for converting real into nominal values. Hence the assessment team considers the above equation as appropriate for converting real benchmark into nominal

benchmark.

The equity IRR calculated is nominal terms as escalation is considered in O&M cost. Accordingly, PP converted the default benchmark which is in real terms into nominal terms by using the following equation:

$$\text{Nominal Benchmark} = (1 + \text{Benchmark real}) \times (1 + \text{Inflation rate}) - 1$$

Where,

Default value for Real Benchmark = 10.24% (as per Appendix of EB105, Annex 06)

Inflation Rate = forecast for by Reserve Bank of India (RBI) (i.e. Central Bank of India) for India.

The assessment team referred the book 'Corporate Finance' 2<sup>nd</sup> edition, by Aswath Damodaran /46/. In page 320 of the book, the same equation is mentioned for converting real into nominal values. Hence the assessment team considers the above equation as appropriate for converting real benchmark into nominal benchmark.

$$\text{Nominal Benchmark estimated} = (1 + 10.24\%) \times (1 + 4.80\%) - 1 = 15.53\%$$

Reserve Bank of India (RBI) is Central Bank of host country (India) and it is India's monetary authority. The CPI inflation forecasted by RBI for next 10 years is expected to be 4.80% as per Results of 36<sup>th</sup> Round (Q2:2015-16) of Survey of Professional Forecasters on Macroeconomic Indicators on 29/09/2015 /29/. The assessment team has verified all the above said documents and confirmed that the benchmark identified to compare the financial attractiveness of the project activity is appropriate.

The input parameters in the financial analysis have been taken as per the values and assumptions applicable and available at the time of decision (i.e. 18/11/2015) to invest in the project activity in line with Paragraph 10, investment analysis tool version 10.0. These extract of board notes/11/ were checked in original as submitted by the project participant and found to be appropriate.

The approach used in the PDD has been assessed based on a document review, whilst the following relevant documents have been reviewed:

- Board Resolution by Prayatna Developers Pvt. Ltd. to invest into the proposed project activity considering CDM revenue/11/
- Detailed Project Report prepared SgurrEnergy India Private Limited (SEI), dated 16/11/2015 /08/.
- Equity IRR and Benchmark Analysis calculation sheet/02/
- Applicable CERC tariff order dated 31/03/2015/5.3/

During the con-call, the parameters used to demonstrate the additionality of the project activity has been discussed with representatives of the PP and finally the data, rationales, assumptions; justifications and documentation provided have been checked using local knowledge and sectoral and financial expertise of the Assessment Team.

The post-tax equity IRR for the project activity at the time of investment decision comes out to be 5.86%. Validation assessment of all the input parameters used in financial analysis is provided as following.

#### **Project cost:**

The Project cost for the project activity has been considered on the basis of the Detailed Project Report/08/ which is in turn based on budgetary offers received from the technology suppliers available to the project participant during conceptualization stage of the project. The project cost includes cost of solar PV modules, transformers, civil, electrical and mechanical works, land cost, cost for obtaining all government permissions and infrastructure development charges. This is found to be appropriate and it is accepted. The project cost for the project activity has been considered as INR 3,658.10 million based on project cost from DPR/08/ available at the time of investment decision for the project activity.

The actual project cost has been also considered by the assessment team to analyse the robustness of IRR calculation in the context of actual scenario. The project cost considered in the financial analysis is compared with the actual project cost provided in the CA certificate/8.1/ and it is verified that actual cost is 2.53% higher than the estimated cost. This variation is already covered under



sensitivity analysis.

Furthermore, the project cost (equivalent to INR 73.16 million per MW) has also been cross verified with recently registered solar power projects bearing UN reference numbers 10403, 10392, 10393 and 10496. The project cost is ranging INR 62.40 – 75 million per MW for the above reference projects. This variation in project cost may be due to reasons such as different suppliers; varying capacity of the projects; specific location of the project activity; negotiation capability of the client; etc.

The validation team has also checked the CERC tariff order dated 31/03/2015 and as per the tariff order (p.24) capital cost of INR 60.58 Million per MW was proposed for solar PV projects FY 2015-16.

The project cost/MW considered for the proposed project activity is higher than the same considered for grid connected solar PV projects in the CERC tariff order, dated 31/03/2015.

It is noted that the proposed project activity is developed and implemented under Jawaharlal Nehru National Solar Mission (JNNSM) Batch-II Tranche-I Phase-II state specific bundling scheme [Non Solar Park – DCR (Domestic Content Requirement) Category]. The policy of Domestic Content Requirement (DCR) is the use of the local manufactured components of solar generation equipment which includes the cells and modules<sup>1</sup>. Since the cost of locally manufactured components is comparatively higher, hence the project cost is on higher side.

Hence it is concluded that the project cost considered by the PP is in the range of investment in the project area. Thus it is found to be appropriate and it is accepted.

#### **Operation and Maintenance Cost and its escalation:**

The O & M cost for the project activity is considered from DPR (Latest applicable at the time of investment decision). Operation and maintenance cost considered is INR 51.87 million for the project activity (approx 1.4% of the project cost) with an annual escalation of 5.72%. In the DPR, O&M cost was estimated from INR 0.6 to 0.8 Million /MW<sub>p</sub>, hence the PP has considered the average of both the values in the IRR sheet to determine the same.

Also, O&M cost considered for the project activity is further checked through the CERC tariff order (p.33) which indicates O&M cost as INR 1.3 Million per MW.

The O&M cost and its percentage escalation has been cross verified with recently registered solar power projects bearing UN reference numbers 10403, 10392, 10393 and 10496 and it is observed that O&M cost was in the range from 1% to 2.25% of the project cost and percentage escalation from 5% to 5.85% considered, hence found to be comparable.

Thus, it is concluded that the O&M cost 1.4% of project cost with annual escalation of 5.72% for the project activity is considered to be appropriate and it is accepted.

#### **Plant Load Factor:**

The Plant Load Factor available to the PP at the time of decision of the project activity is 22.10% and basis for the same is Detailed Project Report prepared by SgurrEnergy India Private Limited (SEI) dated 16/11/2015. The Project Participant had contracted third party and mandate was given to SgurrEnergy India Private Limited for PLF determination of the project activity.

SgurrEnergy was originally established in Glasgow, UK in 2002 with an aim to excel in renewable energy consulting. The company with its in-depth expertise progressed exponentially in solar energy and assessed many projects worldwide. Furthermore, with huge growth and expansion, SgurrEnergy India was incorporated in 2007 to provide technical advisory and engineering services for solar power projects globally.

This is found to be in line with paragraph 3 (b) of "Guidelines for the reporting and Validation of Plant Load Factors" (Annex 11 of EB 48) and it is accepted. To further crosscheck appropriateness of PLF considered for the project activity, CERC tariff order dated 31/03/2015 is checked which is the latest available document at the time of decision making and on page 22 of the order indicates PLF of 19%. This is

<sup>1</sup> <https://www.eqmagpro.com/penalties-for-violation-of-norms-of-domestic-content-requirement-dcr-under-solar-pv-power-projects-under-mnres-schemes-programmes-2/>

covered in the sensitivity analysis variation range and the equity IRR remains additional under the investment benchmark value. Project specific annual average PLF of 22.10% for P90 (90% probability of occurrence) is calculated based on the yearly generation after applying 0.6% annual degradation as reported in the detailed project report/08/. Thus, it is concluded that PLF of 22.10% considered by the PP is appropriate; and the same has been considered in IRR calculations for the project activity.

#### **Electricity Tariff:**

The Project participant had considered INR 5.13/kWh as average electricity tariff fixed for 25 years of project's lifetime. It is checked and confirmed through the DPR, dated 16/11/2015. Since, it was the latest available and applicable at the time of conceptualization of the project activity and it is accepted.

Also the validation team has assessed the impact on IRR value and project additionality in case of actual electricity tariff as per PPA/40/ signed with the NTPC and it is concluded that the tariff rate considered for IRR calculation is same as mentioned in clause(H) at page 3 of the PPA.

The Electricity Act, 2003, the policies framed under the Act, as also the National Action Plan on Climate Change (NAPCC) provide for a roadmap for increasing the share of renewable in the total generation capacity in the country. Central Electricity Regulatory Commission (CERC) has notified Regulation on Renewable Energy Certificate (REC) in fulfilment of its mandate to promote renewable sources of energy and development of market in electricity. Thus, the project's applicability for these benefits under REC mechanism has been checked. Detailed procedure on REC mechanism dated 01/06/2010 by Central Electricity Regulatory Commission/07/ ([https://recregistryindia.nic.in/pdf/REC\\_Procedures.pdf](https://recregistryindia.nic.in/pdf/REC_Procedures.pdf)) checked for REC eligibility of the project activity and it is confirmed that the procedure was applicable at the time of projects investment decision. It is confirmed that REC is not applicable for the projects taking benefits of preferential tariff, hence it is concluded that REC benefits are not applicable to project activity. Also in actual scenario, PP will not be claiming REC benefits for the project activity and it is confirmed (<https://recregistryindia.nic.in/index.php/publics/index>) official website of REC registry; hence it is accepted.

#### **Debt to Equity Ratio:**

The project activity is funded by 30% equity and 70% debt as per the DPR. This is in line with the clause 26 of investment analysis tool version 10.0, which talks about typical debt/equity finance structure in the sector in the country. Typical debt-equity ratio is 70:30 power projects and this is checked from CERC tariff order dated 31/03/2015 /5.3/ which is latest available at the time of investment decision.

Further, actual debt equity ratio was confirmed to be 70:30 from the actual loan sanction letter/33/. There is no variation and IRR remaining well below the benchmark and hence it is found appropriate and thus it is accepted.

#### **Degradation in generation:**

The project participant has considered annual degradation of 0.6% from second year onwards as per the DPR. The DPR value was available to PP at the time of investment decision.

The DOE has further checked the article "Comprehensive study of performance degradation of field-mounted photovoltaic modules in India"

(Source: <http://onlinelibrary.wiley.com/doi/10.1002/ese3.150/pdf> )

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 0.5% per year degradation for 25 years life is appropriate and hence accepted by the assessment team.

Also based on a 2012 NREL (National Renewable Energy Laboratory) study ("Photovoltaic Degradation Rates—An Analytical Review") that found solar panels degrade about 0.5% to 3% each year, barring any equipment issues(source: <https://www.nrel.gov/docs/fy12osti/51664.pdf>) and hence panel manufacturers guarantees 80% production at 25 years. Thus consideration of 0.6% degradation is appropriate.

**Depreciation Rate:**

The project participant has considered straight-line method for book depreciation where 90% of the initial value of the project cost is depreciated for the life period of the project considering 10% salvage value.

The PP had considered IT depreciation rates as 7.69% as per Income Tax, Depreciation rates for power generating units (Source website <https://www.incometaxindia.gov.in/charts%20%20tables/depreciation%20rates.htm> )/28/).

Moreover, as per Schedule XIV of the Companies Act, 1956 /28/ for computing book profit and Income Tax Act 1961 stipulated for income tax calculation, 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.

This has been checked and confirmed with the financial expert involved in the project activity. This is found to be appropriate and it is accepted.

**Residual (Salvage) Value:** Salvage value is considered as 10% of the total project cost (excluding cost of land lease, erection and commissioning charges as well as transportation charges) as per the CERC tariff order (Page 29) dated 31/03/2015. These have been added back to the cash flow. As the land is purchase and it is being non-depreciable item, it is added back to the cash flow. However, PP considered 10% of cost of plant and machinery (solar plant) and 100% land cost as residual (salvage) value for the project activity conservatively). This is further validated as per the accounting practises and same has been also cross checked from Section 205 (2b and c) of Companies Act 1956 on the publically available web-link /28/ which allows a depreciable cost of ninety five percent which implies a consideration of 5% of salvage value as a standard accounting practice.

Salvage value has also been cross verified with recently registered solar power projects bearing UN reference numbers 10403,10404, 10393 and 10496 and found to be consistent with the same considered for project activity.

Thus, the consideration by the PP of 10% salvage value is conservative and hence appropriate for the purpose. The appropriateness of this is confirmed by the financial expert involved in the project activity; thus it is accepted.

**Interest Rate and Loan repayment period:**

The PP has considered the interest rate of 11% and the loan tenure of 20 years and moratorium period of 12 months has been considered by the PP limited to the debt component considered above i.e. 70% portion. This is evident from Detailed Project Report/08/. CERC tariff order dated 31/03/2015/12/ is referred to further crosscheck the appropriateness of the same and as per the CERC tariff order an interest rate as 13% and repayment period of 12 years (Including moratorium period) is recommended.

Interest rate has also been cross verified with recently registered solar power projects bearing UN reference numbers 10403,10404, 10392 and 10393 and found in the range from 10% to 13%. Hence, it is concluded that the repayment period considered for the project activity as 20 years is found to be appropriate and conservative; thus it is accepted.

**Income Tax, Service Tax and MAT:**

PP has considered Income Tax as 34.61% (inclusive of Surcharge (12%), Education Cess (3%) and Secondary and MAT 21.34% respectively (Including surcharge and education cess) in investment analysis for the project activity.

This is as per tax rates applicable to a domestic company in India (<https://taxguru.in/income-tax/income-tax-rate-chart-assessment-year-201516-financial-year-201415.html>).

Service tax rate is considered as 14% and the same is sourced from publically available data published by TaxDose.com

(<https://www.taxdose.com/comparative-service-tax-chart-with-service-tax-rate-of-14-14-5-and-15/>)

The appropriateness of the same has been checked and confirmed by financial expert involved in the project activity. This is found to be appropriate and it is accepted.

**Conclusion:**

The data, rationales, assumptions and justifications mentioned in the PDD and investment analysis excel sheets were checked against the local knowledge of the validation team, sectoral scope expertise, regulatory and applicable legal requirements in the Host country India. The documents were also verified by the financial expert.

The assessment team has confirmed that the evidences were checked for their validity and applicability at the time of the investment decision and found appropriate as per paragraph 10, investment analysis tool version 10.0, thus are acceptable.

The project participant has taken the values of Input parameters from Detailed Project Report prepared by prepared by SgurrEnergy India Private Limited (SEI) dated 16/11/2015 /08/. Further the assessment team confirmed that:

- The DPR is the basis for the decision to proceed with the investment in the project, i.e. that the period of time between the finalization of the DPR and the investment decision is sufficiently short that it is unlikely in the context of the underlying project activity that the input values would have materially changed; Also for robustness of additionality, assessment team has checked IRR calculation with actual scenario and found that project IRR is still below benchmark value. Thus, it is accepted.
- The values used in the PDD and associated annexes are fully consistent with the DPR;
- The input values from the DPR are valid and applicable at the time of investment decision. This has been cross checked from the technical area expert and financial expert of assessment team and found to be appropriate.

The equity IRR for the project activity without CDM revenues is 5.86% as per input values available at the time of investment decision which confirms that the proposed project activity in absence of CDM benefits and compared to the benchmark of 15.53% is not economically and financially attractive.

**Sensitivity Analysis:**

The sensitivity analysis has been carried out by the project participant for a reasonable range of variations i.e. +/-10% of major parameters, and this was found to be as per paragraph 27 of investment analysis tool version 10.0. At the time of decision, the PP had considered the project cost, O&M cost and tariff rate, as per DPR/08/. Also, electricity tariff is assessed under sensitivity analysis though tariff considered for the project activity is average electricity tariff for 25 years of the lifetime of the project activity conservatively. These parameters have material impact on the investment analysis.

The project participant has considered all the variables that constitute more than 20% of either total project costs or total project revenue i.e. PLF, Project Cost, tariff and O&M cost in the sensitivity analysis and hence this is found to be in line with paragraph 27 of investment analysis tool version 10.0.

The impact of +/- 10 % variation in these variables is summarized as below;

Percentage Variation	+10%	0%	-10%
<b>Parameter</b>	<b>Plant Load Factor(Energy generation)</b>		
Equity IRR (%)	7.95	5.86	3.69
<b>Parameter</b>	<b>Project Capital Cost</b>		
Equity IRR (%)	4.37	5.86	7.65
<b>Parameter</b>	<b>Electricity Tariff</b>		
Equity IRR (%)	7.95	5.86	3.69
<b>Parameter</b>	<b>Operation and Maintenance Cost</b>		
Equity IRR (%)	5.39	5.86	6.32

Based on above results, it can be concluded that the equity IRR of the project activity is not crossing the benchmark even with +/-10% variations in the critical parameters.

It is verified that the Equity IRR crosses the benchmark if:

1. Project cost reduced by 31%:

This is not a likely scenario as actual project cost is 2.53% higher than the estimated cost as verified through the CA certificate submitted by the project participant/8.1/. Since purchase order already placed hence further variation in the project cost is not a likely scenario.

2. PLF increases by 37.41%:

PLF considered by the project participant is appropriate in line with paragraph 3 (b) of EB 48 Annex 11. As per CERC tariff order also the indicative PLF (maximum) for tariff determination is 19% /12/. Therefore increase in PLF up to the breaching point is very unlikely.

3. Tariff increases by 37.41%:

Further increase in tariff rate is highly unlikely scenario as the tariff rate is fixed for 25 years as verified through the DPR/08/ and further confirmed with the PPA signed with NTPC.

4. O&M cost decreases by 225.81%

IRR crosses the benchmark if O&M cost decreases by 225.81%, however this is not a likely scenario.

In view of the above discussion the assessment team has concluded that the project activity is additional and it is found to be financially not viable.

**Common practice analysis:**

PP has demonstrated common practice analysis as per “Common practice tool” version 03.1. The stepwise approach to validate common practice analysis for the project activity is discussed as below;

As per paragraph 13 of “Tool for the demonstration and assessment of additionality” – Version 7.0.0, project activity belong to measure “Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies”; hence sub-step 4a) of the tool is applicable for the project activity.

Sub-step 4a): The proposed CDM project activity (ies) applies measure(s) that are listed in the definitions section above

As per sub-step 4a), paragraph 58 of the “Tool for the demonstration and assessment of additionality” – Version 7.0.0, latest version of the “Guidelines on common practice” available on the UNFCCC website shall be applied.

The PP applied latest version 03.1 of “common practice tool” and same has been as below;

**Applicable Geographical Area:** As per section 4 clause 9 of common practice tool version 03.1

*“Applicable geographical area should be the entire host country. If the project participants opt to limit the applicable geographical area to a specific geographical area (such as province, region, etc.) within the host country, then they shall provide justification on the essential distinction between the identified specific geographical area and rest of the host country.”*

The applicable geographical area has been considered as Andhra Pradesh state, 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> ).

Therefore, based on the above discussed objective information validated, it has

been concluded that 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, consideration of the specific geographical area i.e. Andhra Pradesh state for the common practice analysis of the proposed project activity found to be reasonable and justified. The PP has submitted the excel spread sheet of common practise analysis/03/ as per steps below for projects identification for similar and different projects and found to be appropriate.

**Step 1:** calculate applicable capacity or output range as +/-50% of the total design capacity or output of the proposed project activity.

The capacity of the project activity is 50 MW; hence applicable output range is 25 – 75 MW.

**Step 2:** identify similar projects (both CDM and non-CDM) which fulfill all of the following conditions:

- (a) The projects are located in the applicable geographical area;
- (b) The projects apply the same measure as the proposed project activity;
- (c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity;
- (d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant;
- (e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;
- (f) The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

There are 10 projects identified in applicable geo-graphical area.

All the identified projects falls in the output range of +/-50% of the total design capacity of 50 MW i.e. output range of 25 – 75 MW. This is verified through the list of Solar Power Projects commissioned in Andhra Pradesh as on 31/03/2017/32/ as per the state wise data for grid connected solar PV projects published by the Ministry of New and Renewable (MNRE).

The assessment team has checked the CPA analysis sheet and confirmed that start date of commercial operation of all the projects is before the start date of the project activity i.e. after 13/10/2016, hence considered as similar projects.

**Step 3:** within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number  $N_{all}$

Out of the 10 projects identified under step-2, 8 projects are either undergoing CDM validation or registered under CDM or claiming carbon credits under other GHG programme (VCS). Hence the number of projects neither registered CDM project or submitted for registration, nor project activities undergoing validation

Hence  $N_{all} = 2$ .

**Step 4:** within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number  $N_{diff}$

The PP has considered the projects implemented in different investment climate and under different legal regulations as different technology. The solar projects developed under different phases and different batches of National Solar Mission (NSM) or Solar Park through Bidding process can be considered as different technology projects.

A reverse bidding is a type of auction in which sellers bid for the prices at which

	<p>they are willing to sell their goods and services, then place bids for the amount they are willing to be paid for the good or service, and at the end of the auction the seller with the lowest amount wins. Such projects might have signed PPA with NTPC or SECI or state electricity board; therefore, the tariff rate and applicable legal regulations is different for all the allotted projects and can be assumed that projects are governed by different investment climate.</p> <p>It is verified that out of the 2 projects, PPA for one project is not signed with NTPC as implemented under solar park scheme, hence can be considered as different project, thus <math>N_{diff} = 1</math></p> <p><b>Step 5:</b> calculate factor <math>F = 1 - N_{diff}/N_{all}</math> 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.</p> <p>Factor <math>F = 1 - N_{diff}/N_{all}</math></p> <p>Hence, <math>F = 1 - 1/2</math>  <math>= 0.5</math></p> <p>And  <math>N_{all} - N_{diff} = 1</math></p> <p>As per paragraph 18 of the "Common practice tool" v.03.1 "<i>The proposed project activity is a "common practice" within a sector in the applicable geographical area if the factor F is greater than 0.2 and <math>N_{all} - N_{diff}</math> is greater than 3</i>".</p> <p><u>Conclusion:</u>  Thus, assessment team had concluded that the project activity is not a common practice in the host country India, as F is 0.5 and <math>N_{all} - N_{diff}</math> is lesser than 3. This is found to be appropriate and it is accepted.</p>
<b>Findings</b>	CAR #3 was raised and resolved.
<b>Conclusion</b>	<p>The assessment team confirms that:</p> <ol style="list-style-type: none"> <li>The start date of project activity is prior to the date of publication of PDD for stakeholder comments. The start date of the project activity has been determined in accordance 'Glossary of CDM terms'</li> <li>The evidence for prior consideration of CDM project activity is duly assessed and found to be authentic.</li> <li>The project analysis complies with requirements of the latest version of VVS.</li> <li>All the parameters and assumptions used in the investment analysis have been assessed thoroughly and found appropriate. The information with regard to how the input values was validated, cross-checked is included under relevant parameter.</li> <li>The sources used have been reviewed by the assessment team found to be authentic as referenced under relevant parameter.</li> <li>The benchmark was found suitable and has been thoroughly explained in detail.</li> <li>All the assumptions and calculations for investment analysis area have been checked by the financial expert and technical expert and found to be correct and reasonable.</li> <li>The financial returns from the project activity area insufficient to meet the required investment against the selected benchmark under reasonable variations (sensitivity) conducted on key parameters.</li> <li>The project activity complies with the latest version of "Tool for demonstration and assessment of additionality" and "Investment analysis tool".</li> </ol>

#### D.4.7. Estimation of emission reductions or net anthropogenic removals

<b>Means of validation</b>	The proposed project activity has applied baseline methodology as mentioned in the large scale methodology ACM0002 version 20.0, "Grid-connected electricity generation from renewable sources".
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Accordance with the applied methodology emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where,

$ER_y$  = Emission reductions in year  $y$  (t CO<sub>2</sub>e/yr)

$BE_y$  = Baseline emissions in year  $y$  (t CO<sub>2</sub>/yr)

$PE_y$  = Project emissions in year  $y$  (t CO<sub>2</sub>e/yr)

#### **Baseline emissions:**

As per the applied methodology baseline emissions include only CO<sub>2</sub> emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants.

The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$$

where,

$BE_y$  = Baseline emissions in year  $y$  (tCO<sub>2</sub>)

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

$EF_{grid,CM,y}$  = Combined margin CO<sub>2</sub> emission factor for grid connected power generation in year  $y$  calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO<sub>2</sub>/MWh)

#### **Calculation of $EG_{PJ,y}$ :**

As per the paragraph 40, the calculation of  $EG_{PJ,y}$  is different for Greenfield plants, capacity additions, retrofits, rehabilitations, and replacements.

Since the proposed project activity is Greenfield plant, hence as per the paragraph 41 of ACM0002, Version 20.0,

$$EG_{PJ,y} = EG_{facility,y}$$

Where,

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

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

#### **Determination of $EG_{PJ,y}$ :**

Ex-ante determination of  $EG_{PJ,y}$  is done, based on the installed capacity 50 MW and PLF as 22.10% as per Detailed Project report(DPR). The amount of electricity delivered to grid is estimated (average) to be 95,073 MWh/year.

For ex-post, this parameter (of  $EG_{PJ,y}$ ) is being calculated as difference of electricity exported to the grid by the project activity and electricity imported from the grid by the project activity and those are being measured by energy meters of accuracy class 0.2s located at project site.

The net electricity supplied from the project activity to the grid will be cross-checked with the invoices raised by the project participant to state utility.

#### **Calculation of emission factors:**

The calculation for the operating margin and combined margin for the Indian Grid is readily available and published by the Central Electricity Authority, Government of India/10/. The CEA power sector data is referred by all CDM project in India in the ER calculation and it is yearly updated with recent data. The project activity has referred the CEA Baseline Carbon Dioxide Emission Database is version 13/10/ dated June 2018, which was the latest version available during webhosting the PDD.

The PP has used the simple operating margin calculation. The simple operating margin is calculated as an average of the latest available three years (at the time of PDD submission for webhosting of the project activity) i.e. 2014-15, 2015-16 and



	<p>2016-17. The value for weighted average operating margin has been validated and used as 0.9726 tCO<sub>2</sub>/MWh.</p> <p>The Build margin for the National grid is calculated ex-ante based on the average emission intensity of 20% most recent capacity additions in the grid based on the net generation for the year 2016-2017 considered as 0.8723 tCO<sub>2</sub>/MWh.</p> <p>The weighted average combined margin has been calculated by the PP, considering the 75% weighted for operating margin and 25% for build margin; this is in accordance with the tool. The weighted average combined margin emission factor for the project activity comes to 0.9475 tCO<sub>2</sub>/MWh.</p> <p>The PP has provided the calculation for the same in the ER calculation sheet and it was validated by the assessment team. The baseline emission factor for the electricity system has been calculated on ex-ante basis and will remain fixed for the entire project crediting period.</p> <p><b>Calculation of project emissions:</b></p> <p>As per the applied methodology, for most renewable power generation project activities, <math>PE_y = 0</math>. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for, by using the following equation:</p> $PE_y = PE_{EF,y} + PE_{GP,y} + PE_{HP,y}$ <p>Where,</p> <p><math>PE_y</math> = Project emissions in year <math>y</math> (tCO<sub>2</sub>e)</p> <p><math>PE_{FF,y}</math> = Project emissions from fossil fuel consumption in year <math>y</math> (tCO<sub>2</sub>)</p> <p><math>PE_{GP,y}</math> = Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year <math>y</math> (tCO<sub>2</sub>e)</p> <p><math>PE_{HP,y}</math> = Project emissions from reservoirs of hydro power plants in year <math>y</math> (tCO<sub>2</sub>e)</p> <p>Since the project activity is a solar energy based power generation, the project emissions are not applicable to the project activity. Hence, <math>PE_y = 0</math></p> <p><b>Calculation of leakage emissions:</b></p> <p>As per the applied methodology, no leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, and transport). These emissions sources are neglected. Therefore, <math>LE_y = 0</math>.</p>
<b>Findings</b>	CAR #3 was raised and resolved.
<b>Conclusion</b>	<p>In line with the paragraph 113 of VVS for PAs version 02.0, the validation team confirms that the project activity complies with the specified requirements of algorithms and/or formulae used to determine emission reductions and discussed above. The assessment team confirms that</p> <ol style="list-style-type: none"> <li>1. All assumptions and data used by the project participants are listed in the PDD, including their references and sources;</li> <li>2. All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;</li> <li>3. All values used in the PDD are considered reasonable in the context of the proposed project activity;</li> <li>4. The baseline methodology and corresponding tool(s) have been applied correctly to calculate project emissions, leakage emissions, baseline emissions and emission reductions;</li> <li>5. All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.</li> </ol>

#### D.4.8. Monitoring plan

<b>Means of validation</b>	<p>The present CDM project activity uses monitoring methodology ACM0002 Version 20.0, "Grid-connected electricity generation from renewable sources".</p> <p>The monitoring plan provide procedures for the collection and archiving of all relevant</p>
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	<p>data necessary for estimation or measuring the emission reductions within the project boundary during the crediting period.</p> <p>The monitoring plan of final PDD includes the parameter “Quantity of net electricity supplied to the grid by solar plant” (<math>EG_{PJ,y}</math>) along with the electricity exported and imported by the project. This parameter will be being calculated on monthly basis as difference of electricity exported to the grid and electricity imported from the grid by the project and those are being measured by energy meters of accuracy class 0.2s located at project. These export and import parameters are measured continuously and at least monthly recording. This is in line with methodology and is accepted.</p> <p>Monthly values of <math>EG_{PJ,y}</math> obtained directly from the joint meter reading issued by Andhra Pradesh Southern Power Distribution Company Limited (APSPDCL). The invoicing will be done against electricity supplied by the project plant to the NTPC Limited. The measurement results shall be cross checked with records of invoices and it is in line with applied methodology. Thus, this parameter is considered in emission reduction calculations.</p> <p>The assessment team has verified the actual photographs &amp; video recording of monitoring equipments and observed that there are 5 sets of energy meters (main and check meter), hence total 10 energy meters are installed at site for monitoring of parameter <math>EG_{PJ,y}</math>.</p> <p>As verified through the PPA /40/, the meters are under control of state utility ((APSPDCL) and are sealed in presence of both the state utility official &amp; representative of PP.</p> <p>Joint Meter Reading is being taken jointly by the officials of state utility and project participant's representative on monthly basis and accordingly JMR Report is being prepared/40/.</p> <p>The monitoring methodology applies consistently the choice of the option selected for monitoring of baseline emissions. The monitoring plan provide procedures for the collection and archiving of all relevant data necessary for estimation or measuring the emission reductions within the project boundary during the crediting period.</p> <p>The PDD has been reviewed to check that the procedure for data uncertainty, emergency preparedness, roles and responsibility, operational and management structure are mention in the PDD. The monitoring plan completely describes all measures to be implemented for monitoring all parameters required. The monitoring plan described the positioning of the equipment. Calibration frequency for energy meters is once in 5 years. Also, CEA Notification No. 502/70/CEA/DP&amp;D dated 17/03/2006/30/ which is considered as national standard mentions that “<i>All interface meters shall be tested at least once in five years.</i>” Hence calibration frequency of once in 5 years considered for the project activity is found to be appropriate.</p> <p>The project participant has the ability to implement the monitoring plan. This is checked through discussion with consultant, the project participant representative and site personnel, found to be appropriate.</p>
<b>Findings</b>	CAR #4 was raised and resolved.
<b>Conclusion</b>	<p>In accordance with paragraph 117-119 of VVS for PAs version 02.0, the assessment team confirms that:</p> <ol style="list-style-type: none"> <li>1. The monitoring plan as described in section B.7 of the PDD takes into account all the relevant parameters prescribed in the applied monitoring methodology.</li> <li>2. The monitoring plan was assessed by a two way approach: <ul style="list-style-type: none"> <li>• By checking the Compliance of the monitoring plan with the applied approved methodology and</li> <li>• By assessing the feasibility of implementation of the monitoring plan as described in the PDD through remote observation (photographs/video recording) of the project activity and the monitoring system in place.</li> </ul> </li> <li>3. The monitoring plan also considers sufficient details about the parameters being monitored and takes enough measures for the correct estimation of the same. Therefore, the monitoring plan has complied with the requirements in the approved methodology.</li> </ol>

**D.5. Start date, crediting period type and duration**

<b>Means of validation</b>	<p>The start date of the project activity is 13/10/2016 and the operation lifetime is 25 years as described in the PDD.</p> <p>As per 'Glossary of CDM terms (Version 10)', "earliest real action for this project activity was taken on 13/10/2016 when the project participant issued purchase order for supply of solar photovoltaic modules to Mundra Solar PV Limited. Hence, this date has been treated as the start date of the project activity.</p> <p>Operational lifetime of the project is verified through the DPR and further checked with the purchase order placed for supply of solar modules to suppliers.</p> <p>The crediting period chosen is 7 years renewable crediting period and start date of crediting period as 15/08/2020, or the date of registration of the project activity under UNFCCC, whichever is later.</p>
<b>Findings</b>	No non-conformability was observed during assessment. Therefore, no finding was raised.
<b>Conclusion</b>	<p>The assessment team confirms that the start date of the proposed CDM project activity has been determined in accordance with the definition of start date in the "Glossary: CDM terms".</p> <p>Project activity comply the requirements of para 85-91 of CDM PS for PAs Version 02.0.</p>

**D.6. Environmental impacts**

<b>Means of validation</b>	<p>The project participant has mentioned in the PDD that the present project activity does not require EIA to be carried out because as per the schedule 1 of Ministry of Environment and Forest notification dated 14/09/2006 <a href="http://envfor.nic.in/legis/eia/so1533.pdf">http://envfor.nic.in/legis/eia/so1533.pdf</a> and further notification number 3067 from MoEF dated 01/12/2009 (Ref: <a href="http://moef.nic.in/downloads/rules-and-regulations/3067.pdf">http://moef.nic.in/downloads/rules-and-regulations/3067.pdf</a>), 39 activities are required to undertake environmental impact assessment studies. The proposed project activity does not fall under this category and hence not required EIA to be done.</p>
<b>Findings</b>	No non-conformability was observed during assessment. Therefore, no finding was raised.
<b>Conclusion</b>	<p>The assessment team confirm that the project participants have not undertaken an environmental impact analysis; as the Host Party does not require that for a solar power generation facility.</p> <p>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 would not lead to any significant environmental impacts including trans-boundary impact. There is no mandatory legal requirement for carrying out an environmental impact assessment in the host country.</p> <p>The assessment team is of the opinion that the project complies with environmental regulations in India.</p>

**D.7. Local stakeholder consultation**

<b>Means of validation</b>	<p>The local stakeholder consultation process has been described in detail, by the PP, in section E of the PDD.</p> <p>Local stakeholder consultation was carried out before publication of PDD at UNFCCC website (from 21/12/2018 to 19/01/2019).</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), local vendors, project proponent representatives, equipment suppliers and other people involved in the project. The validation team verified the list of participants who attended the stakeholder meeting 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>Based on the conversations of the validation team during the con-call with site personnel /consultant and as per the definition of 'stakeholder' in the latest version of Glossary of CDM terms, the identification of stakeholders for consultation was</p>
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	<p>found to be appropriate. Thus, the validation team is of the opinion that the relevant stakeholders have been consulted appropriately and adequately.</p> <p>The PP has conducted the stakeholder consultation meeting for the project activity at the project site office on 30/09/2016. Identified stakeholders were invited to the Local Stakeholder Consultation Meeting through public notice and personal invitations on 24/09/2016.</p> <p>Also the PP submitted minutes of meeting of Local Stakeholder Consultation Meeting conducted on 30/09/2016 at site office located at Gani- Sakunala village in Kurnool District and attendance sheet of local stakeholder attended the meeting.</p> <p>This is further cross-validated from local stakeholder consultation carried out for the project activity during the video con-call arranged with the consultant and stakeholders available at site. During the con-call, the validation team confirmed that the process of stakeholder consultation was carried out as described in the PDD. This was found to be consistent with the invitation process mentioned in the PDD. Overall, there was agreement among the stakeholders that the proposed project activity would lead to the overall development of the area, mainly by generating employment opportunities and improving the infrastructure leading to an improved life for the villagers.</p>
<b>Findings</b>	CAR #5 was raised and resolved.
<b>Conclusion</b>	<p>The validation team confirms that the summary of stakeholders' comments reported in PDD is complete.</p> <p>Stakeholder Consultation Report submitted by the PP is reviewed by the assessment team and confirmed that the queries raised by the local stakeholders have been answered satisfactorily.</p> <p>In view of the verification of all relevant documents of local stakeholder consultation meeting and interactions done the stakeholders available at the time of con-call arranged with site personnel. It concludes that the project participant conducted the stakeholders' consultation process in transparent and unbiased manner.</p>

#### D.8. Sustainable development co-benefits

<b>Means of validation</b>	Not applicable
<b>Findings</b>	Not applicable
<b>Conclusion</b>	Not applicable

#### D.9. Approval

<b>Means of validation</b>	<p>The project is a unilateral project and hence the host country (India) is the only party involved in the project activity.</p> <p>India (Host Country) fulfils the requirements to participate in the CDM and ratified the Kyoto protocol on 26/08/2002 /5.1/ and established a DNA as National CDM Authority (NCDMA) under Ministry of Environment, Forest and Climate Change, Govt. of India /05/ as per the participating requirements for CDM under the Kyoto Protocol.</p> <p>The project participant is Prayatna Developers Pvt. Ltd. from India, and is a private entity. The project participant is correctly listed in table under section A.4 of the PDD and information is consistent with the contact details provided in Appendix 1 of the PDD.</p> <p>The DNA of India issued a Letter of Approval on 15/04/2019, approving participation of M/s. Prayatna Developers Pvt. Ltd. as a project participant and confirming that the project assists in achieving sustainable development in India. The Approval is provided by the Indian DNA (The Ministry of Environment, Forest and Climate Change, 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://ncdmaindia.gov.in/PublicReportProjectDetail.aspx?pub=4ziuRvY03kw=">http://ncdmaindia.gov.in/PublicReportProjectDetail.aspx?pub=4ziuRvY03kw=</a> )</p> <p>The assessment team also confirmed that the LoA refers to the proposed CDM project activity and the title is in line with the title mentioned in the PDD. The letter of approval does not refer to any specific version of the validation report. By checking the original LoA document /05/, Applus+Certification considers the LoA in accordance with paragraphs 140-144 of the CDM VVS for project activity version 2.0 /41/ and hence the assessment team has no doubt on the authenticity of the LoA for the project activity.</p>
<b>Findings</b>	CAR #6 was raised and closed.

<b>Conclusion</b>	<p>The assessment team confirm that:</p> <ul style="list-style-type: none"> <li>i. Host country (India) is a party to the Kyoto protocol;</li> <li>ii. The participation in the CDM project activity is voluntary;</li> <li>iii. The project under validation contributes to the sustainable development of India;</li> <li>iv. The project title as mentioned in the LoA is consistent with the PDD. LoA has been verified to be unconditional with respect to all the above confirmed aspects.</li> </ul> <p>The assessment team has confirmed that the LoA has met the requirements of paragraph 140-144 of the CDM VVS for project activity version 02.0.</p>
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#### D.10. Authorization

<b>Means of validation</b>	<p>The Authorization is provided by the Indian DNA (The Ministry of Environment, Forest and Climate Change, Govt of India). The assessment team checked the LoA supplied by the project participant and also cross checked the same from the site (<a href="http://ncdmaindia.gov.in/PublicReportProjectDetail.aspx?pub=4ziuRvY03kw=">http://ncdmaindia.gov.in/PublicReportProjectDetail.aspx?pub=4ziuRvY03kw=</a> ).</p> <p>The LoA confirms the authorization of Indian DNA which is the party to Kyoto protocol and confirms that project is vide by the guideline of CDM.</p> <p>The participant of the project activity is Prayatna Developers Pvt. Ltd. with host country India. The information regarding to the project participants are listed in section A.4 of the PDD and are consistent with the contact details provided in Appendix 1 of the PDD.</p>
<b>Findings</b>	CAR #6 was raised and closed.
<b>Conclusion</b>	<p>The validation team confirms participation of Prayatna Developers Pvt. Ltd. in the project activity has been approved by DNA of India, which is a Party to the Kyoto Protocol.</p> <p>The assessment team confirms that:</p> <p>The participation of project participants have been approved/ authorized by the DNA of host Party (India)</p> <p>The participation has been confirmed in the LoA itself, which contains the name of the PPs to which it is issued.</p> <p>The information is consistent within the project documentation viz., PDD, LoA and signed MoC. The validation of authorization has been done on the basis of paragraph 147-150 of CDM VVS for project activity version 02.0 and assessment team confirms that the proposed project activity meets the requirement of paragraph 151 of CDM VVS for project activity version 02.0.</p>

#### D.11. Modalities of communication

<b>Means of validation</b>	<p>PP has submitted duly signed Modalities of Communication (MoC) document dated 10/07/2020. The primary authorized signatory from Prayatna Developers Pvt. Ltd. is Mr. Dhaval Trivedi and Mr. Alpesh Gedia is alternate authorized signatory as per the MoC. The personal identity of Mr. Dhaval Trivedi and Mr. Alpesh Gedia is checked from their respective Aadhar Card issued by Unique Identification Authority of India, Govt. of India /37/.</p> <p>The Corporate Identity of Mr. Dhaval Trivedi and Mr. Alpesh Gedia has been checked from the Written confirmation from the PP /37/ that submits to it the MoC statement that all corporate and personal details, including specimen signature are valid and accurate. The assessment team confirms that the signatory and contact details on the MoC are authorized and credible; the MoC is prepared using latest version of form (CDM-MOC-FORM) and meets the requirement of para 158-160 (a) of CDM VVS for project activities version 02.0.</p> <p>As indicated under section 2 of the MoC, along with the project participant, the entity "Infinite Environmental Solutions LLP" is also nominated as focal point (shared), with the authority to communicate on all the project related matters.</p> <p>The project participant's authorized signatories signing the MOC correspond to the Project participant's authorized signatories included in CDM-MOC-FORM, annex 1.</p>
<b>Findings</b>	CAR #7 was raised and resolved.
<b>Conclusion</b>	<p>The assessment team confirms that:</p> <ul style="list-style-type: none"> <li>a) The MoC is correctly filled and duly authorized using the latest MoC template</li> <li>b) The project participants' authorized signatories signing the F-CDM-MOC correspond to the project participants' authorized signatories included in MOC, annex 1.</li> </ul>

	<p>c) The MoC is directly received from the PP.</p> <p>d) The specimen signature, designation and name of the authorized personals are cross checked from the written confirmation from PP confirming the specimen signature, name and designation of authorized personnel.</p> <p>The modalities of communication statement is correctly filled and including the specimen signature of authorized signatory. The validation of MoC has been done on the basis of paragraph 153-157 of CDM VVS for project activity version 02.0 and validation team confirms that the proposed project activity meets the requirement of CDM VVS for project activity, version 02.0.</p>
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#### D.12. Global stakeholder consultation

<b>Means of validation</b>	<p>Project document (PDD) was published on the UNFCCC website and invited comments by affected Parties, stakeholders, and non-governmental organizations during a 30 day period (from 21/12/2018 to 19/01/2019).</p> <p>Source:  <a href="https://cdm.unfccc.int/Projects/Validation/DB/Y5ZYPKGYBNV57ROSEW3ET7ADJQ5VF1/view.html">https://cdm.unfccc.int/Projects/Validation/DB/Y5ZYPKGYBNV57ROSEW3ET7ADJQ5VF1/view.html</a></p>
<b>Findings</b>	No non-conformability was observed during assessment. Therefore, no finding was raised.
<b>Conclusion</b>	The assessment team confirm that no comments were received during the Global stakeholder consultation. Assessment team is of opinion that the changes in the PDD during the validation process do not require the publication of the revised PDD for global stakeholder consultation.

## SECTION E. Internal quality control

>> As a final step of validation, the final documentation including the validation report has to undergo an internal quality control by the Technical Reviewer. Each report has to be finally approved either by the DOE's Technical Manager or the Deputy. In case one of these two persons is part of the assessment team, the approval can only be given by the person who is not a part of the assessment team. If the documents have been satisfactorily approved, the Request for registration is submitted to the CDM-EB along with the relevant documents.

## SECTION F. Validation opinion

>> Applus+ Certification has been contracted by M/s. Prayatna Developers Pvt. Ltd. to perform a validation of the proposed CDM project activity entitled "50 MW Kurnool Solar PV Power Project by M/s Prayatna Developers Pvt. Ltd. at Gani, Kurnool, AP."

The Validation was performed in accordance with the UNFCCC criteria for the Clean Development Mechanism Validation and Verification Standard for project activities (Version 02.0) and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design document and the subsequent follow-up interviews have provided us with sufficient evidence to determine the fulfilment of the stated criteria.

In our opinion, the project meets all relevant UNFCCC, CDM criteria and all relevant host country criteria. The project correctly applies methodology ACM0002 version 20.0. It is demonstrated that the project is not a likely baseline scenario.

By generating renewable energy from solar energy resources, the project results in reduction of CO<sub>2</sub> emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project 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.

The total emission reductions from the project are estimated to be 630,571 tCO<sub>2</sub> over a 7 year crediting period, averaging 90,081 tCO<sub>2</sub>e annually. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given the underlying assumptions do not change.

The monitoring plan provides for the monitoring of the project's emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is confirmed that the project participants are able to implement the monitoring plan.

In conclusion, Applus+Certification is of the opinion that the project activity "50 MW Kurnool Solar PV Power Project by M/s Prayatna Developers Pvt. Ltd. at Gani, Kurnool, AP." in India, as described in the PDD, version 03 of 08/08/2020, meets all relevant UNFCCC requirements for the CDM and all relevant host party criteria and correctly applies the baseline and monitoring methodology "ACM0002", "Grid-connected electricity generation from renewable sources", version 20.0.

The project will hence be recommended by Applus+Certification for registration with the UNFCCC.

## Appendix 1. Abbreviations

Abbreviations	Full texts
ABT	Availability Based Tariff
APSPDCL	Andhra Pradesh Southern Power Distribution Company Limited
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM PCP	Clean Development Mechanism Project Cycle Procedure
CDM PS	Clean Development Mechanism Project Standard
CDM VVS	Clean Development Mechanism Validation and Verification Standard
CEA	Central Electricity Authority
CER	Certified Emission Reduction
CL	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EF	Emission Factor
EPC	Engineering ,Procurement and Construction
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GHG	Greenhouse Gas(es)
GOI	Government of India
HCA	Host Country Approval
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
JMR	Joint Meter Reading
LoA	Letter of Approval
MoC	Modalities of Communication
MP	Monitoring Plan
MR	Monitoring Report
MWh	Megawatt hour
ODA	Official Development Assistance
PDD	Project Design Document
PDPL	Prayatna Developers Pvt. Ltd.
PP	Project Participant
PPA	Power Purchase Agreement
PRC	Post Registration Changes
PS	Project Standard
TR	Technical Review
UID	Unique Identification number
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard



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

According to the sectoral scope / technical area and experience in the sectoral or national business environment, Applus+ Certification has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of Applus+ Certification.

The composition of audit team shall be approved by the Applus+ Certification ensuring that the required skills are covered by the team.

The four qualification levels for team members that are assigned by formal appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A) / Auditor in Training (AiT).
- Technical Expert (TE).
- Technical Reviewer (TR).

The sectoral scope / technical area knowledge linked to the applied methodology/ies shall be covered by the assessment team.

Name	Qualification	Coverage of scope	Coverage of technical Area	Financial aspect	Host country Experience	Attendance to the On-Site Assessment
Vivek Kumar Ahirwar	Lead Auditor (LA)	Yes (1)	Yes (1.2)	N/A	Yes	NA
Vivek Kumar Ahirwar	Technical Expert (TE)	Yes (1)	Yes (1.2)	N/A	Yes	NA
Vivek Kumar Ahirwar	Financial expert (FE)	Yes(1)	Yes (1.2)	Yes	Yes	NA
Simon Shen	Technical Reviewer (TR)	Yes (1)	Yes (1.2)	N/A	N/A	N/A

The curricula vitae of the DOE's team members are provided below:

**Vivek Kumar Ahirwar** is a BEE-Certified Energy Auditor by Govt of India with over eight years of relevant experience in energy efficiency, energy audit, thermal and electrical energy generation technology from renewable source and energy conservation in energy intensive industries, designated consumers and commercial buildings, implementation of energy conservation building codes, research, process and green building projects. He is a certified lead auditor for ISO 14001 EMS and 14064. He has experience under various categories of projects stating from renewable to waste to supercritical projects and WCD. He has successfully audited more than 100 GHG (CDM/VCS/GS) projects in different states across the India. He has done Master in Technology (Energy Management) from a premier institute, School of Energy & Environmental Studies, DAVV, Indore (M.P.), India and Bachelor of Engineering (Mechanical Engineering) from Govt. Engineering college, Rewa, RGPV, India.

**Simon Shen** (Master Degree in Thermal Energy Engineering, Bachelor Degree in Environmental Engineering) is a Lead Auditor appointed by Applus+ Certification 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+ Certification, he had been worked for TÜV SÜD as a GHG Validator/Verifier and ISO 9001/14001 Lead Auditor for 5.5 years.

### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	PP	Project Design Document	Version 01, dated 16/12/2018	PP
			Version 02, dated 21/07/2020	
			Version 03, dated 08/08/2020	
2	PP	Investment Analysis (Project IRR and Benchmark Calculation) Sheet	Version 01, dated 21/07/2020	PP
			Version 02, dated 08/08/2020	
3	PP	Common practice analysis spread sheet	Version 01, dated 21/07/2020	PP
			Version 02, dated 08/08/2020	
4	PP	Emission reduction calculation spread sheet	Version 01, dated 21/07/2020	PP
			Version 02, dated 08/08/2020	
5	Government of India, Ministry of Environment, Forest and Climate Change	Host Country Letter of Approval	Ref : 13008/81/2017-CC Dated 15/04/2019	PP
5.1	UNFCCC	Status of ratification of the Kyoto Protocol.	<a href="https://unfccc.int/node/61082">https://unfccc.int/node/61082</a>	Other
5.2	Applus+Certification	Solar projects registered by DoE UNFCCC ref.Nos-10392,10393,10403,10404 and 10496	-	Other
5.3	CERC	CERC tariff order	Dated 31/03/2015	Other
6	PP	Modalities of Communication (MoC)	Dated 10/07/2020	PP
7	GOI	REC eligibility procedure	Dated 16/03/2018	PP
8	SEI	Detailed Project Report (DPR) prepared by SgurrEnergy India (SEI) Pvt Ltd.	Dated 16/11/2015	PP
8.1	Hemangi & Associates Chartered Accounts FRN 145225W	CA certificates for actual cost incurred in the project activity	Dated 13/03/2020	PP
9	Different suppliers	Technical specifications of Solar Module, Invertors & transformer's	-	PP
10	CEA	CO2 baseline database published (in June 2018) by Central Electricity Authority, Govt. Of India, available at <a href="http://www.cea.nic.in/tpeandce.html">http://www.cea.nic.in/tpeandce.html</a>	version 13	Other

11	PP	Board Resolution by PDPL	Dated 18/11/2015	PP
12	NTPC	Letter of Intent (LoI) to PSEPL regarding selection of SPD under DCR category non-solar park in Andhra Pradesh	Dated 09/01/2016	PP
13	PP	Intimation letter to UNFCCC notifying their intention to seek CDM status for the project activity	Dated 06/04/2017	PP
14	PP	Stakeholder meeting notice and invitation letters	Dated 24/09/2016	PP
15	PP	Minutes of meeting of Local Stakeholder's consultation	Dated 30/09/2016	PP
16	PP	Attendance sheet of Local Stakeholder Consultation meeting	Dated 30/09/2016	PP
17	PP	Covering letter from PDPL to NCDMA	Dated 06/04/2017	PP
18	CDM EB	Tool to calculate the emission factor for an electricity system	Version 7.0	Other
19	CDM EB	Tool for the demonstration and assessment of additionality	Version 07.0.0	Other
20	CDM EB	Methodological tool: Investment analysis	Version 10.0	Other
21	CDM EB	Methodological tool: Investment analysis	Version 06.0	Other
22	CDM EB	Methodological tool "Common Practice"	Version 3.1	Other
23	CDM EB	Approved methodology ACM0002 "Grid-connected electricity generation from renewable sources"	Version 20.0	Other
24	CDM EB	Glossary of CDM Terms	Version 09.1 of 01/09/2017	Other
25	CDM EB	Guidelines for the reporting and validation of plant load factors	Version 01 annex 11 of EB 48 dated 17/07/2009	Other
26	APSPDCL	Approval for interconnection of project with the grid.	Dated 20/06/2016	PP
27	GOI	Indian Company Act	<a href="http://taxguru.in/company-law/rates-of-depreciation-under-the-companies-act-as-mentioned-in-schedule-xiv.html">http://taxguru.in/company-law/rates-of-depreciation-under-the-companies-act-as-mentioned-in-schedule-xiv.html</a>	Other
		Income Tax Act 1961	<a href="https://www.incometaxindia.gov.in/pages/acts/income-tax-act.aspx">https://www.incometaxindia.gov.in/pages/acts/income-tax-act.aspx</a>	
28	GOI	Income Tax of India	<a href="https://taxguru.in/income-tax/income-tax-rate-chart-assessment-year-201516-financial-year-201415.html">https://taxguru.in/income-tax/income-tax-rate-chart-assessment-year-201516-financial-year-201415.html</a>	Other
		Companies Act 1956	<a href="https://www.mca.gov.in/Ministry/latestnews/Explanatory_Statement_alongwith_Schedule_XIV_4dec2008.pdf">https://www.mca.gov.in/Ministry/latestnews/Explanatory_Statement_alongwith_Schedule_XIV_4dec2008.pdf</a>	
29	RBI	Results of 36 <sup>th</sup> Round (Q2:2015-16) of Survey of Professional Forecasters on Macroeconomic Indicators	Dated 29/09/2015	Other
30	Central Electricity	Notification for regulating the installation and operation of	<a href="http://www.cea.nic.in/reports/regulation/meter_r">http://www.cea.nic.in/reports/regulation/meter_r</a>	Other

	Authority	meters	<a href="#">eg.pdf</a>	
31	PP	Declaration from PDPL for no ODA	-	Other
32	MNRE	List of Solar Power Projects commissioned in Andhra Pradesh published as on 31/03/2017	-	PP
33	Bank of Baroda	Loan Sanction letter (Ref: ALCB:ADV:PA:187)	Dated 29/09/2016	PP
34	PP	Purchase Order raised by PDPL for supply of solar PV modules	Dated 13/10/2016	PP
35	GOI	Electricity Act 2003	Dated 26/05/2003	Other
		National Electricity Policy 2005	Dated 12/02/2005	
36	PP	Purchase orders issued to different suppliers	-	PP
37	Unique Identification Authority of India, GOI	Aadhar Card of Mr. Dhaval Trivedi and Mr. Alpesh Gedia	Confidential	PP
38	UNFCCC	CDM-MoC-FORM	Version 3.0	Other
39	APSPDCL	Commissioning certificates of the project activity	Commissioned on 28/06/2017 and 15/07/2017	PP
40	GOI	Power Purchase Agreement signed by PSEPL with NTPC	Dated 21/03/2016	PP
41	CDM EB	CDM VVS for PAs	Version 02.0	Other
42	CDM EB	CDM PS for PAs	Version 02.0	Other
43	CDM EB	CDM PCP for PAs	Version 02.0	Other
44	UNFCCC	PDD template form	Version 11.0	Other
45	UNFCCC	Project web page <a href="https://cdm.unfccc.int/Projects/Validation/DB/Y5ZYPKGYBNV57ROS/EW3ET7ADJQ5VF1/view.html">https://cdm.unfccc.int/Projects/Validation/DB/Y5ZYPKGYBNV57ROS/EW3ET7ADJQ5VF1/view.html</a>	-	Other
46	Aswath Damodaran	Corporate Finance" 2nd edition, by Aswath Damodaran	-	PP
47	PP	Latest photographs of all the equipments installed at project site. Video recording of project site and the con-call held with PPs representatives on 08/07/2020.	-	PP
48	CDM EB	(a) Email received from CDM Executive Board regarding the relaxation for mandatory site visits by DOEs for a period of three months (23 March to 23 June 2020) due to COVID-19 pandemic  (b) Second email received from CDM Executive Board regarding the relaxation for mandatory site visits by DOEs till 31/12/2020	Dated 20/03/2020  Dated 24/06/2020	Other

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

**Table 1. CLs from this validation**

<b>CL ID</b>	01	<b>Section no.</b>	D.4	<b>Date</b> : 22/06/2020
<b>Description of CL</b>				
Please submit the following documents:				
<ol style="list-style-type: none"> <li>1. Commissioning certificate</li> <li>2. Power Purchase Agreement signed with State utility</li> <li>3. Purchase orders issued by PP</li> <li>4. NoC issued by relevant authorities regarding implementation of project</li> <li>5. Detailed Project Report</li> <li>6. O&amp;M contract</li> <li>7. Loan sanction documents</li> </ol>				
<b>Project participant response</b>				<b>Date</b> : 23/07/2020
<ol style="list-style-type: none"> <li>1. Commissioning certificate – being submitted</li> <li>2. Power Purchase Agreement signed with State utility – being submitted</li> <li>3. Purchase order issued by PP– being submitted</li> <li>4. NoC issued by relevant authorities regarding implementation of project</li> <li>5. Detailed Project Report – being submitted</li> <li>6. O&amp;M contract – Since O&amp;M is done inhouse so there is no O&amp;M contract for the Project.</li> <li>7. Loan sanction documents – being submitted</li> </ol>				
<b>Documentation provided by project participant</b>				
<ol style="list-style-type: none"> <li>1. Commissioning certificate</li> <li>2. Power Purchase Agreement signed with State utility</li> <li>3. Proposals submitted by technology supplier</li> <li>4. Purchase order issued by PP</li> <li>5. NoC issued by relevant authorities regarding implementation of project</li> <li>6. Detailed Project Report</li> <li>7. Loan sanction documents</li> </ol>				
<b>DOE assessment</b>				<b>Date</b> : 31/07/2020
<p>The PP has submitted the requested documents. Since O&amp;M is taking care by internal team hence no separate contract is signed.</p> <p>Information's /references provided in the PDD and IRR sheet are found to be consistent with the relevant documents submitted, hence accepted.</p> <p>CL #1 is closed.</p>				

**Table 2. CARs from this validation**

<b>CAR ID</b>	01	<b>Section no.</b>	D.1	<b>Date</b> : 22/06/2020
<b>Description of CAR</b>				

1. PDD provided by the PP is using template version 10.1, which is not the latest one. Please clarify why latest version of CDM-PDD-FORM is not referred.
2. Since the start date of the project activity is prior to the date of publication of the PDD for global stakeholder consultation, hence please clarify why the information regarding the prior consideration of the CDM is not provided in section B.5 of the PDD, in accordance with applicable provisions related to the demonstration of prior consideration of the CDM in the project standard.
3. Please submit the evidences (email communications etc.) regarding the prior notification submitted to DNA and UNFCCC.
4. Please clarify why the latest version of the applied methodology ACM0002 is not referred in the PDD.

<b>Project participant response</b>	<b>Date : 23/07/2020</b>
<ol style="list-style-type: none"> <li>1. Latest version of CDM-PDD-FORM has been used and PDD has been revised</li> <li>2. Section B.5 has now been revised and information regarding the prior consideration of the CDM is now provided in Section B.5 of the Revised PDD.</li> <li>3. Email sent to DNA and UNFCCC is being shared to DOE along with this submission</li> <li>4. Latest version of the applied methodology ACM0002 is now referred in the PDD.</li> </ol>	
<b>Documentation provided by project participant</b>	
<i>Prior Intimation email</i> <i>Revised PDD</i>	
<b>DOE assessment</b>	<b>Date: 31/07/2020</b>
<ol style="list-style-type: none"> <li>1. The PP has referred the latest version of CDM-PDD-FORM for the updated PDD, found to be satisfactory, hence accepted.</li> <li>2. The PP has included the information regarding CDM prior consideration in section B.5 of the revised PDD. Email communications with UNFCCC &amp; DNA with reference to notifications sent to respective entity are provided and found to be appropriate, hence accepted.</li> <li>3. The PP has submitted email communication with UNFCCC and acknowledgement received from secretariat regarding the same and found to be satisfactory.</li> <li>4. Version of applied methodology is updated in the revised PDD, found satisfactory.</li> </ol>	
CAR #1 is closed.	

<b>CAR ID</b>	02	<b>Section no.</b>	D.3	<b>Date : 22/06/2020</b>
<b>Description of CAR</b>				
Purpose and a general description of the project activity are not provided under section A.1 of the PDD in accordance the instructions for completing the CDM-PDD-FORM. Technical specification of the equipment's and information about the technologies/measures to be employed and/or implemented by the project activity are not provided in section A.3 of the PDD.				
<b>Project participant response</b>				<b>Date : 23/07/2020</b>
<ol style="list-style-type: none"> <li>1. Section A.1 has been revised in accordance with the instructions for completing the CDM-PDD-FORM. DOE is requested to refer the revised PDD</li> <li>2. Technical specification of the equipment's and information about the technologies/measures to be employed and/or implemented by the project activity are now provided in section A.3 of the revised PDD. DOE is requested to refer the revised PDD</li> </ol>				
<b>Documentation provided by project participant</b>				
<i>Revised PDD</i>				
<b>DOE assessment</b>				<b>Date: 31/07/2020</b>
The PP has updated the purpose and a general description of the project activity under section A.1 of the revised PDD in accordance the instructions for completing the CDM-PDD-FORM. Technical specification of the equipment's and information about the technologies/measures to be employed and/or implemented by the project activity are included in section A.3 of the PDD, found to be satisfactory, hence accepted. CAR #2 is closed.				

<b>CAR ID</b>	03	<b>Section no.</b>	D.4.6	<b>Date :</b> 23/06/2020
<b>Description of CAR</b>				
<ol style="list-style-type: none"> <li>1. PP is requested to clarify why the input parameters under section B.5 of the PDD, along with relevant sources is not reported. Also clarify how the PLF of the project activity has been estimated and the conservativeness of the same, as per EB 48, Annex 11.</li> <li>2. Please submit the IRR and benchmark calculation sheet.</li> <li>3. Please clarify why the latest and valid version of the "Methodological tool: Investment analysis" not referred for investment analysis in line with the guidance provided under paragraph 97 of VVS for PAs version 02.0.</li> <li>4. Please clarify why the degradation is not considered.</li> <li>5. Please clarify why actual percentage variation to the parameters considered for sensitivity analysis is not presented while determining breaching limit of benchmark.</li> </ol> <p><u>Common practice analysis:</u> Please submit source documents with reference to the projects identified for common practice analysis and also clarify about the criteria to identify the projects under "different technology".</p> <p>Footnote 7 in the PDD refers the wind power directory; kindly clarify the relevance of the same.</p> <p>Please provide the common practice analysis sheet.</p>				
<b>Project participant response</b>				<b>Date :</b> 10/07/2020
<ol style="list-style-type: none"> <li>1. Input parameters available at the time of investment analysis are used to carry out investment analysis and Input parameters are included in section B.5 of the revised PDD. PLF for the project is considered in accordance with EB 48, Annex 11, i.e. PLF has been sourced from Thirty Party PLF Assessment carried out at the time investment decision.</li> <li>2. IRR and benchmark calculation sheet is being submitted along with this submission.</li> <li>3. Latest version of "Investment analysis" tool available at the time of decision making is now referred for determining the benchmark DOE is requested to refer the revised PDD</li> <li>4. Degradation is already considered in the model to arrive at the P90 Level of PLF and the PLF considered in IRR sheet is the Average PLF Values at P90 over the life of project. Hence not considered in IRR.</li> <li>5. Actual percentage variation in project cost is now presented under section B.5 of the revised PDD. DOE is requested to refer the revised PDD.</li> </ol> <p><u>Common practice analysis:</u> Database of Commissioned Solar Project is sourced from TSSPDCL website which is source documents for the projects identified for common practice analysis and criteria to identify the projects under "different technology" is Investment climate on the date of the investment decision detailed in the revised PDD. Common practice analysis sheet is being submitted along with this submission.</p> <p>Typo error is corrected under footnote 7 of the PDD.</p> <p>CPA sheet is enclosed with the submission.</p>				
<b>Documentation provided by project participant</b>				
<i>Revised PDD</i> <i>IRR and Benchmark analysis Sheet</i> <i>Common Practice Analysis Sheet</i> <i>DPR &amp; PLF Report</i>				
<b>DOE assessment</b>				<b>Date:</b> 25/07/2020

1. The PP has reported the input parameters under section B.5 of the revised PDD, along with relevant sources. Also the PLF of the project activity has been considered as per the DPR prepared by third party estimated and found in accordance with the guidelines provided under Annex 11 of EB 48, hence accepted.
2. The PP has submitted the IRR and Benchmark calculation sheet.
3. Latest version of "Investment analysis" tool available at the time of decision making is referred while determining the benchmark, found to be satisfactory, hence accepted.
4. PLF is determined, considering the degradation 0.6% from second year onwards.
5. Percentage variation between the estimated project cost and actual project cost is reported in the revised PDD; found to be consistent with the CA certificate submitted, hence accepted.

**Common practice analysis:**

The PP has provided the projects database published by the TSSPDCL, government of India, regarding the projects identified for common practice analysis, found to be appropriate, hence accepted.

The projects are allotted through reverse bidding option under the "Solar Park" or "The Jawaharlal Nehru National Solar Mission (JNNSM)", the tariff rate is different for all the allotted projects, hence the criteria "Investment climate on the date of the investment decision" is opted to select project under different technology, that is found to be satisfactory, hence accepted.

The PP has rectified the typo error in the footnote 7, found to be appropriate.

CPA sheet is submitted by the PP, found to be satisfactory, hence accepted.

CAR #3 is closed.

**CAR #3 is re-opened**

**Date : 07/08/2020**

Please address the following issues:

1. Project cost considered in the financial analysis is reasonably higher than the same considered in CERC tariff order and similar projects registered in the host country. Kindly clarify the reason.
2. Please clarify why no degradation is considered while estimating annual generation from project activity.
3. Please clarify why the projects registered under VCS are excluded while calculating  $N_{all}$ . Source web link for the projects considered in CPA is not working.

**Project participant response**

**Date : 08/08/2020**

1. The Project is allocated under the DCR Category,
  4. i.e. The domestic content requirement (DCR) category, the mandate for solar projects in India to utilize domestically manufactured solar modules and cells, was instituted in the Jawaharlal Nehru National Solar Mission (JNNSM) in an effort to create a healthy and robust indigenous manufacturing base and to elevate India's status as a solar hub.
  - 5.
  6. As the PSEPL had to procure the Solar PV Modules from Indian Company which were costlier which in turn resulted in Higher Project Cost compared to other solar projects.
2. Default degradation 0.60% p.a. is now been considered in IRR Sheet and same is updated in the revised PDD
3. Since the Project is registered in other GHG Program i.e. VCS Mechanism and claiming Carbon Credits. Hence Projects registered under other GHG Program are excluded while calculating  $N_{all}$ .

**Documentation provided by project participant**

**Revised IRR**

**Revised PDD**

**DOE assessment**

**Date : 10/08/2020**

1. It is noted that the proposed project activity is developed and implemented under Jawaharlal Nehru National Solar Mission (JNNSM) Batch-II Tranche-I Phase-II state specific bundling scheme [Non Solar Park – DCR (Domestic Content Requirement) Category]. The policy of Domestic Content Requirement (DCR) is the use of the local manufactured components of solar generation equipment which includes the cells and modules. Since the cost of locally manufactured components is comparatively higher, hence the project cost for project is higher than the same as estimated in the CERC tariff order.
2. The PP has considered 0.6% degradation in the generation from second year onwards, found to be consistent with the DPR, hence accepted.
3. In the current scenario, CERs price is low, hence many Project developers have registered their projects in GHG Programs other than CDM and are claiming carbon credits or carbon revenue in other GHG Mechanism. Hence Projects registered under other GHG Program are excluded while calculating  $N_{all}$ .

CAR #3 is closed.



<b>CAR ID</b>	04	<b>Section no.</b>	D.4.8	<b>Date :</b> 08/07/2020
<b>Description of CAR</b>				
<ol style="list-style-type: none"> <li>1. Please submit source document referred for the parameter <math>EG_{PJ,y}</math>. QA/QC procedure for this parameter is not described in line with the methodology requirement.</li> <li>2. Please clarify why the parameters used to calculate the value of net electricity supplied to grid by project activity is not added in section B.7.1 of the PDD.</li> <li>3. Please submit the ER calculation sheet including the calculation of emission factor.</li> <li>4. Please clarify the appropriateness of start date of crediting period as mentioned in section 3.2 of the PDD.</li> <li>5. Please clarify why the single line diagram showing all the metering points is not provided in the PDD.</li> <li>6. In the project boundary diagram in the PDD, there is one main and check meter is revealed, however during the con-call the site personal confirmed that one standby meter is also installed at substation. Kindly clarify the inconsistency observed.</li> <li>7. During the remote audit, the site personal has described the arrangement of meters (at project site &amp; substation) being used for monitoring of electricity. Kindly clarify why the same is not mentioned under section B.7.3 of the PDD.</li> </ol>				
<b>Project participant response</b>				<b>Date :</b> 23/07/2020
<ol style="list-style-type: none"> <li>1. Parameter <math>EG_{PJ,y} = EG_{export} - EG_{import}</math>, However Monthly JMR issued by APSPDCL provides for the calculated value of parameter <math>EG_{export}</math> and <math>EG_{import}</math> which is used to arrive at <math>EG_{PJ,y}</math>. Hence the JMR issued by APSPDCL is being submitted to DOE for reference.</li> <li>2. QA/QC procedure for <math>EG_{PJ,y}</math> is already provided in the Section B.7.1 of the PDD. DOE is requested to refer the same. Parameter <math>EG_{export}</math>, <math>EG_{import}</math> have also been included in the section B.7.1 of the revised PDD.</li> <li>3. Revised ER calculation sheet is being submitted along with this submission.</li> <li>4. The start date of crediting period has been updated in section 3.2</li> <li>5. Single line diagram is now being updated in the revised PDD</li> <li>6. Project Boundary has been revised including standby meters, DOE is requested to refer the same.</li> <li>7. Section B.7.3 has been updated and details of procedure followed are presented in the revised PDD..</li> </ol>				
<b>Documentation provided by project participant</b>				
<i>Revised PDD</i> <i>ER Calculation Sheet</i> <i>JMR</i>				
<b>DOE assessment</b>				<b>Date:</b> 25/07/2020
<ol style="list-style-type: none"> <li>1. PP has submitted sample JMR referred as source of the parameter, found to be satisfactory.</li> <li>2. Parameter <math>EG_{PJ,y}</math> is calculated as difference of electricity exported and imported by the project. This parameter is directly sourced from the monthly JMRs issued by the state utility and QA/QC procedure for this parameter is updated in the revised PDD, in line with the methodology requirement.</li> <li>3. Parameters used in calculation of "Net electricity supplied to grid by project activity" are added in section B.7.1 of the PDD.</li> <li>4. The PP has submitted the ER calculation sheet, found to be satisfactory.</li> <li>5. The start date of crediting period has been updated in section 3.2 of the PDD</li> <li>6. The PP has modified the single line diagram showing all the metering points in section B.7.3 of the PDD, hence accepted.</li> <li>7. Metering arrangement described under section B.7.3 of the PDD is updated and found to be in line with the actual photographs/videos and as described by the site personal during the con-call, hence accepted.</li> </ol>				
CAR #4 is closed.				

<b>CAR ID</b>	05	<b>Section no.</b>	D.7	<b>Date :</b> 22/06/2020
<b>Description of CAR</b>				
Please clarify why the information's are not provided in section E.1 of the PDD: <ul style="list-style-type: none"> <li>• Location of the stakeholder meeting.</li> <li>• Minimum group of stakeholders involved.</li> <li>• Means for inviting stakeholders' participation and date of invitation.</li> <li>• The information to be made available to stakeholders</li> </ul>				
Please submit the attendance list and minutes of meeting (MoM) for the stakeholder meeting conducted.				
<b>Project participant response</b>				<b>Date :</b> 23/07/2020
Section E.1 has been updated with the detail on below information: <ul style="list-style-type: none"> <li>• Location of the stakeholder meeting.</li> <li>• Minimum group of stakeholders involved.</li> <li>• Means for inviting stakeholders' participation and date of invitation.</li> <li>• The information to be made available to stakeholders</li> </ul> DOE is requested to refer the revised PDD.				
Moreover, the attendance list and minutes of meeting (MoM) for the stakeholder meeting conducted is being conducted along with this submission.				
<b>Documentation provided by project participant</b>				
<i>Local Stakeholder Documents</i> <i>Revised PDD</i>				
<b>DOE assessment</b>				<b>Date:</b> 31/07/2020
The PP has updated the section E.1 in the revised PDD including all the information regarding local stakeholder consultation as per the comments raised, found to be satisfactory, hence accepted. Attendance list and minutes of meeting (MoM) for the stakeholder meeting conducted is submitted and found to be appropriate. CAR #5 is closed.				

<b>CAR ID</b>	06	<b>Section no.</b>	D.9	<b>Date :</b> 22/06/2020
<b>Description of CAR</b>				
The project participant is requested to submit the letter of approval (LoA) issued by the designated national authority (DNA) of the Party indicated in the PDD as being involved in the proposed CDM project activity (ref: paragraph 139 of VVS for PAs version 2.0).				
<b>Project participant response</b>				<b>Date :</b> 23/07/2020
Project has received LoA issued by host party (India) and is being submitted along with this submission				
<b>Documentation provided by project participant</b>				
LOA				
<b>DOE assessment</b>				<b>Date:</b> 31/07/2020
PP has submitted LoA and it is found in accordance with paragraphs 140-144 of the CDM VVS for project activity version 2.0, the assessment team has no doubt on the authenticity of the LoA for the project activity and hence accepted. CAR #6 is closed.				

<b>CAR ID</b>	07	<b>Section no.</b>	D.11	<b>Date :</b> 22/06/2020
<b>Description of CAR</b>				
Please submit the "Modalities of Communication" (MoC) statement indicating the project participant and focal points (ref: paragraph 152 of VVS for PAs version 2.0) PP is also requested to submit the personal identity proof of the authorized signatories as mentioned in the MoC.				
<b>Project participant response</b>				<b>Date :</b> 23/07/2020
Filled & duly Signed MOC form along with identity proof of the authorized signatories is being submitted to DOE along with this submission. Please refer the same.				
<b>Documentation provided by project participant</b>				

MOC	
Identity proof of the authorized signatories	
<b>DOE assessment</b>	<b>Date:</b> 31/07/2020
MoC and identity proof of the persons who authorized to sign MoC is submitted by the PP, checked and found to be satisfactory. CAR #7 is closed.	

Table 3. FARs from this validation

<b>FAR ID</b>	01	<b>Section No.</b>	D.3	<b>Date : 31/07/2020</b>
<b>Description of FAR</b>				
During the validation process physical site visit is not conducted, thus the project implementation including monitoring plan as described in the PDD is verified through documentary evidences and site photographs/video recordings. In accordance with the guidance provided under paragraph 36 of VVS for PAs version 02.0, the verifying DOE shall check/review the project implementation in accordance with the PDD, during first verification of the project activity.				
<b>Project participant response</b>				<b>Date : DD/MM/YYYY</b>
NA				
<b>Documentation provided by project participant</b>				
NA				
<b>DOE assessment</b>				<b>Date: DD/MM/YYYY</b>
NA				

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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
04.0	31 May 2019	Revision to: <ul style="list-style-type: none"><li>• Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN);</li><li>• Make editorial improvements.</li></ul>
03.1	11 January 2018	Editorial revision to remove an erroneously included instruction paragraph in section D.2 (Identification of project type).
03.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
02.0	22 July 2016	EB 90, Annex 3 Revision to include provisions related to automatically additional project activities.
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Registration Keywords: project activities, validation report		