

BUNDLED SOLAR POWER PROJECT BY SOLARARISE INDIA PROJECTS PVT. LTD.



Document Prepared By (SUKANTA DAS- LEAD AUDITOR/ TECHNICAL EXPERT)

LGAI Technological Center S.A.

Ctra. Acceso a la facultad de Medicina, s/n, Campus UAB

E – 08193 Bellaterra (Barcelona) – Spain

Tel: +34 935 672 008

Fax: +34 935 672 001

www.appluscertification.com

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Prepared By	LGAI Technological Center S.A. Ctra. Acceso a la facultad de Medicina, s/n, Campus UAB E – 08193 Bellaterra (Barcelona) – Spain Tel.:+34 935 672 008

Contact	Fax.+34 935 672 001 www.appluscertification.com
	Tel.:+34 935 672 008 Fax.+34 935 672 001 www.appluscertification.com
Approved By	Juan Sendin Caballero, Applus+ Certification BU Managing Director
Work Carried Out By	Mr. Sukanta Das-Lead Auditor/Technical expert

Summary:

Validation purpose: The purpose of the project activity (*hereafter referred as “proposed project activity”*) is to generate power using renewable energy source (Solar energy) and sell the power generated to the state grid or third party. The project activity generates electricity using solar energy. The generated electricity is exported to the regional grid system which is under the purview of the INDIAN electricity grid of India. Since, the solar power is Green House Gas (GHG) emissions free, the power generated will replace anthropogenic emissions of greenhouse gases estimated to be approximately 244,968 tCO_{2e} per year, thereon displacing 253,776 MWh/year amount of electricity from the generation-mix of power plants connected to the INDIAN GRID, which is mainly dominated by thermal/ fossil fuel based power plant.

The objective of this validation activity is to have an independent third party for the assessment of the project design, estimated ER sheet and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against “ACM 0002 version 18.1”
- the project's monitoring plan is assessed against “ACM0002 v18.1”
- the projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7
- CDM Validation and Verification Standard version 01
- CDM Project Standard version 01
- CDM project cycle procedure version 01

- VCS standard v3.7¹
- VCS guideline v3.7

Validation is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of estimated verified emission reductions (VERs)

A risk based approach has been followed to perform this validation and verification activity. In the course of Validation, 06 Corrective Action requests (CARs) and 00 Clarification Requests (CLs), 00 Forward action request (FARs) were raised and successfully closed. The review of the project description and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and PROJECT OWNERS have provided Applus+ Certification with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

Verification purpose:

The proposed project activity will assist development of renewable energy generation plants based on solar power technology in India and delivering electricity to the grid.

The proposed project is a voluntary action being undertaken by each project owner of the project activity under a SPV scheme. EKI Energy Services Limited (hereafter referred as “EKIESL”) is acting as the other party for this project activity.

The main purpose of this project activity is to generate clean form of electricity through renewable solar energy source. The project is a bundled project activity which involves installation of 120 MW solar project in different states of India through SPVs.

Over the 10 years of first crediting period, the project will replace anthropogenic emissions of greenhouse gases (GHG’s) estimated to be approximately 244,968tCO₂e per year, thereon displacing 253,776 MWh/year amount of electricity from the generation-mix of power plants connected to the Indian grid, which is mainly dominated by thermal/fossil fuel based power plant.

The details of the SPVs for the project and their location of installation are mentioned in the table below:-

Name of SPVs	Capacity in MW	COD	Connection with Grid	State	Usage
Talettutayi Solar Projects Pvt Ltd	10 MW	23/06/2016	Indian Grid	Telangana	Sale to State Discom

¹ <http://www.v-c-s.org/project/vcs-program/rules-and-requirements/>

NV Vogt Solar One Pvt Ltd	10 MW	23/06/2016	Indian Grid	Telangana	Sale to State Discom
Talettutayi Solar Projects Four Pvt Ltd	50 MW	10/08/2017	Indian Grid	Maharashtra	Sale to SECI
Talettutayi Solar Projects One Pvt Ltd	30 MW	05/01/2018	Indian Grid	Karnataka	Sale to SECI
Talettutayi Solar Projects Two Pvt Ltd	20 MW	Yet to be achieved	Indian Grid	Karnataka	Sale to State Discom

These are the SPVs of SolarArise India Projects Pvt. Ltd. and the project is promoted by SolarArise India Projects Pvt. Ltd.

During the Current Monitoring Period from 23/06/2016 to 25/04/2018 (First and last date included) the project activity has supplied 143,441 MWh of electricity, and thus contributing to the GHG reductions 138,462 tCO_{2e}.

The project activity is a new facility (Greenfield) and the purpose of the project activity is to generate energy electricity by the utilization of renewable Solar technology and further selling the generated energy to the Indian Grid or Third Party Sale. In this process there is no consumption of any fossil fuel and hence the project does not lead to any greenhouse gas emissions. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment.

During the current monitoring period, project activity undergo continued operation since their commissioning and no major breakdown had taken place

The objective of this verification activity is to have an independent third party for the assessment of the project design, Actual ER sheet and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against "ACM 0002 version 18.1"
- the project's monitoring plan is assessed against "ACM0002 v18.1"
- the projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7
- CDM Validation and Verification Standard version 01
- CDM Project Standard version 01

- CDM project cycle procedure version 01
- VCS standard v3.7²
- VCS guideline v3.7

A risk based approach has been followed to perform this verification activity. In the course of verification, 02 Corrective Action requests (CARs) and 00 Clarification Requests (CLs), 00 Forward action request (FARs) were raised and successfully closed. The review of the Monitoring report and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and PROJECT OWNERS have provided Applus+Certification with sufficient evidence to verify the fulfillment of the stated criteria of VCS

² <http://www.v-c-s.org/project/vcs-program/rules-and-requirements/>

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1 INTRODUCTION

1.1 Objective

LGAI Technological Center S.A. (Hereinafter referred as Applus+Certification) has been appointed by “**SolarArise India Projects Pvt. Ltd.**” to perform the validation and verification of the project entitled “Bundled Solar Power Project by SolarArise India Projects Pvt. Ltd.” under VCS standard and guideline version 3.7. The objective of this validation activity is to have an independent third party for the assessment of the project design, ER sheet and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against “ACM 0002 version 18.1”
- the project’s monitoring plan is assessed against “ACM0002 v18.1”
- the projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7
- CDM Validation and Verification Standard version 01
- CDM Project Standard version 01
- CDM project cycle procedure version 01
- VCS standard v3.7³
- VCS guideline v3.7

Validation is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of estimated verified emission reductions (VERs).

1.2 Scope and Criteria

The scope of the Joint validation and verification is the independent and objective review of the Project Document as per Para 3.2.9 of VVM version 3.1 and Monitoring report (MR). The PD and MR are reviewed against the relevant criteria (see 1.1) and decisions by the CDM Executive Board and VCS executive board, including the approved baseline and monitoring methodology. The validation and verification was based on the guidance given in the CDM Validation and Verification Standard version 01, CDM Project Standard version 01, CDM Project Cycle Procedure version 01, VCS guideline and standard version 3.7

³ <http://www.v-c-s.org/project/vcs-program/rules-and-requirements/>

The assessment team has employed a risk based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the PD and MR. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VERs. The validation and verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design and monitoring report combined.

The only purpose of the validation and verification is its usage during the registration /issuance process as part of the VCS project cycle. Therefore, LGAI Technological Center S.A. (Applus+Certification) can't be held liable by any party for decisions made or not made based on the validation/verification opinion, which will go beyond that purpose.

1.3 Level of Assurance

The verification and validation has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS.

1.4 Summary Description of the Project

The main purpose of this project activity is to generate clean form of electricity through renewable solar energy source. The project is a bundled project activity which involves installation of 120 MW solar project in different states of India through SPVs.

Over the 10 years of first crediting period, the project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 244,968 tCO_{2e} per year, thereon displacing 253,776 MWh/year amount of electricity from the generation-mix of power plants connected to the Indian grid, which is mainly dominated by thermal/fossil fuel based power plant.

The details of the SPVs for the project and their location of installation are mentioned in the table below:-

Name of SPVs	Capacity in MW	COD	Connection with Grid	State	Usage
Taletutayi Solar Projects Pvt Ltd	10 MW	23/06/2016	Indian Grid	Telangana	Sale to State Discom
NV Vogt Solar One Pvt Ltd	10 MW	23/06/2016	Indian Grid	Telangana	Sale to State Discom
Taletutayi Solar Projects Four Pvt Ltd	50 MW	10/08/2017	Indian Grid	Maharashtra	Sale to SECI
Taletutayi Solar Projects One Pvt Ltd	30 MW	05/01/2018	Indian Grid	Karnataka	Sale to SECI
Taletutayi Solar	20 MW	Yet to be	Indian Grid	Karnataka	Sale to

Projects Two Pvt Ltd		Commissioned			State Discom
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These are the SPVs of SolarArise India Projects Pvt. Ltd. and the project is promoted by SolarArise India Projects Pvt. Ltd.

The project activity involves the installation of Solar PV project. The total installed capacity of the project is 120 MW of Solar PV plant located at different states in India. The project is promoted by **SolarArise India Projects Pvt. Ltd.**

The Project activity is a new facility (Greenfield) and the electricity generated by the project will be exported to the Indian electricity grid. The project will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. The Project Proponent plans to avail the VCS benefits for the project.

In the Pre- project scenario the entire 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.

The project shall result in replacing anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 244,968 tCO_{2e} per year, thereon displacing 253,776 MWh/year amount of electricity from the grid over the 10 years crediting period.

Solar PV Project Technology Details –

The project activity aims to harness solar energy through installation of Solar PV project with total installed capacity of 120 MW.

The technical specification of 10 MW plant interconnection with grid on 23-06-2016 by Talettutayi Solar Projects Pvt Ltd are as follows:

Sl. No.	Technical details of the equipment ⁴	Description
1	Technology Used	Poly Crystalline Silicon
2	Make of modules installed	Trina Solar
3	Model of the modules installed	TSM-310PC14, TSM-315PC14
4	Number of Inverters	10 Nos.
5	Make & Number of Transformers	Make- Voltamp Model- 2 MVA, 5 Nos.

⁴ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 10 MW.

The technical specification of 10 MW plant interconnection with grid on 23-06-2016 by NV Vogt Solar One Pvt Ltd are as follows:

Sl. No.	Technical details of the equipment ⁵	Description
1	Technology Used	Poly Crystalline Silicon
2	Make of modules installed	Trina Solar
3	Model of the modules installed	TSM-310PC14, TSM-315PC14
4	Number of Inverters	10 Nos.
5	Make & Number of Transformers	Make- Voltamp Model- 2 MVA, 5 Nos.

The technical specification of 50 MW plant interconnection with grid on 10-08-2017 by Talettutayi Solar Projects Four Pvt Ltd are as follows:

Sl. No.	Technical details of the equipment ⁶	Description
1	Technology Used	Poly Crystalline Silicon
2	Make of modules installed	JA Solar
3	Model of the modules installed	320 Wp & 325 Wp
4	Make & Model of Invertor	Make- Sungrow, Model- SG 2500
5	Number of Inverters	20
6	Make & Number of Transformers	Make- Sudhir, Model- 5 MVA, 10 Nos. Make- Voltamp, Model- 50 MVA, 1 No.

The technical specification of 30 MW plant interconnection with grid on 05-01-2018 by Talettutayi Solar Projects One Pvt Ltd are as follows:

Sl. No.	Technical details of the equipment ⁷	Description
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⁵ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 10 MW.

⁶ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 50 MW.

⁷ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 30 MW.

1	Technology Used	Poly Crystalline Silicon
2	Make of modules installed	JA Solar
3	Model of the modules installed	320 Wp & 325 Wp
4	Make & Model of Invertor	Make- Sungrow, Model- SG 2500
5	Number of Inverters	12
6	Make & Number of Transformers	Make- Silchar, Model- 5 MVA, 6 Nos. Make- Raychem, Model- 30 MVA, 1 No.

The 20 MW plant by Talettutayi Solar Projects Two Pvt Ltd is expected to be commissioned by September 2018. The details are also checked by the assessment team during the combined validation and verification site visit and confirm the details to be correct.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

Validation and Verification Scope: The scope is defined as an independent and objective review of the Joint project design document and Monitoring report (Joint PDD & MR. The Joint PD and MR is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board and VCS standard and guideline version 3.7, including the approved baseline and monitoring methodology ACM 0002 version 18.1 (for the present scenario in the project). The validation and verification was based on the requirements in the Validation and Verification Standard (VVS version 01), project standard version 01, project cycle procedure version 01 and VCS guideline and standard version 3.7

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

Validation and Verification Process: The project assessment is based on the “Clean Development Mechanism Validation and Verification Standard version 01.0 and VCS standard and guideline version 3.7 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the VCS project activity are appointed.

Once the project is received by the assessment team, the members of the assessment team carried out:

- I A desk review of the Joint project design documentation and monitoring report;
- II Follow-up interviews with project stakeholders;

III The resolution of outstanding issues and the issuance of the final verification/ validation report and opinion.

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

Appointment of the assessment team

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	Role	SS Coverage	TA Coverage	Financial aspect	Host country experience
Mr. Sukanta Das	LATE	YES	YES	YES	YES
Mr. Simon Shen	TR	YES	YES	YES	NA

The complete list of CVs is included as Appendix 3 of this report.

Document review

The Joint Project Document and Monitoring report submitted by the Client was reviewed against the approved methodology and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information

from other sources has been done. A complete list of all documents and evidence material reviewed is included in this report below in appendix 1

Follow-up interviews

A site visit is conducted by Applus+ Certification performed interviews, telephone conferences, and physical site inspection with project stakeholders to confirm selected information and to resolve issues identified in the document review. The detail is provided in this report in the below section

Resolution of Clarification and Corrective Action Request

The objective of this phase of the joint validation and Verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for Applus+ Certification positive conclusion on the project design and Monitoring report. The Corrective Action Requests and Clarification Requests raised by Applus+ Certification were resolved during communications between the Client and Applus + Certification to guarantee the transparency of the validation and verification process, the concerns raised and responses given are summarized below in the appendix 2.

The Joint PD and MR Version 02 submitted by PROJECT OWNERS on 09/06/2018 respectively serve as the basis for the final assessment presented. Additional changes to the project during the joint validation and verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Internal quality control

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

After confirmation of the PROJECT OWNERS the positive validation/verification opinion and relevant documents are submitted to the VCS secretariat through the VCS web-platform

2.2 Document Review

The details of the document observed during the joint validation and verification process are listed below in appendix 1 of this report

2.3 Interviews

The site visit for the project activity were carried out from 02/06/2018 to 04/06/2018 which covers all the sites (includes all the locations) in the state of Maharashtra, Telangana and Karnataka in republic of India. No sampling procedures were adopted either in document verification and all the document were cross checked to ensure conservative estimation of emission reduction. Kindly find below name of the person interviewed (during onsite and telephonic interview later) for all the sites

Name of SPVs	District	State	Name of Villagers		PP Representative
Talettutayi Solar Projects Pvt Ltd	Mahabubnagar	Telangana	T. Krishna-Villager	Ram Prasad Rao- Farmer	Mr. Amit Sharma
NV Vogt Solar One Pvt Ltd	Mahabubnagar	Telangana			
Talettutayi Solar Projects Four Pvt Ltd	Beed	Maharashtra	Krishna-Driver	Hemant-Villager	
Talettutayi Solar Projects One Pvt Ltd	Koppal	Karnataka	M.Vasu Reddy-Villager	Ramakant Iyer-Shopkeeper	
Talettutayi Solar Projects Two Pvt Ltd	Koppal	Karnataka	Amresh Iyer-Farmer	T.Venkatesh-Fruit Seller	

2.4 Site Inspections

Duration of on-site inspection: 02/06/2018 to 04/06/2018				
No.	Activity performed on-site	Site location	Date	Team member
1.	Assessment team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring.	Maharashtra, Telangana and Karnataka	02/06/2018 to 04/06/2018	Mr. Sukanta Das

2.5 Resolution of Findings

The objective of this phase of the joint validation and Verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for Applus+ Certification's positive conclusion on the project design and Monitoring report. The Corrective Action Requests and Clarification Requests raised by Applus+ Certification were resolved during communications between the Client and Applus+ Certification to guarantee the transparency of the validation process, the concerns raised and responses given are summarized below in the appendix 2.

The Joint final PD and MR Version 02 submitted by PROJECT OWNERS on 09/06/2018 respectively serves as the basis for the final assessment presented. Additional changes to the project during the validation and verification process are not considered to be significant with respect to the main CDM/VCS

objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Areas of validation and verification findings	No. of CL	No. of CAR	No. of FAR
Project design document and Monitoring report	00	01	00
Description of project activity	00	00	00
Application of selected baseline and monitoring methodology and selected standardized baseline			
- Applicability of methodology and standardized baseline	00	00	00
- Deviation from methodology	00	00	00
- Clarification on applicability of methodology, tool and/or standardized baseline	00	00	00
- Demonstration of additionality	00	01	00
- Emission reductions	00	01	00
- Monitoring plan	00	00	00
-Stakeholders consultation process	00	01	00
- Public comments	00	01	00
Others (please specify)-Matter related to double counting- for validation	00	01	00
Others (please specify)-Matter related to Emission reduction calculation- for verification Matter related to feeder details, breakdown and Calibration- for verification	00	02	00
Total	00	Validation+ Verification: 08	00

The list of findings and their resolution is presented in appendix 2 of this report.

2.5.1 Forward Action Requests

No FAR was raised during this joint validation and verification process

3 VALIDATION FINDINGS

3.1 Project Details

The main purpose of this project activity is to generate clean form of electricity through renewable solar energy source. The project is a bundled project activity which involves installation of 120 MW solar project in different states of India through SPVs.

Over the 10 years of first crediting period, the project will replace anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 244,968 tCO_{2e} per year, thereon displacing 253,776 MWh/year amount of electricity from the generation-mix of power plants connected to the Indian grid, which is mainly dominated by thermal/fossil fuel based power plant.

The details of the SPVs for the project and their location of installation are mentioned in the table below:-

Name of SPVs	Capacity in	COD	Connection	State	Usage
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	MW		with Grid		
Talettutayi Solar Projects Pvt Ltd	10 MW	23/06/2016	Indian Grid	Telangana	Sale to State Discom
NV Vogt Solar One Pvt Ltd	10 MW	23/06/2016	Indian Grid	Telangana	Sale to State Discom
Talettutayi Solar Projects Four Pvt Ltd	50 MW	10/08/2017	Indian Grid	Maharashtra	Sale to SECI
Talettutayi Solar Projects One Pvt Ltd	30 MW	05/01/2018	Indian Grid	Karnataka	Sale to SECI
Talettutayi Solar Projects Two Pvt Ltd	20 MW	Yet to be achieved	Indian Grid	Karnataka	Sale to State Discom

These are the SPVs of SolarArise India Projects Pvt. Ltd. and the project is promoted by SolarArise India Projects Pvt. Ltd.

Assessment team checked the technical details of the project activity from the manufactures specification and the detail are as follow:

Solar PV Project Technology Details –

The project activity aims to harness solar energy through installation of Solar PV project with total installed capacity of 120 MW.

The technical specification of 10 MW plant interconnection with grid on 23-06-2016 by Talettutayi Solar Projects Pvt Ltd are as follows:

Sl. No.	Technical details of the equipment⁸	Description
1	Technology Used	Poly Crystalline Silicon
2	Make of modules installed	Trina Solar

⁸ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 10 MW.

3	Model of the modules installed	TSM-310PC14, TSM-315PC14
4	Number of Inverters	10 Nos.
5	Make & Number of Transformers	Make- Voltamp Model- 2 MVA, 5 Nos.

The technical specification of 10 MW plant interconnection with grid on 23-06-2016 by NV Vogt Solar One Pvt Ltd are as follows:

Sl. No.	Technical details of the equipment ⁹	Description
1	Technology Used	Poly Crystalline Silicon
2	Make of modules installed	Trina Solar
3	Model of the modules installed	TSM-310PC14, TSM-315PC14
4	Number of Inverters	10 Nos.
5	Make & Number of Transformers	Make- Voltamp Model- 2 MVA, 5 Nos.

The technical specification of 50 MW plant interconnection with grid on 10-08-2017 by Talettutayi Solar Projects Four Pvt Ltd are as follows:

Sl. No.	Technical details of the equipment ¹⁰	Description
1	Technology Used	Poly Crystalline Silicon
2	Make of modules installed	JA Solar
3	Model of the modules installed	320 Wp & 325 Wp
4	Make & Model of Invertor	Make- Sungrow, Model- SG 2500
5	Number of Inverters	20
6	Make & Number of Transformers	Make- Sudhir, Model- 5 MVA, 10 Nos. Make- Voltamp, Model- 50 MVA, 1 No.

⁹ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 10 MW.

¹⁰ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 50 MW.

The technical specification of 30 MW plant interconnection with grid on 05-01-2018 by Talettutayi Solar Projects One Pvt Ltd are as follows:

Sl. No.	Technical details of the equipment ¹¹	Description
1	Technology Used	Poly Crystalline Silicon
2	Make of modules installed	JA Solar
3	Model of the modules installed	320 Wp & 325 Wp
4	Make & Model of Invertor	Make- Sungrow, Model- SG 2500
5	Number of Inverters	12
6	Make & Number of Transformers	Make- Silchar, Model- 5 MVA, 6 Nos. Make- Raychem, Model- 30 MVA, 1 No.

The 20 MW plant by Talettutayi Solar Projects Two Pvt Ltd is expected to be commissioned by September 2018. The technical details of the plant shall be completed once the plant gets commissioned.

Assessment team checked onsite and confirms that the details of the project proponent is as below:

Organization name	SolarArise India Projects Pvt. Ltd.
Contact person	Kirandeep Singh
Title	Head Project Finance
Address	304, ILD Trade Centre, Sohna road, sector - 47, Gurgaon - 122001
Telephone	-
Email	-

Assessment team checked onsite and confirms that the details of the other entity involved is as below:

Organization name	EKI Energy Services Limited
Role in the project	Project Consultant
Contact person	Manish Dabkara

¹¹ It is to be noted that in future there is possibility of change in module configuration, however project capacity in total will remain same as 30 MW.

Title	CEO & MD
Address	EnKing Embassy, Office No 201, Plot 48, Scheme 78, Part 2, Vijay Nagar, Indore- 452010, Madhya Pradesh, India.
Telephone	+91-731-4289086
Email	manish@enkingint.org

Project Start Date

Assessment team confirms that the Start date of the project activity is the earliest date of interconnection with the grid i.e. 23-06-2016. This is the date of commissioning of 10 MW solar PV project activity by Talettutayi Solar Projects Pvt Ltd and 10 MW solar PV project activity by NV Vogt Solar One Pvt Ltd.

The commissioning details are as below:

Name of SPVs	Capacity in MW	COD ¹²
Talettutayi Solar Projects Pvt Ltd	10 MW	23/06/2016
NV Vogt Solar One Pvt Ltd	10 MW	23/06/2016
Talettutayi Solar Projects Four Pvt Ltd	50 MW	10/08/2017
Talettutayi Solar Projects One Pvt Ltd	30 MW	05/01/2018
Talettutayi Solar Projects Two Pvt Ltd	20 MW	Yet to be achieved

Project crediting period Date

Assessment team confirms that the crediting period dates for the project is as below:

Crediting Period Start date: 23-June-2016

Crediting Period End date: 22-June-2026

¹² Assessment team checked the commission details from the commissioning certificate provided by the Govt agency

The project activity adopts renewable crediting period of 10 years period which can be renewed for maximum 2 times.

Project Scale and Estimated GHG Emission Reductions or Removals

Assessment team confirms that the project is a large scale project that involves setting up of 120 MW of Solar power project.

Project Scale	
Project	✓
Large project	

As the estimated annual average GHG emission reductions or removal per year is 244,968 tCO₂e which is less than 300,000 tonnes of CO₂e per year, thus the project falls in the category of Project.

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
Year 1	244,968
Year 2	244,968
Year 3	244,968
Year 4	244,968
Year 5	244,968
Year 6	244,968
Year 7	244,968
Year 8	244,968
Year 9	244,968
Year 10	244,968
Total estimated ERs	2,449,680
Total number of crediting years	10
Average annual ERs	244,968

The above estimated emission reduction is confirmed by assessment team via emission reduction calculation spreadsheet. The calculation is conservative and this acceptable to the assessment team.

Project location

Assessment team during the validation site visit confirms via google map that the solar plant of respective project investor are located at a single region and the details are as follows¹³:

¹³ Sourced from Detail Project Report of the project activity. The same is checked during the validation site visit via GPS meters

Name of SPVs	Village Site /	Tehsil Mandal /	District	State	Latitude (N)	Longitude (E)
Talettutayi Solar Projects Pvt Ltd	Palwai	Gadwal	Mahabub nagar	Telangana	6.153°	77.764°
NV Vogt Solar One Pvt Ltd	Palwai	Gadwal	Mahabub nagar	Telangana	6.153°	77.764°
Talettutayi Solar Projects Four Pvt Ltd	Chatgaon	Telgaon Taluk	Beed	Maharashtra	18.966639°	76.218777°
Talettutayi Solar Projects One Pvt Ltd	Chikkoppa and Mudhol	Yelburga	Koppal	Karnataka	15.65°	75.99°
Talettutayi Solar Projects Two Pvt Ltd	Yet to finalized	Koppal	Koppal	Karnataka	Yet to be finalized	

Conditions prior to project initiation

Assessment team during the desk review and onsite visit confirms that the project is a Greenfield solar power project and does not involve generation of GHG emissions for the purpose of their subsequent reduction, removal or destruction. The baseline as described in section 3.3.4 of this report will continue to be the baseline in the absence of project activity.

Project compliance with applicable laws, statutes and other regulatory frameworks

Assessment team confirms that the Project has received necessary approvals for development and commissioning for the proposed Solar PV project from the state Nodal agencies and is in compliance to the local laws and regulations. Assessment team checked the Commissioning certificates, power purchase agreement with state board, Installation report for Solar Plant in the name of respective PP issued by state nodal agency of the respective state to confirm the project capacity and its relevant statutory requirements as per the host country regulations.

Assessment team noted that the project fulfils the norms put down by Central pollution control board norms. As per Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India), final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (February 29, 2016).

Being a renewable power project it falls under the category of White and thus this projects do not need clearance for Consent to operate and only needs to inform the relative State pollution control board. The same is done for the project and thus it can be confirmed that it follows the local laws of the host country.

The relevant national laws and regulations pertaining to generation of energy in India are:

- Electricity Act 2003
- National Electricity Policy 2005
- Tariff Policy 2006

The Project activity conforms to all the applicable laws and regulations in India:

- Power generation using solar energy is not a legal requirement or a mandatory option.
- There are state and sectoral policies, framed primarily to encourage solar power projects. These policies have also been drafted realizing the extent of risks involved in the projects and to attract private investments.
- The Indian Electricity Act, 2003 (May 2007 Amendment) 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.

Thus assessment team confirms that the project activity follows the National and local law and regulation of the host country.

Project Ownership

The Project is owned by **SolarArise India Projects Pvt. Ltd**, hence it possess right of use of VER credits. The Ownership is demonstrated through the following documents.

1. **Commissioning certificates** – The letter from respective State Nodal Agency to the SPVs of Solar Arise India Projects Pvt. Ltd i.e. Talettutayi Solar Projects Pvt Ltd, NV Vogt Solar One Pvt Ltd, Talettutayi Solar Projects Four Pvt Ltd, Talettutayi Solar Projects One Pvt Ltd, Talettutayi Solar Projects Two Pvt Ltd for registration of commissioning of generation facility indicates that PP have the legal right to control and operate the project activities.
2. **Contract with EPC contractor** – The purchase order on the name of Talettutayi Solar Projects Pvt Ltd, NV Vogt Solar One Pvt Ltd, Talettutayi Solar Projects Four Pvt Ltd, Talettutayi Solar Projects One Pvt Ltd, Talettutayi Solar Projects Two Pvt Ltd indicates that PP have the legal right to control and operate the project activities.

Emissions trading programs and other binding limits

Assessment team confirms that the Net GHG emission reductions or removals generated by the Project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions in any Emission Trading program or other binding limits.

Additional Information Relevant to the Project

Eligibility Criteria

This is not a grouped project activity. Thus, this section is not applicable for this project.

Leakage Management

Not applicable to the project activity.

Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description. The details are presented transparently to the assessment team for analysis which lead to positive conclusion for this validation and verification.

Sustainable Development

Contribution to sustainable development:

Ministry of Environment and Forests, has stipulated economic, social, environment and technological well-being as the four indicators of sustainable development. Assessment team found that the project contributes to sustainable development using the following ways.

Social well-being: The project would help in generating employment opportunities during the construction and operation phases. The project activity will lead to development in infrastructure in the region like development of roads and also may promote business with improved power generation.

Economic well-being: The project is a clean technology investment in the region, which would not have been taken place in the absence of the VCS benefits the project activity will also help to reduce the demand supply gap in the state.

The project activity will generate power using zero emissions Solar PV based power generation which helps to reduce GHG emissions and specific pollutants like SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities.

Technological well-being: The successful operation of project activity would lead to promotion of Solar based power generation and would encourage other entrepreneurs to participate in similar projects

Environmental well-being: Solar being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the Project activity also helps in avoiding significant amount of GHG emissions.

Project undergone continuous operation and only scheduled maintenance as per the manufacturer specification is considered. No unforeseen incident observed for the present monitoring period.

3.2 Participation under Other GHG Programs

The project has neither been registered nor seeking registration under any other GHG programs. The project is seeking registration only in VCS program. A declaration for the same dated 11/06/2018 is checked and found correct by the assessment team. Also assessment team checked the following registry to confirm the same. The detail of the registry checked are as follows:

1. <https://www.recregistryindia.nic.in/>
2. <http://cdm.unfccc.int/>
3. <http://www.goldstandard.org/>

Rejection by other GHG programs

The Project is not rejected by other GHG programs. A declaration for the same dated 11/06/2018 is checked and found correct by the assessment team. Also assessment team checked the following registry to confirm the same. The detail of the registry checked are as follows:

1. <https://www.recregistryindia.nic.in/>
2. <http://cdm.unfccc.int/>
3. <http://www.goldstandard.org/>
4. www.v-c-s.org

The Project has no intend to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program.

Renewable energy certificates are available for trading in the host country However, the same is not availed by the project participant. The undertaking regarding the same is submitted by PP which is acceptable to the assessment team and assessment team also checked the REC web site (<https://recregistryindia.nic.in/>) and found the declaration to be correct.

3.3 Application of Methodology

3.3.1 Title and Reference

Assessment team checked that following methodology and tools are applicable for the project activity. The details are as below:

Title: Grid-connected electricity generation from renewable sources

Reference: The project activity meets the eligibility criteria of large scale project as it is more than 15 MW

Methodology : ACM0002: Grid-connected electricity generation from renewable sources - Version 18.1¹⁴

Type I : Energy industries (renewable / non-renewable sources)

¹⁴ <http://cdm.unfccc.int/methodologies/DB/5725LCHYPYM4I1V8OD9SFYVAMFFWNP>

Category: Approved Consolidated Methodology (ACM0002)

Tools referred with above methodology and applicable for project activity are:

- Tool to calculate the emission factor for an electricity system¹⁵ - Version 06.0 (EB 97, Annex 07)
- Methodological Tool- Tool for the demonstration and assessment of additionality¹⁶ - Version 07.0.0 (EB 70, Annex 08)

3.3.2 Applicability

The applied baseline methodology is justified as it has been demonstrated that the proposed project activity is:

Applicability 1: The project activity is installation of a new grid connected solar power plant (Option 1 (A)) at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant) and hence this criterion is applicable.

Applicability 2: The proposed project activity is an installation of a new grid connected solar power plant and hence this condition is met. The option (a) of applicability criteria 2 is applicable as project is renewable energy solar power plant/unit.

Applicability 3: The project is installation of new solar based electricity generation plants (not a hydro power plant). Hence this criteria is not applicable.

Applicability 4: The project is solar power project and thus the criterion is not applicable to this project activity.

Applicability 5: The project is solar power project and thus the criterion is not applicable to this project activity.

Applicability 6: The project is solar power project and thus the criterion is not applicable to this project activity.

Applicability 7: The project activity is installation of a new grid connected solar power project and does not involve switching from fossil fuel to renewable energy and hence this criterion is not relevant to the project activity.

&

This is a solar power plant and not a biomass fired plant and hence this applicability criterion is not applicable to the project activity.

¹⁵ <http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v6.pdf>

¹⁶ <http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v7.0.0.pdf>

Applicability 8: The project activity is a new grid connected solar power plant and not a retrofits, replacement or capacity additions and therefore this criterion is not applicable to the project activity.

Applicability 9: Please refer below

Applicability conditions of “Tool to calculate the emission factor for an electricity system”

- OM, BM and CM are estimated using the tool for calculating baseline emissions.
- The project activity is grid connected and thus emission factor is calculated and thus OM, BM and CM are estimated using the tool for calculating baseline emissions.
- The project activity is located in India, a non-Annex I country. Therefore, tool is applicable for the project activity.
- The project is a solar project and there is no involvement of biofuels. Therefore, this criterion is not applicable for the project activity.

Applus+ Certification confirms that the application of the baseline methodology is transparent and conservative, and confirms that the chosen baseline and monitoring methodology i.e. ACM 0002 version 18.1 is applicable to the project activity.

The project activity qualifies as Type I during every year of the crediting period in accordance with applicable provisions for project activity eligibility as discussed above. Also the total installed capacity of project activity is 120 MW which is applicable as per large scale project activities methodology ACM0002: Grid-connected electricity generation from renewable sources Version 18.1. The project capacity will be always remain the same and hence the project activity will always be large scale project activities throughout the crediting period and thereafter.

3.3.3 Project Boundary

Project boundary has been ascertained and confirmed during the site visit using ACM0002 (Version 18.1) – “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”.

Hence the project boundary includes the renewable energy power generation, sub-stations, grid and all power plants connected to grid. The proposed project activity will evacuate power to the grid. The boundary also extends to the project power plant and all power plants connected physically to the electricity system that the VCS project power plant is connected to”.

The calculation of net electricity supplied to grid is under purview of state electricity board and project activity Owner or project activity Implementer does not have any control on it. Thus for project activity, net electricity supplied to grid is the monitoring parameter which is used for ER calculations.

It is to be noted that metering arrangement is under control of state electricity board and PP do not have any control on it.

The sources and GHG gases involved for proposed Project activity are as below

Source		Gas	Included	Justification/Explanation
Baseline	CO ₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.	CO ₂	Yes	Major emission sources.
		CH ₄	No	Excluded for simplification. This is conservative
		N ₂ O	No	Excluded for simplification. This is conservative
Project activity	For geothermal power plants, fugitive emissions of CH ₄ and CO ₂ from non-condensable gases contained in geothermal steam	CO ₂	No	A project activity instance does not involve any Geothermal Power plant. Hence not applicable
		CH ₄	No	A project activity instance does not involve any Geothermal Power plant. Hence not applicable
		N ₂ O	No	A project activity instance does not involve any Geothermal Power plant. Hence not applicable
	CO ₂ emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants	CO ₂	No	A project activity instance does not involve solar thermal or geothermal power plants. Hence not applicable
		CH ₄	No	A project activity instance does not involve solar thermal or geothermal power plants. Hence not applicable
		N ₂ O	No	A project activity instance does not involve solar thermal or geothermal power plants. Hence not applicable
	For hydro power plants, emissions of CH ₄ from the reservoir	CO ₂	No	A project activity instance does not involve hydro power plants. Hence neglected

3.3.4 Baseline Scenario

Assessment team confirms that being a grid connected solar energy generation project, PP developed the project based on the Methodology ACM 0002 version 18.1. As per methodology *if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:*

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

As per VVS version 01, “where the baseline scenario is not prescribed in the approved methodology, the DOE shall assess the list of identified credible alternatives to the project activity in the PD selected to determine the most realistic baseline scenario.” Thus, PD should mention the credible alternatives to the project activity in order to determine the most realistic baseline scenario. As the selected large scale methodology clearly mention the baseline scenario and the same has been opted in this project, therefore, no further analysis on baseline is required.

Validation Team, therefore, concludes that the PD conforms to the guidance given by EB via VVS version 01 and VCS via VCS standard version 3.7.

The project activity involves setting up of solar projects to harness the power of sun to produce electricity and supply to the grid. In the absence of the project activity, the equivalent amount of power would have been supplied by the Indian grid, which is fed mainly by fossil fuel fired plants.

In the absence of the project activity, the equivalent amount of power would have been drawn from the Indian grid. Hence, the baseline for the project activity is the equivalent amount of power from the Indian grid.

The combined margin ($EF_{grid, CM, y}$) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) and build margin (BM). Calculations for this combined margin must be based on data from an official source (where available) and made publically available. The Central electricity authority (=CEA) database version 12 is the latest available data at the time of PD submission to DOE for validation, hence same is considered for emission factor calculations.

The combined margin of the Indian grid used for the project activity is as follows:

Parameter	Value	Nomenclature	Source
$EF_{grid,y}$	0.9653 tCO ₂ /MWh	Combined margin CO ₂ emission factor for the project electricity system in year y	Calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO ₂ Emission Database, Version 12.0, May 2017 published by Central Electricity Authority (CEA), Government of India

EF _{grid,OM,y}	0.9843 tCO ₂ /MWh	Operating margin CO ₂ emission factor for the project electricity system in year y	Calculated as the last 3 year (2013-14, 2014-15, 2015-16) generation-weighted average, sourced from Baseline CO ₂ Emission Database, Version 12.0, May 2017 published by Central Electricity Authority (CEA), Government of India
EF _{grid,BM,y}	0.9083 tCO ₂ /MWh	Build margin CO ₂ emission factor for the project electricity system in year y	Baseline CO ₂ Emission Database, Version 12.0, May 2017 published by Central Electricity Authority (CEA), Government of India

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

Assessment team thus confirmed that baseline is selected as per the applied methodology and combined margin is calculated as per the tool and thus acceptable to the assessment team.

3.3.5 **Additionality**

During conceptualization of the project activity, board of directors of the project proponents considered the VCS revenue to improve the project financials. During the board meeting for board of Directors decided that they would consider VCS revenue for their project activity. In continuation to the board decision, PP issued the respective purchase order for the supply of Solar Panels. The detail of project commission is as follows:

Name of SPVs	Capacity in MW	COD	Connection with Grid	State	Usage
Taletutayi Solar Projects Pvt Ltd	10 MW	23/06/2016	Indian Grid	Telangana	Sale to State Discom

NV Vogt Solar One Pvt Ltd	10 MW	23/06/2016	Indian Grid	Telangana	Sale to State Discom
Talettutayi Solar Projects Four Pvt Ltd	50 MW	10/08/2017	Indian Grid	Maharashtra	Sale to SECI
Talettutayi Solar Projects One Pvt Ltd	30 MW	05/01/2018	Indian Grid	Karnataka	Sale to SECI
Talettutayi Solar Projects Two Pvt Ltd	20 MW	Yet to be achieved	Indian Grid	Karnataka	Sale to State Discom

Step 0: Demonstration whether the proposed project activity is the first-of-its-kind

The proposed project activity is not the first-of-its-kind. Hence not applicable.

Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

Alternative 1: The proposed project activity without VCS benefit;

Alternative 2: Continuation of the current situation, i.e., electricity will continue to be generated by the existing generation mix operating in the grid.

Having regard to the fact that the project activity under consideration is a solar power project validation team is convinced that there are no other realistic and credible alternatives. Both the alternatives are in compliance with all applicable legal and regulatory requirements as;

- the implementation of project activity is a voluntary initiative and is not mandatory or a legal requirement;
- the applicable environmental regulations do not restrict the use of solar energy; and
- There is no legal requirement on the choice of a particular technology.

Assessment team noted that the project fulfils the norms put down by Central pollution control board norms. As per Central Pollution Control Board (Ministry of Environment & Forests, Govt. of India), final document on revised classification of Industrial Sectors under Red, Orange, Green and White Categories (February 29, 2016).

Being a renewable power project it falls under the category of White and thus this projects do not need clearance for Consent to operate and only needs to inform the relative State pollution control board. The same is done for the project and thus it can be confirmed that it follows the local laws of the host country.

However, of the two alternatives identified, alternative (i) cannot be considered realistic as further analysis in the following paragraph reveals that it is not economically feasible option. Hence, alternative (ii) alone could be justified as realistic, credible and plausible alternative to the PP.

Validation team is, therefore, convinced that the project developer has taken into consideration all realistic and credible alternatives (having regard to the governing methodologies) including the project being

undertaken as a non-VCS activity and continuation of current scenario. The identification of alternatives is in conformity with the guidance given by the tool.

Outcome of Sub-step 1a: All the realistic alternatives for the project activity have been enlisted above.

Sub-step 1b: Consistency with mandatory laws and regulations:

The alternative(s) shall be in compliance with all applicable legal and regulatory requirements, even if these laws and regulations have objectives other than GHG reductions, e.g. to mitigate local air pollution. (This sub-step does not consider national and local policies that do not have legally-binding status.)

Both the alternatives are in compliance with all applicable legal and regulatory requirements as;

- the implementation of project activity is a voluntary initiative and is not mandatory or a legal requirement;
- the applicable environmental regulations do not restrict the use of solar energy; and
- There is no legal requirement on the choice of a particular technology.

Moreover, Outcome of Sub-step 1b: Hence, both the alternatives enlisted above are found to comply with the mandatory laws and regulations taking into account the enforcement of the legislations in the region or country and EB decisions on national and/or sectoral policies and regulations. However, Alternative 2 has been selected as the appropriate baseline alternative for this project activity.

Step 2: Investment analysis

Determine whether the proposed project activity is economically or financially less attractive than at least one other alternative, identified in step 1, without the revenue from the sale of emission reductions credits. To conduct the investment analysis, use the following sub-steps:

Sub-step 2a: Determine appropriate analysis method and Sub-step 2b (Option III): Apply benchmark analysis

a) Suitability of investment analysis, financial indicator and benchmark:

Project developer had demonstrated that the financial returns of the proposed VCS project activity would be insufficient to justify the required capital investment as per VVS version 01.0. In the Initial PD version 01. PP has adopted a conservative approach to identify the benchmark for the project activity. The project is earning revenue from the installation of the project activity. Thus simple cost analysis (Option I) is not appropriate. Also in the absence of the project activity grid electricity would have been the obvious choice for the Project which requires no investment. Hence investment comparison analysis (Option II) is also not appropriate for the project activity. Therefore, benchmark analysis (Option III) is used for the project activity as per project type and decision-making context. Therefore, the Expected return on equity is considered appropriate benchmark. Accordingly, the post-tax Equity IRR has been considered as the relevant financial indicator for the project activity which is acceptable to the assessment team. Moreover, the financial indicator selected by the PP is correct based on the fact that tool do not restrict the PP to either use project IRR or Equity IRR. This is under the prerogative of the PP to select appropriate indicator based on his preferences to know the IRR based on his equity investment or debt investment. The same is this acceptable to the assessment team. Assessment team however checked the Equity IRR calculation and thus found that input assumptions used for the calculation of Equity IRR is applicable at

the time of investment decision of the project and thus is in accordance with the relevant guideline of the tool.

As per EB 92 Annex 5, "In situations where an investment analysis is carried out in nominal terms and the available IRR benchmarks are in real terms, project participants shall convert the real term values of benchmarks to nominal values by adding the inflation rate. The inflation rate shall be obtained from the inflation forecast of the central bank of the host country for the duration of the crediting period. If this information is not available, the target inflation rate of the central bank shall be used. If this information is also not available, then the average forecasted inflation rate for the host country published by the IMF (International Monetary Fund World Economic Outlook) or the World Bank for the next five years after the start of the project activity shall be used".

The investment analysis has been carried out in Nominal terms. Accordingly, Default value has been adjusted by adding suitable forecasted inflation rate taken from RBI (Central Bank, India). PROJECT OWNERS has calculated Benchmark based on WPI mean inflation rate. As per Para 17 of appendix of EB 92, Annex 05, the inflation forecast should be for the duration of the crediting period. However, since RBI provides forecast inflation only for 5 & 10 years, the project investor has calculated benchmark using 10 years durations and the same is considered as Benchmark for the project activity.

As per para 20 of EB 92, Annex 5 the cost of equity is determined by selecting the values provided in the Appendix, i.e. Default values for cost of equity (expected return on equity) is presented below:

Appendix in EB 92, Annex 5 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = 11.06%

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

Nominal Benchmark¹⁷ = $\{(1+\text{Real Benchmark}) \times (1+\text{Inflation rate})\} - 1$

Where:

- Default value for Real Benchmark = 11.06% (as per Appendix of EB 92, Annex 5)

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

Benchmark estimation:

(i) For the 10 MW Solar Project by Talettutayi Solar Projects Pvt Ltd

Appendix in EB 92, Annex 5 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = **11.06%**

Inflation Forecast for India as per RBI website¹⁸:

¹⁷ As per Fisher Equation, https://en.wikipedia.org/wiki/Fisher_equation

¹⁸ <https://rbi.org.in/Scripts/PublicationsView.aspx?id=16202>

Since RBI publishes the inflation forecast for 5 years and 10 years, PP has considered the maximum 10 year inflation considering the renewable crediting period of total 30 years.

Benchmark Calculations	Value	Sources Link	Document Date	Decision making Date
Default Value for India as per UNFCCC guidelines	11.06%	EB 92 Annex 5	04-11-16	23-03-2015
Inflation forecast (WPI Mean) as per RBI for 10yrs	4.10%	https://rbi.org.in/Scripts/PublicationsView.aspx?id=16202	03-02-15	
Benchmark (with 10yrs Forecast)	15.61%	Calculated		

Thus benchmark of **15.61%** has been selected for this project activity.

(ii) For the 10 MW Solar Project by NV Vogt Solar One Pvt Ltd

Appendix in EB 92, Annex 5 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = **11.06%**

Inflation Forecast for India as per RBI website¹⁹:

Since RBI publishes the inflation forecast for 5 years and 10 years, PP has considered the maximum 10 year inflation considering the renewable crediting period of total 30 years.

Benchmark Calculations	Value	Sources Link	Document Date	Decision making Date
Default Value for India as per UNFCCC guidelines	11.06%	EB 92 Annex 5	04-11-16	23-03-2015
Inflation forecast (WPI Mean) as per RBI for 10yrs	4.10%	https://rbi.org.in/Scripts/PublicationsView.aspx?id=16202	03-02-15	
Benchmark (with 10yrs Forecast)	15.61%	Calculated		

¹⁹ <https://rbi.org.in/Scripts/PublicationsView.aspx?id=16202>

Thus benchmark of **15.61%** has been selected for this project activity.

(iii) For the 50 MW Solar Project by Talettutayi Solar Projects Four Pvt Ltd

Appendix in EB 92, Annex 5 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = **11.06%**

Inflation Forecast for India as per RBI website²⁰:

Since RBI publishes the inflation forecast for 5 years and 10 years, PP has considered the maximum 10 year inflation considering the renewable crediting period of total 30 years.

Benchmark Calculations	Value	Sources Link	Document Date	Decision making Date
Default Value for India as per UNFCCC guidelines	11.06%	EB 92 Annex 5	04-11-16	05-08-2016
Inflation forecast (WPI Mean) as per RBI for 10yrs	3.60%	https://rbi.org.in/Scripts/PublicationsView.aspx?id=16980	07-06-16	
Benchmark (with 10yrs Forecast)	15.06%	Calculated		

Thus benchmark of **15.06%** has been selected for this project activity.

(iv) For the 30 MW Solar Project by Talettutayi Solar Projects One Pvt Ltd

Appendix in EB 92, Annex 5 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = **11.06%**

Inflation Forecast for India as per RBI website²¹:

Since RBI publishes the inflation forecast for 5 years and 10 years, PP has considered the maximum 10 year inflation considering the renewable crediting period of total 30 years.

Benchmark Calculations	Value	Sources Link	Document Date	Decision making Date
Default Value for India as per UNFCCC	11.06%	EB 92 Annex 5	04-11-16	30-11-2016

²⁰ <https://rbi.org.in/Scripts/PublicationsView.aspx?id=16980>

²¹ <https://rbi.org.in/Scripts/PublicationsView.aspx?id=17390>

guidelines				
Inflation forecast (WPI Mean) as per RBI for 10yrs	3.98%	https://rbi.org.in/Scripts/PublicationsView.aspx?id=17390	04-10-16	
Benchmark (with 10yrs Forecast)	15.48%	Calculated		

Thus benchmark of **15.48%** has been selected for this project activity.

(v) For the 20 MW Solar Project by Talettutayi Solar Projects Two Pvt Ltd

Appendix in EB 92, Annex 5 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = **11.06%**

Inflation Forecast for India as per RBI website²²:

Since RBI publishes the inflation forecast for 5 years and 10 years, PP has considered the maximum 10 year inflation considering the renewable crediting period of total 30 years.

Benchmark Calculations	Value	Sources Link	Document Date	Decision making Date
Default Value for India as per UNFCCC guidelines	11.06%	EB 92 Annex 5	04-11-16	30-11-2016
Inflation forecast (WPI Mean) as per RBI for 10yrs	3.98%	https://rbi.org.in/Scripts/PublicationsView.aspx?id=17390	04-10-16	
Benchmark (with 10yrs Forecast)	15.48%	Calculated		

Thus benchmark of 15.48% has been selected for this project activity.

b) Parameters and assumptions used:

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

²² <https://rbi.org.in/Scripts/PublicationsView.aspx?id=17390>

In the revised PD version 02, the project cost is based on the DPR (=Detailed project report). The details of the DPR report is as below:

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	DPR Date
Telangana	Taletutayi Solar Projects Pvt Ltd	10 MW	883.50	22-02-2015
Telangana	NV Vogt Solar One Pvt Ltd	10 MW	883.50	22-02-2015
Maharashtra	Taletutayi Solar Projects Four Pvt Ltd	50 MW	4,582.50	04-07-2016
Karnataka	Taletutayi Solar Projects One Pvt Ltd	30 MW	2,350.50	01-11-2016
Karnataka	Taletutayi Solar Projects Two Pvt Ltd	20 MW	1,567.00	01-11-2016

DPR report has been submitted to validation team. The DPR were available during decision making and financial profitability of the project was decided based on this DPR. Validation team checked the DPR of the project activity and found that consideration of the project cost in revised PD version 02 is correct and it is in line with Appendix of EB92, Annex 5 as well as in compliance to VVS version 01.0. Hence, the project cost consideration is justified. The actual cost details is as below:

Project cost as per CA Certificates

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	CA Certificate Date
Telangana	Taletutayi Solar Projects Pvt Ltd	10 MW	753	06-04-2018
Telangana	NV Vogt Solar One Pvt Ltd	10 MW	753	06-04-2018
Maharashtra	Taletutayi Solar Projects Four Pvt Ltd	50 MW	3,916.00	01-05-2018
Karnataka	Taletutayi Solar Projects One Pvt Ltd	30 MW	2,274.60	01-05-2018
Karnataka	Taletutayi Solar Projects Two Pvt Ltd	20 MW	PO yet to be released	

Assessment team checked the actual project cost and still the project do not breach the benchmark. The sensitivity analysis below confirm the same. Since the actual cost is considered there is no way the cost can go up and thus the same is assessed to be correct.

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

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

c) Assessment of Plant Load Factor (PLF):

PP considered the Plant load factor from a third party engineering company/DPR, for expected electricity generation estimation. They are contracted by the PPs for this project. PP has submitted the copies of the PLFs estimation report to the assessment team.

The details are as below:

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)= 3 rd party engineering company	Date
Telangana	Taletutayi Solar Projects Pvt Ltd	10 MW	19.00%	22-02-2015
Telangana	NV Vogt Solar One Pvt Ltd	10 MW	19.00%	22-02-2015
Maharashtra	Taletutayi Solar Projects Four Pvt Ltd	50 MW	23.43%	04-07-2016
Karnataka	Taletutayi Solar Projects One Pvt Ltd	30 MW	26.91%	01-11-2016
Karnataka	Taletutayi Solar Projects Two Pvt Ltd	20 MW	26.91%	01-11-2016

PLF estimation by 3rd party engineering company is in line with Para 3 (b) Annex 11, EB 48 and acceptable to the assessment team. The decay factor for IRR calculation is sourced from DPR which was available to the PP at the time of investment decision. Hence the value is considered correct.

D) Assessment of Electricity Tariff:

Tariff rate as per actual PPA and SERC (= State Electricity regulatory commission)/DPR

Site Name	Name of the Investor/Owner/SPVs	Tariff Rate (as per SERC/DPR)	Tariff Rate (as per PPA)	PPA Date
Telangana	Taletutayi Solar Projects Pvt Ltd	6.889	6.889	18-03-2015
Telangana	NV Vogt Solar One Pvt Ltd	6.889	6.888	19-03-2015
Maharashtra	Taletutayi Solar Projects Four Pvt Ltd	5.13	4.43	11-04-2016
Karnataka	Taletutayi Solar Projects One Pvt Ltd	4.36	4.43	02-08-2016
Karnataka	Taletutayi Solar Projects Two Pvt Ltd	4.36	3.04	07-03-2018

Validation team assessed the tariff and found that same value was available during decision making and in conformity with guidance Appendix of EB92, Annex 5. Furthermore, assessment team has also checked the actual tariff in the power purchase agreement signed for further substantiation as these values are available during the validation stage. The values as considered for the financial additionality determination are same as the values mentioned in power purchase agreement.

e) Assessment of O& M cost:

PP considered the O&M cost from the DPR. The details are as below:

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)	Date
Telangana	Taletutayi Solar Projects Pvt Ltd	10 MW	10	22-02-2015
Telangana	NV Vogt Solar One Pvt Ltd	10 MW	10	22-02-2015
Maharashtra	Taletutayi Solar Projects Four Pvt Ltd	50 MW	50	04-07-2016
Karnataka	Taletutayi Solar Projects One Pvt Ltd	30 MW	30	01-11-2016
Karnataka	Taletutayi Solar Projects Two Pvt Ltd	20 MW	20	01-11-2016

The DPR has been used in the financial calculation as same was available during decision making and hence applicable. According to Appendix of EB92, Annex 5, the cost should be based on the input parameters available at the time of decision making and the PP has submitted DPR supporting this consideration. Therefore, considering the above assessment, validation team concluded that the O&M cost considered from respective DPR in the computation of financial indicator is in conformity with guidance Appendix of EB92, Annex 5.

The actual O&M agreements' were also checked and assessment team confirm that the project still do not breach the benchmark.

The details are as below:

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)	Date
Telangana	Talettutayi Solar Projects Pvt Ltd	10 MW	4.7	26-02-2016
Telangana	NV Vogt Solar One Pvt Ltd	10 MW	4.7	26-02-2016
Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	50 MW	37.19	02-08-2017
Karnataka	Talettutayi Solar Projects One Pvt Ltd	30 MW	8.6625	02-01-2018
Karnataka	Talettutayi Solar Projects Two Pvt Ltd	20 MW	Yet to be signed	

F) Assessment of Tax computation:

The project developer has adopted book depreciation rates as per Schedule XIV of the Companies Act, 1956 for computing book profit and Income Tax Act 1961 stipulated for income tax calculation, which are in conformity with the accepted accounting principles adopted by the company and income tax laws in the host country. The block of assets has been computed for depreciation purpose as per the accepted accounting principles. Tax liability has been calculated as per the income tax rules and the rulings given. In computing the income tax liability, the project developers have considered Tax holiday (u/s 80IA of the Income Tax Act, 1961). Accelerated depreciation on plant and machinery is also sourced from IT act. The tax rates assumed corresponds to the tax rate prevailing at the time of taking decision (conformity to Appendix of EB92, Annex 5). Hence, these assumptions are appropriate during decision making context

g)Cross checking parameters:

Name of the parameter	DOE assessment			
Project Cost	The proposed project activity consist of below SPVs. The details are given below.			
	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	Project cost in Million per MW
	Talettutayi Solar Projects Pvt Ltd	10 MW	883.50	88.35
	NV Vogt Solar One Pvt Ltd	10 MW	883.50	88.35

Talettutayi Solar Projects Four Pvt Ltd	50 MW	4,582.50	91.65
Talettutayi Solar Projects One Pvt Ltd	30 MW	2,350.50	78.35
Talettutayi Solar Projects Two Pvt Ltd	20 MW	1,567.00	78.35

The project cost has been considered from DPR and was available at the time decision made for the project activity.

The DOE has also checked the actual cost of the each project site from the CA Certificates and found that, the reduction in project cost is within 10% range of sensitivity analysis. Since the comparison is done with actual project cost and hence, increase of the same in future is not possible. Thus, the project activity is additional with actual project cost.

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)- Actual from CA Certificate	Project Cost (In Million) per MW- Actual from CA Certificate
Telangana	Talettutayi Solar Projects Pvt Ltd	10 MW	753	75.3
Telangana	NV Vogt Solar One Pvt Ltd	10 MW	753	75.3
Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	50 MW	3,916.00	78.32
Karnataka	Talettutayi Solar Projects One Pvt Ltd	30 MW	2,274.60	75.82
Karnataka	Talettutayi Solar Projects Two Pvt Ltd	20 MW	PO yet to be released	

The difference in actual project cost for different project site is due to time difference, manufacturer, different EPC contractor, negotiation skills of individual PP etc.

The assessment team also checked different states tariff orders and found that project cost considered for project is found to be appropriate.

Based on sectoral scope expert and local knowledge, the project cost considered as per DPR for the proposed project activity is found to be appropriate for solar projects. Also since the actual cost is available to DOE and IRR is still within benchmark and thus the same is acceptable.

The IRR as per the assumption from the DPR is as follows:

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	IRR	Benchmark
Telangana	Talettutayi Solar Projects Pvt Ltd	10 MW	883.50	9.08%	15.61%
Telangana	NV Vogt Solar One Pvt Ltd	10 MW	883.50	9.08%	15.61%
Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	50 MW	4,582.50	4.41%	15.06%
Karnataka	Talettutayi Solar Projects One Pvt Ltd	30 MW	2,350.50	8.79%	15.48%
Karnataka	Talettutayi Solar Projects Two Pvt Ltd	20 MW	1,567.00	9.06%	15.48%

The IRR as per the actual project cost is defined as below:

Site Name	Name of the Investor/Owner	Project Capacity (MW)	Actual project cost as per the CA	IRR	Benchmark
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				Certificate		
	Telangana	Talettutayi Solar Projects Pvt Ltd	10 MW	753	14.18%	15.61%
	Telangana	NV Vogt Solar One Pvt Ltd	10 MW	753	14.18%	15.61%
	Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	50 MW	3,916.00	8.61%	15.06%
	Karnataka	Talettutayi Solar Projects One Pvt Ltd	30 MW	2,274.60	9.72%	15.48%
	Karnataka	Talettutayi Solar Projects Two Pvt Ltd	20 MW	PO yet to be released		15.48%

As described above actual project cost with benchmark, the project is still additional. Since the comparison is done with actual project cost, the increase of the same in future is not possible. Thus assessment team is of the opinion that project is still additional with the consideration of actual project cost for the project activity.

O&M cost and Escalation in the operational expense =5(%) - Standard practice in India

The proposed project activity consist of below SPVs. The details are given below.

Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million)
Talettutayi Solar Projects Pvt Ltd	10 MW	10
NV Vogt Solar One Pvt Ltd	10 MW	10
Talettutayi Solar Projects Four Pvt Ltd	50 MW	50
Talettutayi Solar Projects One Pvt Ltd	30 MW	30
Talettutayi Solar Projects Two Pvt Ltd	20 MW	20

The O&M cost has been considered from DPR and was available at the time decision made for the project activity.

The DOE has also checked the actual O&M contract for each project site and found the changes in O&M cost is within threshold limit. Thus the project activity is additional with actual O&M cost.

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)- Actual
Telangana	Talettutayi Solar Projects Pvt Ltd	10 MW	4.7
Telangana	NV Vogt Solar One Pvt Ltd	10 MW	4.7
Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	50 MW	37.19
Karnataka	Talettutayi Solar Projects One Pvt Ltd	30 MW	8.6625
Karnataka	Talettutayi Solar Projects Two Pvt Ltd	20 MW	O&M Agreement yet to be signed

Even after consideration of O&M cost as zero, the project activity is additional.

The assessment team also checked different states tariff orders and found that O&M cost and its escalation considered for project is found to be appropriate.

IRR value as per the assumptions from the DPR is as below:

Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million)	IRR	Benchmark
Talettutayi Solar Projects Pvt Ltd	10 MW	10	9.08%	15.61%
NV Vogt Solar One Pvt Ltd	10 MW	10	9.08%	15.61%
Talettutayi Solar Projects Four Pvt Ltd	50 MW	50	5.69%	15.06%
Talettutayi Solar Projects One Pvt Ltd	30 MW	30	8.79%	15.48%
Talettutayi Solar Projects Two Pvt Ltd	20 MW	20	9.06%	15.48%

IRR value based on the actual O&M agreements signed is as below:

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)-Actual	IRR	Benchmark
Telangana	Talettutayi Solar Projects Pvt Ltd	10 MW	4.7	11.63%	15.61%
Telangana	NV Vogt Solar One Pvt Ltd	10 MW	4.7	11.63%	15.61%
Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	50 MW	37.19	6.75%	15.06%
Karnataka	Talettutayi Solar Projects One Pvt Ltd	30 MW	8.6625	13.54%	15.48%
Karnataka	Talettutayi Solar Projects Two Pvt Ltd	20 MW	Yet to be signed		15.48%

Even after consideration of O&M cost as zero, the project activity is additional.

Benchmark for the project as described above along with actual O&M value, the project is still additional.

Based on sectoral scope expert and local knowledge, the project O&M cost and its escalation considered as per Offer Letter for the proposed project activity is found to be appropriate for solar projects. Also since the O&M cost is available to DOE and IRR is still within benchmark and thus the same is acceptable.

Tariff The proposed project activity consist of below SPVs. The details are given below.

The Tariff rate has been considered from state tariff order or DPR and the same was available at the time decision made for the project activity.

The DOE has also checked the actual PPA for each project site and found there are no changes in tariff rate and is within threshold limit. Thus the project activity is additional with actual Tariff rate.

Site Name	Name of the Investor/Owner/SPVs	Tariff Rate (as per SERC/DPR)	Tariff Rate (as per PPA)
Telangana	Talettutayi Solar Projects Pvt Ltd	6.889	6.889
Telangana	NV Vogt Solar One Pvt Ltd	6.889	6.888
Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	5.13	4.43
Karnataka	Talettutayi Solar Projects One Pvt Ltd	4.36	4.43
Karnataka	Talettutayi Solar Projects Two Pvt Ltd	4.36	3.04

The SERC tariff order has been checked for the Maharastra & Karnataka site projects and found that tariff rate considered for the project activity are appropriate. For the Telangana site projects, tariff rate has been considered from the DPR.

	<p>http://www.mercindia.org.in/pdf/Order%2058%2042/Order-33%20of%202017-28042017.pdf</p> <p>The tariff considered is levelled tariff and hence there is no any escalation. This is found to be appropriate and found to be accepted.</p> <p>IRR value as per the actual PPA signed between Individual project owners and State electricity Board is as below:</p> <table border="1" data-bbox="311 443 1328 751"> <thead> <tr> <th>Site Name</th> <th>Name of the Investor/Owner/SPVs</th> <th>Tariff Rate (as per PPA)</th> <th>IRR</th> </tr> </thead> <tbody> <tr> <td>Telangana</td> <td>Taletutayi Solar Projects Pvt Ltd</td> <td>6.889</td> <td>9.08%</td> </tr> <tr> <td>Telangana</td> <td>NV Vogt Solar One Pvt Ltd</td> <td>6.888</td> <td>9.08%</td> </tr> <tr> <td>Maharashtra</td> <td>Taletutayi Solar Projects Four Pvt Ltd</td> <td>4.43</td> <td>2.30%</td> </tr> <tr> <td>Karnataka</td> <td>Taletutayi Solar Projects One Pvt Ltd</td> <td>4.43</td> <td>10.28%</td> </tr> <tr> <td>Karnataka</td> <td>Taletutayi Solar Projects Two Pvt Ltd</td> <td>3.04</td> <td>0.08%</td> </tr> </tbody> </table> <p>Since the IRR is still below benchmark with the consideration of Actual Power purchase agreement signed which is valid for total operational lifetime of the project, assessment team confirms that the project is still additional with actual Tariff rate. Moreover, in the above table the order from State electricity tariff order is checked and it is confirmed that PPA signed with the rate as mentioned in the Tariff order and hence increase of the same is not possible.</p> <p>Based on sectoral scope expert and local knowledge, the project tariff rate considered as per state tariff order for the proposed project activity is found to be appropriate for solar projects.</p>	Site Name	Name of the Investor/Owner/SPVs	Tariff Rate (as per PPA)	IRR	Telangana	Taletutayi Solar Projects Pvt Ltd	6.889	9.08%	Telangana	NV Vogt Solar One Pvt Ltd	6.888	9.08%	Maharashtra	Taletutayi Solar Projects Four Pvt Ltd	4.43	2.30%	Karnataka	Taletutayi Solar Projects One Pvt Ltd	4.43	10.28%	Karnataka	Taletutayi Solar Projects Two Pvt Ltd	3.04	0.08%
Site Name	Name of the Investor/Owner/SPVs	Tariff Rate (as per PPA)	IRR																						
Telangana	Taletutayi Solar Projects Pvt Ltd	6.889	9.08%																						
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Karnataka	Taletutayi Solar Projects Two Pvt Ltd	3.04	0.08%																						
<p>PLF</p>	<p>The proposed project activity consist of below SPVs. The details are given below.</p> <table border="1" data-bbox="297 1115 1161 1377"> <thead> <tr> <th>Name of the Investor/Owner/SPVs</th> <th>Project Capacity (MW)</th> <th>PLF (%)</th> </tr> </thead> <tbody> <tr> <td>Taletutayi Solar Projects Pvt Ltd</td> <td>10 MW</td> <td>19.00%</td> </tr> <tr> <td>NV Vogt Solar One Pvt Ltd</td> <td>10 MW</td> <td>19.00%</td> </tr> <tr> <td>Taletutayi Solar Projects Four Pvt Ltd</td> <td>50 MW</td> <td>23.43%</td> </tr> <tr> <td>Taletutayi Solar Projects One Pvt Ltd</td> <td>30 MW</td> <td>26.91%</td> </tr> <tr> <td>Taletutayi Solar Projects Two Pvt Ltd</td> <td>20 MW</td> <td>26.91%</td> </tr> </tbody> </table> <p>Validation team assessed the DPR. Same report has been used in the financials and the emission reduction calculation. PLF estimation by 3rd party engineering company is in line with Para 3 (b) Annex 11, EB 48 and acceptable to the assessment team.</p> <p>The PLF has been taken from the DPR, and the same has been checked and found that PLF considered for the project activity in within the range of sensitivity analysis and found to be appropriate.</p> <p>Based on sectoral scope expert and local knowledge, the project PLF considered as per DPR for the proposed project activity is found to be appropriate for solar projects.</p> <p>IRR for PLF value as per the DPR = 3rd party report, Annex 11 EB 48</p> <table border="1" data-bbox="297 1801 1317 1873"> <thead> <tr> <th>Name of the Investor/Owner/SPVs</th> <th>Project Capacity (MW)</th> <th>PLF (%)</th> <th>IRR</th> </tr> </thead> <tbody> </tbody> </table>	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)	Taletutayi Solar Projects Pvt Ltd	10 MW	19.00%	NV Vogt Solar One Pvt Ltd	10 MW	19.00%	Taletutayi Solar Projects Four Pvt Ltd	50 MW	23.43%	Taletutayi Solar Projects One Pvt Ltd	30 MW	26.91%	Taletutayi Solar Projects Two Pvt Ltd	20 MW	26.91%	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)	IRR		
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Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)	IRR																						

	<table border="1"> <tr> <td>Talettutayi Solar Projects Pvt Ltd</td> <td>10 MW</td> <td>19.00%</td> <td>9.08%</td> </tr> <tr> <td>NV Vogt Solar One Pvt Ltd</td> <td>10 MW</td> <td>19.00%</td> <td>9.08%</td> </tr> <tr> <td>Talettutayi Solar Projects Four Pvt Ltd</td> <td>50 MW</td> <td>23.43%</td> <td>5.69%</td> </tr> <tr> <td>Talettutayi Solar Projects One Pvt Ltd</td> <td>30 MW</td> <td>26.91%</td> <td>8.79%</td> </tr> <tr> <td>Talettutayi Solar Projects Two Pvt Ltd</td> <td>20 MW</td> <td>26.91%</td> <td>9.06%</td> </tr> </table>	Talettutayi Solar Projects Pvt Ltd	10 MW	19.00%	9.08%	NV Vogt Solar One Pvt Ltd	10 MW	19.00%	9.08%	Talettutayi Solar Projects Four Pvt Ltd	50 MW	23.43%	5.69%	Talettutayi Solar Projects One Pvt Ltd	30 MW	26.91%	8.79%	Talettutayi Solar Projects Two Pvt Ltd	20 MW	26.91%	9.06%
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NV Vogt Solar One Pvt Ltd	10 MW	19.00%	9.08%																		
Talettutayi Solar Projects Four Pvt Ltd	50 MW	23.43%	5.69%																		
Talettutayi Solar Projects One Pvt Ltd	30 MW	26.91%	8.79%																		
Talettutayi Solar Projects Two Pvt Ltd	20 MW	26.91%	9.06%																		
	<p>Assessment team confirms that since with the value as mentioned in the tariff order for Central Electricity regulatory commission report are considered and still the IRR is still below the benchmark, hence the project is additional.</p>																				
Tax Rates	<table border="1"> <tr> <td>Income tax rate (%)</td> <td>30.00%</td> </tr> <tr> <td>MAT (Minimum Alternate tax) (%)</td> <td>33.00%</td> </tr> <tr> <td>Service Tax (%)</td> <td>15.00%</td> </tr> </table> <p>The above table shows the tax rate considered for individual project Owner and the same is found suitable.</p> <p>Assessment team noted that the project developer has adopted book depreciation rates as per Schedule XIV of the Companies Act, 1956 for computing book profit and Income Tax Act 1961 stipulated for income tax calculation, which are in conformity with the accepted accounting principles adopted by the company and income tax laws in the host country i.e. INDIA. Tax liability has been calculated as per the income tax rules and the rulings given. In computing the income tax liability, the project developers have considered Tax holiday (u/s 80IA of the Income Tax Act, 1961). Accelerated depreciation on plant and machinery is also sourced from IT act. The tax rates assumed corresponds to the tax rate prevailing at the time of taking decision. Hence, these assumptions are appropriate during decision making context and thus acceptable to the assessment team.</p> <p>NO further assessment is required as the Values are directly procured from Income Tax Act, 1961 which is standard guideline for Tax value in India.</p>	Income tax rate (%)	30.00%	MAT (Minimum Alternate tax) (%)	33.00%	Service Tax (%)	15.00%														
Income tax rate (%)	30.00%																				
MAT (Minimum Alternate tax) (%)	33.00%																				
Service Tax (%)	15.00%																				

Assessment team also confirmed the breaching values for individual parameters (=Individual project owners) and thus confirms that the project is still additional

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF in DPR	Tariff order PLF	Variation in PLF	Breaching Value for PLF
Telangana	Talettutayi Solar Projects Pvt Ltd	10 MW	19.00%	19%	0%	18.71%
Telangana	NV Vogt Solar One Pvt Ltd	10 MW	19.00%	19%	0%	18.71%
Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	50 MW	23.43%	19%	19%	31.63%
Karnataka	Talettutayi Solar Projects One Pvt Ltd	30 MW	26.91%	19%	28%	18.60%
Karnataka	Talettutayi Solar Projects Two Pvt Ltd	20 MW	26.91%	19%	28%	16.54%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	DPR Cost	Actual Cost from CA Certificate	Variation in project cost	Breaching value for Project Cost
Telangana	Talettutayi Solar Projects Pvt Ltd	10 MW	883.50	753	-17%	-18.16%

Telangana	NV Vogt Solar One Pvt Ltd	10 MW	883.50	753	-17%	-18.16%
Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	50 MW	4,582.50	3,916.00	-17%	-27.12%
Karnataka	Talettutayi Solar Projects One Pvt Ltd	30 MW	2,350.50	2,274.60	-3%	-18.62%
Karnataka	Talettutayi Solar Projects Two Pvt Ltd	20 MW	1,567.00	PO yet to be released		-16.85%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	SERC Tariff	PPA Tariff	Variation in Tariff	Breaching value in Tariff Rate
Telangana	Talettutayi Solar Projects Pvt Ltd	10 MW	6.889	6.889	0%	18.71%
Telangana	NV Vogt Solar One Pvt Ltd	10 MW	6.889	6.889	0%	18.71%
Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	50 MW	5.13	4.43	16%	31.63%
Karnataka	Talettutayi Solar Projects One Pvt Ltd	30 MW	4.36	3.04	30%	18.60%
Karnataka	Talettutayi Solar Projects Two Pvt Ltd	20 MW	4.36	PPA yet to be signed		16.54%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	DPR O&M cost / MW	Actual O&M cost/MW	Variation in O&M	Breaching value in O&M
Telangana	Talettutayi Solar Projects Pvt Ltd	10 MW	1	0.47	-113%	-148.20%
Telangana	NV Vogt Solar One Pvt Ltd	10 MW	1	0.47	-113%	-148.20%
Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	50 MW	1	0.74	-26%	-229.74%
Karnataka	Talettutayi Solar Projects One Pvt Ltd	30 MW	1	0.288	-246%	-134.21%
Karnataka	Talettutayi Solar Projects Two Pvt Ltd	20 MW	1	O&M yet to be signed		-118.10%

The equity IRR has been computed for a period of 25 years (=Operational lifetime of the project (for solar), which is the life time of the project and is in conformity with the Appendix of EB 92 Annex 05. As required by Appendix of EB 92 Annex 05 the expected realization on the sale of assets at the end of the operating life has been taken as salvage value in the terminal year. In computing the IRR, the project developer has taken into account profit after tax, depreciation tax shield and salvage value (in the terminal year). The principle adopted conforms to the accepted accounting and taxation principles.

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

Sensitivity analysis:

The Guidance on Appendix of EB 92 Annex 05 requires the robustness of the conclusion arrived at to be proved through a sensitivity analysis by varying the critical assumptions to a reasonable variation. The project developer has identified Plant Load Factor (PLF), Project cost, Electricity tariff and O&M cost as critical assumptions. These critical parameters constitute more than 20% of either total project costs or

total project revenues. The sensitivity analysis reveals that even under more favourable conditions, the IRR without CDM revenue would not cross the benchmark return as given in the following table:

Sensitivity Analysis for 10 MW Solar Project by Talettutayi Solar Projects Pvt Ltd

Sensitivity Analysis	Equity IRR			
	-10%	Normal	10%	Breaching Value
PLF	5.95%	9.08%	12.62%	18.71%
O&M	9.62%	9.08%	8.62%	-148.20%
Project Cost	12.38%	9.08%	6.69%	-18.16%
Tariff Rate	5.95%	9.08%	12.62%	18.71%

Sensitivity Analysis for 10 MW Solar Project by NV Vogt Solar One Pvt Ltd

Sensitivity Analysis	Equity IRR			
	-10%	Normal	10%	Breaching Value
PLF	5.94%	9.08%	12.62%	18.71%
O&M	9.62%	9.08%	8.62%	-148.20%
Project Cost	12.38%	9.08%	6.68%	-18.16%
Tariff Rate	5.94%	9.08%	12.62%	18.71%

Sensitivity Analysis for 50 MW Solar Project by Talettutayi Solar Projects Four Pvt Ltd

Sensitivity Analysis	Equity IRR			
	-10%	Normal	10%	Breaching Value
PLF	3.18%	5.69%	8.41%	31.63%
O&M	6.11%	5.69%	5.28%	-229.74%
Project Cost	8.16%	5.69%	3.82%	-27.82%
Tariff Rate	3.18%	5.69%	8.41%	31.63%

Sensitivity Analysis for 30 MW Solar Project by Talettutayi Solar Projects One Pvt Ltd

Sensitivity Analysis	Equity IRR			
	-10%	Normal	10%	Breaching Value
PLF	5.61%	8.79%	12.30%	18.60%
O&M	9.30%	8.79%	8.27%	-134.21%
Project Cost	11.98%	8.79%	6.41%	-18.62%
Tariff Rate	5.61%	8.79%	12.30%	18.60%

Sensitivity Analysis for 20 MW Solar Project by Talettutayi Solar Projects Two Pvt Ltd

Sensitivity Analysis	Equity IRR			
	-10%	Normal	10%	Breaching Value
PLF	5.78%	9.06%	12.92%	16.54%
O&M	9.59%	9.06%	8.53%	-118.10%
Project Cost	12.57%	9.06%	6.61%	-16.85%
Tariff Rate	5.78%	9.06%	12.92%	16.54%

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

Probability to breach the benchmark:
Sensitivity Parameter 1 : PLF
PLF considered in financials for is as per Third Party DPR in line with “ Guidelines for the reporting and validation of Plant load factors ” stated in EB48 Annex11 option 3(b) . Hence, variation in PLF of more than 10% is unlikely to happen as the PLF has been reported as per the Third Party Report based on long term data.
Sensitivity Parameter 2 : O&M
The sensitivity analysis reveals that O&M will breach the benchmark at negative values and is hypothetical case. Since the O&M cost is subject to escalation (as evidence by the O&M agreement) and also subject to inflationary pressure, any reduction in the O&M costs is highly unlikely. Hence, the reduction in the O&M cost is highly unlikely.

<p>Sensitivity Parameter 3 : Project Cost</p> <p>Project Cost for financial analysis is considered from DPR of the project activity, being available at the time of investment making decision to go ahead with the project activity. The actual project cost is lower than the DPR cost. Since the Purchase Order cost is firm, there is no possibility of project cost going below this level. However, Sensitivity is carried out for threshold level below which benchmark is not breached.</p>
<p>Sensitivity Parameter 4 : Tariff Rate</p> <p>The tariff is determined by PPA which is fixed for entire lifetime of the project activity. Hence, there is no probability to get variation for the same. However, Sensitivity is carried out for +/- 10% even then the benchmark is not breached.</p>

Common Practice analysis:

The common practice analysis is proved by following points as per the requirement of Methodological tool “Common Practice”, version 03.1 EB84, Annex 7²³:

1. Applicable Geographical Area (Para 9): The Telangana, Maharashtra and Karnataka states has been considered as the applicable geographical area for this project. PP had considered the state of Telangana, Maharashtra and Karnataka geo-graphical area due to regulatory regime since applicable power tariff structure for renewable energy projects is unique for all the states across national boundary of India; which is based on Electricity Act 2003 (EA 2003), section 82 which clearly mentions “Every State Government shall, within six months from the appointed date, by notification, constitute for the purposes of this Act, a Commission for the State to be known as the (name of the State) Electricity Regulatory Commission” Appropriateness of the same has been checked and confirmed from EA 2003 (<http://www.cercind.gov.in/08022007/Act-with-amendment.pdf/40/>).

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

- Electricity Act 2003 (EA 2003) has changed the legal and regulatory framework for the renewable energy sector in India. The EA 2003 mandates policy formulation to promote renewable sources of energy by the federal government, the State governments and the State Electricity Regulatory Commissions (=SERCs) within their jurisdictions.
- The Electricity Act 2003 introduced some enabling provisions conducive to accelerated development of grid connected renewable energy sources. Under Section 61(h), promotion of cogeneration and generation of electricity from renewable sources of energy has been made the explicit responsibility of SERCs, which are bound by law to take these considerations into account while drafting their terms and conditions for tariff regulations. Nearly all SERCs have issued their tariff regulations incorporating suitable clauses, which will enable them to provide a preferential

²³<https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-24-v1.pdf>

treatment to renewable energy (RE) during the tariff determination process. The SERCs determine the tariff for all renewable energy projects across the States, and the state-owned power Distribution Companies (DISCOMs) ensure grid connectivity to the renewable energy project sites.

- EA 2003 has initiated the adoption of the National Tariff Policy, 2006 as one of the key policies, National Tariff Policy (2006) framed under the Section 3 of the EA 2003. As per the excerpt from National Tariff Policy, 2006; pursuant to provisions of section 86(1)(e) of the EA 2003, the Appropriate Commission shall fix a minimum percentage for purchase of energy from such sources taking into account availability of such resources in the region and its impact on retail tariffs. Such percentage for purchase of energy should be made applicable for the tariffs to be determined by the SERCs latest by April 1, 2006.
- As mandated under section 86(1)(e) of the Electricity Act (2003), by June 2012, 26 SERCs had fixed quotas (in terms of % of electricity being handled by the power utility) to procure power from renewable energy sources. The mandate, which is called a Renewable Purchase Specification (RPS), varies from 0.5% to 14% in various states over varying time-scales. Few states have come out with technology specific RPSs. Besides, the state regulators determine the tariff for all RE projects in the states and ensure connectivity to the grid through extension of power evacuation from the RE project sites.
- At present thirteen SERCs have declared preferential feed-in tariffs (FITs) for purchase of electricity generated from solar power projects established in respective states, which varies from state to state in India. All the SERCs have adopted a 'cost plus' methodology to fix the feed-in tariff, which varies across the states depending upon the state resources, project cost and more importantly the tariff regulations of SERCs. Solar power related tariff policies in different states also has difference in regulatory and policy incentives. Several states have implemented fiscal and financial incentives for renewable energy generation, including; energy buy back (i.e. a guarantee from an electricity company that they will buy the renewable power produced); preferential grid connection and transportation charges and electricity tax exemptions.

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

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

2. Measure (Para 10): The project activity reduces greenhouse gas emissions by generating electricity using renewable energy source-solar. Therefore, the project activity falls under the following measure:

(b) Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies.

3. Output (Para 11): The project activity produces electricity. Therefore, electricity is considered as output of the project activity.

4. Different Technologies (Para 12): The project activity uses solar energy for producing electricity and hence as per Para 12(a), the technologies which use energy source/ fuel other than solar will be considered as the different technologies for the project activity.

The step wise approach to provide common practice analysis as per the guideline is as follows:
 Stepwise approach for common practice analysis has been carried out as per Methodological tool “Common Practice”, version 03.1 EB84, Annex 7:

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

Range	Capacity	Unit
+50%	180	MW
Capacity of the proposed project activity	120	MW
-50%	60	MW

Since the project activity is 120MW, the output range of +/- 50% has been considered as 180 MW (Higher range for comparison) to 60 MW (Lower range for Comparison) which is assessed to be correct.

Step (2): Identify similar projects (both CDM and non-CDM) which fulfil 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.

Identification of the similar projects (CDM and non-CDM) is carried out as per sub-steps of Step (2) as follows:

- a) Assessment team noted that as the projects are located in Telangana, Karnataka and Maharashtra state of India, therefore, projects in the geographical area of Telangana, Karnataka and Maharashtra have been chosen for analysis. Each state have different policies regarding renewable energy, hence Telangana, Maharashtra and Karnataka states is considered as geographical region for common practise analysis. The distinction from choosing the state to entire geographical boundary is already explained above in the report and thus the applied geographical area is acceptable to the assessment team.

b) Assessment team noted that the project activity is a green-field solar power project and uses measure (b) “Switch of technology with or without change of energy source including energy efficiency improvement as well as use of renewable energies”. Therefore, projects applying same measure (b) are candidates for similar projects.

c) Assessment team confirms during the site visit that the energy source used by the project activity is solar. Hence, only solar energy projects have been considered for analysis.

d) Assessment team confirms during the site visit that the project activity produces electricity; therefore, all power plants that produce electricity are candidates for similar projects.

e) Since the project activity is 120MW, the output range of +/- 50% has been considered as 180 MW (Higher range for comparison) to 60 MW (Lower range for Comparison) which is assessed to be correct

f) The start date of the project activity is 23-June-2016. Therefore projects, which have started commercial operation before 23-June-2016, have been considered for analysis.

Thus, $N_{solar} = 2$

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} .

As per the requirement of step 3, CDM project activities, which have got registered or are under validation have been excluded in this step. After excluding the registered and under validation projects the total number of projects is 2. The source of check for the same is cdm.unfccc.int

. $N_{all} = 2$

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} .

As per the tool on Common Practice, the project activities have been separated from the different technologies on the basis two criteria:

1. Size of Installation – Assessment team confirms that as the proposed project activity is a large scale project and applies large scale methodology i.e. AMC002 therefore **small scale projects** i.e. with capacity below or equal to 15 MW are considered as different projects.
2. Investment climate on the date of the investment decision – The solar projects developed under different phases and different batches of National Solar Mission (NSM) can be considered as different technology projects. For proposed project activity, there are no any different technology project considered out of similar identified projects.

Hence, projects where either of the conditions is satisfied those projects are counted for calculating N_{diff} projects.

Thus, $N_{diff} = 0$

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

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

$$F = 1 - (0/2) = 1$$

As per methodological tool “common practise” version 03.1, 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 $N_{all} - N_{diff}$ is greater than 3.

Thus if both conditions are fulfilled, then project activity will be a common practise otherwise, the project activity is treated as not a common practise.

Outcome of Common Practise analysis:

As,

- i. $F = 1$; is greater than 0.2
- ii. $N_{all} - N_{diff} = 2$; is not greater than 3

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

Thus, the proposed project activity is not a “common practice” within a sector in the applicable geographical area.

The above discussions show that solar power development is not a common practice and the project activity is not financially attractive; hence the project activity is additional.

3.3.6 Quantification of GHG Emission Reductions and Removals

Assessment team checked the baseline, project and leakage calculation and confirm that the evaluation of baseline, project and leakage is as per the approved methodology and formula used to calculate the same is correct. The detail analysis is as below:

Baseline Emission:

As per the approved consolidated Methodology ACM0002 (Version 18.1):

Baseline emissions include only CO₂ 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 (t CO₂/yr)

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

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

The grid emission factor is calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values. The value of combined margin is sourced from Baseline CO₂ Emission Database, Version 12.0, May 2017 published by Central Electricity Authority (CEA), Government of India. CEA calculates the data based on Tool to Calculate the Emission Factor for an Electricity System”, Ver. 6.0. No further assessment is required for grid emission calculation as the ex-ante value is sourced directly from the Govt of India database.

Baseline emission factor (EF_y):

$EF_y = EF_{grid,CM,y} = 0.9653$ t CO₂/MWh. This value is fixed ex-ante for the crediting period.

$EG_{PJ,y}$ is calculated based on capacity (Checked from the manufacturer specification), PLF= sourced from 3rd party DPR thus fulfilling the requirement of Para 3 (b), Annex 11 EB 48 and 8760 (365*24) annual hours. Moreover, $EG_{PJ,y}$ is a monitoring parameter and the actual value will be obtained during the verification of the project activity.

$$BE_y = 253,776 \times 0.9653 = 244,968 \text{ tCO}_2$$

Project Emission:

As per the approved consolidated Methodology ACM0002 (Version 18.1) para 36: “For most renewable energy power generation project activities, $PE_y = 0$. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

Where:

PE_y = Project emissions in year y (t CO₂e/yr)

$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (t CO₂/yr) = The project utilizes renewable fuel and thus there is no Consumption of fossil fuel envisaged for the project activity. Thus the parameter is considered zero for project emission calculation.

$PE_{GP,y}$ = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (t CO₂e/yr)= This parameter is not applicable as the proposed project is Solar power project and hence considered zero for project emission calculation.

$PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year y (t CO₂e/yr)= This parameter is not applicable as the proposed project is Solar power project and hence considered zero for project emission calculation.

As the project activity is the installation of a new grid-connected Solar PV Power plant and does not involve any project emissions from fossil fuel, operation of dry, flash steam or binary geothermal power plants, and from water reservoirs of hydro power plants. Therefore $PE_{FF,y}$, $PE_{GP,y}$, $PE_{HP,y}$ are equal to zero and thus, $PE_y = 0$.

Leakage Emission:

Leakage emission is not applicable as per the requirement of ACM 0002 version 18.1.

Net Emission reduction:

Reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER _y	=	Emission reductions in year y (t CO ₂ e/yr)
BE _y	=	Baseline emissions in year y (t CO ₂ /yr)
PE _y	=	Project emissions in year y (t CO ₂ e/yr)

Therefore, Net GHG Emission Reductions and Removals are calculated as follows:

$$ER_y = BE_y - PE_y$$

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
Year 1	244,968	0	0	244,968
Year 2	244,968	0	0	244,968
Year 3	244,968	0	0	244,968
Year 4	244,968	0	0	244,968
Year 5	244,968	0	0	244,968
Year 6	244,968	0	0	244,968
Year 7	244,968	0	0	244,968
Year 8	244,968	0	0	244,968
Year 9	244,968	0	0	244,968
Year 10	244,968	0	0	244,968
Total	2,449,680	0	0	2,449,680

3.3.7 Methodology Deviations

Assessment team confirms that No methodology deviation is applicable for the present project activity.

3.3.8 Monitoring Plan

Assessment team checked the monitoring practice onsite and also checked the guideline of respective State electricity regulatory commission. The detail analysis is as below:

Parameters determined ex-ante:

Baseline emission factor of INDIAN Grid is establish ex-ante based on Tool to calculate the grid emission factor, using a combined approach consisting 75 % operating margin and 25 % build margin. The emission coefficient from official data published in Central Electricity Authority (CEA) CO₂ Baseline database available to the project participant at the time of submission of PDD for validation and global stakeholder's consultation process. CEA is an official source of Ministry of Power, Government of India have worked out baseline as CO₂ baseline database. The assumption were verified by the validation team and found to be correct.

Parameters determined ex-post:

The parameters monitored ex-post involves net electricity supplied to the grid (calculated from electricity exported and imported) to the INDIAN grid by the project activity.

As per the Joint PD & MR version 02, Joint Energy Meter Reading Report (For the state of Telangana, Karnataka and Maharashtra) will be the source of data during verification for each of the respective states. The DOE will use the same source for verification of emission reductions. As per the approved methodology ACM 0002 version 18.1 "Monitoring shall consist of metering the net electricity supplied by the project activity to the grid. Measurement results shall be cross-checked with records of the Invoices".

In accordance with the methodology requirement, net electricity supplied by the project activity is obtained from Joint Energy Meter Reading Report (For the state of Telangana, Karnataka and Maharashtra) issued by State electricity authority of the respective states which provide input values (apportioned $EG_{\text{export},y}$ and apportioned $EG_{\text{import},y}$), used for calculation of $EG_{\text{PJ},y}$ by the project activity and form the forms the basis for emission reduction calculation. Electricity export to the grid and import from the grid is metered by main and check tri-vector energy meters. The main meter reading is taken jointly on a fixed day of every month for the preceding month at the delivery point and signed by the representatives of state utility and O&M personnel.

In the event of failure of main meter, the check meter will be used in monitoring the electricity data. The agency is experienced in the monitoring system and is managing O&M of numerous other solar farm projects. The validation team therefore is of the opinion that the project participant through the O&M agency is capable of implementing the monitoring plan in the context of the project activity.

Calibration of all the meters is done by state electricity board officials as per the industry standards. However, the calibration will be done once in a 5 year²⁴ for all the project activity. The energy meter recording the export and import from the grid at substation is under the control and supervision of state electricity board officials. Similarly O&M contractor is responsible for monitoring of the generation data at CMS.

It is reported that the data will be kept for 2 years following the end of the crediting period.

The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the site visit.

3.4 Non-Permanence Risk Analysis

Not applicable for the present project activity.

4 SAFEGUARDS

4.1 No Net Harm

The project activity promotes environmental and socio-economic well-being as it results in zero GHG emissions due to installation and operation of clean, renewable energy technology for electricity generation.

As project is a renewable energy project hence there is no negative environmental and socio impact effect and the same can be summarized in the below table:

S.No.	Indicator	Assessment team opinion
1	Air quality	<p>The project generates clean energy which replaces the fossil fuel intensive electricity generation.</p> <p>Also report on “Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects” prepared by MNRE dated September 2013. This report clearly mentioned that solar farms operations do not result in direct air pollution.</p> <p>Adequate measures were taken to mitigate the envisaged impacts like spraying water on the road side to reduce dust level, etc. This was confirmed by the local stakeholders. Therefore, it is validated that mitigation measures were robustly</p>

²⁴ http://powermin.nic.in/whats_new/pdf/Metering_Regulations.pdf, page 12

		implemented on ground for air quality issues project will have a positive impact on air quality.
2	Water quality and quantity	<p>The project has no effect on water quality and quantity because it neither generates any waste nor consumes any water. It was validated during on-site assessment that there was no requirement of water for operations of Solar Panels and the only usage of water was for drinking and sanitation purposes. The consumption of fresh water during construction was also pretty much limited as confirmed by the local stakeholders.</p> <p>Hence the parameter is indicated as neutral and the same is acceptable to the DOE</p>
3	Soil condition	<p>There are negligible impacts envisaged during operation of the project activity.</p> <p>For mitigating the impacts during construction, various mitigation measures were taken which is validated from the plant records of PP and the interview with local villagers.</p> <p>The top soil excavated during construction, was stockpiled and used for compaction. The roads were not paved and soling was done with excavated earth & rock material, so land disturbance could be minimized.</p> <p>It was also confirmed that, the vegetation done at site helps for soil erosion. The same is confirmed during the stakeholder meetings during onsite visit.</p> <p>Therefore, it can be concluded that the project has no effect on soil conditions during its operation because it has no waste coming out.</p>
4	Biodiversity	During the validation site visit it was observed that the condition of

		<p>ground vegetation will be gradually improved; No rare species has been found in the around area.</p> <p>The project site is not on the migration route of migratory bird. As Such solar panels do not have any obstruction in the path of migratory birds.</p> <p>With the implementation of Project, the greening water will be increased significantly; the biodiversity in the vicinity will be improved with the vegetation improvement.</p> <p>NO negative impact envisaged.</p>
5	Employment Generation	<p>The project activity employed local population as skilled workers as well as security guards which were envisaged during the validation site visit. The personnel employed by the project activity are also provided trainings and exposed to various awareness programs therefore a positive indicator has been accepted.</p>
6	Livelihood of the poor	<p>The project is associated with infrastructure development like roads in the nearby areas and promoting economic activities like grants to local school and communities temples etc. Also, project employed local villagers as guards for the security of solar panels</p> <p>Positive impact envisaged. .</p>

4.2 Environmental Impact

The project activity is expected to have positive impacts and no significant adverse environmental impacts are foreseen. Since, the project activity is an electricity generation from renewable source (i.e. solar energy) therefore no negative impact are envisaged. There is no mandatory legal requirement for carrying out an environmental impact assessment in the host country. The Ministry of Environment and

Forests (MoEF), Government of India (GoI) notification²⁵ dated September 14, 2006 regarding the requirement of Environment Impact Assessment (EIA) studies states that any project developer in India needs to file an application to the Ministry of Environment and Forests (including a public hearing and an EIA) in case the proposed industry or project is listed in a predefined list. The list includes thirty nine project activities that require EIA studies. The solar power projects are not included in this list and thus an EIA study is not required.

4.3 Local Stakeholder Consultation

As per the VCS requirements, it is necessary to invite the relevant stakeholders, prior of the validation process. Moreover, the stakeholder meeting took place prior to the start date of the project activity which fulfill the requirement of project standard version 01. The DOE checked the relevance of the dates during the validation site visit. The detail of the invitation date and stakeholder meeting date is as below:

The details of the Stakeholder Meetings are as follows:

1. For 10 MW solar power project at Telangana by Talettutayi Solar Projects Pvt Ltd

Date of invitation – 24/04/2015

Date of Meeting – 04/05/2015

Location of Meeting - Project site, Telangana

2. For 10 MW solar power project at Telangana by NV Vogt Solar One Pvt Ltd

Date of invitation – 24/04/2015

Date of Meeting – 04/05/2015

Location of Meeting - Project site, Telangana

3. For 50 MW solar power project at Telangana by Talettutayi Solar Projects Four Pvt Ltd

Date of invitation – 10/09/2016

Date of Meeting – 17/09/2016

Location of Meeting - Project site, Maharashtra

4. For 30 MW solar power project at Telangana by Talettutayi Solar Projects One Pvt Ltd

Date of invitation – 14/01/2017

Date of Meeting – 21/01/2017

Location of Meeting - Project site, Karnataka

²⁵<http://envfor.nic.in/legis/eia/so1533.pdf>

5. For 20 MW solar power project at Telangana by Talettutayi Solar Projects Two Pvt Ltd

Date of invitation – 14/01/2017

Date of Meeting – 21/01/2017

Location of Meeting - Project site, Karnataka

All the stakeholders have been invited through public notice to attend the stakeholders meeting. The local stakeholders’ consultation meeting was attended by local persons including local villagers, local vendors and technology suppliers.

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), panel supplier, project proponent representatives, O&M Team and other people involved in the project. Validation team verified the list of participants who attended the stakeholder meeting and feedback questionnaire and confirms the stakeholders identified are relevant. Validation team verified the list of participants who attended the stakeholder meeting and feedback questionnaire and confirms the stakeholders identified are relevant. The validation team also verified the minutes of meeting to note that no negative comments were received and the same was cross checked with the information obtained during follow up interviews with the stakeholder’s. Moreover, assessment team during the validation site visit also noted that a grievance register is also put onsite for the stakeholder to comment on any grievances during the operation lifetime of the project activity, The grievances from the stakeholder if found suitable will be addressed immediately by the top management and thus the approach is found appropriate for the project activity.

The interaction with some of the stakeholders during the site visit are presented below:

Name of the stakeholder	Krishna
Occupation	Driver, Maharashtra State
DOE QUESTION: Did this Solar power plant cause any pollution? Answer: No, the plant does not cause any pollution.	
DOE QUESTION: Did PP promised employment opportunity? Answer: Yes, PP told us that employment will be generated and the locals will be given priority.	
DOE also like to conclude that during the site visit it was observed that local people were employed for security and operation related work like water spraying, vegetation improvement and other unskilled work. DOE also found that skilled local persons were also employed by the organization for the operation and maintenance of the power plant.	

Name of the stakeholder	Hemant
Occupation	Villager, Maharashtra State
DOE questions: Did the power plant discharge any harmful pollutants? Answer: NO the plant does not discharge any harmful pollutants.	
DOE questions: Did the power plant destroy any crop fields? Answer: The plant is implemented in barren land and there were no any fertile land or crop which is damaged.	

Thus Validation team is of the opinion that the stakeholder meeting was adequate and appropriate.

4.4 Public Comments

Assessment team noted that this project was open for public comment from 8 May - 7 June 2018. No comments were received.

The detail were checked by the assessment team in the following web platform

http://www.vcsprojectdatabase.org/#/pipeline_details/PL1762

5 VERIFICATION FINDINGS

5.1 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the Joint VCS PD+ MR. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the VCS PD
Findings	CAR 07 was raised during the verification process and closed successfully.
Conclusion	<p>The baseline Emissions for a given year is calculated by multiplying the energy baseline (EB) with the regional grid emission factor. The grid in this case would be the 'INDIAN Grid'</p> <p>Formula Used:-</p> $BE_y = EG_{pj,y} * EF_{grid,CM,y}$ <p>Where BE_y = Baseline emission for year 'y' $EG_{pj,y}$ = Energy Baseline; and $EF_{grid,CM,y}$ = Emission factor for INDIAN Grid</p> <p>The verification team has checked the entire monthly JMR report and invoices applicable for the monitoring period as per the project activity applied for verifications and found all the parameters are monitored and recorded as per the monitoring plan in the PD. The verification team has crosschecked the emission reduction sheet and monitoring report data with the JMR sheet and invoice bills and found all the values are matching.</p>

5.2 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the break down log for the monitoring period. During the verification site visit the feeder wise location of the WTGs is also checked. The Calibration details are also checked.
Findings	CAR 08 raised during the verification process which was closed successfully.
Conclusion	<p>The metering arrangement is tri-vector bi-directional energy meters (main and check) at the State Electricity Board (SEB) substation. These meters record several parameters including electricity exported & imported. Moreover, the meters are located at the HT side of the transformer and are of accuracy class of 0.2S for each project activity applied for verification.</p> <p>These electricity meters are being used by state electricity board for JMR (Joint Meter Reading) electricity generation statements. The Net electricity supplied to the grid is then calculated from export and import values. The net electricity exported to the grid is also cross checked from the invoices raised to respective state electricity board which is in line with Methodology requirement for large scale project activity. Hence assessment team confirmed that the value of net</p>

	<p>electricity exported to the grid as used in emission reduction calculation is correct.</p> <p>Electricity export to the grid and import from the grid is metered by main and check tri-vector energy meters. The main meter reading is taken jointly on a fixed day of every month for the preceding month at the delivery point and signed by the representatives of state utility and O&M personnel. In the event of failure of main meter, the check meter will be used in monitoring the electricity data. The agency is experienced in the monitoring system and is managing O&M of numerous other solar farm projects. The validation team therefore is of the opinion that the project participant through the O&M agency is capable of implementing the monitoring plan in the context of the project activity.</p> <p>Calibration of all the meters is done by state electricity board officials as per the industry standards. However, the calibration is done once in a 5year²⁶. The details of Calibration of the meters are mentioned in Appendix 5 of this report. The energy meter recording the export and import from the grid at substation is under the control and supervision of state electricity board officials. Similarly O&M contractor is responsible for monitoring of the generation data at CMS.</p> <p>For 132 KV Telgaon Sub-Station (50 MW project in Maharashtra), the calibration of the energy meter is done by the State Electricity Board and therefore, it is not in hands of the PP. At the time of commissioning, newly calibrated meters were installed by the State Electricity Board. However, the PP do not have the initial calibration reports with them. Hence, as a conservative approach, maximum permissible error factor of 0.2% has been applied to the export and import values during the current monitoring period. Assessment team checked the latest calibration reports dated 02/06/2018 and found that meters are within the permissible limit and thus applied error factor for absence of initial calibration report in export and import is thus acceptable to the assessment team. Calibration were carried out by Meter and testing division of the respective state electricity board. Each of this state board follows the guideline of National Accreditation Board for Testing and Calibration Laboratories (NABL-http://www.nabl-india.org/) Govt of India. Assessment team thus established the traceability of the calibration certificates.</p> <p>It is reported that the data will be kept for 2 years following the end of the crediting period.</p> <p>The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the site visit.</p> <p>On-site visit and interview with O&M personnel also confirms that the operational and organizational chart as mentioned in Joint PD+MR is as per the site practice and thus assessment team confirms that the details are correct.</p> <p>The break down log is checked and found that the solar Panels undergone scheduled maintenance and break down. No unforced error observed and feeder wise solar Panels location is also checked and found correct.</p>
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²⁶http://powermin.nic.in/whats_new/pdf/Metering_Regulations.pdf, page 12

6 VALIDATION AND VERIFICATION CONCLUSION

Applus+Certification has been engaged by **SolarArise India Projects Pvt. Ltd.** to perform the Joint validation and verification of the “Bundled Solar Power Project by SolarArise India Projects Pvt. Ltd.”

The management of the project participant/owner is responsible for the preparation of the GHG emissions data and the reported/estimated GHG emissions reductions on the basis set out within the project’s Monitoring Plan in the Joint PD and MR and the approved methodology ACM 0002 version 18.1.

Our Validation approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board and VCS board. Our approach is risk-based, drawing on an understanding of the risks associated with estimated GHG emissions data and the controls in place to mitigate these. The validation can confirm that:

- The projects description compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 3.7
- The project’s baseline and additionality is assessed against “ACM 0002 version 18.1 for large scale project
- The project’s monitoring plan is assessed against “ACM 0002 version 18.1 for large scale project
- A risk based approach has been followed to perform this validation activity. The review of the project description and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews with Project Owner have provided Applus+ Certification with sufficient evidence for positive validation opinion as per the requirement of VCS.

Our Verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- the project is operated as planned and described in the project document;
- the monitoring plan is as per the applied methodology;
- the monitoring process in Monitoring Report is as per the PD
- the development and maintenance of records and reporting procedures are in accordance with the monitoring plan;
- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately

- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements.
- No limitation observed for the present verification

Verification period: 23-June-2016 to 25-April-2018 (first and last date included)

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2016	19,599	0	0	19,599
2017	52,938	0	0	52,938
2018	65,925	0	0	65,925
Total	138,462	0	0	138,462

Assessment team noted that actual emission reductions achieved are 138,462 tCO₂e, which is approximately 69% lower than the estimated emission reductions. The generation of electricity depends upon the number of annual days of sunshine availability and many other climatic conditions, and not within the control of the project participant. The lower generation during the current verification period is hence due to certain natural conditions and hence acceptable. The commissioning date of each SPV is different and does not cover complete monitoring period. Also, the 20 MW solar project by Talettutayi Solar Projects Two Pvt Ltd is yet to be commissioned.

APPENDIX 1: DOCUMENTS REVIEWED DURING VALIDATION AND VERIFICATION

No.	Author	Title	References to the document			Provider
			Name of SPVs	Capacity in MW	COD	
1	NA	Commissioning certificates of the Solar Panels implemented in the project site.				Project participant
			Talettutayi Solar Projects Pvt Ltd	10 MW	23/06/2016	
			NV Vogt Solar One Pvt Ltd	10 MW	23/06/2016	
			Talettutayi Solar Projects Four Pvt Ltd	50 MW	10/08/2017	
			Talettutayi Solar Projects One Pvt Ltd	30 MW	05/01/2018	
	Talettutayi Solar Projects Two Pvt Ltd	20 MW	Yet to be achieved			
2	NA	Contract of the other entity with the DOE	Contract of the other entity with the DOE			Project participant
3	NA	Technical specifications of Solar Panels generators from manufacturers	Manufacturer technical specifications			Project participant
4	NA	Emission Calculation sheet- version 01-	09/06/2018			Project

		<p>estimated</p> <p>Actual Emission Calculation sheet- version 01- estimated</p>	09/06/2018	participant
5	NA	<p>The operational lifetime of the project activity from the manufacturer=(Technical specifications)</p>	Manufacturer technical specifications	Project participant
6	NA	<p>SERC order of the respective states</p> <p>RBI: Reserve Bank of India</p> <p>www.rbi.org.in</p> <p>Ministry of Environment and forest:</p> <p>www.envfor.nic.in</p> <p>UNFCCC</p> <p>www.cdm.unfccc.int</p> <p>CEA: Central electricity authority</p> <p>www.cea.nic.in</p> <p>Income tax act 1961</p> <p>http://law.incometaxindia.gov.in/DIT/</p> <p>VCS: Verified Carbon Standard</p> <p>www.v-c-s.org</p>	Reference link is provided.	Independent Search
7	NA	<p>Tools/ guidelines used in the project activity</p> <ul style="list-style-type: none"> • Tool to 	UNFCCC CDM web site	UNFCCC

		<p>determine the remaining lifetime of the project activity in line with Annex 15 EB 50</p> <ul style="list-style-type: none"> • Tool to calculate the emission factor for an electricity system version 06 • Glossary of CDM terms version 07 • VCS verification report template version 03 																						
8	NA	<p>Joint VCS PD+ MR Version 01</p> <p>Revised Joint VCS PD+ MR version 02</p>	<p>03/05/2018</p> <p>09/06/2018</p>	Project participant																				
9	NA	<p>Financial Analysis sheet version 01</p> <p>Financial Analysis sheet version 02</p>	<p>03/05/2018</p> <p>09/06/2018</p>	Project participant																				
10	NA	DPR/PLF reports for Individual project owners	<table border="1"> <thead> <tr> <th>Site Name</th> <th>Name of the Investor/Owner/SPVs</th> <th>Project Capacity (MW)</th> <th>Date of PLF/DPR</th> </tr> </thead> <tbody> <tr> <td>Telangana</td> <td>Talettutayi Solar Projects Pvt Ltd</td> <td>10 MW</td> <td>22-02-2015</td> </tr> <tr> <td>Telangana</td> <td>NV Vogt Solar One Pvt Ltd</td> <td>10 MW</td> <td>22-02-2015</td> </tr> <tr> <td>Maharashtra</td> <td>Talettutayi Solar Projects Four Pvt Ltd</td> <td>50 MW</td> <td>04-07-2016</td> </tr> <tr> <td>Karnataka</td> <td>Talettutayi Solar Projects One Pvt</td> <td>30 MW</td> <td>01-11-2016</td> </tr> </tbody> </table>	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Date of PLF/DPR	Telangana	Talettutayi Solar Projects Pvt Ltd	10 MW	22-02-2015	Telangana	NV Vogt Solar One Pvt Ltd	10 MW	22-02-2015	Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	50 MW	04-07-2016	Karnataka	Talettutayi Solar Projects One Pvt	30 MW	01-11-2016	Project participant
Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Date of PLF/DPR																					
Telangana	Talettutayi Solar Projects Pvt Ltd	10 MW	22-02-2015																					
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Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	50 MW	04-07-2016																					
Karnataka	Talettutayi Solar Projects One Pvt	30 MW	01-11-2016																					

				Ltd			
			Karnataka	Talettutayi Solar Projects Two Pvt Ltd	20 MW	01-11-2016	
11	NA	Calibration details of the project activity undergoing verifications	Please referee Appendix 4				Project participant
12	NA	JMR records+ Invoices for the complete monitoring period of the respective states	JMR records+ Invoices for the respective states				Project participant
13	NA	Power purchase agreement dates	Site Name	Name of the Investor/Owner/SPVs	PPA Date		Project participant
			Telangan	Talettutayi Solar Projects Pvt Ltd	18-03-2015		
			Telangan	NV Vogt Solar One Pvt Ltd	19-03-2015		
			Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	11-04-2016		
			Karnataka	Talettutayi Solar Projects One Pvt Ltd	02-08-2016		
			Karnataka	Talettutayi Solar Projects Two Pvt Ltd	07-03-2018		
14	NA	Actual O&M agreement	Site Name	Name of the Investor/Owner/SPVs	Date		Project participant
			Telangan	Talettutayi Solar Projects Pvt Ltd	26-02-2016		
			Telangan	NV Vogt Solar One Pvt Ltd	26-02-2016		
			Maharashtra	Talettutayi Solar Projects Four Pvt Ltd	02-08-2017		
			Karnataka	Talettutayi Solar Projects One Pvt Ltd	02-01-2018		
			Karnataka	Talettutayi Solar Projects Two Pvt Ltd			

APPENDIX 2: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS (CAR/CL/FAR)

CAR ID	01	Section no.	1	Date: 09/06/2018
Description of CAR				
<p>During the document review it was observed that following details are missing in section 1 of the joint PD+MR version 01:</p> <ol style="list-style-type: none"> 1. A summary description of the technologies/measures for individual panels as per the respective state (e.g., plant, equipment, process, or management or conservation measure) included in the project and the status of their implementation. Supporting for technical measures is also not submitted to DOE. 2. The relevant implementation dates (e.g., dates of construction, continued operation periods). Supporting regarding Commissions certificate is also missing. 3. The total GHG emission reductions or removals generated in this monitoring period. 4. The compliance of section 1.11 is not as VCS PD template. Corrective action is required 5. The scenario prior to project activity is not described in section 1.10 of the VCS PD. The scenario as mentioned in section 2.4 is similar or different? Kindly take corrective action <p>Corrective action is sought for the same.</p>				
Project participant response				Date: 11/06/2018
<ol style="list-style-type: none"> 1. <i>The technical details of the solar projects are mentioned in the section 1.8 of the VCS PD+MR, version-2.</i> 2. <i>The date of implementation of the solar projects by each pp have been mentioned in the section 1.1 of the VCS PD+MR, version-2.</i> 3. <i>The total GHG emission reduction or removals generated in this monitoring period has now been mentioned in the section 1.1 of the VCS PD+MR, version-2.</i> 4. <i>The project is in Compliance with Laws, Statutes and Other Regulatory Frameworks and the Project has received all the necessary approvals for development and commissioning certificates are issued once project meets all statutory requirements.</i> 5. <i>The baseline scenario is explained in the section 1.10 and it is same as explained in the section 2.4 of the VCS PD+MR, version-2.</i> 				
Documentation provided by project participant				
<ol style="list-style-type: none"> 1. <i>DPR</i> 2. <i>Commissioning Certificate</i> 3. <i>VCS PD+MR, version-2</i> 4. <i>ER sheet</i> 				
DOE assessment				Date: 18/06/2018
<p>Following are the observation of the DOE:</p> <ul style="list-style-type: none"> • The technical details are now mentioned in section 1.8 of the revised VCS PD+ MR • The date of implementation by each project owner is now mentioned in the revised VCS PD+ MR • The total GHG generated for the present monitoring period is now mentioned in the revised VCS PD+MR • The baseline scenario as mentioned in section 2.4 is same as mentioned in 1.10. 				

CAR is thus closed.

CAR ID	02	Section no.	1.12.3 to 1.12.5	Date: 09/06/2018
Description of CAR				
<p>During the desk review it was observed that the details regarding REC benefits were not provided. Please provide appropriate link for the same and also proper documents to confirm that the PP will not claim other form of environmental credit for the monitoring period concerned. Moreover, PP should also produce documentary evidence that it has not participated in any other form of GHG emission/rejected by any other form of GHG program for the current monitoring period.</p> <p>Corrective action is sought for the same and documents are required to be submitted for further analysis.</p>				
Project participant response				Date: 11/06/2018
<p><i>The PP is not availing the REC benefits and the web-link of the same has also been provided in the section 1.12.3 of the VCS PD+MR, version-2.</i></p> <p><i>An Undertaking Letter from PP is now provided which states that the PP shall not claim any other form of environmental credit for the concerned monitoring period and also, it shall not participate in any other form of GHG emission/rejected by any other form of GHG program for the current monitoring period.</i></p>				
Documentation provided by project participant				
<ol style="list-style-type: none"> 1. VCS PD+MR, version-2 2. Undertaking Letter from PP 				
DOE assessment				Date: 18/06/2018
<p>The PP is not availing any REC benefits. The declaration for the same is checked by the assessment team and found correct. The scenario of double counting for the present monitoring period does not exist.</p> <p>Also assessment team also checked Undertaking Letter from PP is now provided which states that the PP shall not claim any other form of environmental credit for the concerned monitoring period and also, it shall not participate in any other form of GHG emission/rejected by any other form of GHG program for the current monitoring period. CAR is thus closed.</p>				

CAR ID	03	Section no.	2.5	Date: 09/06/2018
Description of CAR				
<p>During the desk review of the PDD and onsite visit document verifications, APPLUS team observed following inconsistency in the additionality determination :</p> <ol style="list-style-type: none"> 1. Following documents are missing and thus the IRR calculation is reserved: <ol style="list-style-type: none"> a. PLF reports b. All the input value (e.g. Offer letters, DPR (if any), Loan sanction if any, Insurance etc.) 2. IRR calculation is reserved as no IRR sheets are provided 3. The supporting documents for the Common practice analysis is not submitted to the DOE. Common practice analysis is thus reserved till the submission of the same. <p>Additionality section of the VCS PD version 01 is reserved till the documents and IRR sheet are submitted.</p>				
Project participant response				Date: 11/06/2018

<ol style="list-style-type: none"> (a) PLF reports are now provided (b) The input values for IRR has been taken from the DPR. The same is now provided to the DOE assessment team. The IRR calculation excel sheets are now provided to the DOE assessment team. The common practice analysis and the supporting is now submitted to the DOE assessment team.
Documentation provided by project participant
<ol style="list-style-type: none"> (a) PLF reports (b) DPR of all sites IRR calculation excel sheets Common Practice Analysis excel sheet
DOE assessment Date: 18/06/2018
<p>Following are the observation of the DOE: PLF reports and DPR are now submitted to the assessment team. CAR is thus closed The IRR calculation sheet is checked and found correct. CAR is thus closed. Common practice analysis sheet is checked and found correct. CAR is thus closed.</p>

CAR ID	04	Section no.	3	Date: 09/06/2018
Description of CAR				
Assessment team found during desk review is that emission reduction sheet is missing for the project activity. Hence estimated ER in section 3 of the Joint PD and MR is thus reserved.				
Project participant response				Date: 11/06/2018
<i>The estimated ER sheet is now provided to the DOE assessment team.</i>				
Documentation provided by project participant				
<i>Estimated ER sheet</i>				
DOE assessment				Date: 18/06/2018
The estimated ER sheet is checked by the assessment team and found correct. CAR is thus closed.				

CAR ID	05	Section no.	5.3	Date: 09/06/2018
Description of CAR				
During the desk review related to stakeholder consultation following observation is made by the APPLUS project team:				
<ol style="list-style-type: none"> The stakeholder documentation is also not provided to the DOE The site photograph of LSHC meeting is not provided to the DOE. 				
Corrective action is this sought for the same.				
Project participant response				Date: 11/06/2018
<ol style="list-style-type: none"> The stakeholder documentation is now provided to the DOE. The site photographs are now provided to the DOE. 				
Documentation provided by project participant				
<ol style="list-style-type: none"> Stakeholder documentations (i.e. Public Notice, MOM and List of attendees) Site photographs 				
DOE assessment				Date: 18/06/2018

The Minutes of meeting for the stakeholder consultation is checked and found correct by the assessment team. Also, the attendance sheet is also cross checked and it is observed that sufficient stakeholders are invited to inform regarding the project activity. All the stakeholders are happy with the implementation of the project activity and no negative comments observed. Stakeholders are happy as the project provide job opportunities to the local villagers and also improved their standard of living which is acceptable to the assessment team. CAR is thus closed.

CAR ID	06	Section no.	5.4	Date: 09/06/2018
Description of CAR				
During the desk review it is observed that the section in the VCS PD & MR do not contains details of Public comments (if any). Corrective action is sought.				
Project participant response				Date: 11/06/2018
<i>The public Comment section is now updated in the section 5.4 of the VCS PD+MR, version-2.</i>				
Documentation provided by project participant				
<i>VCS PD+MR, version-2</i>				
DOE assessment				Date: 18/06/2018
Assessment team checked the public comments web page and it is observed that no GSC comments were received for the project activity. The project was open for Public Comments from 08-May-2018 to 07-June-2018.				
CAR is thus closed.				

CAR ID	07	Section no.	3	Date: 09/06/2018
Description of CAR				
Assessment team found during desk review is that emission reduction sheet is missing for the project activity. JMR sheets and the invoices are missing. The claimed ER is thus reserved till submission of proper documents.				
Project participant response				Date: 11/06/2018
<ol style="list-style-type: none"> 1. <i>ER sheet of the project activity is now submitted.</i> 2. <i>The JMRs and Invoices for the current monitoring period are now submitted to the DOE assessment team.</i> 				
Documentation provided by project participant				
<ol style="list-style-type: none"> 1. <i>ER sheet</i> 2. <i>JMRs and Invoices for the current monitoring period.</i> 				
DOE assessment				Date: 18/06/2018
The actual emission reduction sheet for the current monitoring period is submitted to the assessment team and the same is found correct. The JMRs and invoice for the present monitoring period is checked and assessment team confirm that no overestimation of VERs is envisaged and the ER calculation is conservative and correct.				
CAR is thus closed.				

CAR ID	08	Section no.	Appendix	Date: 09/06/2018
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Description of CAR	
<p>The calibration certificates of and details for the individual PP are missing. The assessment is thus reserved until the calibration details are submitted.</p> <p>The breakdown details for the complete monitoring period is missing. Log records are not submitted to DOE. Corrective action is sought in joint PD and MR and supporting documents are sought for the same.</p> <p>The feeder details for the connected Panels is missing. Corrective action is sought in joint PD and MR and supporting documents are sought for the same.</p>	
Project participant response	Date: 11/06/2018
<ol style="list-style-type: none"> The Calibration certificates and the Meter details of the individual PP are now provided in Appendix-2 of the VCS PD+ME, version-2. The breakdown details for the current monitoring period has now been provided in Appendix-3 of the VCS PD+MR, version-2. The supporting documents are also provided. The details of the feeder locations are now mentioned in the Appendix-2 of the VCS PD+MR, version-2. 	
Documentation provided by project participant	
<ol style="list-style-type: none"> Calibration Certificates VCS PD+MR, version-2 Breakdown details 	
DOE assessment	Date: 18/06/2018
<p>Following are the observation of the DOE:</p> <ol style="list-style-type: none"> The calibration details are now mentioned in the revised VCS PD+MR. The calibration certificates are also checked and found correct. The delay calibration is also applied wherever applicable which is acceptable to the assessment team. CAR is thus closed The breakdown details log sheet is checked by the assessment team. The commissioning panels log records were checked and it is observed that the scheduled maintenance were undertaken as per manufacturer specification which is a normal practice. No unusual activity observed during the current monitoring period. CAR is thus closed. The feeder location details are now mentioned in the revised VCS PD and MR. The details as mentioned is same as per the onsite practice. CAR is thus closed. 	

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Lead auditor/ Technical	OR	DAS	SUKANTA	TQC- Outsourced	Yes	Yes	Yes	Yes

Expert				entity			
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Technical reviewer and approver of the verification and certification 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 (TR)	EI	Shen	Simon	Applus+ Certification
2.	Approver	IR	Sendin	Juan	Applus+ Certification

Short CVs of the Team:

- Mr. Sukanta DAS, has done M. SC in (Electronics and Photonics) and M. Tech in (Energy technology) from Tezpur Central University/ Indian Institute of technology Bombay in India. He is a certified lead auditor for ISO 14001 EMS LA and ISO 9001 QMS LA from International registry for Certified Auditors (IRCA) and Certified Lean Management practitioner from Quality Council of India (QCI). He has more than Nine (9) years of working experience at TUV NoRD/ Reconsult/CRA/APROJECT OWNERSLUS certifications under various categories of projects stating from Renewable to waste to supercritical projects. He was JI/ CDM Lead Assessor in TUV NoRD and was involved in more than 100 CDM validation and verifications activities in Gold Standard, VCS, CDM projects as a team leader/technical reviewer / validator / verifier covering the sectoral scope 1, 13 technical areas 1.2/1.1/13.1. Currently he is associated with True Quality Certifications Private Limited and is empanelled with APROJECT OWNERSLUS certification to carry out GHG audit.
- Meng (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+ LGAI, he had been worked for TÜV SÜD as a GHG Validator/Assessment team and ISO 9001/14001 Lead Auditor for 3.5 years

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request

CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CM	Combined Margin
CMS	Central Monitoring system
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming potential
JMR	Joint Metering reading
RBI	Reserve Bank Of India

APPENDIX 5: CALIBRATION DETAILS

Meter Calibration details of 10 MW solar project by Talettutayi Solar Projects Pvt Ltd

Metering Location: 132/33 KV Gadwal Sub-Station

Meter Details	Main Meter	Check Meter	Standby Meter
Meter Serial No	APX00685	APX00686	APX00687
Meter Make	Secure	Secure	Secure
Accuracy Class	0.2 s	0.2 s	0.2 s
Date of Calibration ²⁷	23-02-16	23-02-16	23-02-16

Meter Calibration details of 10 MW solar project by NV Vogt Solar One Pvt Ltd

Metering Location: 132/33 KV Gadwal Sub-Station

Meter Details	Main Meter	Check Meter	Standby Meter
Meter Serial No	APX00682	APX00684	APX00704
Meter Make	Secure	Secure	Secure
Accuracy Class	0.2 s	0.2 s	0.2 s
Date of Calibration ²⁸	23-02-16	23-02-16	23-02-16

Meter Calibration details of 50 MW solar project by Talettutayi Solar Projects Four Pvt Ltd

Metering Location: 132 KV Telgaon Sub-Station

Meter Details	Main Meter	Check Meter
Meter Serial No	2832405	2832406
Meter Make	Elster	Elster
Accuracy Class	0.2 s	0.2 s
Date of Latest Calibration ²⁹	02/06/2018	02/06/2018

²⁷ The Calibration frequency of the energy meter is once in five year. Hence, the calibration is valid till 22-02-2021. Hence, during the current monitoring period, delay in calibration is not applicable.

²⁸ The Calibration frequency of the energy meter is once in five year. Hence, the calibration is valid till 22-02-2021. Hence, during the current monitoring period, delay in calibration is not applicable.

²⁹ The calibration of the energy meter is done by the State Electricity Board and therefore, it is not in hands of the PP. At the time of commissioning, newly calibrated meters were installed by the State Electricity Board. However, the

Meter Calibration details of 30 MW solar project by Talettutayi Solar Projects One Pvt Ltd**Metering Location:** 110 KV Yelburga Substation

Meter Details	Main Meter	Check Meter
Meter Serial No	16112988	16198152
Meter Make	L & T	L & T
Accuracy Class	0.2 s	0.2 s
Date of Calibration³⁰	11-10-17	11-10-17

PP do not have the initial calibration reports with them. Hence, as a conservative approach, maximum permissible error factor of 0.2% has been applied to the export and import values during the current monitoring period.

³⁰ The Calibration frequency of the energy meter is once in five year. Hence, the calibration is valid till 10-10-2022. Hence, during the current monitoring period, delay in calibration is not applicable.