

VCS GROUPED PROJECT FOR RENEWABLE POWER GENERATION BY ESSEL MINING & INDUSTRIES LIMITED



Document Prepared By (ATUL TAKARKHEDE - 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. (Applus+ Certification)
Contact	Campus UAB – Ronda de la Font del Carme, s/n 08193 Bellaterra – Barcelona (Spain)

	Tel.: +34 93 567 20 08 Fax.: +34 93 567 20 01 www.appluscertification.com agustin.calle@applus.com carla.debat@applus.com
Approved By	Juan Sendin Caballero, BU Managing Director (Applus+ Certification)
Work Carried Out By	Dr. Atul Takarkhede-Lead Auditor/Technical expert

Summary:

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

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

All the 11 project instances i.e. renewable energy generation plants to be included in this grouped project will be from within India only comprising total capacity 150.4 MW.

During the Current Monitoring Period from 12/03/2014 to 20/10/2018 (First and last date included) the project activity has achieved 565,556 tCO₂e GHG reductions.

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.

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

This is the first monitoring under VCS and covers the activity from 12/03/2014 to 20/10/2018 (inclusive of both dates). Project activity has Renewable crediting period having each of 10 years renewal twice.

Thus, VCS crediting period should be maximum of 10 years and renewed twice till end date of CDM crediting period.

Start date of crediting period for VCS verification: 12/03/2014 (Date of commissioning of first WTG)

The GHG credits from 12/03/2014 to 20/10/2018 (inclusive of both dates) will be claimed under VCS only. An undertaking from the project participant confirms that project will not claim any other scheme benefits for the concerned monitoring period.

A risk based approach has been followed to perform this verification activity. In the course of verification, 08 Corrective Action requests (CAR), 00 Clarification Requests (CLs) and 00 Forward

action requests (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 PP have provided DOE with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

Further, assessment was extended for validation of the applicability of additional methodology AMS.-I.F Version 03, its impact on baseline, scale of project activity and additionality of project activity instances added during registration of project activity. Also additionality of the new project activity instances added during this verification was assessed.

LGAI Technological Center S.A. (Applus+ Certification) (Hereafter referred as Applus+ Certification) has been appointed by “Essel Mining & Industries Limited” to perform the 1st periodic verification of the “VCS Grouped Project for Renewable Power Generation by Essel Mining & Industries Limited” under VCS standard and guideline version 3.7. The objective of this verification activity is to have an independent third party for the assessment of the project design, Monitoring report and Final Verification report 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 “ACM0002 Version 16, AMS-I.D Version 18 & AMS-I.F Version 03” as mentioned in revised VCS PD.
- the project's monitoring plan is assessed against “ACM0002 Version 16, AMS-I.D Version 18 & AMS-I.F Version 03” as mentioned in revised VCS PD.
- 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 02 for the project activity
- CDM Project Standard version 02 for the project activity
- CDM Project Cycle Procedure version 02 for the project activity
- VCS standard v3.7
- VCS program guideline v3.7

Verification 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 verified emission reductions (VERs).

The scope of the verification is the independent and objective review of the Monitoring report (MR). The MR is reviewed against the relevant criteria (see above) and decisions by the CDM Executive Board and VCS executive board, including the approved baseline and monitoring methodology. The verification was based on the guidance given in the CDM Validation and Verification Standard version 02 for the project activity, review against registered PD and Final Validation report, CDM Project Standard version 02 for the project activity, CDM Project Cycle Procedure version 02 for the project activity and VCS program guideline and standard version 3.7.

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 MR. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VERs. The 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 monitoring report combined.

The only purpose of the verification is its usage during the 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 verification opinion, which will go beyond that purpose.

The verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. No sampling procedure applied for site visit or document verifications. The entire documents checked/WTGs verification conducted to arrive at positive verification conclusions.

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1 INTRODUCTION

1.1 Objective

LGAI Technological Center S.A. (Applus+ Certification) (Hereafter referred as Applus+ Certification) has been appointed by “Essel Mining & Industries Limited” to perform the 1st periodic verification of the “VCS Grouped Project for Renewable Power Generation by Essel Mining & Industries Limited” under VCS standard and guideline version 3.7. The objective of this verification activity is to have an independent third party for the assessment of the project design, Monitoring report and Final Verification report 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 “ACM0002 Version 16, AMS-I.D Version 18 & AMS-I.F Version 03” as per revised VCS PD.
- the project's monitoring plan is assessed against “ACM0002 Version 16, AMS-I.D Version 18 & AMS-I.F Version 03” as per revised VCS PD.
- 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 02 for the project activity
- CDM Project Standard version 02 for the project activity
- CDM Project Cycle Procedure version 02 for the project activity
- VCS standard v3.7
- VCS program guideline v3.7

Verification 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 verified emission reductions (VERs).

1.2 Scope and Criteria

The scope of the verification is the independent and objective review of the Monitoring report (MR). The MR is 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 verification was based on the guidance given in the CDM Validation and Verification Standard version 02 for the project activity, review against registered PD and Final Validation report, CDM Project Standard version 02 for the project activity, CDM Project Cycle Procedure version 02 for the project activity and VCS program guideline and standard version 3.7.

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 MR. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VERs. The 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 monitoring report combined.

The only purpose of the verification is its usage during the 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 verification opinion, which will go beyond that purpose.

1.3 Level of Assurance

The verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. No sampling procedure applied for site visit or document verifications. The entire documents checked/WTGs verification conducted to arrive at positive verification conclusions.

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 sources. All the 11 project instances i.e. renewable energy generation plants to be included in this grouped project will be from within India only comprising total capacity 150.4 MW.

The estimated annual emission reductions over a 10 year period from initial five project activity instances and additional six project activity instances are 247,123 tCO₂e/year.

All the project activity instances being included in the proposed grouped project are owned by EMIL (or their group companies) who is also acting as Coordinating and Managing entity for the Grouped Project activity.

Following five project activity instances are being included in the grouped project at the time of registration:

Project activity instances	Project Owner	Title of the project activity	Location	Date of Commissioning	Estimated Annual Average ERs over a 10-year period
Instance – 1	Essel Mining and Industries Limited	VCS Project for Solar Power Plant at Bhadla, Rajasthan	Bhadla Solar Park, Village – Bhadla, Tehsil – Bap, District – Jodhpur, Rajasthan India	12/03/2014	29,270
Instance – 2		VCS Project for Solar Power plant at Achampet, Telagana	5 MW Solar Power Plant, Achampet Village and Mandal, Dist. Mehaboobnagar, Telangana, India.	07/07/2014	7,171
Instance – 3		VCS Project for Solar Power Plant at Kalwakurthy, Dist. Mehabubnagar, Telangana	Ternikal Village, Kalwakurthy Mandal, Dist. Mehaboobnagar, Telangana, India.	30/06/2014	14,524
Instance – 4		VCS Project for Solar Power Plant at Salakpur, Telangana	Village: Salakpur District: Warangal State: Telangana, India	17/09/2014	14,240
Instance – 5		VCS Project for Solar Power Plant at Alladurg, Telangana	Village: Bharamdhibba District: Medak State: Telangana, India	28/07/2014	14,679

Being grouped project activity, following project instances are added. These new instances are also grid connected solar power plants generating renewable power and will contribute to GHG emission reductions.

The details of new project activity instances are as below

Project activity instances	Title of the project activity	Location	Project Owner	Date of Commissioning	Estimated Annual Average ERs over a 10-year period
Instance – 6	VCS Project for Solar Power Plant at Karnataka	Village: Bellatti, Shirahatti District: Gadag State: Karnataka, India	Aditya Birla Solar Limited	11/05/2017	36,410
		Village: Chandargi, Kaktol, Ramadurg Taluk District: Belagavi State: Karnataka, India		12/05/2017	36,513
		Village: Mulbangal, District: Kolar State: Karnataka, India		13/10/2017	36,599
		Village: Devar Nimbargi, District: Vijayapura State: Karnataka, India	Aditya Birla Renewables Limited	26/03/2018	26,460
Instance – 7	VCS Project for Solar Power Plant at Vijaypur	Village: Devar Nimbargi, District: Vijayapura State: Karnataka, India	Aditya Birla Renewables SPV 1 Limited	26/03/2018	10,525
Instance – 8	VCS Project for Solar Power Plant at Hotgi, Maharashtra	Village: Hotgi, Tal South Solapur District: Solapur State: Maharashtra, India		20/06/2018	1,432
Instance – 9	VCS Project for Solar Power Plant at Gotan, Rajasthan, India	Village: Kharia Khangar, Tehsil: Bhopalgarh District: Jodhpur State: Rajasthan, India		01/02/2018	8,956
Instance – 10	VCS Project for Solar Power Plant at Sevagram, Gujrat	Village: Sevagram, Tal- Abdasa District: Kutch State: Gujarat, India		14/08/2018	8,956
Instance – 11	VCS Project for Solar Power Plant at Pune, Maharashtra	Village: Peth, Tal Havelim Dist Pune, Maharashtra, India		01/02/2018	1,388

During the Current Monitoring Period from 12/03/2014 to 20/10/2018 (First and last date included) the project activity has achieved 565,556 tCO₂e GHG reductions.

Project Technology Details –

Project activity instances	Capacity	PV Modules	Inverters
Instance – 1 Bhadla	20 MW	36,288 nos. (245 Wp each) 52,488 nos. (250 Wp each) Manufactured by CSun	30 nos. (680 KVA each) Manufactured by Schneider
Instance – 2 Achampet	5 MW	18,340 nos. (300 Wp each) Manufactured by CSun	7 nos, (860 kVA each) Manufactured by Schneider Electric
Instance – 3 Kalwakurthy	10 MW	37,940 nos. (290 Wp each) Manufactured by CSun	14 nos, (680 kVA each) Manufactured by Schneider Electric
Instance – 4 Salakpur	10 MW	36,680 nos. (300 Wp each) Manufactured by YINGLI	14 nos, Manufactured by Schneider Electric of capacity 680 kVA each

Project activity instances	Capacity	PV Modules	Inverters
Instance – 5 Alladurg	10 MW	36,680 nos. (300 Wp each) Manufactured by CSUN	14 nos, (680 KVA) Manufactured by Schneider Electric
Instance – 6 Karnataka	20 MW	69,800 nos. (320/315 Wp each) Make Seraphim	30 nos. Schnidler make (680KW)
	20 MW	69,760 nos. (320/315 Wp each) Make Seraphim	30 nos. Schnidler make (680KW)
	20 MW	70,040 nos. (320/315 Wp each) Make Seraphim	30 nos. Schnidler make (680KW)
	17 MW	87,120 nos. (78,360- 320 Wp)	20 nos. Schnidler make (680KW)
Instance – 7 Vijaypur	6.8 MW	8,760-315 Wp each, Make Znshine Solar	10 nos. Schnidler make (680KW)
Instance – 8 Hotgi	0.8 MW	3,000 nos. (320 Wp each) Make Canadian solar	10 invertors, Deltaww
Instance – 9 Gotan	5 MW	Total 18,340, 8090- 325 Wp/ 10250- 330 Wp), Make- Canadian Solar	5 Invertors (Make- ABB Ltd) 1 MW each
Instance – 10 Sevagram	5 MW	15,520 nos. (320 Wp each) Make Emmvee	4 Invertors, TMEIC make
Instance – 11 Pune	0.8 MW	3,000 nos. (320 Wp each) Make Canadian solar	10 invertors, Deltaww

It is to be noted that in future there is possibility of change in module configuration of projects implemented, however project capacity of each instance will remain same as above. The timeline for Commission of the project activity is also checked by the assessment team. Assessment team checked the Commission of all the solar power plants via the commissioning Certificates and found correct. The project is implemented as per the description in the registered PD. No event observed during the current monitoring period which can alter or deviate from the methodology requirement. The details are as below:

Project activity instances	Title of the project activity	Location	Project Owner	Geo Coordinates
Instance – 1 Bhadla	VCS Project for Solar Power Plant at Bhadla, Rajasthan	Bhadla Solar Park, Village – Bhadla, Tehsil – Bap, District – Jodhpur, Rajasthan India	Essel Mining and Industries Ltd.	Latitude: 27.561° N Longitude: 71.929° E
Instance – 2 Achampet	VCS Project for Solar Power plant at Achampet, Telangana	5 MW Solar Power Plant, Achampet Village and Mandal, Dist. Mehaboobnagar, Telangana, India.		Latitude: 16.4° N Longitude: 78.6° E
Instance – 3 Kalwakurthy	VCS Project for Solar Power Plant at Kalwakurthy, Dist. Mehabubnagar,	Ternikal Village, Kalwakurthy Mandal, Dist. Mehaboobnagar, Telangana, India.		Latitude: 16.7° N Longitude: 78.5° E

Project activity instances	Title of the project activity	Location	Project Owner	Geo Coordinates
	Telangana			
Instance – 4 Salakpur	VCS Project for Solar Power Plant at Salakpur, Telangana	Village: Salakpur District: Warangal State: Telangana, India		Latitude: 17.89° N Longitude: 79.05° E
Instance – 5 Alladurg	VCS Project for Solar Power Plant at Alladurg, Telangana	Village: Bharamdhibba District: Medak State: Telangana, India		Latitude: 17.94° N Longitude: 77.92° E
Instance – 6 Karnataka	VCS Project for Solar Power Plant at Karnataka	Village: Bellatti, Shirahatti District: Gadag State: Karnataka, India	Aditya Birla Solar Limited	Latitude 15.09° N Longitude: 75.623° E
		Village: Chandargi, Kaktol, Ramadurg Taluk District: Belagavi State: Karnataka, India		Latitude: 16° 1'11.39"N, Longitude: 75° 7'41.11"E
		Village: Mulbangal, District: Kolar State: Karnataka, India		Latitude:13°05'04.4" N, Longitude:78°17'28.8" E
		Village: Devar Nimbargi, District: Vijayapura State: Karnataka, India	Aditya Birla Renewables Limited	Latitude: 17°15'1.53"N Longitude: 75°39'38.69"E
Instance – 7 Bijapur	VCS Project for Solar Power Plant at Vijaypur	Village: Devar Nimbargi, District: Vijayapura State: Karnataka, India	Aditya Birla Renewables SPV 1 Limited	Latitude: 17°15'1.53"N Longitude: 75°39'38.69"E
Instance – 8 Hotgi	VCS Project for Solar Power Plant at Hotgi, Maharashtra	Village: Hotgi, Tal South Solapur District: Solapur State: Maharashtra, India		Latitude: 17°33'27.58"N Longitude: 75°59'29.45"E
Instance – 9 Gotan	VCS Project for Solar Power Plant at Gotan, Rajasthan, India	Village: Kharia Khangar, Tehsil: Bhopalgarh District: Jodhpur State: Rajasthan, India		Latitude:26° 36' 25" N, Longitude:73° 41' 33" E
Instance – 10 Sevagram	VCS Project for Solar Power Plant at Sevagram, Gujrat	Village: Sevagram, Tal- Abdasa District: Kutch State: Gujarat, India		Latitude:23° 25' 44.55" N, Longitude:68° 42' 13.17" E
Instance – 11 Pune	VCS Project for Solar Power Plant at Pune, Maharashtra	Village: Peth, Tal Haveli, Dist Pune, Maharashtra, India		Latitude: 18.494475°N , Longitude:74.0970218° E

There was no activity at the site prior to implementation of the project activity (Greenfield). The electricity generated by the project is exported to the Indian grid. The project activity will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. Since Solar power is Greenhouse Gas (GHG) emissions free, the power generated will

prevent the anthropogenic gas emissions generated by fossil fuel based thermal power stations comprising coal, diesel, furnace oil and gas.

Assessment team confirms following during the verification site visit:

1. Start date of the project activity is 12/03/2014 as mentioned in the registered VCS PD
2. An undertaking has been submitted by PP for double counting with any other GHG program. PP also has given a written declaration that project has not claimed other form of GHG credit for the concerned monitoring period. Assessment team also checked that the projects are not registered under the REC mechanism of India and the same is cross-checked at <https://recregistryindia.nic.in>. PP has given a written declaration that the credit claimed under VCS for the current monitoring period is not claimed under any other GHG mechanism.
3. Assessment team confirms that this monitoring under VCS and covers the activity from 12/03/2014 to 20/10/2018 (inclusive of both dates). Project activity has Renewable crediting period of 21 years for the CDM project.
Thus VCS crediting period should be maximum of 10 years and renewed twice till end date of CDM crediting period.
Start date of crediting period for VCS verification: 12/03/2014 (Date of commissioning of first WTG)
The GHG credits from 12/03/2014 to 20/10/2018 (inclusive of both dates) will be claimed under VCS only. At any point of time during the crediting period, the project proponent will abide by the "Double Counting"
4. Assessment team checked and found that the Project proponent of the project activity is as below for the current monitoring period:

Organization name	Essel Mining and Industries Limited
Contact person	Mr. Surajit Chanda
Title	Authorized Signatory
Address	4C, Aditya Birla Centre, SK Ahire Marg, Mumbai – 400 030 (Maharashtra) INDIA
Telephone	+91-9873722454
Email	surajit.chanda@adityabirla.com

5. Assessment team also checked the details of other entity and found correct. The details are as below:

Organization name	EKI Energy Services Limited
Role in the project	Project Consultant

Contact person	Bhaskar Dutta
Title	Manager- Operations
Address	Office No. 201, EnKing Embassy, Plot No. 48, Scheme No. 78, Part II, Vijay Nagar INDORE – 452010, India.
Telephone	-
Email	bhaskar@enkingint.org

6. The quantified emission reduction calculation for the monitoring period is correct and conservative. Assessment team also compared actual VER with the estimated VER for all project activity instances combined and found that the actual VER is 8.24% higher than the estimated emission reduction which is due to higher PLF during current monitoring period. The current monitoring period involves variation in Solar isolation and PLF and this is nature dependent and not in control of PP. It is to be noted that there is no change in design of project activity as checked by the assessment team during the onsite visit and all the parameters has been monitored as per the Monitoring Plan mentioned in the Registered PDD, hence there is no any post registration changes applicable.

The comparison between estimated and actual ER for each project activity instance is as below. For few project activity PLF is higher than estimated, hence actual ER are higher than estimation. However this solar PLF is nature dependent and PP does not have any control on it. There is no any impact on scale, applicability and additionality of project activity instance due to this high PLF during current monitoring period.

Comparison Estimated Vs Actual Emission Reductions							
Project activity instances	Title of the project activity	COD	Operational days in current MP	Annual Estimation for 365 days	ER estimation for actual days	Actual ER	% Variation between Actual ER and estimated ER
Instance – 1 Bhadla	VCS Project for Solar Power Plant at Bhadla, Rajasthan	12/03/2014	1684	29270	135043	168548	24.81%
Instance – 2 Achampet	VCS Project for Solar Power plant at Achampet, Telangana	07/07/2014	1567	7171	30786	36621	18.95%
Instance – 3 Kalwakurthy	VCS Project for Solar Power Plant at Kalwakurthy, Dist. Mehabubnagar, Telangana	30/06/2014	1574	14524	62632	73985	18.13%

Comparison Estimated Vs Actual Emission Reductions							
Project activity instances	Title of the project activity	COD	Operational days in current MP	Annual Estimation for 365 days	ER estimation for actual days	Actual ER	% Variation between Actual ER and estimated ER
Instance – 4 Salakpur	VCS Project for Solar Power Plant at Salakpur, Telangana	17/09/2014	1495	14240	58325	67591	15.89%
Instance – 5 Alladurg	VCS Project for Solar Power Plant at Alladurg, Telangana	28/07/2014	1546	14679	62175	69654	12.03%
Instance 6 Karnataka	VCS Project for Solar Power Plant at Karnataka	11/05/2017	528	36410	52670	46411	-11.88%
		12/05/2017	527	36513	52719	47078	-10.70%
		13/10/2017	373	36599	37401	20325	-45.66%
		26/03/2018	209	26460	15151	18563	22.52%
Instance – 7 Bijapur	VCS Project for Solar Power Plant at Vijaypur	26/03/2018	209	10525	6027	7570	25.60%
Instance – 8 Hotgi	VCS Project for Solar Power Plant at Hotgi, Maharashtra	20/06/2018	123	1432	483	376	-22.15%
Instance – 9 Gotan	VCS Project for Solar Power Plant at Gotan, Rajasthan, India	01/02/2018	262	8956	6429	6511	1.28%
Instance – 10 Gujarat	VCS Project for Solar Power Plant at Sevagram, Gujarat	14/08/2018	68	8956	1669	1278	-23.43%
Instance – 11 Pune	VCS Project for Solar Power Plant at Pune, Maharashtra	01/02/2018	262	1388	996	1045	4.92%
					522506	565556	8.24%

2 VERIFICATION PROCESS

2.1 Method and Criteria

Verification Scope: The scope is defined as an independent and objective review of the Monitoring report (MR) prepared as per the registered PD and registered approved methodology ACM0002 Version 16, AMS-I.D Version 18 & AMS-I.F Version 03. The 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 ACM0002 Version 16, AMS-I.D Version 18 & AMS-I.F Version 03. The verification was based on the requirements in the CDM Validation and Verification Standard (VVS version 02 for the project activity), CDM project standard version 02 for the project activity, CDM project cycle procedure version 02 for the project activity and VCS program guideline and standard version 3.7

The 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 Monitoring report.

Verification Process: The project assessment is based on the "Clean Development Mechanism Validation and Verification Standard" version 02 for the project activity and "VCS standard and program 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:

1. A desk review of the Monitoring report against the registered PD and final validation report;
2. Follow-up interviews with project participant;
3. The resolution of outstanding issues and the issuance of the final verification report and opinion.

The prepared verification report and other supporting documents then undergo an internal quality control at the HQ (Accredited office) before being submitted to the VCS executive board.

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

Appointment of the assessment team

According to the 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
Dr. Atul Takarkhede	LA/TE	YES	YES	NA	YES
Mr. Denny Xue	TR	YES	YES	NA	NA

The detail regarding the assessment team is provided below in this report as Appendix 3

Document review

The Monitoring report version 1 submitted by the PP was reviewed against the approved methodology, registered PD, final validation report 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.

Resolution of Clarification and Corrective Action Request

The objective of this phase of the 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 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 verification process, the concerns raised and responses given are summarized below in the appendix 2.

The final MR Version 02 submitted by PP on 15/12/2018 & revised VCS PD version 4 dated 15/12/2018 serves as the basis for the final assessment presented. Additional changes to the project during the 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 verification of the final documentation including the 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 PP the positive verification opinion and relevant documents are submitted to the VCS board through the VCS web-platform

2.2 Document Review

The details of the document observed during the verification process are listed below in Appendix 1 of this report

2.3 Interviews

No .	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Verma	Amitabh	PP Representative	21/11/2018 to 24/11/2018	Implementation of the project and monitoring. Baseline emission calculation, achieved emission reduction for the monitoring period, monitoring process followed onsite	Dr. Atul Takarkhede
2	Kadali	Nagaraju	Engineer	21/11/2018 to 24/11/2018	Local Stakeholder Consultations	Dr. Atul Takarkhede
3.	Patil	Ramkrishna	Consultant	21/11/2018 to 24/11/2018	MR, ER Calculations etc.	Dr. Atul Takarkhede
4.	Dutta	Bhaskar	Consultants	21/11/2018 to 24/11/2018		

2.4 Site Inspections

Duration of on-site inspection: 21/11/2018 to 24/11/2018				
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. Assessment team also checked that whether the monitoring plan as described in the VCS PD is actually practised onsite. Also assessment team checked any change in host country criteria which may affect the baseline of the project activity. Assessment team also had a discussion with Local stakeholders and checked grievance register placed onsite as per the continuous improvement measure of PP for the Local villagers.	Karnataka, Maharashtra, Gujarat, Telangana, Rajasthan States of India	21/11/2018 to 24/11/2018	Dr. Atul Takarkhede

2.5 Resolution of Findings

The objective of this phase of the Verification was to resolve the requests for corrective actions and clarification and any other outstanding issues from validation which need to be clarified for Applus+ Certification's positive conclusion on the 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 verification process, the concerns raised and responses given are summarized below in the appendix 2.

The final MR Version 02 submitted by PP on 15/12/2018 & revised VCS PD version 4 dated 15/12/2018 serves as the basis for the final assessment presented. Additional changes to the project during the verification process are not considered to be significant with respect to the main CDM/VCS objectives except addition of new methodology AMS I F for project instances supplying electricity for captive consumption. 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	00	00
Description of project activity	00	02	00
Application of selected baseline and monitoring methodology and selected standardized baseline			
Applicability of methodology and standardized baseline	00	01	00
Deviation from methodology	00	00	00

Areas of validation and verification findings	No. of CL	No. of CAR	No. of FAR
Clarification on applicability of methodology, tool and/or standardized baseline	00	00	00
Project boundary	00	00	00
Establishment and description of baseline scenario	00	00	00
Demonstration of additionality	00	00	00
Emission reductions	00	02	00
Calibration details	00	01	
Monitoring plan	00	01	00
No Net harm assessment	00	00	
Local stakeholder consultation	00	01	
Others (please specify)-Matter related to breakdown details	00	00	00
PP declaration – Related to participation in other GHG program for the monitoring period			
Total	00	08	00

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

2.5.1 Forward Action Requests

This is 1st periodic verification of the project activity and no FAR raised from previous validation.

2.6 Eligibility for Validation Activities

This section is not applicable for present verification.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

This section is not applicable for present verification.

3.2 Methodology Deviations

This section is not applicable for present verification.

3.3 Project Description Deviations

There is a methodology addition for the project activity instances added in the grouped project, supplying electricity for the captive purpose and applicable methodology is AMS-I.F Version 03. The PP has obtained the clarification from the VCS and accordingly revised registered VCS PD and MR is submitted by PP. Audit team has assessed the impacts of the newly added methodology on the scale of the project activity, applicability of methodology and additionality of the grouped project activity.

Applicability of the methodology AMS-I.F Version 03:

The new methodology is added for the project instances under small scale which are supplying generated electricity for the captive consumption through dedicated internal grid. Auxiliary consumption is met by the state grid for which dedicated metering system is available. There is mutual contract between electricity supplier and the consumer. The instance added in the grouped project activity is meeting the applicability criteria of the AMS-I.F Version 03 and same is appropriately justified in the revised registered VCS PD submitted by the PP. Thus same has been accepted by the audit team.

Scale of the Grouped project activity:

There is no impact on the scale of the project activity as each project activity instance estimated Emission reductions are less than 300,000 tCO₂e, hence categorised as “projects”. Same has been checked by the audit team and found correct.

Additionality of the project activity:

There is no impact of the application of new methodology as the instances added falling under AMS-I.F Version 03 are small scale projects and falls under the the positive list of technologies that are automatically additional as mentioned above.

Monitoring Plan of the project activity:

There is no impact of the application of new methodology on the monitoring plan as the individual instances under grouped project are meeting the monitoring requirement of applied methodology under AMS-I.F Version 03.

3.4 Grouped Project

This is a grouped project. Essel Mining & Industries Limited (EMIL) and their group companies (hereafter referred as “*project proponent*”) have installed Renewable Energy Power Plants based on solar photovoltaic (PV) technology at various locations across India as a grouped project activity.

Following five project activity instances are being included in the grouped project at the time of registration:

Project activity instances	Project Owner	Title of the project activity	Location	Date of Commissioning	Estimated Annual Average ERs over a 10-year period
Instance – 1	Essel Mining and Industries Limited	VCS Project for Solar Power Plant at Bhadla, Rajasthan	Bhadla Solar Park, Village – Bhadla, Tehsil – Bap, District – Jodhpur, Rajasthan India	12/03/2014	29,270
Instance – 2		VCS Project for Solar Power plant at Achampet, Telagana	5 MW Solar Power Plant, Achampet Village and Mandal, Dist. Mehaboobnagar, Telangana, India.	07/07/2014	7,171
Instance – 3		VCS Project for Solar Power Plant at Kalwakurthy, Dist. Mehabubnagar, Telangana	Ternikal Village, Kalwakurthy Mandal, Dist. Mehaboobnagar, Telangana, India.	30/06/2014	14,524
Instance – 4		VCS Project for Solar Power Plant at Salakpur, Telangana	Village: Salakpur District: Warangal State: Telangana, India	17/09/2014	14,240
Instance – 5		VCS Project for Solar Power Plant at Alladurg, Telangana	Village: Bhiaramdhibba District: Medak State: Telangana, India	28/07/2014	14,679

Being grouped project activity, following project instances are added during this monitoring period. These new instances are also grid connected solar power plants generating renewable power and will contribute to GHG emission reductions.

The details of new project activity instances are as below

Project activity instances	Title of the project activity	Location	Project Owner	Date of Commissioning	Estimated Annual Average ERs over a 10-year period
Instance – 6	VCS Project for Solar Power Plant at Karnataka	Village: Bellatti, Shirahatti District: Gadag State: Karnataka, India	Aditya Birla Solar Limited	11/05/2017	36,410
		Village: Chandargi, Kaktol, Ramadurg Taluk District: Belagavi State: Karnataka, India		12/05/2017	36,513
		Village: Mulbangal, District: Kolar State: Karnataka, India		13/10/2017	36,599
		Village: Devar Nimbargi, District: Vijayapura State: Karnataka, India	Aditya Birla Renewables Limited	26/03/2018	26,460
Instance – 7	VCS Project for Solar Power Plant at Vijaypur	Village: Devar Nimbargi, District: Vijayapura State: Karnataka, India	Aditya Birla Renewables SPV 1 Limited	26/03/2018	10,525
Instance – 8	VCS Project for Solar Power Plant at Hotgi, Maharashtra	Village: Hotgi, Tal South Solapur District: Solapur State: Maharashtra, India		20/06/2018	1,432
Instance – 9	VCS Project for Solar Power Plant at Gotan, Rajasthan, India	Village: Kharia Khangar, Tehsil: Bhopalgarh District: Jodhpur State: Rajasthan, India		01/02/2018	8,956
Instance – 10	VCS Project for Solar Power Plant at Sevagram, Gujrat	Village: Sevagram, Tal- Abdasa District: Kutch State: Gujarat, India		14/08/2018	8,956
Instance – 11	VCS Project for Solar Power Plant at Pune, Maharashtra	Village: Peth, Tal Havelim Dist Pune, Maharastra, India		01/02/2018	1,388

Audit team has assessed the eligibility criteria for inclusion of the new project instances and found all instances added during this monitoring period are meeting eligibility for addition of new instances.

Sr. No.	Eligibility Criteria	Project Activity instances eligibility
1	Applicability Conditions: The project activity instances shall meet applicability conditions for applicable methodology	Details of applicability conditions for new project activity instances 6 to 11 as per respective methodologies as per registered PD including new methodology AMS-I.F Version 03 added has been assessed in section 3.3 of this report by audit team and found that the new instances are meeting eligibility criteria of the respective methodologies.
2.	Geographical Area: The project activity instances to be included in the grouped project activity will be activities involving grid connected renewable electricity generation using solar technology located within India	All the new project activity instances 6 to 11 are located within geographic boundaries of India.
3.	Baseline scenario: All Project Activity Instances shall meet the baseline definition as defined in respective methodology	The new project activity instances Instance 6 to 11 have same baseline scenario as per methodology as detailed in subsequent sections, hence this eligibility criteria is fulfilled.

Sr. No.	Eligibility Criteria	Project Activity instances eligibility
		Audit team assessed the validity of baseline scenario for application of new methodology AMS-I.F Version 03 and found that same is still valid. PP has justified baseline scenario appropriately.
4.	Technology type: The project activity instances to be included in the grouped project activity will be Greenfield activities involving grid connected renewable electricity generation using solar PV technology	The new project activity instances Instance 6 to 11 are solar PV power plants supplying electricity to grid and all are Green field projects. Hence this condition is fulfilled.
5.	Additionality: The project activity instances to be added as part of the grouped project will meet additionality criteria as set out in respective methodologies - for Small Scale Project instances the methodology applicable will be AMS-ID and for Large Scale Project instances methodology applicable will be ACM0002. For small scale projects as per CDM terminology, Tool for demonstration of additionality for small scale project activities will be used Further for inclusion of Large Scale project activity instances with solar photovoltaic technology in to the grouped project, following condition will be fulfilled at the time of inclusion of project activity instance into the grouped project for the project to be considered automatically additional as per positive list of technologies as per para 30 of ACM0002 ver 16: The percentage share of total installed capacity of the specific technology (solar PV) in the total installed grid connected power generation capacity in the host country is equal to or less than two per cent.	Project activity instance 6 is the large-scale project activity instance being included in the grouped project activity during current verification. The additionality of this new large-scale project activity instance is demonstrated using the latest version of the "Tool for the demonstration and assessment of additionality". Audit team assessed the additionality justification and found that the new instances added are additional. Refer section 3.4 of this report. As per CDM Tool for demonstration of additionality for small scale project activities, solar PV projects with capacity up to 15 MW fall in positive list of technologies termed as automatically additional. Hence project activity instances 7 to 11 which are added during current verification are small scale projects and are automatically additional.
6.	Start Date: The start date of each project activity instance under the grouped project should not be prior to the start date of the grouped project. The start date of each project activity instance will be determined through documentary evidence.	As the start date of all new project instances in grouped project is later than 12/03/2014 which is earliest commissioning date of project activity instance at Bhadla. This fulfill the condition requirement. Same is checked with the commissioning certificates of respective project instances.
7.	Conditions that avoid double counting of emission reductions like unique identifications of project and claiming emission reduction only	The existing and new project activity instances are identified by latitude and longitude and location of the plant. Declaration has been submitted by PP and also checked with REC registry of India and confirmed that

Sr. No.	Eligibility Criteria	Project Activity instances eligibility
	under one GHG program	these project activity instances are not participating in any other GHG program. Hence this condition is fulfilled.
8.	The Grouped Project specific requirements stipulated by the Entity responsible for coordinating and managing grouped project for conducting local stakeholder consultations and environmental impact assessment (EIA), as applicable.	Local stakeholder consultation has been conducted at the project site for initial project activity instances 1 to 5 and also new project activity instances 6 to 11. Details are mentioned in subsequent section of this document. There is no requirement for carrying out EIA for these projects in India, hence this condition is fulfilled.
9.	The project activity using solar PV project will supply electricity to grid	The existing and new project activity instances are solar PV power plants supplying electricity to grid. Hence this condition is fulfilled. Audit team checked the technical specifications of each project instance and verified during site visit.

Additionality Assessment of New Large Scale Instances added:

In the present verification one large scale project activity instance (Instance 6: Karnataka) has been added with a bundled total installed capacity of 77 MW. Baseline considerations for the project are based on approved consolidated baseline methodology ACM0002 (Version 16.0). The methodology requires the project investor to determine the additionality based on "Methodological Tool- Tool for the demonstration and assessment of additionality", Version 7.0.0.

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. 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 (29/02/2016).

The newly introduced White category of industries pertains to those industrial sectors which are practically non-polluting such as Biscuit trays etc. from rolled PVC sheet (using automatic vacuum forming machines), Cotton and woollen hosiers making (Dry process only without any dying/washing operation), Electric lamp (bulb) and CFL manufacturing by assembling only, Scientific and mathematical instrument manufacturing, Solar power generation through photovoltaic cell, wind power and mini hydel power (less than 25 MW).

There shall be no necessity of obtaining the "Consent to Establish/Operate" for White category of industries. Intimation to concerned SPCB / PCC is sufficient.

Being a renewable power project it falls under the category of White and thus these 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.

Due to above categorization of white category and being the renewable in nature, the project activity does not emit any emissions. Thus there are no any other surplus regulatory requirement for the project activity and found to be accepted by assessment team.

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 CDM Validation and Verification Standard for project activities version 02. In the Initial MR 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 thus acceptable to the assessment team. Assessment team however checked the Equity IRR calculation and found that input assumptions used for the calculation of Equity IRR are 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 85 Annex 12, "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 have calculated Benchmark based on WPI mean inflation rate. As per Para 7 of appendix A of EB 85, Annex 12, 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.

Benchmark estimation:

As per para 20 of EB 85, Annex 12 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 85, Annex 12 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = **11.10%**

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

Nominal Benchmark¹ = $\{(1+\text{Real Benchmark}) \times (1+\text{Inflation rate})\} - 1$

Where:

- Default value for Real Benchmark = 11.10% (as per Appendix of EB 85, Annex 12)
- Inflation Rate forecast for by Reserve Bank of India (RBI) (i.e. Central Bank of India) for India.

Appendix in EB 85, Annex 12 specifies default value of expected return on equity in real terms for Energy Industries (Group 1) in India = **11.10%**

Benchmark estimation:

Inflation Forecast for India as per RBI website²:

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	11.10%	EB 85 Annex 12	24/07/2015	14/11/2015
Inflation forecast (WPI Mean) as per RBI for 10yrs	3.60%	https://rbi.org.in/Scripts/PublicationsView.aspx?id=16696	29/09/2015	
Benchmark (with 10yrs Forecast)	15.10%	Calculated		

b) Parameters and assumptions used:

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

In the revised MR Version 02, the project cost is based on the DPR (Detailed project report)/offer letter. The details of the DPR/offer letter is as below:

Aditya Birla Renewables Ltd 17 MW Bijapur project

Project cost as per the Detailed Project Report

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	DPR Date
Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	926.7	28/07/2016

¹ As per Fisher Equation, https://en.wikipedia.org/wiki/Fisher_equation

² <https://rbi.org.in/Scripts/PublicationsView.aspx?id=16731>

Actual Project cost as per Company Balance Sheet

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	Audited Balance Sheet
Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	878.26	31/03/2018

Aditya Birla Solar Ltd 20 MW Mulbangal project

Project cost as per the Detailed Project Report

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	DPR Date
Mulbangal, Karnataka	Aditya Birla Solar Limited	20 MW	1112.9	30/06/2016

Actual Project cost as per Company Balance Sheet

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	Audited Balance Sheet
Mulbangal, Karnataka	Aditya Birla Solar Limited	20 MW	952.04	31/03/2018

Aditya Birla Solar Ltd 20 MW Ramadurg project

Project cost as per the Detailed Project Report

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	DPR Date
Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	1064.8	01/07/2016

Actual Project cost as per Company Balance Sheet

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	Audited Balance Sheet
Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	971.32	31/03/2018

Aditya Birla Solar Ltd 20 MW Sirahatti project

Project cost as per the Detailed Project Report

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	DPR Date
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Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	1034.6	04/07/2016
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Actual Project cost as per Company Balance Sheet

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	Audited Balance Sheet
Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	988.60	31/03/2018

DPR 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 MR Version 02 is correct and it is in line with Appendix of EB 85, Annex 12 as well as in compliance to CDM Validation and Verification Standard for project activities version 02. Hence, the project cost consideration is justified. Assessment team checked the actual project cost and still the project do not breach the benchmark. The sensitivity analysis below confirms 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/offer letter, 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.

PLF as per 3rd party PLF report/Offer Letter

Aditya Birla Renewables Ltd 17 MW Bijapur project

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)= 3 rd party engineering company	PLF (%)= As per actual generation	Date
Bijapur, Karnataka	Aditya Birla Renewables Limited	Bijapur, Karnataka	20.00%	20.7%	28/07/2016

Aditya Birla Solar Ltd 20 MW Mulbangal project

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)= 3 rd party engineering company	PLF (%)= As per actual generation	Date
Mulbangal, Karnataka	Aditya Birla Solar Limited	20	21.31%	22.7%	30/06/2016

Aditya Birla Solar Ltd 20 MW Ramadurg project

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)= 3 rd party engineering company	PLF (%)= As per actual generation	Date
Ramadurg, Karnataka	Aditya Birla Solar Limited	20	21.27%	22.9%	01/07/2016

Aditya Birla Solar Ltd 20 MW Sirahatti project

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)= 3 rd party engineering company	PLF (%)= As per actual generation	Date
Sirahatti, Karnataka	Aditya Birla Solar Limited	20	21.27%	22.9%	04/07/2016

1PLF estimation in offer letter is in line with Para 3 (b) Annex 11, EB 48 and acceptable to the assessment team. The deration factor for IRR calculation is sourced from offer letter 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/ Invoice

Aditya Birla Renewables Ltd 17 MW Bijapur project

Site Name	Name of the Investor/Owner/SPVs	Tariff Rate (as per DPR/Last 3 year Annual Report)	Tariff Rate (as per Invoice/PPA)
Bijapur, Karnataka	Aditya Birla Renewables Limited	4.42	4.42

Aditya Birla Solar Ltd 20 MW Mulbangal project

Site Name	Name of the Investor/Owner/SPVs	Tariff Rate (as per DPR/Last 3 year Annual Report)	Tariff Rate (as per Invoice/PPA)
Mulbangal, Karnataka	Aditya Birla Solar Limited	4.86	4.86

Aditya Birla Solar Ltd 20 MW Ramadurg project

Site Name	Name of the Investor/Owner/SPVs	Tariff Rate (as per DPR/Last 3 year Annual Report)	Tariff Rate (as per Invoice/PPA)
Ramadurg, Karnataka	Aditya Birla Solar Limited	4.92	4.92

Aditya Birla Solar Ltd 20 MW Sirahatti project

Site Name	Name of the Investor/Owner/SPVs	Tariff Rate (as per DPR/Last 3 year Annual Report)	Tariff Rate (as per Invoice/PPA)
Sirahatti, Karnataka	Aditya Birla Solar Limited	4.97	4.97

Validation team assessed the tariff and found that same value was available during decision making and in conformity with guidance Appendix of EB 85, Annex 12. Furthermore, assessment team has also checked the actual tariff in the Wheeling Agreement signed for further substantiation as these values are available during the validation stage. IRR is still below benchmark with the consideration of Wheeling Agreement signed which is valid for total operational lifetime of the project.

e) Assessment of O& M cost:**Aditya Birla Renewables Ltd 17 MW Bijapur project**

O&M as per DPR

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)	Date
Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	21.25	28/07/2016

The actual O&M agreements were also signed for individual PP and the values are mentioned in the below table. The IRR is still below the benchmark

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)	Date
Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	19.70	03/12/2017

Aditya Birla Solar Ltd 20 MW Mulbangal project

O&M as per DPR

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)	Date
Mulbangal, Karnataka	Aditya Birla Solar Limited	20 MW	25.0	30/06/2016

The actual O&M agreements were also signed for individual PP and the values are mentioned in the below table. The IRR is still below the benchmark

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)	Date
Mulbanga, Karnataka	Aditya Birla Solar Limited	20 MW	21.6	27/01/2017

Aditya Birla Solar Ltd 20 MW Ramadurg project

O&M as per DPR

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)	Date
Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	25.0	01/07/2016

The actual O&M agreements were also signed for individual PP and the values are mentioned in the below table. The IRR is still below the benchmark

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)	Date
Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	21.6	27/01/2017

Aditya Birla Solar Ltd 20 MW Sirahatti project

O&M as per DPR

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)	Date
Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	25.0	04/07/2016

The actual O&M agreements were also signed for individual PP and the values are mentioned in the below table. The IRR is still below the benchmark

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)	Date
Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	21.6	31/03/2018

The offer letter has been used in the financial calculation as same was available during decision making and hence applicable. According to Appendix of EB 85, Annex 12, the cost should be based on the input parameters available at the time of decision making and the PP has submitted offer letter 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 EB 85, Annex 12.

F) Assessment of Tax computation:

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

g)Cross checking parameters:

Aditya Birla Renewables Ltd 17 MW Bijapur project

Name of the parameter	DOE assessment												
Project Cost	The details of the proposed project activity as per DPR are given below.												
	<table><tr><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Project Cost (In Million)</th><th>Project cost in Million per MW</th></tr><tr><td>Aditya Birla Renewables Limited</td><td>17 MW</td><td>926.70</td><td>54.51</td></tr></table>				Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	Project cost in Million per MW	Aditya Birla Renewables Limited	17 MW	926.70	54.51	
	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	Project cost in Million per MW									
	Aditya Birla Renewables Limited	17 MW	926.70	54.51									
	The project cost has been considered from DPR which 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 PO and found that, the reduction in project cost is within the 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.													
<table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Project Cost (In Million)- Actual from PO</th><th>Project Cost (In Million) per MW- Actual from PO</th></tr><tr><td>Bijapur, Karnataka</td><td>Aditya Birla Renewables Limited</td><td>17 MW</td><td>878.26</td><td>51.66</td></tr></table>				Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)- Actual from PO	Project Cost (In Million) per MW- Actual from PO	Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	878.26	51.66
Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)- Actual from PO	Project Cost (In Million) per MW- Actual from PO									
Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	878.26	51.66									
	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 the respective state tariff orders and found that project cost considered for project is found to be appropriate. The assessment team also checked the state 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 PV 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: <table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Project Cost (In Million)</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Bijapur, Karnataka</td><td>Aditya Birla Renewables Limited</td><td>17 MW</td><td>926.70</td><td>3.76%</td><td>15.43%</td></tr></table> The IRR as per the actual project cost is defined as below: <table><tr><th>Site Name</th><th>Name of the Investor/Owner</th><th>Project Capacity (MW)</th><th>Actual project cost as per the Balance Sheet</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Bijapur, Karnataka</td><td>Aditya Birla Renewables Limited</td><td>17 MW</td><td>878.26</td><td>4.57%</td><td>15.43%</td></tr></table> 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.	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	IRR	Benchmark	Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	926.70	3.76%	15.43%	Site Name	Name of the Investor/Owner	Project Capacity (MW)	Actual project cost as per the Balance Sheet	IRR	Benchmark	Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	878.26	4.57%	15.43%
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Aditya Birla Renewables Limited	17 MW	21.25																							

	<table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>O&M (In Million) (Without tax)- Actual</th></tr><tr><td>Bijapur, Karnataka</td><td>Aditya Birla Renewables Limited</td><td>17 MW</td><td>19.70</td></tr></table>	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)- Actual	Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	19.70								
	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)- Actual													
	Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	19.70													
	The assessment team also checked the respective state 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 Report is as below:																
	<table><tr><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>O&M (In Million)</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Bijapur, Karnataka</td><td>Aditya Birla Renewables Limited</td><td>17 MW</td><td>3.76%</td><td>15.43%</td></tr></table>					Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million)	IRR	Benchmark	Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	3.76%	15.43%		
	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million)	IRR	Benchmark												
	Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	3.76%	15.43%												
	IRR value based on the actual O&M agreements signed is as below:																
	<table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>O&M (In Million) (Without tax)- Actual</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Bijapur, Karnataka</td><td>Aditya Birla Renewables Limited</td><td>17 MW</td><td>19.70</td><td>4.33%</td><td>15.43%</td></tr></table>						Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)- Actual	IRR	Benchmark	Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	19.70	4.33%
Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)- Actual	IRR	Benchmark												
Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	19.70	4.33%	15.43%												
Even after consideration of Actual O&M cost, 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 wind 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 Tariff rate has been considered from DPR and previous 3 years Annual Report 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.																	
<table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Tariff Rate as per DPR</th><th>Tariff Rate at present</th></tr><tr><td>Bijapur, Karnataka</td><td>Aditya Birla Renewables Limited</td><td>17 MW</td><td>4.42</td><td>4.42</td></tr></table>						Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate as per DPR	Tariff Rate at present	Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	4.42	4.42		
Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate as per DPR	Tariff Rate at present													
Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	4.42	4.42													

	IRR value as per the actual PPA signed between project owners and State electricity Board is as below: <table><tr><th>Site Name</th><th>Name of the Investor/Owner/SP Vs</th><th>Project Capacity (MW)</th><th>Tariff Rate (as per actual electricity bill)</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Bijapur, Karnataka</td><td>Aditya Birla Renewables Limited</td><td>17 MW</td><td>4.42</td><td>3.76%</td><td>15.43%</td></tr></table>	Site Name	Name of the Investor/Owner/SP Vs	Project Capacity (MW)	Tariff Rate (as per actual electricity bill)	IRR	Benchmark	Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	4.42	3.76%	15.43%																		
Site Name	Name of the Investor/Owner/SP Vs	Project Capacity (MW)	Tariff Rate (as per actual electricity bill)	IRR	Benchmark																										
Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	4.42	3.76%	15.43%																										
PLF	The details of the proposed project activity are given below. <table><tr><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>PLF (%)</th></tr><tr><td>Aditya Birla Renewables Limited</td><td>17 MW</td><td>18.05%</td></tr></table> Validation team assessed the Feasibility Report. 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. The PLF has been taken from the Feasibility Report, 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. IRR for PLF value as per the DPR = 3rd party report, Annex 11 EB 48 <table><tr><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>PLF (%)</th><th>IRR</th><th>Benchmark</th><th>Breaching Value</th></tr><tr><td>Aditya Birla Renewables Limited</td><td>17 MW</td><td>20.00 %</td><td>3.76%</td><td>15.43%</td><td>51.36%</td></tr></table> IRR against actual PLF value are as follows: <table><tr><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>PLF (%)</th><th>IRR</th><th>Benchmark</th><th>Breaching Value</th></tr><tr><td>Aditya Birla Renewables Limited</td><td>17 MW</td><td>20.7%</td><td>4.56%</td><td>15.43%</td><td>46.21%</td></tr></table>	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)	Aditya Birla Renewables Limited	17 MW	18.05%	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)	IRR	Benchmark	Breaching Value	Aditya Birla Renewables Limited	17 MW	20.00 %	3.76%	15.43%	51.36%	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)	IRR	Benchmark	Breaching Value	Aditya Birla Renewables Limited	17 MW	20.7%	4.56%	15.43%	46.21%
Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)																													
Aditya Birla Renewables Limited	17 MW	18.05%																													
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Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)	IRR	Benchmark	Breaching Value																										
Aditya Birla Renewables Limited	17 MW	20.7%	4.56%	15.43%	46.21%																										
Tax Rates	<table><tr><td>Income tax rate (%)</td><td>30.00%</td></tr><tr><td>MAT (Minimum Alternate tax) (%)</td><td>18.50%</td></tr><tr><td>Service Tax (%)</td><td>15.00%</td></tr></table> The above table shows the tax rate considered for individual project Owner and the same is	Income tax rate (%)	30.00%	MAT (Minimum Alternate tax) (%)	18.50%	Service Tax (%)	15.00%																								
Income tax rate (%)	30.00%																														
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	found suitable. 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. 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.
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Aditya Birla Solar Ltd 20 MW Mulbangal project

Name of the parameter	DOE assessment												
Project Cost	The details of the proposed project activity as per DPR are given below.												
	<table><tr><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Project Cost (In Million)</th><th>Project cost in Million per MW</th></tr><tr><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>1112.9</td><td>55.65</td></tr></table>				Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	Project cost in Million per MW	Aditya Birla Solar Limited	20 MW	1112.9	55.65	
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	Aditya Birla Solar Limited	20 MW	1112.9	55.65									
	The project cost has been considered from DPR which 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 PO and found that, the reduction in project cost is within the 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.													
<table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Project Cost (In Million)- Actual from PO</th><th>Project Cost (In Million) per MW- Actual from PO</th></tr><tr><td>Mulbangal, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>952.04</td><td>31.73</td></tr></table>				Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)- Actual from PO	Project Cost (In Million) per MW- Actual from PO	Mulbangal, Karnataka	Aditya Birla Solar Limited	20 MW	952.04	31.73
Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)- Actual from PO	Project Cost (In Million) per MW- Actual from PO									
Mulbangal, Karnataka	Aditya Birla Solar Limited	20 MW	952.04	31.73									
	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 the respective state tariff orders and found that project cost												

	considered for project is found to be appropriate. The assessment team also checked the state 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 PV 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: <table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Project Cost (In Million)</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Mulbangal, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>1112.9</td><td>7.22%</td><td>15.43%</td></tr></table> The IRR as per the actual project cost is defined as below: <table><tr><th>Site Name</th><th>Name of the Investor/Owner</th><th>Project Capacity (MW)</th><th>Actual project cost as per the Balance Sheet</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Mulbangal, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>952.04</td><td>10.45%</td><td>15.43%</td></tr></table> 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.	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	IRR	Benchmark	Mulbangal, Karnataka	Aditya Birla Solar Limited	20 MW	1112.9	7.22%	15.43%	Site Name	Name of the Investor/Owner	Project Capacity (MW)	Actual project cost as per the Balance Sheet	IRR	Benchmark	Mulbangal, Karnataka	Aditya Birla Solar Limited	20 MW	952.04	10.45%	15.43%
Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	IRR	Benchmark																				
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Name of the Investor	Project Capacity (MW)	O&M (In Million)																							
Aditya Birla Solar Limited	20 MW	25																							
Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)- Actual																						
Mulbangal, Karnataka	Aditya Birla Solar Limited	20 MW	21.60																						

PLF	The details of the proposed project activity are given below.																	
	<table><tr><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>PLF (%)</th></tr><tr><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>21.31%</td></tr></table>						Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)	Aditya Birla Solar Limited	20 MW	21.31%						
	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)															
	Aditya Birla Solar Limited	20 MW	21.31%															
	Validation team assessed the Feasibility Report. Same report has been used in the financials and the emission reduction calculation. PLF estimation by 3 rd party engineering company is in line with Para 3 (b) Annex 11, EB 48 and acceptable to the assessment team.																	
The PLF has been taken from the Feasibility Report, 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.																		
IRR for PLF value as per the DPR = 3 rd party report, Annex 11 EB 48																		
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	IRR against actual PLF value are as follows:																	
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Aditya Birla Solar Ltd 20 MW Ramadurg project

Name of the parameter	DOE assessment											
Project Cost	The details of the proposed project activity as per DPR are given below.											
	<table><tr><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Project Cost (In Million)</th><th>Project cost in Million per MW</th></tr><tr><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>1064.8</td><td>53.24</td></tr></table>	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	Project cost in Million per MW	Aditya Birla Solar Limited	20 MW	1064.8	53.24			
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	Aditya Birla Solar Limited	20 MW	1064.8	53.24								
	The project cost has been considered from DPR which 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 PO and found that, the reduction in project cost is within the 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.											
	<table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Project Cost (In Million)- Actual from PO</th><th>Project Cost (In Million) per MW- Actual from PO</th></tr><tr><td>Ramadurg, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>971.32</td><td>32.38</td></tr></table>	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)- Actual from PO	Project Cost (In Million) per MW- Actual from PO	Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	971.32	32.38	
	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)- Actual from PO	Project Cost (In Million) per MW- Actual from PO							
	Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	971.32	32.38							
	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.											
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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 PV projects. Also since the actual cost is available to DOE and IRR is still within benchmark and thus the same is acceptable.												
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<table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Project Cost (In Million)</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Ramadurg, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>1064.8</td><td>8.32%</td><td>15.43%</td></tr></table>	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	IRR	Benchmark	Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	1064.8	8.32%	15.43%
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O&M cost and Escalation in the operational expense =5(%)- Standard practice in India	The details of the proposed project activity are given below. <table><tr><th>Name of the Investor</th><th>Project Capacity (MW)</th><th>O&M (In Million)</th></tr><tr><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>25</td></tr></table> The O&M cost has been considered from DPR Report 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. <table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>O&M (In Million) (Without tax)- Actual</th></tr><tr><td>Ramadurg, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>21.60</td></tr></table> The assessment team also checked the respective state 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 Report is as below: <table><tr><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>O&M (In Million)</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Ramadurg, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>8.32%</td><td>15.43%</td></tr></table> IRR value based on the actual O&M agreements signed is as below: <table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>O&M (In Million) (Without tax)- Actual</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Ramadurg, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>21.6</td><td>9.21%</td><td>15.43%</td></tr></table>	Name of the Investor	Project Capacity (MW)	O&M (In Million)	Aditya Birla Solar Limited	20 MW	25	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)- Actual	Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	21.60	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million)	IRR	Benchmark	Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	8.32%	15.43%	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)- Actual	IRR	Benchmark	Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	21.6	9.21%	15.43%
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	Even after consideration of Actual O&M cost, 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 wind 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 Tariff rate has been considered from DPR and previous 3 years Annual Report 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. <table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Tariff Rate as per DPR</th><th>Tariff Rate at present</th></tr><tr><td>Ramadurg, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>4.86</td><td>4.86</td></tr></table> IRR value as per the actual PPA signed between project owners and State electricity Board is as below: <table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Tariff Rate (as per actual electricity bill)</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Ramadurg, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>4.86</td><td>8.32%</td><td>15.43%</td></tr></table>	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate as per DPR	Tariff Rate at present	Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	4.86	4.86	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate (as per actual electricity bill)	IRR	Benchmark	Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	4.86	8.32%	15.43%
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PLF	The details of the proposed project activity are given below.												
	<table><tr><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>PLF (%)</th></tr><tr><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>21.27%</td></tr></table>	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)	Aditya Birla Solar Limited	20 MW	21.27%						
	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)										
	Aditya Birla Solar Limited	20 MW	21.27%										
	Validation team assessed the Feasibility Report. Same report has been used in the financials and the emission reduction calculation. PLF estimation by 3 rd party engineering company is in line with Para 3 (b) Annex 11, EB 48 and acceptable to the assessment team.												
The PLF has been taken from the Feasibility Report, 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.													
IRR for PLF value as per the DPR = 3 rd party report, Annex 11 EB 48													
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Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)	IRR	Benchmark	Breaching Value								
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Aditya Birla Solar Ltd 20 MW Sirahatti project

Name of the parameter	DOE assessment											
Project Cost	The details of the proposed project activity as per DPR are given below.											
	<table><tr><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Project Cost (In Million)</th><th>Project cost in Million per MW</th></tr><tr><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>1034.6</td><td>51.73</td></tr></table>	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	Project cost in Million per MW	Aditya Birla Solar Limited	20 MW	1034.6	51.73			
	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	Project cost in Million per MW								
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	The project cost has been considered from DPR which 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 PO and found that, the reduction in project cost is within the 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.											
	<table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Project Cost (In Million)- Actual from PO</th><th>Project Cost (In Million) per MW- Actual from PO</th></tr><tr><td>Sirahatti, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>988.6</td><td>32.95</td></tr></table>	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)- Actual from PO	Project Cost (In Million) per MW- Actual from PO	Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	988.6	32.95	
	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)- Actual from PO	Project Cost (In Million) per MW- Actual from PO							
	Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	988.6	32.95							
	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.											
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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 PV 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:												
<table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Project Cost (In Million)</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Sirahatti, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>1034.6</td><td>8.45%</td><td>15.43%</td></tr></table>	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	IRR	Benchmark	Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	1034.6	8.45%	15.43%
Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost (In Million)	IRR	Benchmark							
Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	1034.6	8.45%	15.43%							
The IRR as per the actual project cost is defined as below:												

	<table><tr><th>Site Name</th><th>Name of the Investor/Owner</th><th>Project Capacity (MW)</th><th>Actual project cost as per the Balance Sheet</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Sirahatti, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>988.6</td><td>9.44%</td><td>15.43%</td></tr></table> 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.	Site Name	Name of the Investor/Owner	Project Capacity (MW)	Actual project cost as per the Balance Sheet	IRR	Benchmark	Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	988.6	9.44%	15.43%																								
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Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	O&M (In Million) (Without tax)- Actual	IRR	Benchmark																																
Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	21.6	9.36%	15.43%																																

	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 wind 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 Tariff rate has been considered from DPR and previous 3 years Annual Report 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. <table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Tariff Rate as per DPR</th><th>Tariff Rate at present</th></tr><tr><td>Sirahatti, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>4.97</td><td>4.97</td></tr></table> IRR value as per the actual PPA signed between project owners and State electricity Board is as below: <table><tr><th>Site Name</th><th>Name of the Investor/Owner/SPVs</th><th>Project Capacity (MW)</th><th>Tariff Rate (as per actual electricity bill)</th><th>IRR</th><th>Benchmark</th></tr><tr><td>Sirahatti, Karnataka</td><td>Aditya Birla Solar Limited</td><td>20 MW</td><td>4.97</td><td>8.45%</td><td>15.43%</td></tr></table>	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate as per DPR	Tariff Rate at present	Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	4.97	4.97	Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate (as per actual electricity bill)	IRR	Benchmark	Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	4.97	8.45%	15.43%
Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate as per DPR	Tariff Rate at present																			
Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	4.97	4.97																			
Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate (as per actual electricity bill)	IRR	Benchmark																		
Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	4.97	8.45%	15.43%																		

PLF

The details of the proposed project activity are given below.

Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)
Aditya Birla Solar Limited	20 MW	21.27%

Validation team assessed the Feasibility Report. 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.

The PLF has been taken from the Feasibility Report, 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.

IRR for PLF value as per the DPR = 3rd party report, Annex 11 EB 48

Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)	IRR	Benchmark	Breaching Value
Aditya Birla Solar Limited	20 MW	21.27%	8.45%	15.43%	24.17%

IRR against actual PLF value are as follows:

Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF (%)	IRR	Benchmark	Breaching Value
Aditya Birla Solar Limited	20 MW	22.5%	10.10%	15.43%	17.54%

Tax Rates

Income tax rate (%)	30.00%
MAT (Minimum Alternate tax) (%)	18.50%
Service Tax (%)	15.00%

The above table shows the tax rate considered for individual project Owner and the same is found suitable.

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.

	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.
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Sensitivity analysis:

The Guidance on Appendix of EB 85Annex 12 requires the robustness of the conclusion arrived at to be proved through a sensitivity analysis by varying the critical assumptions to a reasonable variation. The project developer has identified Plant Load Factor (PLF), Project cost, Electricity tariff and O&M cost as critical assumptions. These critical parameters constitute more than 20% of either total project costs or total project revenues. The sensitivity analysis reveals that even under more favourable conditions, the IRR without CDM revenue would not cross the benchmark return.

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.

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

Aditya Birla Renewables Ltd 17 MW Bijapur project

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost	Actual Project Cost	Variation	Breaching Value for Project cost
Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	926.70	878.26	5%	-41.39%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	DPR O&M Cost	Actual O&M Cost from PO	Variation in OM cost	Breaching value for OM Cost
Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	21.25	19.7	20.3%	-210.87%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate as per DPR	Actual Tariff Rate from PPA	Variation in Tariff Rate	Breaching value
Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	4.42	4.42	0%	51.36%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF as per DPR	PLF as per JMR	Variation in PLF	Breaching value
Bijapur, Karnataka	Aditya Birla Renewables Limited	17 MW	20.00%	20.5%	8%	51.36%

Aditya Birla Solar Ltd 20 MW Mulbangel project

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost	Actual Project Cost	Variation	Breaching Value for Project cost
Mulbangal, Karnataka	Aditya Birla Solar Limited	20 MW	1112.90	952.04	14%	-28.93%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	DPR O&M Cost	Actual O&M Cost from PO	Variation in OM cost	Breaching value for OM Cost
Mulbangal, Karnataka	Aditya Birla Solar Limited	20 MW	25	21.6	24%	-150.33%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate as per DPR	Actual Tariff Rate from PPA	Variation in Tariff Rate	Breaching value
Mulbangal, Karnataka	Aditya Birla Solar Limited	20 MW	4.86	4.86	0%	31.27%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF as per DPR	PLF as per JMR	Variation in PLF	Breaching value
Mulbangal, Karnataka	Aditya Birla Solar Limited	20 MW	21.31%	22.5%	8%	31.27%

Birla Solar Ltd 20 MW Ramadurg project

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost	Actual Project Cost	Variation	Breaching Value for Project cost
Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	1064.8	971.32	9%	-24.72%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	DPR O&M Cost	Actual O&M Cost from PO	Variation in OM cost	Breaching value for OM Cost
Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	25	21.6	24%	-122.97%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate as per DPR	Actual Tariff Rate from PPA	Variation in Tariff Rate	Breaching value
Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	4.92	4.92	0%	25.31%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF as per DPR	PLF as per JMR	Variation in PLF	Breaching value
Ramadurg, Karnataka	Aditya Birla Solar Limited	20 MW	21.27%	22.5%	8%	25.31%

Aditya Birla Solar Ltd 20 MW Sirahatti project

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Project Cost	Actual Project Cost	Variation	Breaching Value for Project cost
Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	1034.6	988.6	4%	-23.84%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	DPR O&M Cost	Actual O&M Cost from PO	Variation in OM cost	Breaching value for OM Cost
Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	25	21.6	24%	-119.8%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	Tariff Rate as per DPR	Actual Tariff Rate from PPA	Variation in Tariff Rate	Breaching value
Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	4.97	4.97	0%	24.17%

Site Name	Name of the Investor/Owner/SPVs	Project Capacity (MW)	PLF as per DPR	PLF as per JMR	Variation in PLF	Breaching value
Sirahatti, Karnataka	Aditya Birla Solar Limited	20 MW	21.27%	22.5%	8%	24.17%

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 7³:

1. Applicable Geographical Area (Para 9): The Karnataka has been considered as the applicable geographical area for this project. PP had considered these states as 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

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

the appointed date, by notification, constitute for the purposes of this Act, a Commission for the State to be known as the (name of the State) Electricity Regulatory Commission” Appropriateness of the same has been checked and confirmed from EA 2003 (<http://www.cercind.gov.in/08022007/Act-with-amendment.pdf/40/>).

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

- Electricity Act 2003 (EA 2003) has changed the legal and regulatory framework for the renewable energy sector in India. The EA 2003 mandates policy formulation to promote renewable sources of energy by the federal government, the State governments and the State Electricity Regulatory Commissions (=SERCs) within their jurisdictions.
- The Electricity Act 2003 introduced some enabling provisions conducive to accelerated development of grid connected renewable energy sources. Under Section 61(h), promotion of cogeneration and generation of electricity from renewable sources of energy has been made the explicit responsibility of SERCs, which are bound by law to take these considerations into account while drafting their terms and conditions for tariff regulations. Nearly all SERCs have issued their tariff regulations incorporating suitable clauses, which will enable them to provide a preferential treatment to renewable energy (RE) during the tariff determination process. The SERCs determine the tariff for all renewable energy projects across the States, and the state-owned power Distribution Companies (DISCOMs) ensure grid connectivity to the renewable energy project sites.
- EA 2003 has initiated the adoption of the National Tariff Policy, 2006 as one of the key policies, National Tariff Policy (2006) framed under the Section 3 of the EA 2003. As per the excerpt from National Tariff Policy, 2006; pursuant to provisions of section 86(1)(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 01/04/2006.
- As mandated under section 86(1)(e) of the Electricity Act (2003), by 26/06/2012 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 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.

For the concerned project activity, Common Practice Analysis has been carried out for 77 MW capacity solar Power Project at Karnataka which is developed by **Aditya Birla Solar Limited**.

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%	115.5	MW
Capacity of the proposed project activity	77	MW
-50%	38.5	MW

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) As the projects are located in Karnataka of India, therefore, projects in the geographical area of Karnataka has been chosen for analysis. The project activity involves generation of electricity from solar energy. The project activity is located in the state of Karnataka in India and the policy applicable for the solar projects is regulated by respective state policy. The policies/tariff for each state is regulated by State Electricity Regulatory Commissions of respective states and they differ for respective states. The project implemented in Karnataka is claimed as different since the policies and regulations differ in each state. Each state has different policies regarding renewable energy, hence Karnataka is considered as geographical region for common practise analysis.

b) 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) The energy source used by the project activity is solar energy. Hence, only solar energy projects have been considered for analysis.

d) The project activity produces electricity; therefore, all power plants that produce electricity are candidates for similar projects.

e) The capacity range of the projects is within the applicable capacity range from 115.5 MW to 38.5 MW.

f) The start date of the concerned project activity is 11/05/2017. Therefore projects, which have started commercial operation before 11/05/2017, have been considered for analysis.

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

$N_{\text{solar}} = 6$

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} .

CDM project activities, which have got registered or are under validation have been excluded in this step. The list of the power plants identified is provided to the DOE. After excluding the registered and under validation projects the total number of projects.

$N_{\text{all}} = 3$

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 – Since project activity is large scale project, small and micro scale projects are considered as different technology project. Based on this criteria, there are no any different technology project out of similar identified projects.

2. Investment climate on the date of the investment decision – 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.

$N_{diff} = 0$

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

$$F = 1-(0/3) = 1$$

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. $N_{all} - N_{diff} = 0$; is not greater than 3

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

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the verification site visit it was concluded that the project is implemented as per the requirement of the registered PD and Final Validation report. During the current monitoring period it was observed that no unforeseen incident/event evolved which can impact the operation of the project activity. The project undergone continuous operation and only scheduled maintenance is observed as per the manufactures specification which is acceptable to the assessment team.

All the 11 project instances i.e. renewable energy generation plants to be included in this grouped project will be from within India only comprising total capacity 150.4 MW. Out of 11 project instances, 6 instances are included during this monitoring period as below:

Project activity instances	Title of the project activity	Location	Project Owner	Date of Commissioning	Geo-coordinates
Instance – 6	VCS Project for Solar Power Plant at Karnataka	Village: Bellatti, Shirahatti District: Gadag State: Karnataka, India	Aditya Birla Solar Limited	11/05/2017	Latitude 15.09° N , Longitude: 75.623° E
		Village: Chandargi, Kaktol, Ramadurg Taluk District: Belagavi State: Karnataka, India		12/05/2017	Latitude: 16.021° N, Longitude: 75.127° E
		Village: Mulbangal, District: Kolar State: Karnataka, India		13/10/2017	Latitude:13°05'04.4" N, Longitude:78°17'28.8" E
		Village: Devar Nimbargi, District: Vijayapura State: Karnataka, India	Aditya Birla Renewables Limited	26th Mar 2018	Latitude:17.250426° N , Longitude:75.660746° E
Instance – 7	VCS Project for Solar Power Plant at Vijaypur	Village: Devar Nimbargi, District: Vijayapura State: Karnataka, India	Aditya Birla Renewables SPV 1 Limited	26/03/2018	Latitude:17.250426°N Longitude: 75.660746°E
Instance – 8	VCS Project for Solar Power Plant at Hotgi, Maharashtra	Village: Hotgi, Tal South Solapur District: Solapur State: Maharashtra, India		20/06/2018	Latitude:17.55953712°N Longitude:76.00214484°E
Instance – 9	VCS Project for Solar Power Plant at Gotan, Rajasthan, India	Village: Kharia Khangar, Tehsil: Bhopalgarh District: Jodhpur State: Rajasthan, India		01/02/2018	Latitude:26° 36' 25" N, Longitude:73° 41' 33" E
Instance – 10	VCS Project for Solar Power Plant at Sevagram, Gujarat	Village: Sevagram, Tal- Abdasa District: Kutch State: Gujarat, India		14/08/2018	Latitude:23° 25' 44.55" N, Longitude:68° 42' 13.17" E
Instance – 11	VCS Project for Solar Power Plant at Pune, Maharashtra	Village: Peth, Tal Havelim Dist Pune, Maharashtra, India		01/02/2018	Latitude: 18.494475°N , Longitude:74.0970218°E

Project location of newly added project instances are confirmed by the assessment team during the site visit. Assessment team also checked with the GPS meter regarding the latitude and longitude of the project site and confirm that the details as mentioned in the MR are correct. Assessment team also checked the Technical details of the solar power plants installed onsite. The same is checked during the onsite visit from the number plate capacity of modules and also cross checked from the technical manual of the Manufactures. The detail is as below:

Project activity instances	Capacity	PV Modules	Inverters
Instance – 1 Bhadla	20 MW	36,288 nos. (245 Wp each) 52,488 nos. (250 Wp each) Manufactured by CSun	30 nos.(680 KVA each) Manufactured by Schneider
Instance – 2 Achampet	5 MW	18,340 nos. (300 Wp each) Manufactured by CSun	7 nos, (860 kVA each) Manufactured by Schneider Electric
Instance – 3 Kalwakurthy	10 MW	37,940 nos. (290 Wp each) Manufactured by CSun	14 nos, (680 kVA each) Manufactured by Schneider Electric
Instance – 4 Salakpur	10 MW	36,680 nos. (300 Wp each) Manufactured by YINGLI	14 nos, Manufactured by Schneider Electric of capacity 680 kVA each
Instance – 5 Alladurg	10 MW	36,680 nos. (300 Wp each) Manufactured by CSUN	14 nos, (680 KVA) Manufactured by Schneider Electric
Instance – 6 Karnataka	20 MW	69,800 nos. (320/315 Wp each) Make Seraphim	30 nos. Schnidler make (680KVA)
	20 MW	69,760 nos. (320/315 Wp each) Make Seraphim	30 nos. Schnidler make (680KVA)
	20 MW	70,040 nos. (320/315 Wp each) Make Seraphim	30 nos. Schnidler make (680KVA)
	17 MW	87,120 nos. (78,360- 320 Wp	20 nos. Schnidler make (680KVA)
Instance – 7 Vijaypur	6.8 MW	8,760-315 Wp each, Make Znshine Solar	10 nos. Schnidler make (680KVA)
Instance – 8 Hotgi	0.8 MW	3,000 nos. (320 Wp each) Make Canadian solar	10 invertors, Deltaww
Instance – 9 Gotan	5 MW	Total 18,340, 8090- 325 Wp/ 10250- 330 Wp), Make- Canadian Solar	5 Invertors (Make- ABB Ltd) 1 MW each
Instance – 10 Sevagram	5 MW	15,520 nos. (320 Wp each) Make Emmvee	4 Invertors, TMEIC make
Instance – 11 Pune	0.8 MW	3,000 nos. (320 Wp each) Make Canadian solar	10 invertors, Deltaww

Assessment team checked the commissioning certificate and confirmed that the dates of Commission for the solar power plants are correct.

The assessment team confirmed that there is no proposed or actual change to the project design during this monitoring period. The project design as mentioned in the registered VCS PD & monitoring report submitted is implemented and thus the same is acceptable to the assessment team. All required monitoring equipment's and procedures as mentioned in the registered VCS PD & monitoring report are available and implemented in an appropriate manner.

The organisational role and responsibility as mentioned in the registered VCS PD & monitoring report is followed onsite. All the monitoring equipment was calibrated as per the specified interval in the registered VCS PD & monitoring report. No delay is observed in Calibration for the current monitoring period. All the emergency preparedness as mentioned in the registered VCS PD & monitoring report is followed onsite and no discrepancies were found regarding the same.

It was also observed during the verification process that project is not rejected by any other GHG program around the world. Declaration in that effect is also provided by PP.

The assessment team observed that the project is in line with the registered VCS PD, monitoring report, Validation report and approved methodology except there are project activity instances 8 to 11 which follows AMS-I.F methodology, thus deviation has been requested to add AMS-I.F methodology in the grouped project activity and VCS PD is revised accordingly. The eligibility criteria, applicability, base line scenario, additionality, monitoring plan is justified in line with AMS-I.F for new 4 project activity instances and found inline and hence accepted by assessment team.

Impact of this deviation on the determination of the baseline, additionally, applicability conditions and new eligibility criteria for new project activity instances of this new project activity type, has been assessed by the assessment team and found inline with the requirements.

4.2 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 VCS PD. 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 02, CAR 4 & CAR 8 was raised during the verification process and closed successfully. Please refer Appendix 2 of this report for the detail closure of the CAR
Conclusion	The baseline Emissions for a given year is calculated by multiplying the energy baseline (EB) with the regional grid emission factor. Formula Used:- $BE_y = EG_{PJ, facility, y} * EF_{Grid, CM, y}$ Where, BE_y baseline emissions, tCO₂e $EG_{PJ, facility, y}$ = Quantity of net electricity generation that is generated and fed into the grid or grid electricity displaced as a result of the implementation of the CDM project activity in year y (MWh) $EF_{Grid, CM, y}$ = Combined margin CO₂ emission factor for grid connected power generation For the project instances applying methodology AMS I.F. baseline emissions are being calculated as follows: $BE_y = EG_{BL, y} * EF_{CO2, CM, y}$ Where $EG_{BL, y}$ = Quantity of net electricity displaced in year y $EF_{CO2, CM, y}$ = Combined margin CO₂ emission factor for grid connected power generation Where $EF_{Grid, CM, y} = EF_{CO2, CM, y}$ <u>Ex ante Parameters:</u> $EF_{Grid, CM, y}$ was mentioned as ex-ante fixed parameter. Assessment team checked the values, source of data, choice of data, purpose of the data mentioned in the MR from the registered PDD and confirms that the similar approach was considered for the current monitoring period also. For AMS I.F component project activity instances, the project activity displace

electricity from national grid, hence same grid emission factor is considered for current AMS I.F project activity instances.

The values are 0.9770 for NEWNE grid and 0.9817 for Southern grid

$EF_{grid,CM,y} / EF_{CO2,CM,y}$: Combined Margin emissions factor for grid connected power generation in year y calculated using the latest version of "Tool to calculate the emission factor for an electricity system. Combined Margin is computed using the official data sources and is in-line with the guidance provided in the tool. The value is considered from CEA version 05 and registered PD. Assessment team checked the registered PD and found that value considered for emission reduction calculation in this present monitoring period is sourced from the registered PD. Thus assessment team conclude that the emission reduction calculation for the present monitoring period is conservative and correct.

Ex-post parameter:

As per the registered monitoring plan and requirement of the registered methodology following parameters needs to be monitored:

(a) Net electricity supplied to the grid by the project activity instance during the year y ($EG_{PJ, facility,y}$) – This parameter is a calculated parameter, and is deduced as the difference between Electricity exported and electricity imported by the project activity. The verification team verified the net electricity supplied by all the power plants of the project activity to the grid from the monthly Credit note issued by the respective State utility on a monthly basis. The verification team noted that the monthly energy statement also indicates the values of the electricity export and electricity import. Based on this statement, the Project Participant raises an invoice on respective state utility for payment, subsequent to which payments are made. The verification team cross-checked the values of the net electricity supplied values indicated in the energy statement with the invoices raised by the Project Participant. The verification team confirms that all the values of net electricity supplied to the grid are sourced from the monthly Credit Notes and are correct.

(b) Net electricity displaced by the project activity instance during the year y (for AMS-I.F component) ($EG_{BL,y}$) – Electricity displaced by the project i.e electricity consumed by consumer is recorded by the energy meters at respective metering point. The meter readings are taken by the representatives of the consumer party and Project participant on a monthly basis. In the form of Joint Meter Reading (JMR). This was further crosschecked with the invoices raised by the Project participant on consumer and was found to be correct.

Baseline Emissions:

Project activity instances	Location	Net Electricity supplied to grid/displaced by project	Total ER achieved
Instance – 1 Bhadla	Bhadla Solar Park, Village – Bhadla, Tehsil – Bap, District – Jodhpur, Rajasthan India	172516.54	168548

	Instance – 2 Achampet	5 MW Solar Power Plant, Achampet Village and Mandal, Dist. Mehaboobnagar, Telangana, India.	37303.78	36621
	Instance – 3 Kalwakurthy	Ternikal Village, Kalwakurthy Mandal, Dist. Mehaboobnagar, Telangana, India.	75364.50	73985
	Instance – 4 Salakpur	Village: Salakpur ,District: Warangal ,State: Telengana, India	68851.54	67591
	Instance – 5 Alladurg	Village: Bhiaramdhibba,District: Medak,State: Telengana, India	70953.36	69654
	Instance 6 Karnataka	Village: Bellatti, Shirahatti,District: Gadag,State: Karnataka, India	47276.63	46411
		Village: Chandargi, Kaktol, Ramadurg Taluk,District: Belagavi,State: Karnataka, India	47956.06	47078
		Village: Mulbangal, District: Kolar,State: Karnataka, India	20703.93	20325
		Village: Devar Nimbargi, District: Vijaypura,State: Karnataka, India	18909.09	18563
	Instance – 7 Bijapur	Village: Devar Nimbargi, District: Vijaypura,State: Karnataka, India	7711.96	7570
	Instance – 8 Hotgi	Village: Hotgi, Tal South Solapur,District: Solapur ,State: Maharashtra, India	384.89	376
	Instance – 9 Gotan	Village: Kharia Khangar, Tehsil: Bhopalgarh,District: Jodhpur, State: Rajasthan, India	6664.94	6511
	Instance – 10 Gujarat	Village: Sevagram, Tal- Abdasa, District: Kutch,State: Gujarat, India	1308.35	1278
	Instance – 11 Pune	Village: Peth,District: Pune,State: Maharashtra, India	1070.50	1045
		Total	576976.06	565,556
The project activity involves in harnessing Solar power. So the emissions from the				

	project are zero. Leakage emission is not applicable as per the applied methodologies. As per the applied methodology, project and leakage emissions are zero, hence emission reductions are calculated as follows: $ER_y = BE_y$ $= 565,556 \text{ tCO}_2\text{e} = 565,556 \text{ tCO}_2\text{e (rounded down)}$ Where: ER_y = Emission reductions in year y ($\text{tCO}_2\text{e/yr}$) BE_y = Baseline emissions in year y ($\text{tCO}_2\text{e/yr}$)
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4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the Calibration details of the monitoring meters with the calibration certificates.
Findings	CAR 05 was raised during the verification process. The description of the CAR and its closure is described below in Appendix 2 of this report
Conclusion	The metering arrangement is bi-directional energy meters (main and check) at the State Electricity Board (SEB) substation and plant sites. These meters record several parameters including electricity exported & imported. These electricity meters are being used by state electricity board for JMR. Assessment team found that Since metering arrangement, monitoring practice, accuracy class, calibration interval is under control of state electricity board, the PP do not have all calibration certificates available with them. The details of the Calibration is presented in Appendix 5 Assessment team confirms that all the energy meters (both main and check meter) installed at the substation are of accuracy class of 0.2s and are calibrated as per the national standards followed by the electricity board and calibration frequency as per registered VCS PD is at least once in five years. There were no delay in calibration except Instance – 6: Shirahatti, Karnataka for main meter Sr. No. 16102125 from May 2017 to August 2017. Assessment team checked the same and found correct. The calibration of the monitoring meters is done through accredited by NABL (National Accreditation Board for Laboratory, Govt of India) to carry out the testing of the meters which is as per the national regulation and thus traceability of the Calibration is also confirmed by the assessment team.

4.4 Non-Permanence Risk Analysis

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
NA	NA	NA	NA	NA

5 SAFEGUARDS

5.1 No Net Harm

No potential environment or socio-economic matter was found during the site visit. The project is renewable energy project and thus no negative impact observed onsite.

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. The report on “Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects” prepared by MNRE dated September 2013. This report clearly mentioned that Solar power project activity operations do not result in direct air pollution, noise pollution. Moreover, also as per the Central Pollution Control Board of India notification⁴ solar project falls under White Category and are practically non-polluting.

However, assessment team still conducted the No net harm assessment for some of the parameters and the result is described below.

SL.NO	Indicator	Assessment team opinion
1	Air quality	The project generates clean energy which replaces the fossil fuel intensive electricity generation. 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 power plant operations do not result in direct air pollution. 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 implemented on ground for air quality issues project will have a positive impact on air quality.
3	Soil condition	There are negligible impacts envisaged during operation of the project activity. 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. The top soil excavated during construction, was stockpiled and used for

⁴ http://envfor.nic.in/sites/default/files/Latest_118_Final_Directions.pdf

		compaction. The roads were not paved and soling was done with excavated earth & rock material, so land disturbance could be minimized. 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. Therefore, it can be concluded that the project has no effect on soil conditions during its operation because it has no waste coming out.
4	Biodiversity	During the validation site visit it was observed that the condition of ground vegetation will be gradually improved; No rare species has been found in the around area. The project site is not on the migration route of migratory bird. As Such Solar plants do not have any obstruction in the path of migratory birds. With the implementation of Project, the greening water will be increased significantly; the biodiversity in the vicinity will be improved with the vegetation improvement. No negative impact envisaged.
5	Employment Generation	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.
6	Livelihood of the poor	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 power project. Positive impact envisaged. .

5.2 Local Stakeholder Consultation

All the stakeholders are happy with the implementation and operation of the project activity and no negative comments envisaged for the project activity. There was no change in technical project description form the registered VCS PD. Assessment team confirmed the same during the verification site visit. Also, as best practice method PP also placed a grievance register onsite to record any grievance from the stakeholders during and after the implementation of the project activity. Assessment team checked the grievance register maintained onsite and no negative comments were observed for the project activity. Local people are happy as the project generated employment opportunities and thus the living standards in and around the vicinity of the project is increased and thus assessment team confirms that local stakeholders have no issue with this project activity after implementation and continuous operation.

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

Name of the stakeholder	Nagaraju Kadali
Occupation	Site Engineer
DOE QUESTION: Did due to project activity employment opportunity increased?	
Answer: Yes, due to project activity local employment opportunities increased in O&M and other services.	
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.

DOE questions: Did the power plant emit any harmful pollutants?

Answer: NO the plant does not emit any harmful pollutants.

6 VERIFICATION CONCLUSION

Applus+ Certification has been engaged by Essel Mining & Industries Limited to perform the 1st periodical verification of the "VCS Grouped Project for Renewable Power Generation by Essel Mining & Industries Limited"

The management of Essel Mining & Industries Limited is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project's Monitoring Plan in the registered VCS PD and the applied methodology ACM0002 Version 16, AMS-I.D Version 18 & AMS-I.F Version 03

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 team 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.

Verification period: 12/03/2014 to 20/10/2018 (inclusive of both days)

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)
2014	52,694	0	0	52,694
2015	95,689	0	0	95,689
2016	95,613	0	0	95,613
2017	136,515	0	0	136,515
2018	185,045	0	0	185,045
Total	565,556	0	0	565,556

APPENDIX 1: DOCUMENTS REVIEWED OR REFERENCED (VERIFICATION)

No.	Author	Title	References to the document	Provider
1.	NA	Commissioning certificates of the solar plants implemented in the project site.	NA	Project participant
2.	NA	Contract of the project participant with the DOE	Contract document signed between PP and DOE	Project participant
3.	NA	Technical specifications of solar power plants from manufacturers	Manufacturer technical specifications	Project participant
4.	NA	Registered PD dated 26/02/2016 version 3. Revised VCS PD dated 15/12/2018 version 4	NA	Project participant
5.	NA	Registered Final Validation report 05/03/2016 version 02	NA	Project participant
6.	NA	Actual Emission Calculation sheet version 01 Actual Emission Calculation sheet version 02	ER sheet Dated 10/10/2018 ER sheet Dated 15/12/2018	Project participant
7.	NA	MR version 01 MR version 02	10/10/2018 15/12/2018	PP
8.	NA	The operational lifetime of the project activity from the manufacturer=(Technical specifications)	Manufacturer technical specifications	Project participant
9.	NA	RBI: Reserve Bank of India www.rbi.org.in Ministry of Environment and forest: www.envfor.nic.in UNFCCC www.cdm.unfccc.int CEA: Central electricity authority www.cea.nic.in Income tax act 1961 http://law.incometaxindia.gov.in/DIT/ VCS: Verified Carbon Standard www.v-c-s.org	Reference link is provided.	Independent Search
10.	NA	Tools/ guidelines used in the project activity • Tool to calculate the emission factor for an electricity system (Version 5.0) • Tool for the demonstration and assessment of additionality", (Version 7.0.0) • Combined tool to identify the baseline scenario and demonstrate additionality (version 06.0.0) • Demonstration of additionality for small scale project activities (version 12.0) • Glossary of CDM terms version 07 • VCS verification report template version 03	UNFCCC CDM/VCS web site	UNFCCC

11.	NA	Share reports/Monthly statement for the complete monitoring period	Share reports/Monthly statement for the complete monitoring period	PP
12.	NA	Invoices for the complete monitoring period	Invoice	PP
13.	NA	Break down details of the complete monitoring period	Log sheet	PP
14.	NA	Declaration regarding no participation in other GHG program for the concerned monitoring period	Declaration dated 15/12/2018	PP
15.	NA	Estimated Emission Calculation sheet version 01 Estimated Emission Calculation sheet version 02	ER sheet Dated 10/10/2018 ER sheet Dated 15/12/2018	Project participant
16.	NA	IRR sheets for larges scale SPV (large scale Project activity instance)	IRR sheet dated 15/12/2018	Project participant

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

CAR ID	01	Section no.	1	Date: 06/12/2018
Description of CAR				
Following inconsistencies are observed during review of the documents:				
- Project design documents not found inline with “<i>Monitoring Report Template</i>” and Instructions for completing the same. - Confirmation on number of instances to be included in the project activity and accordingly completion of the project design document. - PP requested to submit Declaration regarding participation in other trading / GHG programs, rejection under other GHG program etc.				
Project participant response				Date: 15/12/2018
<i>Project Monitoring Report has been revised and updated as per latest applicable template and instructions and the same version 02 has been submitted</i> <i>Number of instances which are included in the project activity has been mentioned transparently in MR Version 02</i> <i>Declaration by PP not participating in any other GHG program has been submitted</i>				
Documentation provided by project participant				
<i>MR Version 02 dated 15/12/2018</i> <i>PP Declaration dated 15/12/2018</i>				
DOE assessment				Date: 02/01/2019
Revised registered VCS PD and revised monitoring report for the current monitoring period is submitted by PP and found inline. CAR closed.				

CAR ID	02	Section no.	2	Date: 06/12/2018
Description of CAR				
Revision in MR and ER calculation sheets is requested for application of latest version of applied methodology, latest version of Tool to calculate the emission factor for an electricity system and latest version of CEA database.				
Project participant response				Date: 15/12/2018
<i>MR Version 02 has been revised as well as ER Sheet has been submitted for the estimated and achieved emission reductions.</i>				
Documentation provided by project participant				
<i>MR Version 02</i> <i>ER Sheet</i>				
DOE assessment				Date: 02/01/2019
Revised monitoring report & ER sheets for the current monitoring period is submitted by PP and found appropriate. CAR closed.				

CAR ID	03	Section no.	2.5	Date: 06/12/2018
Description of CAR				
PP requested to justify additionality along with submission of all supporting documents for additionality justification.				
Project participant response				Date: 15/12/2018
<i>Additionality of new project instances included in the project activity has been discussed in details and supporting for the same has been submitted with MR Version 02</i>				
Documentation provided by project participant				
1. MR Version 02 2. IRR Sheet 3. PO copies				
DOE assessment				Date: 02/01/2019
Additionality justification is checked by the assessment team and found that additionality is justified appropriately. CAR closed.				

CAR ID	04	Section no.	3.1 & 6	Date: 06/12/2018
Description of CAR				
Recalculation of combined margin emission factor calculations using latest version of "CEA database" is released by CEA is requested. Accordingly revision in ER calculations and other sections of & MR and ER sheet as applicable.				
Project participant response				Date: 15/12/2018
<i>Since the project is being applied for verification hence the emission factor has been applied as per the registered PDD being combined margin an ex ante parameter</i>				
Documentation provided by project participant				
MR Version 02 ER Estimation sheet				
DOE assessment				Date: 02/01/2019
Revised monitoring report & ER sheets for the current monitoring period is submitted by PP and found correct. CAR closed.				

CAR ID	05	Section no.	4.3	Date: 06/12/2018
Description of CAR				
Line diagram of metering arrangement is inadequate with respect to actual site meeting arrangements. Also calibration details of the meters are missing in the MR. Also details of monitoring equipments along with calibration certificates to be submitted.				
Project participant response				Date: 15/12/2018
<i>Line diagram has been depicted in relevant section. Also details of Meters used in the project activity and their calibration schedule has been depicted in MR Version 02.</i>				
Documentation provided by project participant				
MR Version 02 Calibration Reports of energy meters				
DOE assessment				Date: 02/01/2019
Revised monitoring report along with calibrations certificates for the current monitoring period is submitted by PP and found inline. CAR closed.				

CAR ID	06	Section no.	5.3	Date: 06/12/2018
Description of CAR				
PP is requested to submit supporting documentation for local stakeholder's consultation process.				
Project participant response				Date: 15/12/2018
<i>Supporting documents for local stakeholder consultation is submitted with version 02</i>				
Documentation provided by project participant				
<i>MR Version 02</i>				
<i>LSHM Documents</i>				
DOE assessment				Date: 02/01/2019
Supporting documents for local stakeholders consultation is submitted by PP and found correct. CAR closed.				

CAR ID	07	Section no.	5.4	Date: 06/12/2018
Description of CAR				
PP is requested to update section for public comments during GSP of VCS.				
Project participant response				Date: 15/12/2018
<i>Public comments section has been updated in MR Version 02</i>				
Documentation provided by project participant				
<i>MR Version 02</i>				
DOE assessment				Date: 02/01/2019
Section revised and from VCS website found that no comments received. CAR closed.				

CAR ID	08	Section no.	6.0	Date: 06/12/2018
Description of CAR				
ER achieved are reserved for submission of all supporting documents viz. JMR, Invoices and calibration certificates for the complete monitoring period.				
Project participant response				Date: 15/12/2018
<i>ER sheet has been submitted with MR Version 02 and supporting for the same has also been submitted.</i>				
Documentation provided by project participant				
1. <i>ER Sheet</i> 2. <i>JMR and invoices for the complete monitoring period</i>				
DOE assessment				Date: 02/01/2019
Documents required submitted by PP and same are checked and found inline. CAR 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 Expert	OR	Takarkhede	Atul	TQC-Outsourced entity	Yes	Yes	Yes	Yes

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	Xue	Denny	Applus+ Certification
2.	Approver	IR	Sendin	Juan	Applus+ Certification B.U. Managing Director

Short CVs of the Team:

1. Dr. Atul Takarkhede counts with 9 years of experience in field of Environmental Auditing, consulting and accreditation. He is an Expert in ISO 9001-14001, CO2/GHG Reporting, Carbon Foot Print, Energy, Water and Waste Management Reporting for organizations environmental performance. His professional portfolio is mainly related with carrying out EIA, conducting QA/QC of EIA Reports; Conducting Environmental/water Audits; NABET requirements appliance. Furthermore, he counts with solid experience on CDM-VCS-GS consultancy and auditing. He has Ph.D. (Environmental Science) from Institute of Science, RTM Nagpur University, Nagpur, and he has already published different technical reports related to environmental science. Currently he is associated with True Quality Certifications Private Limited and is empanelled with APPLUS certification to carry out GHG audit.
2. Hanshen (Denny) Xue (Master Degree in Environmental Engineering, Bachelor Degree in Thermal Engineering) is an Auditor appointed by Applus+ LGAI for the GHG project assessment. He is based on Shanghai. He has 1.5 years of work experiences in CDM project development. Before he joined Applus+ LGAI, he has been worked for Shanghai Chuanji Investment and Management which is a CDM consultancy company as a project manager for CDM project development.

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 ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming potential
RBI	Reserve Bank Of India
PP	Project Participant

APPENDIX 5: CALIBRATION DETAILS OF THE METERS

Project activity instances	Project site	Main Meter	Check Meter	Meter Make & Class	Calibration Date	Validity
Instance – 1: Bhadla	Bhadla, Rajasthan	13194946	13194947	Energ0 0.2 s	26/02/2014	25/02/2019
Instance – 2: Achampet	Achampet, Telangana	02781573	02781574	Elster 0.2 s	07/07/2014	06/07/2019
Instance – 3: Kalwakurthy	Kalwakurthy, Telangana	02781577	02781578	Elster 0.2 s	26/06/2014	25/06/2019
Instance – 4: Salakpur	Mutsyal, Telangana	13194257	13194258	L&T 0.2s	15/09/2014	14/09/2019
Instance – 5: Alladurg	Alladurg, Telangana	02781621	02781631	Elster 0.2 s	27/07/2014	26/07/2019
Instance – 6: Karnataka	Shirahatti, Karnataka	16102125	16102130	L&T 0.2s	11/08/2017 ⁵	10/08/2022
	Ramadurg, Karnataka	16102135	16102133	MTE 0.2 s	27/01/2017	26/01/2022
	Mulbangal, Karnataka	14194780	14194782	L&T 0.2s	10/10/2017	09/10/2022
	Vijaypur, Karnataka	X0488422	X0488423	MTE 0.2 s	23/02/2018	22/02/2023
Instance – 7: Vijaypur	Vijaypur, Karnataka	X0488419	X0488421	MTE 0.2 s	23/02/2018	22/02/2023
Instance – 8: Hotgi	Hotgi, Maharashtra	05288830	05288838	Elster 0.2 s	15/06/2018	14/06/2023
Instance – 9: Gotan	Gotan, Jodhpur	RJB 90318	RJB 90317	Premier 0.2 s	17/01/2018	16/01/2023

⁵ At the time of commissioning, pre calibrated meters are installed. However for this SPV, there is delay in calibration and 0.2% error factor is applied from May 2017 to August 2017 conservatively.

Project activity instances	Project site	Main Meter	Check Meter	Meter Make & Class	Calibration Date	Validity
Instance – 10: Sevagram	Sevagram, Gujarat	HT 01180175	HT 01180176	EDMI 0.2 s	13/08/2018	12/08/2023
Instance – 11: Pune	Pune, Maharashtra	Y 0355612	Y 0355568	Secure 0.2 s	01/02/2018	31/01/2023