




**Verification and certification report form for
CDM project activities
(Version 03.0)**

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

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	Grid-connected Solar PV project in Méouane (UNPA Reference Number: 10327)
Scale of the project activity	<input checked="" type="checkbox"/> Large-scale <input type="checkbox"/> Small-scale
Version number of the verification and certification report	Version 4
Completion date of the verification and certification report	27/08/2019
Monitoring period number and duration of this monitoring period	Monitoring Period Number: 1 Duration of the monitoring period: 28/07/2017 – 30/06/2018
Version number of the monitoring report to which this report applies	Version 1.2
Crediting period of the project activity corresponding to this monitoring period	28/07/2017 – 27/07/2024
Project participants	Senenergy PV SA
Host Party	Senegal
Applied methodologies and standardized baselines	Methodology: ACM0002 - Grid-connected electricity generation from renewable sources - Version 16.0
Mandatory sectoral scopes	Sectoral Scope 01
Conditional sectoral scopes, if applicable	NA
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	31,953 tCO ₂ e
Certified amount of GHG emission reductions or GHG removals for this monitoring period	28,992 tCO ₂ e
Name and UNFCCC reference number of the DOE	Carbon Check (India) Private Ltd. (E-0052)
Name, position and signature of the approver of the verification and certification report	Amit Anand, CEO 

SECTION A. Executive summary

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Introduction:

The Project Participant, Senergy PV SA, has commissioned the DOE, Carbon Check (India) Private Ltd. (CC IPL) to perform an independent verification of the CDM Project Activity “Grid-connected Solar PV project in Méouane” (UNPA ref no. 10327) in Senegal (hereafter referred to as “Project Activity”). The project is a 29.49 MW solar PV plant located in Méouane, department of Tivaouane, region of Thies, Senegal, producing electricity and supplying to the grid. The electricity generated by the project replaces the grid electricity generated from fossil fuels and reduce GHG emissions for the duration of the project. This project consists of 92,160 modules of 320 W each, connected to the national grid with a total installed capacity of 29.49 MW. The solar PV power plant covers an area of 64 hectares. This report summarises the findings of the verification of the project, performed on the basis of paragraph 62 of the CDM Modalities & Procedures, as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the CDM Executive Board. Verification is required for all registered CDM project activities intending to confirm their achieved emission reductions and proceed with request for issuance of CERs. This report contains the findings and resolutions from the verification and a certification statement for the certified emission reductions.

Objective:

Verification is the periodic independent review and ex-post determination of both quantitative and qualitative information by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during a defined monitoring period.

Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify emission reductions reported for the project activity for the period from 28/07/2017 to 30/06/2018 (including both the days).

The purpose of verification is to review the monitoring results and verify that the monitoring methodology was implemented according to the monitoring plan and monitoring data and used to confirm the reductions in anthropogenic emissions by sources is sufficient, definitive and presented in a concise and transparent manner. CC IPL's objective is to perform a thorough, independent assessment of the registered project activity.

In particular, the monitoring plan, monitoring report and the project's compliance with relevant UNFCCC and host Party criteria are verified in order to confirm that the component project/s has/have been implemented in accordance with the previously registered/included component project design and conservative assumptions, as documented. It is also confirmed if the monitoring plan is in compliance with the registered/ revised approved PDD and the approved monitoring methodology.

Scope:

The scope of the verification is:

- To verify the project implementation and operation with respect to the registered/ revised approved PDD
- To verify the implemented monitoring plan with the registered PDD or approved revised PDD and the applied baseline and monitoring methodology.
- To verify that the actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that the reported emission reductions are complete and accurate in order to be certified.

The verification comprises a review of the monitoring report over the monitoring period from from 28/07/2017 to 30/06/2018 and based on the registered/revised approved PDD in part of the monitoring parameters and monitoring plan, emission reduction calculation spreadsheet, monitoring methodology and all related evidence provided by project participant.

On-site visit and stakeholders' interviews are also performed as part of the verification process.

The verification team assigned by the DOE concludes that the PDD /B04/ and the Monitoring report /02/, meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M& P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the CDM VVS for project activities, version 02.0 /B01-1/.

The project activity was correctly implemented according to selected monitoring methodology, monitoring plan and the registered/ revised approved PDD /B04/. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and on site visit the verification team confirms that the project activity has resulted in the 28,992 tCO₂e emission reductions during the second monitoring period.

CC IPL, as a DOE, is therefore pleased to issue a positive verification opinion expressed in the attached Certification statement.

Four (04) Corrective Action Requests (CAR) and Two (02) Clarification Actions (CL) have been raised and satisfactorily closed during the verification process. Two (02) forward Action Requests from the validation have also been closed.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation	Involvement in
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					(e.g. name of central or other office of DOE or outsourced entity)	Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader/ Technical Expert/ Verifier	IR	Dimri	Anubhav	CC IPL	X	X	X	X
2.	Local Expert	EI	Mar	Papa Moussa	CC IPL		X	X	

B.2. 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	IR	Singh	Vikash Kumar	CC IPL
2.	Approver	IR	Anand	Amit	CC IPL

SECTION C. Application of materiality

C.1. Consideration of materiality in planning the verification

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	
1.	Human error in the quantification of emissions	Low	<p>According to the monitoring plan and the Monitoring Report, there are QA/QC procedures applied for monitoring parameters and data management/information flow.</p> <p>Calculation spread-sheets are used to determine the emissions reductions. Further data collected are through calibrated meters and automated system.</p>	<p>Verification team of CC IPL has focused on assessment of the following:</p> <ul style="list-style-type: none"> • Procedure of raw data collection/ Monitoring procedures. • Data & information flow with a special focus on any material mistake • Calculation spreadsheets. • Procedures/QA/QC established to detect and correct any error or omission in monitoring parameters. • Quality control for monitored parameters and metering systems. <p>Complete verification (100 % data) of all the monitoring records (measurement records, invoices and the calibration certificates) was done by the verification team and compared with the values indicated in the</p>

				<i>emission reduction spread-sheet. No risk identified.</i>
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C.2. Consideration of materiality in conducting the verification

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The Project is a large-scale CDM project activity achieving total emission reductions of less than 300,000 tons of CO₂e per year; as such, a 2 per cent materiality threshold is applied /B01-1/. Accordingly, the materiality threshold is 583 tons of CO₂e. The materiality thresholds have been calculated in accordance with the § 326 (c) of CDM VVS for project activities, version 02 /B01-1/.

In line with Guidelines for Application of materiality in verifications /B06/, a reasonable level of assurance is defined for the verification of the project. Complete verification of all the monitoring records (measurement records, invoices and the calibration certificates) was done by the verification team and compared with the values indicated in the emission reduction spread-sheet.

Some mistakes were identified and subsequently findings were raised. These findings are detailed in Appendix 4 and they were successfully closed. Therefore, related identified mistakes as listed in findings in Appendix 4 to this report have been determined to be immaterial. Thus, it is confirmed that there are no material errors, omissions or misstatements and a reasonable level of assurance is established.

SECTION D. Means of verification

D.1. Desk/document review

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The verification was performed primarily based on the review of the Monitoring report /01/ and the supporting documentation. This process included review of data and information presented to verify their completeness and review of the monitoring plan/B04/ and monitoring methodology/B02/. Documents reviewed or referenced during the verification are listed in Appendix 3 below.

D.2. On-site inspection

Duration of on-site inspection: 08/08/2018				
No.	Activity performed on-site	Site location	Date	Team member
1.	An assessment of the implementation and operation of the registered project activity as per the registered PDD/B04/.	Méouane solar site, Thiess region, Senegal	08/08/2018	Anubhav Dimri, Papa Moussa Mar
2.	A review of information flows for generating, aggregating and reporting the monitoring parameters.	Méouane solar site, Thiess region, Senegal	08/08/2018	Anubhav Dimri, Papa Moussa Mar
3.	Interviews with the relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD/B04/.	Méouane solar site, Thiess region, Senegal	08/08/2018	Anubhav Dimri, Papa Moussa Mar
4.	A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources.	Méouane solar site, Thiess region, Senegal	08/08/2018	Anubhav Dimri, Papa Moussa Mar
5.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD/B04/ and the selected methodology and corresponding tool(s), where applicable.	Méouane solar site, Thiess region, Senegal	08/08/2018	Anubhav Dimri, Papa Moussa Mar

6.	A review of calculations and assumptions made in determining the GHG data and emission reductions.	Méouane solar site, Thiess region, Senegal	08/08/2018	Anubhav Dimri, Papa Moussa Mar
7.	An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.	Méouane solar site, Thiess region, Senegal	08/08/2018	Anubhav Dimri, Papa Moussa Mar

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Thiam	Amadou	Eiffage	08/08/2018	Project technical specification and operation including metering and QA/QC, Project operation, Quality Assurance – Management and operating system	Anubhav Dimri, Papa Moussa Mar
2.	Mayr	Sebastian	Aera Group	08/08/2018	Project operation, CER calculation and completeness of monitoring report, Quality Assurance – Management and operating system, compliance of monitoring plan with monitoring methodology and PDD.	Anubhav Dimri, Papa Moussa Mar
3.	Ba	Abdourahmane	Cabinet EES	08/08/2018	Environmental and Social aspects of the project activity, Sustainable Development benefits	Anubhav Dimri, Papa Moussa Mar
4.	Sow	Colo	Senelec	08/08/2018	Metering and invoicing, Grid connections and capacity, calibration procedure requirements	Anubhav Dimri, Papa Moussa Mar

D.4. Sampling approach

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Not Applicable

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	00	01	00
Compliance of the project implementation and operation with the registered PDD	00	01	00
Post-registration changes	01	00	00
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	00	00	00
Compliance of monitoring activities with the registered monitoring plan	01	00	00
Compliance with the calibration frequency requirements for measuring instruments	00	01	00
Assessment of data and calculation of emission reductions or net removals	00	01	00
Assessment of reported sustainable development co-benefits	00	00	00
Global stakeholder consultation	00	00	00
Others (please specify)	00	00	00
Total	02	04	00

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means of verification	Document Review, Interview
Findings	CAR 01 had been raised in this regard and has been resolved.
Conclusion	CCIPL had made the version 1.0, dated 06/07/2018 of the Monitoring report /01/, covering the monitoring period from 01/05/2017 to 30/06/2018 (both days inclusive) publicly available on 17/07/2018 through its dedicated interface on the UNFCCC website /B05/. The crediting period of the project and the monitoring period has been updated from the webhosted version and is 28/07/2017 to 30/06/2018 (both days included). The MR /02/ uses the latest form available at UNFCCC website. The MR /02/ is complete and meets all the requirements of the Instructions for filling out the monitoring report form version 07.0 /B03/ and CDM project standard version 02.0 /B01-2/. The site visit was conducted after the monitoring report was made publicly for a period of 21 days in accordance with the §186 of the CDM PCP for the project activities, version 02/B01-3/. This confirms compliance with the §314, §315, §352 and §353 of CDM VVS for project activities, version 02.0 /B01-1/.

E.2. Remaining forward action requests from validation and/or previous verifications

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Yes, there are two forward action requests from the validation and the FARs have been listed in the Appendix 4 of the Verification Report. This is the first periodic verification of the project activity and thus FARs from previous verifications is not applicable.

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	Document Review, Interview
Findings	CAR 02 had been raised in this regard and has been resolved.
Conclusion	The verification team determined the conformity of the actual project activity and its operation with the registered PDD /B04/ and the monitoring plan contained therein. CCIPL has, by means of a desk review and on-site visit, assessed that all physical features of the project activity proposed in the PDD /B04/ are in place, and that the project participants have operated the CDM project activity as per the registered/ revised approved PDD /B04/.

CCIPL by means of an on-site inspection and document review, assessed that all the features (technology, project equipment and monitoring) of the registered PDD /B04/ are in place and that the project participants have operated the project as per the registered PDD /B04/.

The verification team has reviewed the commissioning certificates /06/, Power Purchase Agreements (PPA) /12/, electricity generation records /11/. The implemented project activity's physical features viz., MW capacity, make, model and its operation, location, grid connectivity are as per the registered PDD /B04/, thus comply with requirement of § 383 to 384 of VVS for the project activities (version 2.0)/B01-1/.

The project activity is a grid connected (connected to SENELEC) 29.49 MW solar PV power plant located in Méouane, department of Tivaouane, region of Thies, Senegal. The solar power plant covers an area of 64 hectares and is equipped with 92,160 modules of 320 W each, connected to the national grid. The PV modules are provided by JinkoSolar manufacturer: modules JKM320PP-72 of poly silver frame solar panel. The configuration of the solar panel/09-2/ is provided below:

Manufacturer	Renesola
Model	JC320M
Type of cells	Poly Silver Frame
Peak Power (W)	320
Rated voltage (Vmpp) STC (V)	37.4
Rated current (Impp) STC (A)	8.56
Dimension	1956 x 992 x 40 (mm)

The configuration of the inverters/09-4/ installed is provided below:

Manufacturer	Schneider Electric
Model	Conext Core XC Series XC 680
Maximum Input Current	1280 A
Rated AC Power (Wp)	680 kW
Operating frequency range	50/60 Hz
Maximum Efficiency	99.1 %

The configuration of the transformers/09-1/ installed is provided below:

Manufacturer	Schneider Electric
Rated Capacity	2040 kVA
Rated Voltage H/L (V)	20-22- 30 -33 V
Rated Frequency	50 or 60 Hz

All the configurations as provided in the MR and confirmed during the on-site visit are in accordance with the registered/ revised approved PDD/B04/.

The date of project commissioning is 28/07/2017. This has been confirmed from the commissioning certificate/07/.

The start date of the crediting period is 28/07/2017. A change of start date of the crediting period has been done for the project activity from 01/05/2017 to 28/07/2017, in accordance with the para 235 of the PS for the project activities, version 02/B01-2/. No new technology measure or retrofits have been added during this verification period. It was confirmed through the document review and during the site visit that the PP had operated the proposed CDM project activity as per the registered PDD during the current monitoring period.

Furthermore, the verification team, through OSV, interview with representatives of the PP and review of commissioning certificates /06/ confirms that the registered

	<p>CDM project activity was implemented and monitored as per the registered/revised approved PDD /B04/. This fulfills the requirement contained in §359 (a) of the VVS for the project activities (version 2).</p> <p>CC IPL's verification team considers the project implementation to be complete and accurate. The relevant implementation dates and events during the operation have been provided in the MR/02/.</p> <p>In summary, the monitoring period is reasonable, and the operation of the project activity is in accordance with the registered PDD /B04/. Verification team confirms that the project has been implemented as per the registered/ revised approved PDD/B04/. This confirms the compliance of §341 (b)(i), §357, §358 and §359 of CDM VVS for project activities (version 02.0) /B01-1/.</p>
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E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents¹

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In accordance with the §231 of the Project Standard for the project activities, version 2/B01-2/, a temporary deviation has been applied by the PP. No invoice was issued to the electricity off taker Senelec (grid operator in Senegal) by the PP for July 2017. Thus, PP was unable to perform cross-check of the electricity produced and consumed with the electricity sales invoice for the period 28/07/2017 to 31/07/2017 in order to meet the requirements of the QA/QC procedures of the registered/revised approved PDD/B04/. PP has applied a value of 0 for the baseline emissions for the period 28/07/2017 to 31/07/2017, in accordance with the §231(b)(i) of the Project Standard for the project activities, version 02/B01-2/. Verification team confirms that the PP has applied the most-conservative estimate in accordance with the § 282 and §284 of the VVS for the project activities, version 02/B01-1/. The period for the deviation is 28/07/2017 to 31/07/2017 and the temporary deviation is being submitted as an issuance track in accordance with the § 1 (b) of the Appendix to the Project Standard, version 02/B01-2/. This meets the compliance of the §285 and §286 of the VVS for the project activities, version 02/B01-1/.

E.4.2. Corrections

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Corrections (PRC-10327-001) were made to the registered PDD/B04-1/ and were approved by the EB on 23/06/2019 in the revised approved PDD/B04-2/. The corrections made to the PDD/B04-1/ are provided below:

Correction of sections A.3 and B.7.1 with regard to situation of meters to be coherent with figures 6 and 7 of the same section and correction of section B.7.1 with regard to number of meters to be coherent with section A.3. Correction of section B.7.3 with regard to situation of meters to be coherent with figures 6 and 7 and with regard to number of meters to be coherent with section A.3.

E.4.3. Changes to the start date of the crediting period

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CL 01 had been raised in this regard and has been resolved. The start date of the crediting period was changed by the PP from 01/05/2017 to 28/07/2017. This was approved by UNFCCC.

E.4.4. Inclusion of a monitoring plan

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Not applicable

¹ Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

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Permanent changes from registered monitoring plan (PRC-10327-001) were made to the registered PDD/B04-1/ and were approved by the EB on 23/06/2019 in the revised approved PDD/B04-2/. The permanent changes made to the PDD/B04-1/ are provided below:

Update of frequency of calibration, maintenance & testing requirements of the electricity meters according to methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" Version 3.0, and para. 81 (c) of Project Standard version 02/B01-2/ and the actual situation observed during the onsite visit.

E.4.6. Changes to the project design

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Not applicable

E.4.7. Changes specific to afforestation and reforestation project activities

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Not applicable

E.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

Means of verification	Document Review, Interview
Findings	No findings have been raised on this section of the VR.
Conclusion	<p>The verification team has checked the actual monitoring plan against the latest approved monitoring plan and monitoring methodology and applicable tools. Furthermore, the verification team has checked monitoring system during the onsite inspection by means of comparison with the information given in the monitoring plan and monitoring methodology. The monitoring plan is completely in accordance with the approved methodology applied by the registered PDD/B04/.</p> <p>All the parameters need to be monitored and corresponding monitoring approach have been discussed in the monitoring plan in the registered PDD/B04/ and QA/QC procedure has been stipulated.</p> <p>The verification team confirms that the monitoring plan complies with the applied methodology and the monitoring system and all applied procedures are completely in compliance to the latest approved monitoring plan and the methodology ACM0002 version 16.0 /B02/.</p> <p>The verification team took cognizance of §360, §361 and §362 of CDM VVS for project activities, version 02 /B01-1/.</p>

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	Document Review, Interview					
Findings	No findings have been raised on this section of the VR.					
Conclusion	<p>The verification team has determined whether the registered monitoring plan in the revised approved PDD /B04/ has been properly implemented and followed by the PP and whether all parameters fixed ex-ante for emission reduction calculation are as per the registered/ revised approved PDD /B04/. The verification team's assessment of each data and parameter fixed ex-ante is provided below:</p>					
	Parameter	Description	Value	Unit	Source	Assessment
	EF _{CO2,i,y}	CO ₂ emission factor of fuel type i used in	Refer to the Excel sheet of the registered	t CO ₂ / GJ	IPCC default values	The parameter is used for the ex-ante calculation of the emission factor

		power unit m in year y	ex-ante ER calculation			for the project activity. The emission factor is fixed for the 1 st renewable crediting period and shall be revised at the renewal of each crediting period. The value is consistent with registered/ revised approved PDD/B04/ and fixed ex-ante for the project activity.
	NCV _{i,y}	Net calorific value (energy content) of fuel type i in year y	Refer to the Excel sheet of the registered ex-ante ER calculation	GJ/m ass or volu me unit	All NCV values have been provided by the national power utility (SENELEC)	The parameter is used for the ex- ante calculation of the emission factor for the project activity. The emission factor is fixed for the 1 st renewable crediting period and shall be revised at the renewal of each crediting period. The value is consistent with registered/ revised approved PDD/B04/ and fixed ex-ante for the project activity.
	EF _{grid,CM,y}	Combined margin CO ₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"	0.6798	tCO ₂ /MW h	As per data provided by Senelec	The emission factor is fixed for the 1 st renewable crediting period and shall be revised at the renewal of each crediting period. The value is consistent with registered/ revised approved PDD/B04/ and fixed ex-ante for the project activity.
	EF _{grid,OM,y}	Operating Margin CO ₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an	0.6795	tCO ₂ /MW h	As per data provided by Senelec	The parameter is used for the ex- ante calculation of the emission factor for the project activity. The emission factor is fixed for the 1 st renewable crediting period and shall be revised at the renewal of each crediting period. The value is

		electricity system"				consistent with registered/ revised approved PDD/B04/ and fixed ex-ante for the project activity.
	EF _{grid,BM,y}	Build Margin CO ₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system"	0.6808	tCO ₂ /MWh	As per data provided by Senelec	The parameter is used for the ex-ante calculation of the emission factor for the project activity. The emission factor is fixed for the 1 st renewable crediting period and shall be revised at the renewal of each crediting period. The value is consistent with registered/ revised approved PDD/B04/ and fixed ex-ante for the project activity.
	FC _{i,m,y}	Amount of fuel type i consumed by power unit m in year y	Refer to the Excel sheet of the registered ex-ante ER calculation	Mass or volume unit	As per data provided by Senelec	The parameter is used for the ex-ante calculation of the emission factor for the project activity. The emission factor is fixed for the 1 st renewable crediting period and shall be revised at the renewal of each crediting period. The value is consistent with registered/ revised approved PDD/B04/ and fixed ex-ante for the project activity.
	EG _{m,y}	Net electricity generated by power plant/unit m, k or n (or in the project electricity system in case of EGy) in year y or hour h	Refer to the Excel sheet of the registered ex-ante ER calculation	MWh	For grid-connected plants, data are provided by the SENELEC. For off-grid power plants, "the value of 10 per cent of the total electricity generation by grid power plants in the electricity system" is used for the purpose of the operating margin determination	The parameter is used for the ex-ante calculation of the emission factor for the project activity. The emission factor is fixed for the 1 st renewable crediting period and shall be revised at the renewal of each crediting period. The value is consistent with the registered/ revised approved PDD/B04/ and fixed ex-ante for the project activity.

					; “The value of 10 per cent of the electricity generation by grid power plants included in the sample group as per Step 5” is used for the purpose of the build margin determination.	
	$\eta_{m,y}$	Average net energy conversion efficiency of power unit m or k in year y	37.50% for natural gas steam turbine for new units (after 2000).	-	Among the 3 options below: a) Documented manufacturer's specifications (if the efficiency of the plant is not significantly increased through retrofits or rehabilitations); or b) For grid power plants: data from the utility, the dispatch center or official records if it can be deemed reliable; or c) The default values provided in the table below in appendix 1 (if available for the type of power plant) Option c) is chosen because data for option a) and b) are not available.	The parameter is used for the ex-ante calculation of the emission factor for the project activity. The emission factor is fixed for the 1 st renewable crediting period and shall be revised at the renewal of each crediting period. The value is consistent with the registered/ revised approved PDD/B04/ and fixed ex-ante for the project activity.
	The percentage share of total installed capacity of grid-connected solar PV	The percentage share of total installed capacity of grid-connected solar PV in the total installed	0.02%	%	Senelec data and governmental communications	The parameter is required for additionality demonstration at the time of validation and has been provided in accordance with the para 30 (a) of

		grid connected power generation capacity in the host country				the methodology, ACM0002, version 16/B02/. The value is consistent with registered/ revised approved PDD/B04/ and fixed ex-ante for the project activity.
	The total installed capacity of solar PV	The total installed capacity of the grid-connected solar PV in the host country	2 MW (at the time of PDD submission for registration)	MW	Senelec data and governmental communications	The parameter is required for additionality demonstration at the time of validation and has been provided in accordance with the para 30 (b) of the methodology, ACM0002, version 16/B02/. The value is consistent with registered/ revised approved PDD/B04/ and fixed ex-ante for the project activity.
<p>The values are consistent with the registered/ revised approved PDD/B04/ and defined fixed ex-ante during 1st renewable crediting period of the project activity. The fixed ex-ante data and parameter have been listed in the monitoring report/02/ and confirmed by the verification team as correct and consistent with that stated in the registered PDD/B04/. The verification team confirms that the MR/02/ and the ER calculation spreadsheet/04/ have considered the parameters fixed ex-ante correctly, no deviations have been observed.</p> <p>The verification team took cognizance of §363 of CDM VVS for project activities, version 02 /B01-1/</p>						

E.6.2. Data and parameters monitored

Means of verification	Document Review, Interview					
Findings	CL 02 had been raised in this regard and has been resolved.					
Conclusion	The verification team confirms that the Data and parameters monitored are in compliance with the registered/ revised approved PDD /B04/. The operation and monitoring of the plant has been done by trained personnel/10/. All the monitoring parameters have been assessed by the verification team:					
	Parameter	Description	Value	Unit	Source	Assessment
	EG _{facility,y}	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y	42,656	MWh	Electricity meter(s) at project site.	<p>The values for the monitoring period 28/07/2017 to 30/06/2018 have been verified through review of meter readings /11/ and cross check with electricity sales invoice /05/. Complete readings for each month have been provided in the section E.8.1 of this report. The values have been checked in the ER sheet/04/ and compared with electricity sales invoices/05//17/.</p> <p>In accordance with the §231 of the Project Standard for the project activities, version 2/B01-</p>

						<p>2/, a temporary deviation has been applied by the PP. No invoice was issued to the electricity off taker Senelec (grid operator in Senegal) by the PP for July 2017. Thus, PP was unable to perform cross-check of the electricity produced and consumed with the electricity sales invoice for the period 28/07/2017 to 31/07/2017 in order to meet the requirements of the QA/QC procedures of the registered/revised approved PDD/B04/. PP has applied a value of 0 for the baseline emissions for the period 28/07/2017 to 31/07/2017, in accordance with the §231(b)(i) of the Project Standard for the project activities, version 02/B01-2/. Verification team confirms that the PP has applied the most-conservative estimate in accordance with the § 282 and §284 of the VVS for the project activities, version 02/B01-1/. The period for the deviation is 28/07/2017 to 31/07/2017 and the temporary deviation is being submitted as an issuance track in accordance with the § 1 (b) of the Appendix to the Project Standard, version 02/B01-2/. This meets the compliance of the §285 and §286 of the VVS for the project activities, version 02/B01-1/.</p> <p>Based on the interview with the PP, it is confirmed that the provisions in Appendix 7 of the revised approved PDD/B04/ are currently verified manually via the monthly metering readings (by the PP/ Senelec) and no deviation beyond the limits has been detected during the monitoring period. PP has clarified that as per power purchase agreement, each deviation would involve an inspection and testing of the meter.</p> <p>During the course of on-site visit, the VT witnessed the daily meter reading procedure being</p>
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						<p>conducted at the site by power plant staff from the calibrated energy meters, which are the same meters used for meter readings. The raw metering data for all the meters was checked by the verification team during the on-site visit. This confirms the compliance of the §338 (b)(ii) of the VVS for the project activities, version 02/B01-1/.</p> <p>The meter calibration data has been provided in the section E.7 of this report.</p>
	<p>All relevant monitoring parameters (as listed in section B. 7.1 of the PDD and D.2 of the MR) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The verification team took cognizance of §363, §364 and 367 of CDM VVS for project activities, version 02 /B01-1/.</p> <ul style="list-style-type: none"> The monitoring has been carried out in accordance with the monitoring plan in the registered PDD/B04/. <p>All parameters required by the monitoring plan have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.</p>					

E.6.3. Implementation of sampling plan

Means of verification	Document Review
Findings	Not Applicable
Conclusion	The registered/ revised approved PDD/B04/ does not have any provision of sampling.

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	Document Review, Interview
Findings	CAR03 had been raised in this regard and have been resolved.
Conclusion	<p>The verification team has determined whether the calibration and calibration frequency procedures undertaken by PP for all measuring instruments are in conformance to the requirements stated in the registered/ revised approved PDD /B04/, and as per CDM Project Standard (version 02.0) /B01-2/.</p> <p>The verification team has checked the relevant monitoring equipment to verify the fulfilment of the calibration requirements, especially if calibration frequency and accuracy levels are in line with the requirements of the registered/ revised approved PDD/B04/ and/or the applicable calibration standards. During this monitoring period, the installed measuring instruments have been operating correctly and were duly calibrated. Total 4 electricity meters have been installed on the site, 2x2 electricity meters (1 maintained by the PP, Senergy PV SA and 1 by the grid, Senelec meter at each of the two measuring points) have been installed at the 30 kV delivery point (cells ITS1-5-9-10-11-12 & cells ITS2-3-4-6-7-8). The grid operator, Senelec installed meters have been treated as main meters as they are used for the generation of electricity sales invoice by the grid. The connection point for the meters however are same. The calibration records of the meters are provided below:</p> <p><u>Main Meter (Meter 1: ITS1-5-9-10-11-12)</u> Type: ITRON SL7000</p>

	<p>Accuracy class: CI 0.2S (active); CI 2 (reactive) Serial number: 73068569 Date of Initial calibration: 14/09/2016 Verification Frequency: Annual (First verification shall be carried out once the site completes one year by Senelec in accordance with the Decree 60-415 of the Department of Metrology, Senegal) Note: There is no change in the meter during the reported monitoring period.</p> <p><u>Main Meter (Meter 2: ITS2-3-4-6-7-8)</u> Type: ITRON SL7000 Accuracy class: CI 0.2S (active); CI 2 (reactive) Serial number: 73068568 Date of Initial calibration: 14/09/2016 Verification Frequency: Annual (First verification shall be carried out once the site completes one year by Senelec in accordance with the Decree 60-415 of the Department of Metrology, Senegal) Note: There is no change in the meter during the reported monitoring period.</p> <p><u>Backup Meter (Meter 3: ITS1-5-9-10-11-12)</u> Type: ITRON SL7000 Accuracy class: CI 0.2S (active); CI 2 (reactive) Serial number: 73068570 Date of Initial calibration: 14/09/2016 Verification Frequency: Annual (First verification shall be carried out once the site completes one year by Senelec in accordance with the Decree 60-415 of the Department of Metrology, Senegal) Note: There is no change in the meter during the reported monitoring period.</p> <p><u>Backup Meter (Meter 4: ITS2-3-4-6-7-8)</u> Type: ITRON SL7000 Accuracy class: CI 0.2S (active); CI 2 (reactive) Serial number: 73068571 Date of Initial calibration: 14/09/2016 Verification Frequency: Annual (First verification shall be carried out once the site completes one year by Senelec in accordance with the Decree 60-415 of the Department of Metrology, Senegal) Note: There is no change in the meter during the reported monitoring period.</p> <p>The precision of the meters is 0.2 as per the PPA provisions in the registered PDD/B04/. Verification team confirms that the accuracy of monitoring equipment is assured. The verification took cognizance of § 260(b) of CDM Project Standard for project activities version 2 /B01-2/ and § 368-374 of VVS for project activities (version 02.0) /B01-1/.</p>
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E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	Document Review, Interview
Findings	CAR 04 had been raised in this regard and has been resolved.
Conclusion	<p>The Baseline Emissions (BE_y) are calculated as follows:</p> $BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$ <p>Where:</p> <p>BE_y = Baseline emissions in year y (t CO₂/yr) $EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr) $EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO₂/MWh)</p> <p>Since the project activity consists in the installation of new grid-connected renewable power plant at site where no renewable power plant was operated prior to the implementation of the project activity, it verifies the case of Greenfield renewable energy power plant, option (a) whereby:</p>

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

Where:

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

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

The monitoring of this parameter has been done through recording of electricity (import and export) data by bi-directional electricity meters installed on the site.

The verified values (in MWh) are provided in the table below:

Billing Month	Period Covered	Electricity delivered by the project activity to SENELEC, MWh	Electricity received by the project activity from SENELEC, MWh	Net Electricity delivered by the project activity to SENELEC, MWh
July 2017	28/07/2017 to 31/07/2017	261 ²	0.7	260
August 2017	01/08/2017 to 31/08/2017	3,542	18.6	3,524
September 2017	01/09/2017 to 30/09/2017	4,103	17.6	4,086
October 2017	01/10/2017 to 31/10/2017	3,418	13.5	3,404
November 2017	20/11/2017 to 30/11/2017	2,299	10.1	2,289
December 2018	01/12/2017 to 31/12/2017	3,562	16.6	3,545
January 2018	01/01/2018 to 31/12/2018	4,331	17.2	4,314
February 2018	01/02/2018 to 28/02/2018	3,857	15.7	3,841
March 2018	01/03/2018 to 31/03/2018	4,603	16.1	4,586
April 2018	01/04/2018 to 30/04/2018	4,494	15.2	4,479
May 2018	01/05/2018 to 31/05/2018	4,689	15.4	4,674
June 2018	01/06/2018 to 30/06/2018	3,929	15.3	3,914

² Electricity sales invoice for the period 28/07/2017 to 31/07/2017 is not available as it was not issued by the PP and thus in accordance with the §231(b) (i) of the Project Standard for project activities, version 02 a value of 0 has been taken for baseline emissions and since project emissions are not applicable to the project activity in accordance with the methodology ACM0002, version 16, no project emissions have been accounted in accordance with the §231(b)(ii) of the Project Standard, version 02. A temporary deviation has been applied in this regard.

	Total	01/05/2017 to 30/06/2018	43,089	172.1	42,917
	Values Adjusted to account for non-availability of sales invoice for the period 28/07/2017 to 31/07/2017	01/05/2017 to 30/06/2018	42,827	171	42,656
<p>The grid emission factor ($EF_{grid,CM,y}$), was calculated ex-ante as per the “Tool to calculate the emission factor for an electricity-system” (Version 05.0.0). The verification took cognizance of § 264 of the CDM Project Standard for the project activities, version 02.0 /B01-2/ § 372, § 373 and § 374 of the CDM VVS for the project activities, version 02.0 /B01-1/.</p>					

E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	Document Review, Interview
Findings	No findings have been raised on this section of the VR.
Conclusion	<p>The project emissions from the project is zero. This is in accordance with ACM0002 version 16 /B02/, registered/ revised approved PDD /B04/, project emissions of the project activity (solar PV project) are not considered.</p> <p>The verification took cognizance of § 264 of the CDM Project Standard for the project activities, version 02.0 /B01-2/ § 373 and § 374 of the CDM VVS for the project activities, version 02.0 /B01-1/.</p>

E.8.3. Calculation of leakage GHG emissions

Means of verification	Document Review, Interview
Findings	No findings have been raised on this section of the VR.
Conclusion	The leakage from the project is zero, thus is in accordance with ACM0002 version 16 /B02/, registered PDD /B04/.

E.8.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	Document Review, Interview
Findings	No findings have been raised on this section of the VR.
Conclusion	<p>The verification team has checked if the MR includes a summary table of the emission reductions calculation specifying separately:</p> <ul style="list-style-type: none"> • Total baseline emissions, • Total emission reductions. <p>The emission reductions during the monitoring period 28/07/2017 to 30/06/2018 are calculated as:</p> $ER_y = BE_y - PE_y - LE_y = 28,992 - 0 - 0 = 28,992 \text{ tCO}_2\text{e.}$ <p>According to § 375 of CDM VVS for project activities, version 02.0/B01-1/ the verification team confirms that:</p> <ul style="list-style-type: none"> • A complete set of data for the monitoring period is available.

	<ul style="list-style-type: none"> Information provided in the monitoring report has been cross-checked with other sources, electricity sales receipts; Calculations of baseline emissions and emission reductions have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology. <p>Appropriate/correct emission factor value has been applied to the calculations.</p> <p>In summary, verification team confirms that actual emission reductions are lower than the estimate of the registered/revised approved PDD/B04/ for the current monitoring period. The verification took cognizance of § 372 to § 374 of CDM VVS for the project activities, version 02 /B01-1/.</p>
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E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	Document Review, Interview
Findings	No findings have been raised on this section of the VR.
Conclusion	<p>The comparison of actual GHG emission reductions with estimates in registered PDD /B04/ has been checked by the verification team. Based on the above assessment, the emission reduction during the monitoring period 28/07/2017 to 30/06/2018 is verified as 28,992 tCO₂e. The ex-ante estimated value of the emission reductions for the monitoring period (28/07/2017 to 30/06/2018) is 31,953. The verification team noted that the verified emission reductions are less than the estimated value in the monitoring period.</p> <p>According to § 375 of CDM VVS for project activities, version 02.0, the verification team confirms that:</p> <p>A comparison of actual GHG emission reductions or net anthropogenic GHG removal of the project activity achieved during this monitoring period with the estimates in the registered PDD has been provided.</p> <p>The verification team considers the calculation of the comparison is correct.</p> <p>The verification team took cognizance of § 267 of CDM Project Standard for project activities, version 02 /B01-2/.</p>

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	Document Review, Interview
Findings	No findings have been raised on this section of the VR.
Conclusion	<p>Actual emission reductions for the first monitoring period 28/07/2017 to 30/06/2018 are less than the ex-ante estimated value of the emission reductions. Hence, this section is not applicable.</p> <p>The verification team took cognizance of § 267 of CDM Project Standard for project activities, version 02 /B01-2/.</p>

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	Document Review, Interview
Findings	No findings have been raised on this section of the VR.
Conclusion	<p>The verification team has checked section E.4 of the MR and the ER calculation spreadsheet. The MR in section E.4 includes a summary table of the ER breakdown which states that the GHG emission reductions have completely been generated from 1 January 2013 onwards. Actual GHG emission reductions have been generated from 1 January 2013 onwards.</p> <p>CERs achieved upto 31st Dec 2012 = 0 tCO₂e. CERs achieved from 1st Jan 2013 = 28,992 tCO₂e</p>

E.9. Assessment of reported sustainable development co-benefits

Means of verification	Document Review, Interview
Findings	--
Conclusion	Not applicable

E.10. Global stakeholder consultation

Means of verification	Document Review, Interview
Findings	--
Conclusion	Not applicable

SECTION F. Internal quality control

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The final verification report has passed a technical review before being submitted to the UNFCCC Executive Board. The technical review is performed by a technical reviewer qualified in accordance with CCIPL's qualification scheme for CDM validation and verification.

SECTION G. Verification opinion

>>

Carbon Check (India) Private Ltd. has performed the first periodic verification of the registered CDM project activity "Grid-connected Solar PV project in Méouane" and UNFCCC reference number 10327. The verification team assigned by the DOE concludes that the project activity as described in the revised approved PDD (Version 1.6, dated 18/04/2019) and monitoring report (version 1.2, dated 26/08/2019) /02/, meets all the relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M & P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the VVS requirements for the project activities version 02.0 /B01-1/.

Verification methodology and process

The Verification team confirms the contractual relationship signed on 27/04/2018 between the DOE, Carbon Check (India) Private Ltd. and the Project Participant, (Senegy PV SA). The team assigned to the verification meets the Carbon Check (India) Private Ltd.'s internal procedures including the UNFCCC requirements for the team composition and competence. The verification team has conducted a thorough contract review as per the UNFCCC and Carbon Check procedures and requirements.

The verification has been performed as per the requirements described in the VVS for the project activities, version 02.0 and constitutes the review and completion of the following steps:

- Reviewing the registered/revised approved PDD (Version 1.6, dated 18/04/2019), including the monitoring plan and the corresponding validation report/s;
- Publication of the MR on the UNFCCC website (version 1.0, 06/07/2018) (submitted to UNFCCC for publication on 17/07/2018)
- Desk review of the validation report, MR and other relevant documents including documents related to the project activities in emission reductions
- Review of the applied monitoring methodology (ACM0002, version 16);
- Review of any CMP and EB decisions, clarifications and guidance;
- On-site assessment (08/08/2018)
- Resolution of CARs and CLs raised during verification
- Issuance of Verification Report

The project activity was correctly implemented according to the selected monitoring methodology, monitoring plan and the registered/revised approved PDD/B04/. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and on site visit the verification team confirms that the project activity has resulted in the 28,992 tCO₂e emission reductions during the third monitoring period.

The break-up of emission reduction from 28/07/2017 to 30/06/2018 as verified during the course of verification are as below:

Item	Emission reductions up to 31 December 2012	Emission reductions from 1 January 2013 onwards
Emission reductions (t CO₂e)	0	28,992

Carbon Check as a DOE is therefore pleased to issue a positive verification opinion expressed in the attached Certification statement.

SECTION H. Certification statement

>>

Carbon Check (India) Private Ltd, the DOE, has performed the verification of the registered project activity “UNFCCC Registration Number 10327”, “Grid-connected Solar PV project in Méouane” in Senegal. Grid-connected Solar PV project in Méouane project involves installation of PV systems for electricity generation.

The Project Participant, Senergy PV SA, is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity. It is DOE's responsibility to express an independent verification statement on the reported GHG emission reductions from the component projects. The DOE does not express any opinion on the selected baseline scenario or on the validated and registered/revised approved PDD. The verification is carried out in-line with the VVS requirements.

The verification was performed to identify the compliance of the project activity with the implementation and monitoring requirements, and to verify the actual amount of achieved emission reductions, through obtaining evidence and information on-site that included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

The verification is based on:

- PDD Version 1.6, dated 18/04/2019, registered with the CDM Executive Board and its monitoring plan.
- Approved monitoring methodology ACM0002 “Grid-connected electricity generation from renewable sources”, version 16;
- Validation report /B04/ for the registered/ revised approved project activity;
- Monitoring report(s) version(s) 1, 1.1, 1.1, 1.1, 1.1, 1.2 and 1.2 (dated 06/07/2018, 17/10/2018, 12/12/2018, 25/06/2019, 05/07/2019, 20/08/2019 and 26/08/2019 respectively).

This statement covers verification period of 337 days between 28/07/2017 and 30/06/2018.

The DOE had raised 02 clarification and 05 corrective action requests, all of which have been successfully resolved by PP(s). There were two (02) Forward action requests from the validation which have been resolved.

The DOE considers necessary to give reasonable assurance that reported GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology and the monitoring plan contained in the registered/revised approved PDD are fairly stated.

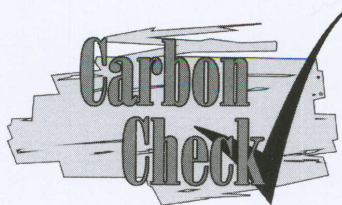
The DOE, hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 28,992 tCO₂e and all monitoring requirements have been fulfilled and is substantiated by an audit trail that contains evidence and records. The break-up of emission reduction from 28/07/2017 to 30/06/2018 as verified during the course of verification are as below:

Item	Emission reductions up to 31 December 2012	Emission reductions from 1 January 2013 onwards
Emission reductions (t CO ₂ e)	0	28,992

Appendix 1. Abbreviations

Abbreviations	Full texts
BE	Baseline Emissions
CA	Corrective Action/ Clarification Action
CER	Certified Emission Reduction
CAR	Corrective Action Request
CC IPL	Carbon Check (India) Private Ltd.
CDM	Clean Development Mechanism
CL	Clarification Request
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DOE	Designated Operational Entity
DVR	Draft Verification Report
EB	CDM Executive Board
EF	Emission Factor
FA	Final Approval
FAR	Forward Action Request
FVR	Final Verification Report
GHG	Greenhouse gas(es)
GWh	Giga Watt Hour
IPCC	Intergovernmental Panel on Climate Change
LE	Leakage Emissions
MP	Monitoring Period
MR	Monitoring Report
MWh	Mega Watt Hour
OSV	On Site Visit
PE	Project Emissions
PP(s)	Project Participant(s)
PRC	Post registration change
QC/QA	Quality Control/ Quality Assurance
SENELEC	Société nationale d'électricité du Sénégal
TA	Technical Area
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers



Carbon Check (India) Private Ltd.

Anubhav Dimri

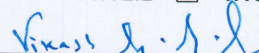
has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

Validator	<input checked="" type="checkbox"/>	Team Leader	<input checked="" type="checkbox"/>	Technical reviewer	<input checked="" type="checkbox"/>
Verifier	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>	Local Expert ¹	<input checked="" type="checkbox"/>

In the following Technical Areas:

TA 1.1	<input checked="" type="checkbox"/>	TA 3.1	<input checked="" type="checkbox"/>	TA 5.2	<input type="checkbox"/>	TA 9.2	<input type="checkbox"/>	TA 13.2	<input type="checkbox"/>
TA 1.2	<input checked="" type="checkbox"/>	TA 4.1	<input type="checkbox"/>	TA 8.1	<input checked="" type="checkbox"/>	TA 10.1	<input type="checkbox"/>	TA 14.1	<input type="checkbox"/>
TA 2.1	<input type="checkbox"/>	TA 5.1	<input type="checkbox"/>	TA 9.1	<input type="checkbox"/>	TA 13.1	<input checked="" type="checkbox"/>		


Mr. Vikash Kumar Singh
Compliance Officer


Mr. Amit Anand
CEO

Date of Approval
24/12/2018

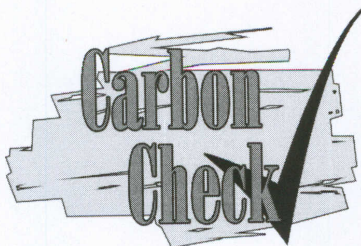
Valid Till
23/12/2019

Revision History of the Document

26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2016	Annual Revision
24/12/2017	Annual Revision
24/12/2018	Annual Revision

¹ India, South Africa

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Carbon Check (India) Private Ltd.

Vikash Kumar Singh

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

For following functions:

Validator ☒ Team Leader ☒ Technical reviewer ☒
 Verifier ☒ Technical Expert ☒ Local Expert¹ ☒

In the following Technical Areas:

TA 1.1 ☒ TA 3.1 ☒ TA 5.2 ☐ TA 9.2 ☐ TA 13.2 ☒
 TA 1.2 ☒ TA 4.1 ☒ TA 8.1 ☐ TA 10.1 ☐ TA 14.1 ☐
 TA 2.1 ☐ TA 5.1 ☐ TA 9.1 ☐ TA 13.1 ☒

Mr. Amit Anand
CEO

Date of Approval
24/12/2018

Valid Till
23/12/2019

Revision History of the Document

26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2016	Annual Revision
24/12/2017	Annual Revision
24/12/2018	Annual Revision

¹ India, South Africa

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Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	AERA Group	<ol style="list-style-type: none"> Monitoring Report Monitoring Report Monitoring Report Monitoring Report Monitoring Report Monitoring Report 	Version 1.0, dated 06/07/2018 Version 1.1, dated 17/10/2018 Version 1.1, dated 12/12/2018 Version 1.1, dated 25/06/2019 Version 1.1, dated 05/07/2019 Version 1.2, dated 20/08/2019	Others
2	AERA Group	Final Monitoring Report	Version 1.2, dated 26/08/2019	Others
3	AERA Group	<ol style="list-style-type: none"> Emission reduction spreadsheet corresponding to /01-1/ Emission reduction spreadsheet corresponding to /01-2/ Emission reduction spreadsheet corresponding to /01-3/ Emission reduction spreadsheet corresponding to /01-4/ Emission reduction spreadsheet corresponding to /01-5/ Emission reduction spreadsheet corresponding to /01-6/ 	--	Others
4	AERA Group	Final emission reduction spreadsheet corresponding to /02/	--	Others
5	SENELEC	Electricity Invoices for the months of: <ol style="list-style-type: none"> August 2017 September 2017 October 2017 November 2017 December 2017 January 2018 February 2018 March 2018 April 2018 May 2018 June 2018 	NA	Others

6	Itron	Calibration Certificates of the energy meters	Certificate Number: CC SL7000 020087	Others
7	Senelec	Commissioning Certificate of the plant/ Evidence of commissioning	Dated 28/07/2017	Others
8	RMT Clemessy	Site Layout		Others
9	Schneider Electric/ JinkoSolar/	Manufacturer's Specifications/ Nameplate Configuration: 1. Transformer (Schneider 300415) 2. Solar Panels (Renesola JC320M/24-Abs) 3. Electricity Meters (ITRON SL7000) 4. Inverters (Schneider Conext Core XC Series XC 680)	NA	Others
10	apave	Training Certificates: 1. Amadou Mariata Thiam (19-21 July 2017) 2. Momar Talla Gueye (19-21 July 2017) 3. David Tisane Lambal (29-31 August 2017) 4. Abdou Diouf Gueye (29-31 August 2017)	NA	Others
11	Senergy	Meter readings in the record for each month	--	Others
12	Senelec/ Senergy	1. Power purchase agreement Dated 31/12/2013 2. Amendment Dated 28/01/2016	Dated 31/12/2013	Others
13	Senelec	Electricity sales invoices for the monitoring period	NA	Others
14	Sgurr Energy	Third Party Engineer's Report for the Actual Cost of the project activity	Dated 23/10/2018	Others
15	EES SARL	ESIA (Environmental and Social Impact Assessment)	Dated January 2016	Others
16	Division de la Metrologie, Senegal	Meter Verification: 1. Meter Verification Reports 2. Communication with the Senelec (Department of metrology) on the meter verification	07/02/2019	Others
17	AERA Group	Cross-check of electricity sales invoices with the electricity generation data	NA	Others
B01	UNFCCC	1. Validation and Verification Standard for projects, version 02.0 2. Project Standard for projects, version 02.0 3. Project Cycle Procedure for projects, version 02.0	http://cdm.unfccc.int/	Others

B02	UNFCCC	Applied baseline and monitoring methodology, ACM0002: "Grid-connected electricity generation from renewable sources", version 16	http://cdm.unfccc.int/	Others
B03	UNFCCC	Attachment. Instructions for filling out the monitoring report form version 07.0	http://cdm.unfccc.int/	Others
B04	UNFCCC	1. Registered PDD (version 1.5 dated 25/11/2016) and the corresponding validation report. 2. Revised Approved PDD (Version 1.6, 18/04/2019) and the corresponding validation report.	http://cdm.unfccc.int/	Others
B05	Web sites	Websites: 1. http://cdm.unfccc.int/ 2. www.ipcc.ch	--	Others
B06	UNFCCC	Guideline: "Application of materiality in verifications" Version 02.0	http://cdm.unfccc.int/	Others

Appendix 2. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verifications

FAR ID	01	Section no.	E.2	Date: 16/08/2018
Description of FAR				
<i>In line with §31 of the applied methodology ACM0002, version 16.0, the project proponent has applied the simplified procedure to demonstrate additionality and shall therefore provide information on actual capital cost of the project activity at the time of the first verification.</i>				
Project participant response				Date: 24/09/2018
The project participant informs that the total investment cost of the project has been 44,1 m€ and that the Weighted Average Cost of Capital has been 8,09%.				
Documentation provided by project participant				
-				
DOE assessment				Date: 25/09/2018
The information on the total investment cost of the project and the weighted average cost of capital has not been provided in the monitoring report. No supporting document has been provided to confirm the capital cost and weighted average cost of capital. The applicable values have not been presented in internationally recognisable format (US English).				
Project participant response				Date: 17/10/2018
The actual capital cost of 43.1 MEUR, as per certificate issued by independent Engineer SGURR Energy Limited to the lender on 23/10/2017, is now mentioned internationally recognisable format in section B.2.1 of the MR. These certificates are used to justify/certify to the lender, with each drawdown of the debt, that the money drawn is used to finance the needs.				
Documentation provided by project participant				
SgurrEnergy - Senergy - Certificat Ingenieur Independant n°6.pdf				
DOE assessment				Date: 26/11/2018

PP has provided the actual capital cost of the project activity in accordance with the certificate from an independent engineer (SGURR Energy Limited). This has been provided in the section B.1 of the MR.

FAR ID	02	Section no.	E.2	Date: 16/08/2018
Description of FAR				
<i>The ESIA was not approved yet.</i>				
Project participant response				Date: 24/09/2018
<i>The final and approved ESIA is submitted with these responses. The official approval is provided by "Arrêté ministériel n° 8557 en date du 14 juin 2016", which is published here: http://www.jo.gouv.sn/spip.php?article10959</i>				
Documentation provided by project participant				
1) 160125-RAPPORT_FINAL_EIES_SENERGY.pdf (ESIA)				
DOE assessment				Date: 25/09/2018
The ESIA report has been provided to the verification team and through the notification from Ministry of Environment and Sustainable Development, Senegal, it is confirmed that the ESIA has been approved.				

Table 2. CL from this verification

CL ID	01	Section no.	E.4.3	Date: 16/08/2018
Description of CL				
<i>A change of start date of the crediting period is proposed for the project activity to 28/07/2017 in section B.2.3 of the MR, however such change has not been made on the interface yet in accordance with the para 235 of the PS for the project activities, version 01.</i>				
Project participant response				Date: 24/09/2018
<i>The change of start date has been requested to the UNFCCC secretariat on 22/09/2018 and been approved. The MR has been changed accordingly.</i>				
Documentation provided by project participant				
-				
DOE assessment				Date: 25/09/2018
The start date of the crediting period has been changed by the PP and the applicable renewable crediting period for the project activity is 28/07/2017 to 27/07/2024				

CL ID	02	Section no.	E.6.2	Date: 16/08/2018
Description of CL				
<i>The organization structure as provided in the section C of the MR is not provided in accordance with the monitoring organization provided in section B.7.3 of the PDD.</i>				
Project participant response				Date: 24/09/2018
<i>The organisation structure provided showed only the staff of operation & maintenance. Managerial staff has thus been added to the structure to be in accordance with section B.7.3 of the PDD.</i>				
Documentation provided by project participant				
-				
DOE assessment				Date: 25/09/2018
The organisation structure is not available in the section C of the MR.				
Project participant response				Date: 17/10/2018
The organisation structure has been made available in section C of the MR.				
Documentation provided by project participant				
-				
DOE assessment				Date: 26/11/2018
PP has provided the organisation structure in the section C of the MR in accordance with the monitoring organization provided in section B.7.3 of the PDD.				

Table 3. CAR from this verification

CAR ID	01	Section no.	E.1	Date: 16/08/2018
Description of CAR				
<i>In section A.5 of the MR, in accordance with the instruction text requirement, the start date and end date of the crediting period are not provided.</i>				
Project participant response				Date: 24/09/2018
<i>The start and end dates of the CP have been added in section A.5 of the MR.</i>				
Documentation provided by project participant				

-	
DOE assessment	Date: 25/09/2018
The start date and end date of the crediting period has been provided in the section A.5 of the MR in accordance with the instruction text requirement for the monitoring report form.	

CAR ID	02	Section no.	E.3	Date: 16/08/2018
Description of CAR				
<i>Information on the implementation and actual operation of the project activity, including relevant dates (e.g. construction, commissioning, start of operation) is not provided in the MR. The date of project commissioning and the relevant construction dates have not been provided in the section B.1 of the MR.</i>				
Project participant response				Date: 24/09/2018
<i>Date of start of construction of power plant have been added in section B.1. Detail on the date of commissioning has been added.</i>				
Documentation provided by project participant				
-				
DOE assessment				Date: 25/09/2018
The relevant dates of implementation and operation of the project activity have been provided. It needs to be clarified that how the start of the project activity was determined if the official commissioning certificate is not available.				
Project participant response				Date: 17/10/2018
The start date provided in the MR (28/07/2017) corresponds to the date of synchronization of the power plant with the grid. This is reflected and documented by the minutes produced and signed on the date of synchronization by all involved parties including offtaker Senelec.				
Documentation provided by project participant				
Senergy PV SA Pv de raccordement au réseau.pdf				
DOE assessment				Date: 26/11/2018
PP has clarified that the start date of operation is based on the date of synchronization of the power plant with the grid (28/07/2017). This is the date when the project started exporting electricity to the grid. The date is supported by the letter signed by Senelec for synchronisation with Senergy PV SA.				

CAR ID	03	Section no.	E.7	Date: 16/08/2018
Description of CAR				
<i>The calibration details of the monitoring equipment used for monitoring the electricity generation have not been provided in the section D.2 of the MR. The calibration certificates for the monitoring equipment are not provided to the verification team.</i>				
<i>The meter readings have not been provided in accordance with the section B.7.1 of the MR.</i>				
Project participant response				Date: 04/07/2019
<p><i>The calibration details have not been provided as no calibration is required for the electricity meters. Digital electricity meters have been calibrated by supplier at time of manufacturing (cf. Certificats compteurs Meouane.pdf) and they do not require periodic calibration as they are not exposed to tear and wear. Cf. manufacturer specifications (email by ITRON).</i></p> <p><i>Furthermore, as per Power Purchase Agreement, the Project Proponent has no contractual obligation to calibrate the electricity meters as erroneously interpreted at time of validation.</i></p> <p><i>The QA/QC requirement in section D.2 of the MR is modified accordingly and a PRC is requested to the Board (cf. approved revised PDD).</i></p> <p><i>It is noted that the division of metrology carried out a successful first verification on 2 February 2019 after governmental decision of verification campaign on 4 Mai 2018 and information of project participant on details through the division of metrology on September 25, 2018 (cf. Email « TR Arrêté campagne 2018 (102Mo).msg). No issues have been found by the division and a certificate of the successful verification (Attestation de vérification des compteurs Senergy.pdf) has been issued.</i></p>				
Documentation provided by project participant				
<ol style="list-style-type: none"> 1. Certificats compteurs Meouane.pdf (Certificate of conformity of Itron meters) 2. PPA_Senergy_Signed.pdf.pdf (Power Purchase Agreement) & PPA amendment Jan-16.pdf 3. Email Itron 4. Email « TR Arrêté campagne 2018 (102Mo).msg » (Communication and transmission of regulation by division of Metrology) 5. Attestation de vérification des compteurs Senergy.pdf 				
DOE assessment				Date: 05/07/2019

<p>Post registration changes to the registered PDD have been done and thus the QA/QC procedures include annual verification of the electricity meters and thus calibration of the electricity meters is not required in accordance with the power purchase agreement. The initial calibration certificate of the electricity meters has been provided to the verification team.</p> <p>Furthermore, the first verification testing for the installed electricity meters was conducted on 02/02/2019. The evidence for the verification testing is provided to the verification team. Since, the frequency of verification testing is 'Annual', it needs to be clarified how the verification conducted on 02/02/2019 meet the QA/QC procedures stated in the revised approved PDD.</p>	
Project participant response	Date: 05/07/2019
<p>As clarified in a revised MR, the "attestation of verification" is valid for "2017-18, i.e. from start of the site operation until end of 2018" and concludes "The instruments comply with the technical requirements of Decree 60-415 of 23 November 1960 and therefore receive the valid conformity label."</p> <p>This reconfirms the stipulations in the PDD: "As per Senegalese decree 60-415, in normal circumstances, a periodic verification of the meters is performed on an annual basis."</p>	
Documentation provided by project participant	
Revised PDD	
DOE assessment	Date: 06/07/2019
<p>PP has clarified that the attestation of verification is valid for a period of one year from the start of the commissioning of the site in accordance with the Decree 60-415 of the Department of Metrology, Senegal. Thus, the first verification shall be carried out after 27/07/2018 once the site completes one year. It is also determined based on the verification testing report that they were finally conducted on 07/02/2019 and based on the communication between Senelec and the PP, Senergy, it is confirmed that the delay was due to the delay from Senelec.</p> <p>However, the verification is not applicable for the reported monitoring period as one year is not completed by the end of the monitoring period.</p>	

CAR ID	04	Section no.	E.8.1	Date: 16/08/2018
Description of CAR				
The electricity sales invoices for the months of May 2017 to June 2018 have not been provided to the verification team.				
Project participant response				Date: 24/09/2018
The electricity sales invoices for the mentioned months are (re-) submitted with these responses.				
Documentation provided by project participant				
Relevés SENERGY.zip				
DOE assessment				Date: 25/09/2018
<p>For the month of August 2017, the value of electricity import doesn't match with the invoice. It is 16.9 MWh in the ER sheet and 18.6 MWh in the sales invoice.</p> <p>For the month of November 2017, the value of electricity export doesn't match with the invoice. It is 2,298 MWh in the ER sheet and 2,298.8 MWh in the sales invoice.</p>				
Project participant response				Date: 17/10/2018
The production data has been replaced by the exact values of the primary data as recorded continuously by the SCADA system, and corroborated by the official meter readings for the invoices.				
Documentation provided by project participant				
<p>Production of active energy</p> <p>SMK0%cumulelecmeter%com%cumulativeetu.xls</p> <p>For download here:</p> <p>https://aera.cloudvault.m-files.com/SharedLinks.aspx?accesskey=c2dcc2f81a4b333783c56d114ff747fdca79947ae1cae0ed795a6988cab58181&VaultGUID=FFE8D84A-A981-4720-85E2-A323C816E47E</p> <p>Consumption of active energy</p> <p>SMK0%cumulelecmeter%com%cumulativeefu.xls</p> <p>For download here:</p> <p>https://aera.cloudvault.m-files.com/SharedLinks.aspx?accesskey=cc6d6cf19d70fb3d189b39b653b39a04710dcd785f977b575025791f536eb963&VaultGUID=FFE8D84A-A981-4720-85E2-A323C816E47E</p>				
DOE assessment				Date: 27/11/2018
<p>The continuous raw metering data from SCADA has not been provided to the verification team. The comparison of the monthly metering data with the sales invoices has not been provided in accordance with the QA/QC procedures for the monitoring parameter.</p> <p>The provided links are not accessible.</p>				
Project participant response				Date: 12/12/2019

The raw metering data is resubmitted herewith. The comparison is now provided in a revised ER sheet.	
Documentation provided by project participant	
- Raw data	
DOE assessment	Date: 17/12/2018
It has been noticed that for some periods during the monitoring period, import/export of electricity has been taken as null or 0 (01/05/2018 onwards in May, 30/10/2017, 15/09/2017, 25/08/2017, 30/08/2017 etc.), the reason for the same has not been provided in the section B.1 of the MR.	
Project participant response	Date: 21/12/2019
PP currently checks this period and submits a revised chronology of events in the MR.	
Documentation provided by project participant	
-	
DOE assessment	Date: 02/01/2019
Chronology of events in the MR.	
Project participant response	Date: 16/04/2019
PP clarifies that no revision of events is actually necessary as the missing data marked as "null" simply refers to communication/recording problems in the SCADA system. However, in all cases the electronic meters continue to work and measure even if the SCADA recording system doesn't work. The SCADA system will reflect again the actual meter standing once the proper recording kicks in again.	
Documentation provided by project participant	
-	
DOE assessment	Date: 05/07/2019
PP has clarified that in cases where the data is provided as "null", the SCADA system would reflect the actual meter standing once the communication/recording system is connected again. However, it is not clear how the monitoring frequency can be considered continuous in this case.	
Project participant response	Date: 05/07/2019
Whereas the data transmission network (SCADA) may be affected by temporary malfunction, the bidirectional meters monitor continuously and without interruption the electricity produced and consumed. The SCADA recordings re-mirror the meter after each interruption so that recorded accumulated energy remains accurate always. The comparison with invoices (based on direct meter readings) as part of the QA/QC (cf. ER calculations) confirmed this.	
Documentation provided by project participant	
-	
DOE assessment	Date: 06/07/2019
PP has clarified that the data transmission network (SCADA) may be affected at times but the bidirectional meters monitor continuously. The SCA recordings ate re-mirrored after each interruption of data transmission and the accumulated energy remains accurate. The electricity meter readings are further compared with the electricity sale/purchase invoices and found to be comparable.	

Table 4. FAR from this verification

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

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none">• Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN);• Make structural and editorial improvements.
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		