



**Verification and certification report form for  
CDM project activities  
(Version 04.0)**

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

**BASIC INFORMATION**

<b>Title and UNFCCC reference number of the project activity</b>	Hydro Electric Plant - Hidro Pantasma UNFCCC ID: 9118		
<b>Scale of the project activity</b>	<input type="checkbox"/> Large-scale <input checked="" type="checkbox"/> Small-scale		
<b>Version number of the verification and certification report</b>	1.0		
<b>Completion date of the verification and certification report</b>	27/09/2021		
<b>Monitoring period number and duration of this monitoring period</b>	MP 1 <sup>st</sup> 07/10/2013 to 06/10/2020 (including both days)		
<b>Version number of the monitoring report to which this report applies</b>	2.0		
<b>Crediting period of the project activity corresponding to this monitoring period</b>	Fixed/Renewable Crediting Period 07/10/2013- to 06/10/2020 (including both days)		
<b>Project participants</b>	Hidropantasma S.A		
<b>Host Party</b>	Nicaragua		
<b>Applied methodologies and standardized baselines</b>	CDM Methodology: AMS-I.D. Version 17.0 - Grid connected renewable electricity generation Standardized baseline: N/A		
<b>Mandatory sectoral scopes</b>	Scope:1: Energy industries (renewable - / non-renewable sources)		
<b>Conditional sectoral scopes, if applicable</b>	N/A		
<b>Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD</b>	250,072 t CO <sub>2e</sub>		
<b>Certified amount of GHG emission reductions or GHG removals for this monitoring period</b>	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020	Amount from 1 January 2021
	-	229,478 t CO <sub>2e</sub>	-
<b>Name and UNFCCC reference number of the DOE</b>	TÜV NORD CERT GmbH; E-0022		
<b>Name, position and signature of the approver of the verification and certification report</b>	 Stefan Winter Final Approver		

**SECTION A. Executive summary**

Hidropantasma S.A. has commissioned the TÜV NORD JI/CDM Certification Program to carry out this periodic verification of the project:

“Hydro Electric Plant - Hidro Pantasma”

with regard to the relevant requirements for CDM project activities.

This verification covers the period as indicated on the title page.

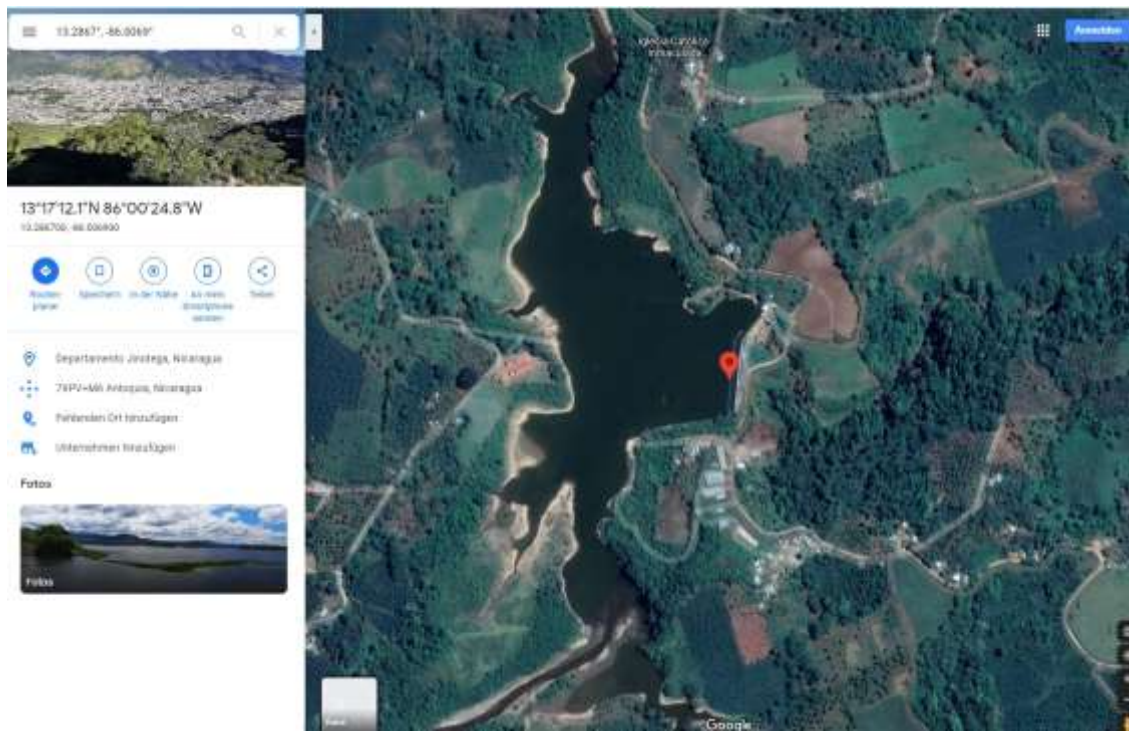
The project reduces GHG emissions due to the use of hydropower to generate renewable electricity to be delivered to the national grid of Nicaragua which is mainly fossil fuel dominated.

Details of the project location are given in table A-1 below:

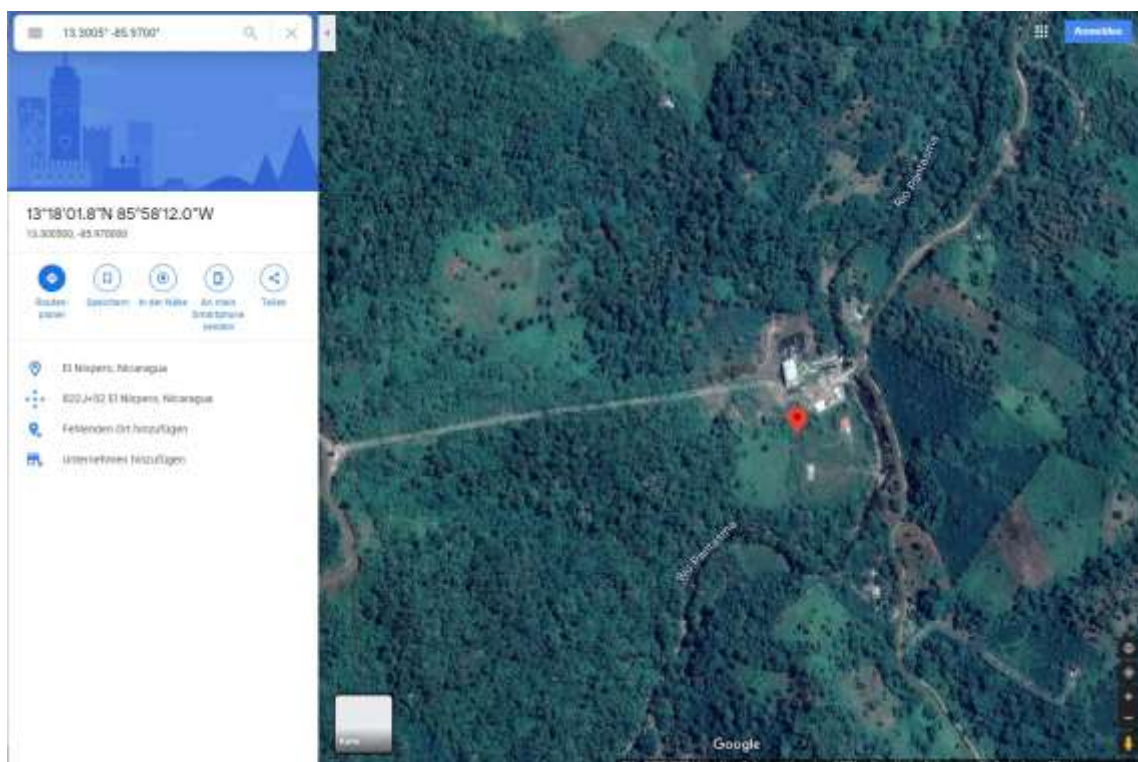
**Table A-1:** Project Location

No.	Project Location
Host Country	Nicaragua
Region:	Department of Jinotega
Project location address:	22 km north of the city of Jinotega
Powerhouse	
Latitude:	13.3005°
Longitude:	-85.9700°
Water intake	
Latitude:	13.3005°
Longitude:	-85.9700°

The location has been crosschecked with google maps as per following screenshots. To identify the related position the latitude and longitude values as per PDD section A.4.1.4. have been inserted in the search as indicated in the below screenshots at top left corner. CL1 has been raised and successfully closed..



Water intake



Powerhouse

Basic technical details of the project are summarized in table A-2.

**Table - A-2:** Technical data of the project activity

From equipment nameplates

Turbine

Parameter	Unit	Value
Manufacturer	-	KOSSLER GESELLSCHAFT m.b.H
Type	-	Pelton – PH2I - 1300/390
Number of turbines	-	2

Parameter	Unit	Value
Axis	-	Horizontal
Design Flow	m <sup>3</sup> /s	2.00 (each one)
Rated Output	kW	6,860 (each one)
Speed	rpm	600
Impeller diameter	mm	1,300
Design head	m	374
Turbine efficiency (at design flow)	%	89.9

## Generator

Parameter	Unit	Value
Manufacturer	-	Voith
Number of generators	-	2
Rated Output	kW	7,200 (each one)
Voltage	V	13,800 +/- 5%
Power factor	-	0.90
Frequency	Hz	60
Speed	rpm	600
Connection	-	Star – Neutral grounded
Efficiency 100% of rated output	%	97.13

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document.
- the monitoring plan is in accordance with the applied approved CDM methodology,
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of this periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

## SECTION B. Verification team, technical reviewer and approver

### B.1. 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 <sup>1</sup>	Interview(s)	Verification findings
1.	Team Leader	EI	Quireza	Oliver	TN México	x	x	x	x
2.	Verifier	EI	Raul	Mitre	TN México	x	x	x	x
3.	Observer	IR	Nuske	Alexandra	TNCert	-	x	-	-

<sup>1</sup> Remote via alternative means

**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	Stefan	Winter	TÜV NORD CERT
2.	Approver	IR	Stefan	Winter	TÜV NORD CERT

**SECTION C. Application of materiality****C.1. Consideration of materiality in planning the verification**

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Materiality Threshold

The verification is based on the materiality threshold identified in table C-1 below:

**Table C-1: Applied Materiality Threshold**

	Threshold	Related to
<input type="checkbox"/>	0.5 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal equal to or more than 500,000 tonnes of carbon dioxide equivalent per year <sup>2</sup> ;
<input type="checkbox"/>	1 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal of between 300,000 and 500,000 tonnes of carbon dioxide equivalent per year;
<input type="checkbox"/>	2 %	Emission reductions or removals for registered large-scale CDM project activities achieving a total emission reduction or removal of 300,000 tonnes of carbon dioxide equivalent per year or less;
<input checked="" type="checkbox"/>	5 %	Emission reductions or removals for registered small-scale CDM project activities other than registered CDM project activities covered under next category below;
<input type="checkbox"/>	10 %	Emission reductions or removals for the type of registered CDM project activities referred to in decision 3/CMP.6, paragraph 38 (referred to as microscale project activities).

Strategic Analysis

At the beginning of the verification, the verification team leader has assessed the nature, scale and complexity of the verification tasks by carrying out a strategic analysis of all activities relevant to the project activity. The team leader has collected and reviewed the information relevant to assess that the designated verification team is sufficiently competent to carry out the verification and to ensure that it is able to conduct the necessary risk analysis.

Risk analysis and detailed audit testing planning

For the identification and assessment of potential reporting risks and to determine the necessary detailed audit testing procedures for residual risk areas the following table is used.

<sup>2</sup> A year refers to a period of 12 consecutive months.

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.	Overlook relevant differences when cross checking electricity data from main meter and invoices	low	Even though there is procedures in place for all metering and cross checking processes the personnel could overlook important differences when performing the electricity reports.	Interview with personnel as well as demonstration of how the cross check is done. Cross check electricity data from both meters directly by the VT.
2.	Omissions and misstatements in data transfer from SCADA into digital Excel ER spreadsheet	low	Ineffective quality control of data transfer due to unclear QA/QC procedure	Check QM procedure/manual. PP may demonstrate how to transfer data and how this is crosschecked. Conduct interview with related personnel whether procedure is actually conducted but not adequately described.
3.	Missing data due to failure of measurement equipment	Low	The monitoring plan defines emergency procedures in case a meter fails. Besides back-up meters are either installed or available onsite for fast exchange.	Check if related meters are installed as per monitoring plan. Check if emergency procedure is known across related personnel via interviews. Check back-up meters on correct calibration.

Based on the risk analysis the verification has been planned. A detailed audit/verification plan has been prepared and submitted to the project participant(s) in due time before the remote audit inspection.

## C.2. Consideration of materiality in conducting the verification

Based on the verification planning the verification has been carried out. The concept of materiality has been considered. A breakdown of the chosen approaches is included in the following table.

Parameter	Approach*	Errors* detected	Corrected	Remaining verification risk after correction
$EG_{facility,y}$	CDC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Not material
$FC_{i,j,y}$	CDC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Not material
$EG_{m,y}$	CDC	<input type="checkbox"/>	<input type="checkbox"/>	Not material
$FC_{i,m,y}$	CDC	<input type="checkbox"/>	<input type="checkbox"/>	Not material
$NCV_{i,y}$	CDC	<input type="checkbox"/>	<input type="checkbox"/>	Not material
$EF_{CO2,i,y} / EF_{CO2,m,i,y}$	CDC	<input type="checkbox"/>	<input type="checkbox"/>	Not material
$\eta_{m,y}$	CDC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Not material
Aggregate				Materiality threshold not exceeded

\*) incl. omissions and misstatements

\*) Verification Approaches:

CDC: Complete data check of data including all data aggregation steps

NDC: Non-complete data check – omissions not material

SPL: Sampling approach (all data available)

ASP: Acceptance Sampling

COM: Data check at higher data aggregation levels and sampling at original data levels

The verification was mainly carried out as per the corresponding verification plan. However, based on the actual situation during desk review and remote audit and the errors, omissions and

misstatements identified during the verification minor deviations from the original plan occurred. However, due to the reason that the validation team has checked all data and did not apply any sampling, it was not required to adjust the audit planning due to these mistakes identified as per table above. Esp. there was no need for significant modification of the sampling approaches (if applicable) or for additional / less locations to be checked during the remote audit. Related findings have been raised which are now to be addressed by the PP to correct the mistakes identified.

## SECTION D. Means of verification

### D.1. Desk/document review

During the desk review, all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- the last revision of the PDD including the monitoring plan<sup>/PDD/</sup>,
- the last revision of the validation report<sup>/VAL/</sup>,
- documentation of previous verifications<sup>/VER/</sup>
- the monitoring report, including the claimed emission reductions for the project<sup>/MR/</sup>,
- the emission reduction calculation spreadsheet<sup>/XLS/</sup>.

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

### D.2. On-site inspection

Duration of on-site inspection: 25/02/2021 to 25/02/2021				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening meeting	Hidropantasma plant via Zoom	25/02/2021	Raul Mitre Oliver Quireza
2.	Viewing of relevant site points / Plant tour	Hidropantasma plant via Zoom	25/02/2021	Raul Mitre Oliver Quireza
3.	Evidence assessment Discussion of GSC comments received (if any)	Hidropantasma plant via Zoom	25/02/2021	Raul Mitre Oliver Quireza
4.	Preparation of the DVR and corresponding findings	Hidropantasma plant via Zoom	25/02/2021	Raul Mitre Oliver Quireza
5.	Findings summary presentation to the client	Hidropantasma plant via Zoom	25/02/2021	Raul Mitre Oliver Quireza
6.	Closing meeting	Hidropantasma plant via Zoom	25/02/2021	Raul Mitre Oliver Quireza

Due to the recent COVID-19 pandemic and related travel restrictions to the host country, the team leader who is based in Mexico was not able to participate in the on-site inspection activity in Nicaragua. According to the Contract<sup>/ERPA/</sup> signed on 30/06/2020 between project owner and CER buyer, and the Schedule including CER issuance procedures, it was not possible to postpone the site visit in order to meet CER delivery commitment (31/05/2021).

On the basis of the information note issued by the CDM EB on 20/03/2020 titled “*CDM Executive Board agrees to relax mandatory site visits by DOEs for a period of three months (23 March to 23 June 2020) due to COVID-19 pandemic*”, and extended to 30/06/2021 in the EB108 §28 and TN Guidance and TN announcements and information distributed via EEMs the following alternative approach has been realized: <sup>/COVID/</sup>

Team members conducted remotely by ZOOM interviews with project owners and detailed documents check. The team members conducted a remote site visit to check the original data and other subjects listed in the Table D.2. above.

### D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1	Giraldo	Carlos	South Pole	25/02/2021	MR/ ER	Oliver Quireza Raul Mitre
2	Mantica	Rodrigo	Hidropantasma	25/02/2021	Plant operations	Oliver Quireza Raul Mitre

					/Equipment	
3	Rodriguez	David	Hidropantasma	25/02/2021	Plant operations / Raw data	Oliver Quireza Raul Mitre

#### D.4. Sampling approach

##### D.4.1. Sampling during monitoring

<input checked="" type="checkbox"/>	No sampling approach has been used by the PP to determine the monitored parameters				
<input type="checkbox"/>	A sampling approach has been taken for the following monitored parameter(s):				
	Parameter	Sampling approach <sup>1)</sup>	Sampling Type <sup>2)</sup>	Population	Sample Size
	Not applicable				

<sup>1)</sup> Sampling Approaches:

SiRS: Simple Random Sampling  
 StRS: Stratified Random Sampling  
 SS: Systematic Sampling  
 CS: Cluster Sampling  
 MSS: Multi-stage Sampling  
 AS: Acceptance Sampling

<sup>2)</sup> Sampling Types:

PS: Parameter Sampling

##### D.4.2. Sampling approaches during verification

<input checked="" type="checkbox"/>	No sampling approach has been used by the VT to verify the monitored parameters				
<input type="checkbox"/>	A sampling approach has been applied by the VT for the following monitored parameter(s):				
	Parameter	Sampling approach <sup>1)</sup>	Sampling Type <sup>2)</sup>	Population	Sample Size
	Not applicable				

<sup>1)</sup> Sampling Approaches:

SiRS: Simple Random Sampling  
 StRS: Stratified Random Sampling  
 SS: Systematic Sampling  
 CS: Cluster Sampling  
 MSS: Multi-stage Sampling

<sup>2)</sup> Sampling Types:

AS: Acceptance Sampling  
 PS: Parameter Sampling  
 COM: Full data check at higher data aggregation levels and sampling at original data levels

#### 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	-	CAR10	-
Compliance of the project implementation and operation with the registered PDD	CL01,	CAR01, CAR02,	-
Post-registration changes	-	CAR01	-
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	CL02, CL04,	CAR03, CAR04, CAR05, CAR06,	-



		CAR07, CAR08, CAR09, CAR12	
Compliance with the calibration frequency requirements for measuring instruments	-	CAR03	-
Assessment of data and calculation of emission reductions or net removals	CL03,	CAR11, CAR13	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
<b>Total</b>	<b>4</b>	<b>13</b>	<b>-</b>

## SECTION E. Verification findings

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

Means of verification	<p>A draft monitoring report was submitted to the verification team by the project participants. The DOE has made this report publicly available prior to the start of the verification activities. No comments were received.</p> <p>By means of the UNFCCC website it has been checked whether the latest applicable MR template CDM-MR-FORM has been used.</p> <p>Further, it has been checked whether the latest instructions for filling out the MR template have been followed. Every section has been checked against the respective guidance.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"><li>• /MR/</li><li>• /MRT/</li><li>• /unfccc/</li></ul>	
Findings	<input checked="" type="checkbox"/>	The latest reporting template CDM-MR-FORM as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.
	<input type="checkbox"/>	The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification.
	<input checked="" type="checkbox"/>	<p>The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:</p> <p>CAR 10</p>
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The latest version of the MR has been used and The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification. However, CAR 10 has been raised.	

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

During the validation, the validating DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose, FARs might have been raised. Likewise, FARs might have been raised in the course of previous verifications.

In the course of this verification the latest version of the PDD <sup>/PDD/</sup> and the previous verification report <sup>/VER/</sup>, where applicable, have been checked in order to identify any remaining forward action requests. For the current monitoring period the following applies:

#### (i) Open issues from validation:

<input checked="" type="checkbox"/>	There were no open issues, which have been addressed in the latest version of the validation report.
<input type="checkbox"/>	All open issues from the validation have been appropriately addressed in the context of previous verifications.
<input type="checkbox"/>	All issues related to the validation have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the validation have <b>not</b> yet been appropriately addressed (for details please refer to appendix 4):

	- N/A
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(ii) Open issues from previous verifications:

<input checked="" type="checkbox"/>	N/A – as this is the first monitoring period for this CDM project activity.
<input type="checkbox"/>	There were no open issues which have been addressed in the previous verification report
<input type="checkbox"/>	All issues related to the previous verification have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the previous verification have <b>not</b> yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

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

<b>Means of verification</b>	<p>By means of an in-depth review of the PDD in its latest form – as downloaded from the UNFCCC project webpage - and the checks carried out during the remote audit an assessment has been carried out whether the project has been implemented and operated in line with the latest approved version of the PDD and whether all physical features of the project are in place. The following has been checked: implemented technology, project equipment as well as monitoring and metering equipment.</p> <p>Further, it has been checked if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period and consistent notations of key equipment (meters etc.) in PDD, MR and calculation spreadsheet are applied.</p> <p>Interviews with operational personnel have been carried out, QMS records, maintenance records, instrument and technical specifications were checked in this context to assess that all physical features (technology, project equipment, and monitoring and metering equipment) of the registered CDM project activity specified in the registered PDD are in place and that the project participants have operated the project activity as per the registered PDD or any approved revised PDD.</p> <p>Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred.</p> <p>Further, it has been checked whether any observed deviations from the registered project design have been identified and have been correctly addressed as PRCs.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /PDD/</li> <li>• /MR/</li> <li>• /VVS/</li> <li>• /XLS/</li> <li>• /QMS/</li> <li>• /MTR/</li> <li>• /INSTR/</li> <li>• /unfccc/</li> </ul>	
<b>Findings</b>	<input type="checkbox"/>	The project has been implemented and operated as described in the latest version of the PDD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.
	<input type="checkbox"/>	The following deviations from the registered / approved project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4): - N/A
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs have been raised: CL 01, CAR 01, CAR 02
		<i>In case of phased implementation:</i>
	<input checked="" type="checkbox"/>	N/A
	<input type="checkbox"/>	The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.

	<input type="checkbox"/>	The description in section B.1 of the MR differs in content or the level of detail from the latest version of the PDD. However, the description in the MR is correct and reflects the situation as identified during the onsite inspection.
	<input type="checkbox"/>	The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A or add as appropriate
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The relevant information at implementation stage such as dates, technical data and PA location is correctly provided in accordance with the PDD.	

#### E.4. Post-registration changes

##### E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents<sup>3</sup>

It has been checked whether Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been applied during this monitoring period. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been submitted to the UNFCCC prior to the current monitoring period.		
<input type="checkbox"/>	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	<input checked="" type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.: )
		Appr.date	N/A
		Ref. No.	N/A
	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.: )
		Appr.date	
		Ref.No.	
<input type="checkbox"/>	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
<input type="checkbox"/>	An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		
	1	Issue:	
	2	Issue:	
<input checked="" type="checkbox"/>	The following TDfrMP or TDfMM for which appendix of the PS, "Indicative list of post-registration changes that may be suitable for approval under the issuance track", is applicable have been applied:		
	1	Issue:	During the entire monitoring period parameter FCi,j,y was not properly monitored, and the volume meter was not calibrated as defined in the registered PDD. Therefore, as a conservative approach, the maximum diesel consumption of the backup electricity system during the entire monitoring period was estimated to calculate the project's emissions according to its fuel efficiency and maximum

<sup>3</sup> 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).

		operating capacity or load factor defined in the manufacturer's specifications.
2	Issue:	-

#### E.4.2. Corrections

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input type="checkbox"/>	During the verification of the current MP no need for corrections has been identified.	
<input checked="" type="checkbox"/>	The following corrections have been applied:	
1	Issue:	Turbine type: the registered PDD states as turbine type "Pelton – PH2/1300/390" which was determined during the plant design stage based on the "Technical proposal – Mechanical equipment – Final offer No. 020824-30B_Kossler". However, the turbine type was updated to "Pelton – PH2I - 1300/390" according to the installed turbine nameplates.
2	Issue:	Rated output capacity: the registered PDD states as turbine rated output capacity "6,547 kW (each one)" which was determined during the plant design stage based on the "Technical proposal – Mechanical equipment – Final offer No. 020824-30B_Kossler". However, the turbine rated output capacity was updated to "6,860 kW (each one)" according to the installed turbine nameplates.
The PDD has been revised accordingly: (New) version No.: 5.1 Revision date: 07/07/2021		
It is confirmed that the updated / corrected information is an accurate reflection of the actual project information and that the corrected parameters are in accordance with the applied methodology and the monitoring plan.		
<input type="checkbox"/> A related post registration change has been submitted prior to the issuance request. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z. <input checked="" type="checkbox"/> A related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		

#### E.4.3. Change to the start date of the crediting period of the project activity

<input type="checkbox"/>	N/A - as this is not the first verification within the crediting period
<input checked="" type="checkbox"/>	The PPs do not intend to change the start date of the crediting period.
<input type="checkbox"/>	As the change in the start date was below the related time period as indicated in PS § 233 and § 234 no prior approval was required but only a notification. This notification has been submitted by the PP without involvement of the DOE. The change and new start date has been checked from the related UNFCCC project webpage.
<input type="checkbox"/>	The PPs intend to change the start date of the crediting period. As the intended change in start date beyond the related time period as indicated in PS § 235 and as per §236 prior approval by the Board is required. For detailed assessment of the change please refer to related PRC validation report. As per assessment in this report the DOE confirms that the change to the start date of the crediting period are in line with the related requirements of the VVS and PS.
<input type="checkbox"/>	The approval to change the start date of the crediting period has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z

**E.4.4. Inclusion of a monitoring plan**

<input checked="" type="checkbox"/>	N/A - as this monitoring plan was part of the registered PDD
<input type="checkbox"/>	In line with PS § 237 and § 83 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 83 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.
<input type="checkbox"/>	In line with PS § 237 and § 83 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z.

**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**

It has been checked whether any permanent changes or deviations from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) or other methodological regulatory documents have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period									
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC									
	1	<table border="1"> <tr> <td>Title</td> <td></td> </tr> <tr> <td>Status</td> <td><input type="checkbox"/> under approval; <input type="checkbox"/> approved</td> </tr> <tr> <td>Appr.date</td> <td></td> </tr> <tr> <td>Ref. No.</td> <td></td> </tr> </table>	Title		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved	Appr.date		Ref. No.	
Title										
Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved									
Appr.date										
Ref. No.										
	2	<table border="1"> <tr> <td>Title</td> <td></td> </tr> <tr> <td>Status</td> <td><input type="checkbox"/> under approval; <input type="checkbox"/> approved</td> </tr> <tr> <td>Appr.date</td> <td></td> </tr> <tr> <td>Ref.No.</td> <td></td> </tr> </table>	Title		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved	Appr.date		Ref.No.	
Title										
Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved									
Appr.date										
Ref.No.										
<input type="checkbox"/>	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA									
<input type="checkbox"/>	An approval of the following PCfrMP, PCfMM or PCfSB is to be requested from the EB for the current MP as appendix of the PS, "Indicative list of post-registration changes that may be suitable for approval under the issuance track", does not apply.									
	1	Issue:								
	2	Issue:								
<input checked="" type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB for which appendix of the PS, "Indicative list of post-registration changes that may be suitable for approval under the issuance track", is applicable have been applied:									
	1	<table border="1"> <tr> <td>Issue:</td> <td>The PDD under operating margin calculation it is stated that "the emission factor should be updated for the year in which the power plant displaces electricity from the grid (applicable over the crediting period)", however, data for calculating emission factor from official sources is usually only available 18 months after the end of year y, therefore the emission factor of the year proceeding the previous year y-2 was used and the same data vintage (y, y-1 or y-2) was used throughout all crediting periods, i.e., 2011-2018, then the PDD was updated in accordance with Tool 07 allowing the applicability of such option.</td> </tr> </table>	Issue:	The PDD under operating margin calculation it is stated that "the emission factor should be updated for the year in which the power plant displaces electricity from the grid (applicable over the crediting period)", however, data for calculating emission factor from official sources is usually only available 18 months after the end of year y, therefore the emission factor of the year proceeding the previous year y-2 was used and the same data vintage (y, y-1 or y-2) was used throughout all crediting periods, i.e., 2011-2018, then the PDD was updated in accordance with Tool 07 allowing the applicability of such option.						
Issue:	The PDD under operating margin calculation it is stated that "the emission factor should be updated for the year in which the power plant displaces electricity from the grid (applicable over the crediting period)", however, data for calculating emission factor from official sources is usually only available 18 months after the end of year y, therefore the emission factor of the year proceeding the previous year y-2 was used and the same data vintage (y, y-1 or y-2) was used throughout all crediting periods, i.e., 2011-2018, then the PDD was updated in accordance with Tool 07 allowing the applicability of such option.									

2	Issue:	
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**E.4.6. Changes to the project design**

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No CoPD has been submitted to the UNFCCC prior to the current monitoring period		
<input type="checkbox"/>	The following CoPD have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref. No.	
	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref.No.	
<input type="checkbox"/>	During the verification of the current MP no need for a CoPD has been identified. the project design is in line with the description as per latest registered PDD.		
<input type="checkbox"/>	An approval of the following CoPD.is to be requested from the EB for the current MP as appendix of the PS, "Indicative list of post-registration changes that may be suitable for approval under the issuance track", does not apply.		
	1	Issue:	
	2	Issue:	
<input type="checkbox"/>	The following CoPD for which appendix of the PS, "Indicative list of post-registration changes that may be suitable for approval under the issuance track", is applicable have been applied:		
	1	Issue:	
	2	Issue:	

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

It has been checked whether any changes specific to afforestation and reforestation project activities (CsARPA) have been approved prior or during this monitoring period, or submitted with this monitoring report. The result is summarized in the table below.

<input checked="" type="checkbox"/>	N/A - as this is no A/R project activity		
<input type="checkbox"/>	No CsARPA has been submitted to the UNFCCC prior to the current monitoring period		
<input type="checkbox"/>	The following CsARPA have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref. No.	
	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved

	Appr.date	
	Ref.No.	
<input type="checkbox"/>	During the verification of the current MP no need for a CsARPA has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA	
<input type="checkbox"/>	An approval of the following CoPD is to be requested from the EB for the current MP as appendix of the PS, "Indicative list of post-registration changes that may be suitable for approval under the issuance track", does not apply.	
	1	Issue:
	2	Issue:
<input type="checkbox"/>	The following CsARPA for which "Guidelines on accounting of specified types of changes in A/R CDM project activities from the description in registered project design documents, Version 02.0" (EB 66, Annex 24) is applicable have been applied:	
	1	Issue:
	2	Issue:
	The changes listed above are identified as minor in nature and do not require prior approval by the EB.	
<input type="checkbox"/>	The following CsARPA for which "Guidelines on application of specified versions of A/R CDM methodologies in verification of registered A/R CDM project activities" (Version 01.1) (EB68, Annex 31)" is applicable have been applied:	
	1	Issue:
	2	Issue:
	All changes listed above are applied in line with "Guidelines on application of specified versions of A/R CDM methodologies in verification of registered A/R CDM project activities" (Version 01.1) (EB68, Annex 31) and are applicable to the project.	

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

<b>Means of verification</b>	By means of comparison of the MR with (i) the applied CDM methodology (ii) all applicable CDM Meth tools and (iii) if applicable, a standardized baseline the verification team has checked whether the MP is in compliance with the MP related requirements of the applied methodology/tools/SB. The following sources of information have been used in this context: <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /METH/</li> <li>• /TOOL/</li> <li>• /unfccc/</li> </ul>								
<b>Findings</b>	<input type="checkbox"/>	The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD)							
	<input checked="" type="checkbox"/>	The breakdown of MP accordance of the referenced tools is as follows:							
		1	<table border="1"> <tr> <td>Title (of the tool)</td> <td>TOOL07 Tool to calculate the emission factor for an electricity system</td> </tr> <tr> <td>Version</td> <td>7</td> </tr> <tr> <td>MP compliance</td> <td> <input type="checkbox"/> full compliance  <input checked="" type="checkbox"/> findings have been raised  <input type="checkbox"/> N/A (for MP) </td> </tr> </table>	Title (of the tool)	TOOL07 Tool to calculate the emission factor for an electricity system	Version	7	MP compliance	<input type="checkbox"/> full compliance <input checked="" type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)
Title (of the tool)	TOOL07 Tool to calculate the emission factor for an electricity system								
Version	7								
MP compliance	<input type="checkbox"/> full compliance <input checked="" type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)								
		2	<table border="1"> <tr> <td>Title (of the tool)</td> <td>TOOL03: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"</td> </tr> </table>	Title (of the tool)	TOOL03: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"				
Title (of the tool)	TOOL03: Tool to calculate project or leakage CO2 emissions from fossil fuel combustion"								

		Version	3
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A
	<input type="checkbox"/>	The breakdown of MP accordance of the applicable SB is as follows:	
		1	Title (of the SB)
Version		-	
		MP compliance	<input type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CL 04, CAR 11	
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.	
	After clarification and correction provided by the PP the findings were successfully closed The registered PDD refers to TOOL07 ver. 2.2.1, nevertheless as the PP calculated the EF ex post, he decided to apply the latest version (07) of the TOOL07. It is important to notice that the procedures followed as per the ver. 2.2.1 doesn't has any change versus the procedure followed with ver. 7. The TOOLS reported in the MR are correct and in line with the registered PDD and applicable methodology.		

## 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

<b>Means of verification</b>	By means of comparison of the MR and the ER calculation with the latest version of the registered PDD the verification team has checked whether all parameters fixed ex-ante have been applied correctly. Further, it has been checked whether the GWP for the respective period have been correctly applied. The following list of ex-ante fixed parameters have been applied:				
	<b>Nbr.</b>	<b>Parameter abbreviation</b>	<b>Description</b>	<b>Value as per initial MR</b>	<b>Unit</b>
	1.	EG <sub>m,y</sub>	Net electricity generated by power units m in year y	As per annex 3 of PDD	MWh
	2.	FC <sub>i,m,y</sub>	Amount of fossil fuel type i consumed by power plant/unit m in year y	As per annex 3 of PDD	Mass or volume unit/y.
	3.	NCV <sub>i,y</sub>	Net calorific value of coal used during year y	41.4 (Diesel oil) 39.8 (Fuel oil)	GJ/t
	4.	EF <sub>CO2,i,y</sub> / EF <sub>CO2,m,i,y</sub>	CO <sub>2</sub> emission factor of fossil fuel type i used in power unit m in year y / Weighted average CO <sub>2</sub> emission factor of fuel type i in year y	0.0726 (Diesel oil) 0.0755 (Fuel oil)	tCO <sub>2</sub> /GJ
	Please note that the following parameters are given as ex-ante fixed as well as monitoring parameters in the registered PDD: EG <sub>m,y</sub> - Net electricity generated by power units m in year y. FC <sub>i,m,y</sub> - Amount of fossil fuel type i consumed by power plant/unit m in year y.				
	The following sources of information have been used in this context: <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /XLS/</li> <li>• /PDD/</li> </ul>				



	<ul style="list-style-type: none"> <li>• /PS/</li> <li>• /VVS/</li> <li>• /unfccc/</li> </ul>	
<b>Findings</b>	<input type="checkbox"/>	The MR and the ER calculation have considered the parameters fixed ex-ante or at the renewal of the crediting period correctly, no deviations have been observed.
	<input type="checkbox"/>	The following deviations from the parameters fixed ex-ante or at renewal of crediting period have been identified in the course of this verification: - N/A
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CAR 12
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
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**E.6.2. Data and parameters monitored**

<b>Means of verification</b>	During the verification all relevant monitoring parameters as listed in registered or latest approved PDD have been verified with regard to the <ul style="list-style-type: none"> <li>(i) appropriateness of the applied measurement / determination method,</li> <li>(ii) the correctness of the values applied for ER calculation,</li> <li>(iii) the accuracy, and applied QA/QC measures.</li> </ul> The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5).	
<b>Findings</b>	<input checked="" type="checkbox"/>	Based on document check, interviews conducted and/or onsite inspection (physically or virtual/remotely) it is confirmed that all parameters stated in the registered monitoring plan and relevant Board decisions have been monitored and updated as applicable, including: <ul style="list-style-type: none"> <li>(i) Project emission or net removal parameters;</li> <li>(ii) Baseline emission or net removal parameters;</li> <li>(iii) Leakage parameters;</li> <li>(iv) Management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the registered monitoring plan;</li> </ul>
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CARs: 03, 04, 05, 08, 09, CL 02
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		After corrections it can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements. The registered monitoring plan has been properly implemented and followed by the project participants during this monitoring period.

**E.6.3. Implementation of sampling plan**

<b>Means of verification</b>	Based on monitoring report, ER spreadsheet, interview with PP and check of related supporting documents. The following sources of information have been used in this context: <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /XLS/</li> <li>• /PDD/</li> <li>• /PS/</li> <li>• /VVS/</li> <li>• /unfccc/</li> <li>• /EG/</li> </ul>
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	• /EF/			
<b>Findings</b>	<input checked="" type="checkbox"/>	The PPs have not applied sampling approaches for the parameters monitored.		
	<input type="checkbox"/>	The PPs have applied sampling approaches for the following parameters monitored.		
		1	Parameter:	-
			Name:	-
			Description on how the sampling efforts and survey comply with the validated sampling plan:	-
		2	Parameter:	-
Name:	-			
Description on how the sampling efforts and survey comply with the validated sampling plan:	-			
<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:			
	-			
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
		-		

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

<b>Means of verification</b>	<p>During the verification, the relevant monitoring equipment has been checked whether the calibration requirements have been met; especially if the calibration frequency is in line with the requirements of the validated PDD and/or the applicable calibration standards.</p> <p>The results as well as the verification procedure are described equipment-wise in the project specific verification checklist (Appendix 6).</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /XLS/</li> <li>• /CC/.</li> </ul>	
<b>Findings</b>	<input type="checkbox"/>	Based on the details listed in appendix 6 the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.
	<input checked="" type="checkbox"/>	<p>Based on the assessment and information as per appendix 6 delay(s) in calibration have been identified. The PP has applied the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</p> <p>From the related calibration certificates and emission reduction calculation the verification team confirms that the maximum permissible error has been applied in a conservative manner so that the adjusted measured values due to the delayed calibration result in fewer claimed emission reductions.</p> <p>For details please refer to appendix 6</p>
	<input checked="" type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p>CAR 03 and CAR 08</p>
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		<p>There were calibration gaps during the MP, which were properly identified by the PP. The raw data used for the ER calculation was adjusted with the maximum permissible error of the meter (0.2%), in the case of electricity generated, the 0.2% was subtracted and in the case of the electricity consumption the 0.2% was added, so in line with §365-371 of the VVS version 2, the ER calculation is considered conservative, correct. It is confirmed by the calibration certificates that none of the meters surpassed the maximum permissible error.</p>

## 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	<p>During the verification, the calculation of baseline GHG emissions has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> <li>• <i>Transparency</i>: It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae.</li> <li>• <i>Parameter consistency</i>: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet.</li> <li>• <i>Correctness</i>: It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology.</li> <li>• <i>Completeness</i>: It has been checked whether all calculations are complete and without omissions.</li> </ul> <p>The GHG calculation is based on the following equation:</p> $BE_y = EG_{BL,y} * EF_{CO_2,grid,y}$ <p>Where:</p> <p><math>BE_y</math> = Baseline emissions in year “y” (tCO<sub>2e</sub>/year)</p> <p><math>EG_{BL,y}</math> = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year “y” (MWh)</p> <p><math>EF_{CO_2,grid,y}</math> = CO<sub>2</sub> emission factor of the grid in year “y” (tCO<sub>2e</sub>/MWh)</p> <p><math>EF_{CO_2,grid,y}</math> is calculated yearly according to “ TOOL 07 to calculate the emission factor of an electricity system”.</p> <p>As per PDD Ex post option is chosen to calculate the <math>EF_{CO_2,grid,y}</math>.</p> <p>As per registered PDD Nicaragua’s Electric National System (Sistema eléctrico Nacional, SEN) is assumed as the project electricity system. Furthermore, Off-grid power plants are not included in the project electricity system; option 1 is chosen.</p> <p><u>Step 1. Identification of the relevant electricity systems</u></p> <p>As mentioned above the plant Hidropantasma is connected to the grid Nicaragua’s Electric National System through the substation Asturias, which is chosen properly for the <math>EF_{CO_2,grid,y}</math> calculation.</p> <p><u>Step 2. Inclusion off-grid power plants in the project electricity system</u></p> <p>In line with Option 1 of the tool and as indicated in the registered PDD the PP decided to not to include off-grid power plants but grid power plants only.</p> <p><u>Step 3. Selection of a method to determine the operating margin</u></p> <p>As per registered PDD the PP has chosen to calculate the related emission factor as the simple OM emission factor, which is calculated as the generation-weighted average of CO<sub>2</sub> emissions per unit net electricity generation (tCO<sub>2</sub>/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units.</p> <p>In line with approach 1 of the TOOL07 the PP analysed the low-cost/must run share of the total generation in: 1) average of the five most recent years, and 2) based on the long-term averages</p> <p>The analysis made y the PP in sheet OM method LCMR_Analysis shows that the LCMR share in the long term (2006-2020) is less than 50% so that the OM method can be used.</p> <p>The data is taken directly from the original data downloaded from the INE webpage<sup>4</sup>, which is publicly available.</p> <p>Option A of the TOOL is selected for the OM calculation.</p>
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<sup>4</sup> <https://www.ine.gob.ni/index.php/electricidad/serie-historica/>

For the OM calculation the simple OM option is used, where the equation is the following:

$$EF_{grid,OMsimple,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad \text{Equation (3)}$$

Where:

- $EF_{grid,OMsimple,y}$  = Simple operating margin CO<sub>2</sub> emission factor in year  $y$  (t CO<sub>2</sub>/MWh)  
 $EG_{m,y}$  = Net quantity of electricity generated and delivered to the grid by power unit  $m$  in year  $y$  (MWh)  
 $EF_{EL,m,y}$  = CO<sub>2</sub> emission factor of power unit  $m$  in year  $y$  (t CO<sub>2</sub>/MWh)  
 $m$  = All power units serving the grid in year  $y$  except low-cost/must-run power units  
 $y$  = The relevant year as per the data vintage chosen in Step 3

The build margin is calculated as follow:

#### Step 5. Calculation of Build Margin emission factor

For the BM calculation the PP chose option 2, where the BM for the 2<sup>nd</sup> CP is calculated ex ante as per option 1, (Based on the most recent information available on units already built at the time of submission of the request for RCP to the DOE (January 2021), where the most recent information available was from 2018. In this regard as the data vintage available information is only y-2 as per TOOL 07 then a PRC has been reported and assessed by the VT in a separate report.

The following procedure was followed:

As per the tool the sample group of power units  $m$  is determined through as follow:

1. the identification of the set of five power plants units, excluding the registered CDM power units that started supplying electricity most recently ( $SET_{5-units}$ ) and determine their annual electricity generation ( $AEG_{5-units}$ , in MWh)
2. Determine the annual electricity generation of the NIS excluding the registered CDM projects ( $AEG_{total}$ ), than identify the set of power plant units that started to supply electricity most recently that comprises 20% of the  $AEG_{total}$  (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) ( $SET_{\geq 20\%}$ ) and determine the annual electricity generation  $AEG_{SET \geq 20\%}$ .
3. From  $SET_{\geq 20\%}$  and  $SET_{5-units}$  select the set of power units that comprises the larger annual electricity generation ( $SET_{sample}$ )
4. For this MP the  $AEG_{SET \geq 20\%} = SET_{sample}$  for the six years (2013-2018)
5. The  $SET_{\geq 20\%}$  was selected as the  $SET_{sample}$  because it is the set of power units that comprises the larger annual generation or the annual generation is equal compared to  $SET_{5-units}$  annual generation.
6. It was checked the date when the power units in  $SET_{sample}$  started to supply electricity to the grid. As none of the power units in  $SET_{sample}$  started to supply electricity to the grid more than 10 years ago, then  $SET_{sample}$  was to calculate the build margin.

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad \text{Equation (15)}$$

Where:

- $EF_{grid,BM,y}$  = Build margin CO<sub>2</sub> emission factor in year  $y$  (t CO<sub>2</sub>/MWh)  
 $EG_{m,y}$  = Net quantity of electricity generated and delivered to the grid by power unit  $m$  in year  $y$  (MWh)  
 $EF_{EL,m,y}$  = CO<sub>2</sub> emission factor of power unit  $m$  in year  $y$  (t CO<sub>2</sub>/MWh)  
 $m$  = Power units included in the build margin  
 $y$  = Most recent historical year for which electricity generation data is available

The emission factor of the electric system used for the baseline is calculated as:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM} \quad \text{Equation (16)}$$

Where:

$EF_{grid,OM,y}$	= Operating Margin emission factor
$EF_{grid,BM,y}$	= Building Margin emission factor
$EF_{grid,CM,y}$	= $EF_{CO_2,grid,y}$ = CO <sub>2</sub> emission factor of the grid in year "y" (tCO <sub>2</sub> /MWh)
$W_{OM}$	= Weighting of operating margin emissions factor
$W_{BM}$	= Weighting of build margin emissions factor

In line with registered PDD and related tool the weighing factors of 0.5 for both OM and BM have been applied.

The actual  $EF_{grid,CM,y}$  values for this MP as per MR are summarized as follows:

Year	Operating Margin (OM) [tCO <sub>2</sub> /MWh]	Build Margin (BM) [tCO <sub>2</sub> /MWh]	WOM	WBM	Weighted Average CM
2013	0.6636	0.6527	0.5000	0.5000	0.6582
2014	0.6843	0.6523	0.5000	0.5000	0.6683
2015	0.6772	0.6547	0.5000	0.5000	0.6660
2016	0.6757	0.6556	0.5000	0.5000	0.6657
2017	0.6823	0.6594	0.5000	0.5000	0.6709
2018	0.6875	0.4004	0.5000	0.5000	0.5440
2019	0.6673	0.4004	0.5000	0.5000	0.5339
2020	0.6685	0.4004	0.5000	0.5000	0.5345

The year indicated in the table above is the one corresponding to the crediting period, but the data vintage used for the calculation is the y-2, i.e. the data vintage used for year 2013 is 2011 and so on.

Notice that the data vintage applied for the calculation is the y-2, which is in line with the updated PDD and the TOOL07.

By checking the public available information in the official web page of the INE (<https://www.ine.gob.ni/index.php/electricidad/estadisticas-anuales/>) it is confirmed the latest available public information is from year 2018.

From the year-wise grid emission factor calculation follows the baseline calculation as following:

Year	MWh dispatch	Baseline	Project	Net benefit tCO <sub>2</sub>
2013	21,796.89	14,346	5.98	14,340
2014	49,238.72	32,906	25.39	32,881
2015	46,818.99	31,179	25.39	31,154
2016	53,909.15	35,885	25.39	35,859
2017	67,912.71	45,559	25.39	45,534
2018	61,316.83	33,353	25.39	33,328
2019	32,018.10	17,093	25.39	17,067
2020	36,177.14	19,335	19.41	19,315
<b>Total</b>	<b>300,993</b>	<b>229,656</b>	<b>178</b>	<b>229,478</b>

The following sources of information have been used in this context:

- /MR/
- /XLS/
- /PDD/
- /EF/

#### Findings



The calculation of the baseline emissions was found to be fully compliant with the above stated principles.

		The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information has been identified.
	<input checked="" type="checkbox"/>	The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CARs: 07, 08, 09, 11 and 13
	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
<b>Conclusion</b>	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		Where corrections were required a revised baseline emissions calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct.

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

<b>Means of verification</b>	<p>During the verification, the calculation of project GHG emissions has been checked. In detail the following has been verified:</p> <p>Transparency: It has been checked whether the calculation of project emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae.</p> <p>Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet.</p> <p>Correctness: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology.</p> <p>Completeness: It has been checked whether all calculations are complete and without omissions.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /PDD/</li> <li>• /XLS/</li> <li>• /TOOL/</li> <li>• /METH/</li> </ul> <p>The PE are calculated in line with the methodology ACM002 ver. 13 as follows:</p> $PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y} \quad (1)$ <p>Where:</p> <p><math>PE_y</math> = Project emissions in year y (tCO<sub>2</sub>e/yr)</p> <p><math>PE_{FF,y}</math> = Project emissions from fossil fuel consumption in year y (tCO<sub>2</sub>/yr)</p> <p><math>PE_{GP,y}</math> = Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO<sub>2</sub>e/yr)</p> <p><math>PE_{HP,y}</math> = Project emissions from water reservoirs of hydro power plants in year y (tCO<sub>2</sub>e/yr)</p> <p>For <math>PE_{FF,y}</math></p> <p>As per PDD a fossil fuel based emergency generator is in place in case of emergencies as per published MR no consumption of diesel was considered during the monitoring period, nevertheless the VT raised a finding to confirm the amounts of diesel used during the monitoring period.</p>
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	<p>In case of any related project emissions they are calculated as following:</p> $PE_{FC,j,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$ <p>Where:</p> <p><math>PE_{FC,j,y}</math> CO2 emissions from fossil fuel combustion in process j during the year y (tCO<sub>2</sub>/yr)</p> <p><math>FC_{i,j,y}</math> Quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)</p> <p><math>COEF_{i,y}</math> CO2 emission coefficient of fuel type i in year y (tCO<sub>2</sub>/mass or volume unit)</p> <p>i Fuel types combusted in process j during the year</p> $COEF_{i,y} = NCV_{i,y} \times EF_{CO2,i,y}$ <p>Where:</p> <p><math>COEF_{i,y}</math> CO2 emission coefficient of fuel type i in year y (tCO<sub>2</sub>/mass or volume unit)</p> <p><math>NCV_{i,y}</math> Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)</p> <p><math>EF_{CO2,i,y}</math> Weighted average CO2 emission factor of fuel type i in year y (tCO<sub>2</sub>/GJ)</p> <p>i Fuel types combusted in process j during the year y</p> <p><math>PE_{GP,y}</math> is not applicable as this is not a geothermal project.</p> <p>For <math>PE_{HP,y}</math></p> <p>In line with the registered PDD, the emissions from the reservoir have to be calculated if the Power Density (PD) is lower than 10 W/m<sup>2</sup>.</p> <p>The PD is calculated as follows:</p> $PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}} \quad (5)$ <p>Where:</p> <p><math>PD</math> = Power density of the project activity (W/m<sup>2</sup>)</p> <p><math>Cap_{PJ}</math> = Installed capacity of the hydro power plant after the implementation of the project activity (W)</p> <p><math>Cap_{BL}</math> = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero</p> <p><math>A_{PJ}</math> = Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m<sup>2</sup>)</p> <p><math>A_{BL}</math> = Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m<sup>2</sup>). For new reservoirs, this value is zero</p> <p>The PD calculation has been provided in the MR nevertheless a related finding has been raised.</p>	
	Findings	<p><input type="checkbox"/> The calculation of the project emissions was found to be fully compliant with the above stated principles. The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p> <p><input checked="" type="checkbox"/> The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.</p> <p><input checked="" type="checkbox"/> In this context the following CARs, CLs, FARs have been raised: CAR 04 and 06</p>
	Conclusion	<p><input type="checkbox"/> No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.</p> <p><input checked="" type="checkbox"/> The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p> <p>After the correction it is confirmed that the proper consideration of the possible use of fossil fuel was taken into consideration, so it can be conformed that the project</p>

	emissions are determined correctly, in line the registered PDD and applied methodology.
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**E.8.3. Calculation of leakage GHG emissions**

<b>Means of verification</b>	<p>During the verification, it has been checked whether leakage emissions have to be considered and, in cases where leakage emissions have to be calculated, the respective calculation of leakage GHG emissions has been checked. In such cases the same verification principles have been considered as for the baseline and project emissions calculation. Please refer to E.8.1 and E.8.2.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /XLS/.</li> </ul>	
<b>Findings</b>	<input checked="" type="checkbox"/>	No leakage emissions were to be considered (LE = 0).
	<input type="checkbox"/>	<p>The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see 8.1 and 8.2).</p> <p>The calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in leakage emissions calculations have been justified. Where applicable, appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information have been identified.</p>
	<input type="checkbox"/>	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
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**E.8.4. Summary of calculation of GHG emission reductions or net anthropogenic GHG removals by sinks**

<b>Means of verification</b>	<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"> <li>- Total baseline emissions,</li> <li>- Total project emissions,</li> <li>- Total leakage,</li> <li>- Total emission reductions.</li> </ul> <p>It has been assessed whether the values are correct or need to be revised as a consequence of issues identified above.</p>	
<b>Findings</b>	<input checked="" type="checkbox"/>	Section E.4 of the MR includes in a summary table of the emission reductions calculation.
	<input checked="" type="checkbox"/>	The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.
	<input checked="" type="checkbox"/>	The values as specified in the ER summary table are correct; no issues have been identified during the verification, which requires changes in the ER calculation.
	<input checked="" type="checkbox"/>	During the verification, issues with impact on the ER calculation have been identified.
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CAR 04, CAR 05, CAR 06, CAR 07, CAR 09, CAR 10, CAR 12
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.



	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		It is concluded that the GHG emission reductions are calculated correctly and in line the registered PDD and applicable methodology and tool.

#### E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

<b>Means of verification</b>		The verification team has checked if the MR includes a comparison of actual values of the monitoring period with the estimations in the registered PDD. It has further checked which of the below listed cases is applicable for the calculated ER of the current monitoring period.
<b>Findings</b>	<input checked="" type="checkbox"/>	Case 1: The ex-ante estimated value was found to be proportionally higher than the ex-post determined value. No further action is deemed required.
	<input type="checkbox"/>	Case 2: The ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.
	<input type="checkbox"/>	Case 3: The ex-ante estimated value was found to be proportionally lower than the ex-post determined value.
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CL 03 and CAR 10
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		The reported ER calculation is consistent with the calculation in the ER spreadsheets, furthermore the PP could demonstrate that the SSC project activity was below the related threshold for each year during the monitoring period.

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

<b>Means of verification</b>		On the basis of the above comparison of actual values of the monitoring period with the estimations in the registered PDD the verification team has checked whether (in case 3) an appropriate explanation is included in the MR.
<b>Findings</b>	<input checked="" type="checkbox"/>	No further justification or explanation is deemed required as actual emissions of this MP do not exceed significantly the ex-ante calculated emission reductions (applicable for case 1 and 2).
	<input type="checkbox"/>	For case 3: The PP has provided a related justification in the MR. The reasons for the increase are as follows: - N/A
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CL 03 and CAR 10
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		The reported ER calculation is consistent with the calculation in the ER spreadsheets, furthermore the PP could demonstrate that the SSC project activity was below the related threshold for each year during the monitoring period.

#### 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

<b>Means of verification</b>		The verification team has checked chapter E.4 of the MR and the emission reduction calculation sheet /XLS/.
<b>Findings</b>	<input checked="" type="checkbox"/>	The MR in section E.4 includes a summary table of the ER breakdown ER before 01/01/2013 and ER from 01/01/2013 until 31/12/2020 ER from 01/01/2021
	<input checked="" type="checkbox"/>	The breakdown of the ERs before 01/01/2013 (during the first commitment

	period), from 01/01/2013 until 31/12/2020 and from 01/01/2021 onwards is as follows: <input type="checkbox"/> The ER have completely been generated before 01/01/2013 (during the first commitment period) <input checked="" type="checkbox"/> The ERs have completely been generated from 01/01/2013 until 31/12/2020, <input type="checkbox"/> The ERs have completely been generated from 01/01/2021 onwards, <input type="checkbox"/> The ERs have partly been generated before 01/01/2013 (during the first commitment period) and partly from 01/01/2013 until 31/12/2020 and no further ERs from 01/01/2021, <input type="checkbox"/> The ERs have partly been generated from 01/01/2013 until 31/12/2020 and partly from 01/01/2021, <input type="checkbox"/> The ERs have partly been generated before 01/01/2013 (during the first commitment period) and partly from 01/01/2013 until 31/12/2020 and remaining partly from 01/01/2021. <input checked="" type="checkbox"/> The breakdown of the ERs is correct, considering the applicable guidance.				
		<b>before 01/01/2013</b>	<b>from 01/01/2013 - 31/12/2020</b>	<b>from 01/01/2021</b>	<b>Sum</b>
	<b>Emission reductions [tCO<sub>2e</sub>]</b>	0 t CO <sub>2e</sub>	233,408 t CO <sub>2e</sub>	0 t CO <sub>2e</sub>	233,408 t CO <sub>2e</sub>
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CAR 10 and CAR 11			
<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.			
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.			
	The data provided in the MR is correct as well as the related breakdown. The pro-rata approach was correctly applied to the calculations of GHG emission reductions or net anthropogenic GHG removals in accordance with the project standard, as the monitoring period starts after 01 January 2013 and ends anytime thereafter.				

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

<b>Means of verification</b>	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	<input type="checkbox"/>	The project participants have monitored the sustainable development co-benefits of the registered CDM project activity, and requested the DOE to verify them. The following sources of information have been used in this context: <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /PDD/</li> <li>• /DSD/</li> <li>• /unfccc/.</li> </ul>
<b>Findings</b>	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	<input type="checkbox"/>	Therefore the DOE has assessed and confirms that: (a) The monitoring has been carried out in accordance with the document for monitoring sustainable development co-benefits, if such document was developed and published on the UNFCCC CDM website in accordance with the “CDM project standard for project activities”; (b) The reported monitoring results correspond to the sustainable development co-benefits of the project activity as observed by the DOE.
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:

<b>Conclusion</b>	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<input checked="" type="checkbox"/>	N/A – as the PP has not monitored the sustainable development co-benefits of the registered CDM project activity or not requested the DOE to verify them.
	-	

**E.10. Global stakeholder consultation**

<b>Means of verification</b>	<p>In accordance with the PCP the DOE has submitted the initial version of the monitoring report provided by the PP for this monitoring period to be published on the UNFCCC webpage.</p> <p>The monitoring report has been published from 28/01/2021 for 21 days.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> <li>• /MR/</li> <li>• /unfccc/.</li> </ul>		
<b>Findings</b>	<input checked="" type="checkbox"/>	No comments have been received on the published monitoring report for this monitoring period.	
	<input type="checkbox"/>	Comments have been received and the DOE has concluded that comments are related to issues outside the CDM rules and requirements. Please refer to the list provided under Conclusion of this Section below for related information.	
	<input type="checkbox"/>	<p>Comments have been received.</p> <p>The DOE has</p> <ul style="list-style-type: none"> <li>- requested further information from the submitters of the comments</li> <li>- informed the project participants of the comments received, and requested their feedback within a specified timeframe,</li> <li>- considered the input received and has assessed whether such comments are relevant to the CDM project activity,</li> <li>- acknowledged receipt of all submitted comments on the MR of the proposed CDM project activity,</li> <li>- assessed whether the comments are related to the CDM rules and requirements (if so related findings have been raised as per below),</li> <li>- used all possible means to determine the authenticity of the name and contact details of the individual or organization on whose behalf the comments have been submitted,</li> <li>- contacted the secretariat to make them publicly available (if only addressed to the DOE),</li> <li>- determined whether authentic and relevant comments in the global stakeholder consultation were taken into due account in the PDD of the proposed CDM project activity.</li> </ul>	
	<input type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised, i.e. as the DOE concludes that the comments are related to the CDM rules and requirements:</p>	
<b>Conclusion</b>	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.	
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.	
	As the DOE has concluded that comments are related to issues outside the CDM rules and requirements the comments and information gathered are listed as follows:		
		<b>Nbr.</b>	<b>Original comment received</b>
		<b>Feedback by the PP</b>	<b>Statement by DOE</b>
		1	
		2	
		3	
		4	

## SECTION F. Internal quality control

Before the submission of the final verification report a technical review of the whole verification procedure was carried out. The technical reviewers are competent GHG auditors being appointed for the scope this project falls under. The technical reviewers are not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may have been confirmed or revised. Furthermore, reporting improvements might have been achieved.

After the successful technical review an overall (esp. procedural) assessment of the complete verification has been carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step, the submission for requesting for issuance is conducted.

## SECTION G. Verification opinion

Hidropantasma S.A. has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 1st periodic verification of the project: "Hydro Electric Plant - Hidro Pantasma", with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to the use of hydropower to generate renewable electricity to be delivered to the national grid of Nicaragua which is mainly fossil fuel dominated. This verification covers the period from 07/10/2013 to 06/10/2020 (including both days).

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document,
- the monitoring plan is in accordance with the applied approved CDM methodology,
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately,
- the monitoring system is in place and functional. The project has generated GHG emission reductions,
- the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

TÜV NORD JI/CDM CP further confirms that the project has achieved emission reductions in the above mentioned reporting period as stated on the title page.

## SECTION H. Certification statement

As a duly accredited DOE, TÜV NORD CERT confirms that the project

"Hydro Electric Plant - Hidro Pantasma"

registered under

UNFCCC-No. : 9118

has achieved emission reductions in accordance with all applicable requirements for registered CDM project activities during the current monitoring period

MP-No.: 1<sup>st</sup>

from: 07/10/2013

to: 06/10/2020

(including both days) as follows:

Emission reductions: 229,478 tCO<sub>2e</sub>.

Mexico, 27/09/2021


A handwritten signature in blue ink, appearing to read 'O. Quireza', is written on a light blue rectangular background.

Oliver Quireza  
Team Leader

## Appendix 1. Abbreviations

Abbreviations	Full texts
CL	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CNDC	National Load Dispatch Center
CO <sub>2</sub>	Carbon dioxide
CO <sub>2eq</sub>	Carbon dioxide equivalent
CL	Clarification Request
DOE	Designed Operational Entity
DVerR	Draft Verification Report
ER	Emission Reduction
ERPA	Emission Reduction Purchase Agreement
ENATREL	National Company of Transmission of Electricity “ <i>Empresa Nacional de Transmisión eléctrica</i> ”
FAR	Forward Action Request
GHG	Greenhouse gas(es)
Hidropantasma	Hydro Electric Plant – Hidro Pantasma
IM	Interview Memo
INE	Nicaraguan Institute of Energy ( <i>Instituto Nicaragüence de Eneqía</i> )
MARENA	Ministry for the Environmental “ <i>Ministerio del Ambiente y los Recursos Naturales</i> ” (DNA)
MP	Monitoring Plan or Monitoring Period
MR	Monitoring Report
PA	Project Activity
PCP	Project Cycle Procedure
PDD	Project Design Document
PP	Project Participant
PS	Project Standard
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
VT	Verification Team
XLS	Emission Reduction Calculation Spread Sheet

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



**Statement of Competence**  
Appointment and authorization according to the procedures  
of the TUV NORD JRCOM Certification Program

**Mr. Oliver Quireza Campos**

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2021-05-28
VCS / ISO 14064-2	Lead Assessor	2021-05-28

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
13.1	Solid waste and wastewater
13.2	Marine

337 - Rev. 5, Date: 2018-09-17

ISO\_14064-2\_VCS\_2018-11.pdf  
ISO\_14064-2\_VCS\_2018-11.pdf



**Statement of Competence**  
Appointment and authorization according to the procedures  
of the TUV NORD JRCOM Certification Program

**Mr. Raul Gonzalez Mitre**


SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2021-06-27
VCS / ISO 14064-2	Senior Assessor	2021-06-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
13.1	Solid waste and wastewater

382 - Rev. 6, Date: 2018-06-08

ISO\_14064-2\_VCS\_2018-11.pdf  
ISO\_14064-2\_VCS\_2018-11.pdf



**Statement of Competence**  
Appointment and authorization according to the procedures  
of the TUV NORD JRCOM Certification Program

**Mr. Stefan Winter**

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2023-07-27
VCS / ISO 14064-2	Senior Assessor (Validation, Verification) Technical Reviewer	2023-07-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.1	Thermal energy generation
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
4.1	Cement and lime production
4.2	Paper
5.2	Copolymers, other plastic pipes and Plastic and thermoplastic production
9.2	Iron, steel and ferro-alloy production
10.1	Fugitive emissions from oil and gas
12.1	Solid waste and wastewater
13.2	Marine

410 - Rev. 7, Date: 2023-07-27

ISO\_14064-2\_VCS\_2023-07-27.pdf  
ISO\_14064-2\_VCS\_2023-07-27.pdf

## Appendix 3. Documents reviewed or referenced

No .	Author	Reference	Title			References to the document	Provider
1.	UNFCCC	<b>/METH/</b>	AMS-I.D.: Grid connected renewable electricity generation, Ver. 17			<a href="https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK">https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK</a>	Other
2.	DOE	<b>/CPM/</b>	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)				Other
3.	UNFCCC	<b>/GOT/</b>	Glossary “CDM terms” (version 10.0)			<a href="https://cdm.unfccc.int/Reference/index.html">https://cdm.unfccc.int/Reference/index.html</a>	Other
4.	IPCC	<b>/IPCC/</b>	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book			<a href="http://www.ipcc-nggip.iges.or.jp">www.ipcc-nggip.iges.or.jp</a>	Other
5.	UNFCCC	<b>/KP/</b>	Kyoto Protocol (1997)			<a href="http://unfccc.int/kyoto_protocol/items/2830.php">http://unfccc.int/kyoto_protocol/items/2830.php</a>	Other
6.	UNFCCC	<b>/MA/</b>	Decision 3/CMP. 1 (Marrakesh – Accords)			<a href="http://cdm.unfccc.int/Reference/COPMOP/index.html">http://cdm.unfccc.int/Reference/COPMOP/index.html</a>	Other
7.	PP	<b>/MR/</b>	Monitoring Report: Hydro Electric Plant - Hidro Pantasma, versions: -Version 1.0, 17/12/2020 -Version 2.0, 13/09/2021			N/A	Other
8.	UNFCCC	<b>/MRT/</b>	Monitoring Report Form (CDM-MR-FORM), Version 8.0			<a href="https://cdm.unfccc.int/Reference/PDDs_Forms/index.html">https://cdm.unfccc.int/Reference/PDDs_Forms/index.html</a>	Other
9.	UNFCCC	<b>/PDD/</b>	Project Design Document for CDM project: “Hydro Electric Plant - Hidro Pantasma” version 5, dated 19/12/2012			<a href="https://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1356253134.74/view?cp=1">https://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1356253134.74/view?cp=1</a>	Other
10.	UNFCCC	<b>/NewPDD/</b>	Updated Project Design Document for CDM project: “Hydro Electric Plant - Hidro Pantasma” version 5.1, dated 07/07/2021			N/A	Other
11.	UNFCCC	<b>/PS/</b>	CDM Project Standard (Version 2.0)			<a href="http://cdm.unfccc.int/Reference/Standards/index.html">http://cdm.unfccc.int/Reference/Standards/index.html</a>	Other
12.	UNFCCC	<b>/TOOL/</b>	Rel.	Name	Ver.	<a href="http://cdm.unfccc.int/Reference/tools/index.html">http://cdm.unfccc.int/Reference/tools/index.html</a>	Other
			<input checked="" type="checkbox"/>	Tool to calculate project or leakage CO <sub>2</sub> emissions from fossil fuel combustion	3		
			<input type="checkbox"/>	Emissions from solid waste disposal sites	-		
			<input type="checkbox"/>	Tool to calculate baseline, project and/or leakage emissions from electricity consumption	-		
			<input type="checkbox"/>	Project emissions from flaring Version	-		
			<input checked="" type="checkbox"/>	Tool to calculate the emission factor for an electricity system	7		
			<input type="checkbox"/>	Tool to determine the mass flow of a greenhouse gas in a gaseous stream	-		
<input type="checkbox"/>	Tool to determine the baseline efficiency of thermal or electric energy generation systems	-					



No.	Author	Reference	Title			References to the document	Provider
			<input type="checkbox"/>	Tool to determine the remaining lifetime of equipment	-		
			<input type="checkbox"/>	Project and leakage emissions from transportation of freight	-		
			<input type="checkbox"/>	Determining the baseline efficiency of thermal or electric energy generation systems	-		
			<input type="checkbox"/>	Project and leakage emissions from anaerobic digesters	-		
			<input type="checkbox"/>	Upstream leakage emissions associated with fossil fuel use	-		
			<input type="checkbox"/>	Project and leakage emissions from biomass	-		
			<input type="checkbox"/>	Leakage in biomass small-scale project activities	-		
			<input type="checkbox"/>	Tool for the demonstration and assessment of additionality	-		
13.	PP	<b>/VAL/</b>	Validation Report for registration of the CDM project "Hydro Electric Plant - Hidro Pantasma", submitted by TUV RHEINLAND, version 03 dated 21/12/2012			<a href="https://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1356253134.74/view?cp=1">https://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1356253134.74/view?cp=1</a>	Other
14.	UNFCCC	<b>/VVS/</b>	CDM Validation and Verification Standard (Version 02.0)			<a href="http://cdm.unfccc.int/Reference/Standards/index.html">http://cdm.unfccc.int/Reference/Standards/index.html</a>	Other
15.	TUV NORD CERT	<b>/PRC/</b>	Validation Report in PRC for CDM project "Hydro Electric Plant - Hidro Pantasma", 27/09/2021, TUV NORD CERT			N/A	TUV NORD CERT
16.	PP	<b>/EG/</b>	<b>Evidence of Energy Generation covering the monitoring period:</b> <ul style="list-style-type: none"> <li>• Original energy meter readings;</li> <li>• Sales invoices;</li> </ul>			N/A	PP
17.	PP	<b>/CC/</b>	Calibration certificates issued by ENATREL, see Appendix 6 of this report			N/A	PP
18.	PP	<b>/XLS/</b>	210128_ER_HidroPantasma-MDL 210315_ER_Hidropantasma-MDL 210416_ER_Hidropantasma-MDL 210624_ER_Hidropantasma-MDL 210706_ER_Hidropantasma-MDL			N/A	PP
19.	INE	<b>/EF/</b>	-Monthly net generation SEN, covering the period from 2013 to 2018, by INE. -Raw materials for electricity generation SEN, covering 2013-2018, by INE.			<a href="https://www.ine.gob.ni/index.php/electricidad/estadisticas-anuales/">https://www.ine.gob.ni/index.php/electricidad/estadisticas-anuales/</a>	PP
20.	CNEE	<b>/LIC/</b>	✓ Environmental License, Resolution administrative DGCA-028-2008R, by MARENA. ✓ Public Act -Contract, License of Generation, 2-DGERR-02-201			N/A	PP

No	Author	Reference	Title	References to the document	Provider
	MARN		project Hidropantasma, by MEM, 24/10/2011 ✓ Report of socio environmental activities January 2021.		
21.	PP	/L-B/	-Operation and maintenance reports	N/A	PP
22.	SIEMENS	/Meter/	-Power meter 9510/9610, user guide, SIEMENS -Power meter 9510/9610, Technical data sheet, SIEMENS	N/A	PP
23.	INE	/LAW/	<b>Commercial Annexes:</b> -Commercial information of market -Share unit -Variable costs and costs of thermal start-up -commercial measurement of system -mandatory generation -Dispatch without restriction and energy price in the spot market -Contracts coordination	N/A	PP
24.	PP	/ERPA/	ERPA, between PP and CERs buyer, June 2020.	N/A	PP
25.	TN JI/CDM CP	/COVID/	TUV NORD Covid pandemic guidance and notifications: • TN Guidance 20/001 "CORONAVIRUS – GUIDELINE FOR AUDITORS", version 2 • Covid pandemic Announcements along with related EB emails and EB decision via JI/CDM Team SharePoint 20/03/2020, 24/06/2020, 25/02/2021 • Information provided during EEM conducted on 11/11/2020 and 16/12/2020 • Covid-19 pandemic EB decision	<a href="https://extranet.tuev-nord.de/sites/jicdm/default.aspx">https://extranet.tuev-nord.de/sites/jicdm/default.aspx</a> <a href="https://cdm.unfccc.int/newsroom/latestnews/releases/2020/01041_index.html">https://cdm.unfccc.int/newsroom/latestnews/releases/2020/01041_index.html</a>	TN JI/CDM CP
26.	PP	/PIC/	Pictures form Name plates of main equipment	N/A	PP
27.	UNFCCC	/POST2020 /	Clarification: Regulatory requirements under temporary measures for post-2020 cases, version 01.1; CDM-EB109-A01-CLAR	<a href="https://cdm.unfccc.int/Reference/PDDs_Forms/index.html">https://cdm.unfccc.int/Reference/PDDs_Forms/index.html</a>	Other
28.	Olympian  EMSA	/Emer/	Backup generators: OLYMPIAN ✓ Olympian GEN150-1, data sheet ✓ Main Plate Olympian GEN150-1 ✓ Generator Plate, motor Perkins 2332/1800  EMSA ✓ E PR ST 0075/6, data sheet ✓ Main plate STAMFORD ✓ Plater motor Perkins 2510/1500	N/A	PP

No.	Author	Reference	Title	References to the document	Provider
29.	Kosser Pelton	/TURB/	✓ Technical proposal – Mechanical equipment – Final offer No. 020824-30B_Kossler ✓ Nameplate turbines “Pelton – PH2I - 1300/390	N/A	PP

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

Table 3. Remaining FAR from validation and/or previous verifications

FAR ID	XX	Section no.	E.2	Date: DD/MM/YYYY
<b>Description of FAR</b>				
<b>Project participant response</b>				<b>Date: DD/MM/YYYY</b>
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date: DD/MM/YYYY</b>

Table 4. CL from this verification

CL ID	CL 01	Section no.	A.2	Date: 10/02/2021
<b>Description of CAR</b>				
Clarification on why the project location coordinates in the MR are slightly different than in the PDD				
<b>Project participant response</b>				<b>Date: 09/03/2021</b>
<i>This was a measurement error, so the coordinates were again updated according to the PDD, which correspond to the coordinates provided in the last “Social and Environmental Activities Implementation Report” of the project (Page 3).</i>				
<b>Documentation provided by project participant</b>				
210315_MR_Hidropantasma_TC.docx				
<b>DOE assessment</b>				<b>Date: 18/03/2021</b>
The reported coordinates are very similar to ones observed by the VT by google maps. The slight differences are due to the exact location of the GPS equipment, no major discrepancies are observed. Finding is closed				

CL ID	CL 02	Section no.	D.2	Date: 24/02/2021
<b>Description of CAR</b>				
<b>Parameter EG<sub>facility,y</sub> (EG<sub>BL,y</sub>)</b>				
Please clarify the difference between the measured values of electricity generation and the published values by the national authority INE				
<b>Project participant response</b>				<b>Date: 15/03/2021</b>
The invoicing data were included in the crosscheck. As can be seen, the main meter data tends to be higher than the invoicing data, this difference is due to the technical losses that are discounted in each invoice. However, approximately between the months of April and June there is a clear pattern where the invoiced value is higher than the net measured data, this is since during these months there is a period of dry season where it is necessary to consume energy from the grid (SIN), so the energy received increases, decreasing even more the net dispatch value tending to be lower than the invoiced value. Conservative values were used in the ER calculation.				
<b>Documentation provided by project participant</b>				
210315_Meter and Invoicing data_crosscheck				
<b>DOE assessment</b>				<b>Date: 18/03/2021</b>

The VT confirm the statement provide by the PP by cross checking the electricity invoices versus the information published by the national authority INE.  
Finding is closed

CL ID	CL 03	Section no.	Title page	Date: 03/03/2021
<b>Description of CAR</b>				
Clarification is requested why the ex-ante value mentioned on title page of the MR of 250,270 tCO <sub>2</sub> e is inconsistent to the value in the registered PDD of 250,027 tCO <sub>2</sub> e given that the monitoring period is equivalent to the entire 1 <sup>st</sup> crediting period.				
<b>Project participant response</b>				<b>Date: 23/03/2021</b>
<i>The ex-ante value mentioned in the MR was estimated with the exact number of days of the monitored period. However, to be consistent with the PDD and the ex-ante values, the MR was updated with the value reported in the PDD = <b>250,075 tCO<sub>2</sub></b>.</i>				
<b>Documentation provided by project participant</b>				
210416_MR_Hidropantasma_TC.docx				
<b>DOE assessment</b>				<b>Date: 17/06/2021</b>
The corrected ER ex ante values is in line with the value in the PDD. Finding is closed				

CL ID	CL 04	Section no.	A.4	Date: 10/02/2021
<b>Description of CL</b>				
Version 2.2.1 of the TOOL07 has been referenced in the MR, nonetheless, the PP is requested to clarify why it hasn't been used the latest version of the TOOL 07 Tool to calculate the emission factor for an electricity system" .				
<b>Project participant response</b>				<b>Date: 15/03/2021</b>
MR was corrected with the latest version of TOOL 07				
<b>Documentation provided by project participant</b>				
210315_MR_Hidropantasma_TC.docx 210315_ER_HidroPantasma-MDL.xlsx				
<b>DOE assessment</b>				<b>Date: 18/03/2021</b>
Even though it is not mandatory to apply the latest version of the TOOL07, the PP decided to applied the latest version of the TOOL 07 to calculate the calculate the emission factor for the electricity system. Finding is closed				

**Table 5. CAR from this verification**

CAR ID	CAR 01	Section no.	B.1	Date: 10/02/2021
<b>Description of CAR</b>				
<b>Following issues w.r.t. section B.1 have been identified:</b>				
<ol style="list-style-type: none"> <li>MR states turbine type as "Pelton – PH2I - 1300/390" whereas the PDD states "Pelton – PH2/1300/390. Pls clarify the difference.</li> <li>MR states that the rated output capacity of the turbines is "6,860 kW (each one)" which is inconsistent with PDD, which states "6,547 kW (each one)".</li> <li>Similar for the related generator, the output capacity in MR is given with "8,000 kW (each one)" which is inconsistent with PDD, which states "7,200 kW (each one)".</li> <li>Section states that the start of operation was on 24 August 2013. Pls clarify the correctness of the value considering that the ER spreadsheet provided entitled "Estadística de Generación Diaria 2013 – 2020" provided generation values from 18 August 2013.</li> </ol>				
<b>Project participant response</b>				<b>Date: 29/03/2021</b>

1. The turbine type included in the PDD was determined on the “Technical proposal – Mechanical equipment – Final offer No. 020824-30B\_Kossler” during the design stage, in the MR this information was updated according to nameplate specifications. A PRC was included accordingly in the MR.
2. The rated output capacity of the turbines included in the PDD was determined on the “Technical proposal – Mechanical equipment – Final offer No. 020824-30B\_Kossler” during the design stage, in the MR this information was updated according to nameplate specifications. A PRC was included accordingly in the MR.
3. This was an error originally reported in the MR, the installed capacity has not changed according to the registered PDD, this can be verified in the nameplates of the installed generators. Table 1 in the MR was corrected.
4. According to the Nicaraguan CNDC statement, the project started commercial operation on 7 October 2013. In August and September the plant was testing performance, power generation and metering, so these were not considered as part of the project's emission reductions for this MR. MR was corrected.

**Documentation provided by project participant**

- 210416\_MR\_Hidropantasma\_TC.docx
- Carta Justificacion Entrada en Operacion Comercial (ENATREL Nov 06 2013).pdf

**DOE assessment****Date:** 17/06/2021

1. A Correction (PRC) has been provided by the PP. There was an inconsistency between the turbine model in the “Technical proposal – Mechanical equipment – Final offer No. 020824-30B\_Kossler and the final model name in the equipment plate Pelton – PH2I - 1300/390. This is assessed in a separate Validation report for PRC.
  2. As above, there was an inconsistency between the “Technical proposal – Mechanical equipment – Final offer No. 020824-30B\_Kossler and the final capacity value in the plant. This is assessed in a separate Validation report for PRC.
  3. The 8 MW in the MR was a typo, the PDD and actual equipment plates states 7.2 MW
  4. According to the official letter from ENATREL from 06/11/20213, the operation start 07/10/2013. The statement provided by the PP is correct.
- Fining is closed

<b>CAR ID</b>	CAR 02	<b>Section no.</b>	B.2.6	<b>Date:</b> 10/02/2021
<b>Description of CAR</b>				
Clarification is requested w.r.t. the description provided under section B.2.6 of MR which refers that a design change is applied and PDD has been revised due to different installed capacity.” If the installed /rated capacity as per manufacturer is different to PDD then it is a PRC.				
<b>Project participant response</b>				<b>Date:</b> 29/03/2021
This was an error originally reported under section B.2.6 of MR, the installed capacity has not changed according to the registered PDD, this can be verified in the nameplates of the installed generators. However, it is included a PRC regarding the turbine rated output capacity, the registered PDD states as “6,547 kW (each one)” which is different from the turbine nameplate features.				
<b>Documentation provided by project participant</b>				
210330_MR_Hidropantasma_TC.docx				
<b>DOE assessment</b>				<b>Date:</b> 17/06/2021
There was an inconsistency between the “Technical proposal – Mechanical equipment – Final offer No. 020824-30B_Kossler and the final capacity value in the plant. This is assessed in a separate Validation report for PRC.				
Fining is closed				

<b>CAR ID</b>	CAR 03	<b>Section no.</b>	D.2	<b>Date:</b> 10/02/2021
<b>Description of CAR</b>				

**Parameter EG<sub>facility,y</sub> (EG<sub>BL,y</sub>)**

1. It is said in section "additional comments" that a correction factor of 0.2% has been applied, nevertheless such calculation is not traceable in the spreadsheets.
2. The calibration gaps have not been reported, and validity of calibrations also missing.
3. A backup meter is used but it is never explained when the data from such meter will be used
4. It is not described when it is considered that the main meter is measuring incorrectly or has a failure
5. The meters recording frequency is not mentioned.
6. As per instructions the calibration frequency is also to be stated under "Monitoring equipment"
7. It is not described how the net electricity is determined and whether the meters are bidirectional
8. Calibration certificates previous to 14/08/2015 have not been provided. Also the calibration dates from 2018 are to be provided in MR
9. As per QA/QC procedure the meters date has to be cross checked with the electricity sales receipts obtained from the grid trader/generator, nonetheless the sales receipts have not been provided to the DOE
10. Description under QA/QC is inconsistent with PDD description e.g. 2nd sentence in PDD states "...and reference points or IEC standards and recalibrated at appropriate intervals according to manufacturer's specifications (at least once in three years)...."

**Project participant response****Date:** 09/03/2021

1. MR and spreadsheets were updated accordingly.
2. The calibration gaps and the validity of the calibrations were reported in the MR.
3. When the CNDC detects that the main meter is failing, it will take as official the reading of the backup meter. MR updated.
4. the maximum total percentage error at cosine  $\phi_i = 0.9$ , introduced in the measurement by the voltage drop in the secondary circuit cables of the voltage transformers exceeds 0.1%, the backup measurement must be taken. MR updated.
5. The meters recording are every 15 minutes. MR updated.
6. MR updated.
7. The net electricity is described in the MR and provided in the spreadsheet.
8. Calibration certificate previous to 14/08/2015 was provided and included in the MR. In accordance with the calibration frequency required by the regulatory body, during 2018 it was not necessary to calibrate the meters. Last calibration in 2019 valid until 2021.
9. The crosscheck was done in the "Meter and Invoicing data" file, and the sales invoices are provided.
10. MR was corrected accordingly.

**Documentation provided by project participant**

210416\_MR\_Hidropantasma\_TC.docx

**DOE assessment****Date:** 17/06/2021

The missing information has been reported in the updated MR and it is confirmed that it is in accordance with the registered PDD.  
Finding is closed

<b>CAR ID</b>	CAR 04	<b>Section no.</b>	D.2	<b>Date:</b> 10/02/2021
<b>Description of CAR</b>				
<b>Parameter FC<sub>i,j,y</sub></b>				
<ol style="list-style-type: none"> <li>1. It is not described how was determined that the fuel consumption is 0 (invoices, meters, etc.).</li> <li>2. Further specification of what kind of equipment is installed is requested in line with instructions to fill MR which requires providing "information on type, accuracy class, serial number, calibration frequency, date of last calibration and validity."</li> <li>3. Besides, clarification is requested why source of data is not specified as under QA/QC it is stated that results are recorded in data log file.</li> </ol>				
<b>Project participant response</b>				<b>Date:</b> 09/03/2021

1. According to the PDD, fuel consumption emissions were not included initially as these represent less than 1% of the project's emission reductions. However, as required by the DOE these were included in the spreadsheet and the MR was updated accordingly.

2. The fuel is purchased at fuel service stations and is stored in a tank of approximately 60 liters. Fuel consumption at the backup electricity system is measured with a buoy/float volume meter, which shows the actual tank contents. The meter is calibrated and monitored by the PP, it is not calibrated by external entities. No minutes or calibration reports have been recorded. The meter does not have an identifying serial number (see picture). In addition, it was not possible to cross-check with fuel invoices, there are not enough records, and it is difficult to track the quantities used in the backup electricity system.

Since during the entire monitoring period this parameter was not properly monitored, and the volume meter was not calibrated as defined in the registered PDD a temporary deviation is included in the MR. As a conservative approach, the maximum diesel consumption of the backup electricity system during the entire monitoring period was estimated to calculate the project's emissions according to its fuel efficiency and maximum operating capacity or load factor defined in the manufacturer's specifications (see ER spreadsheet).

3. The volume meter reading is recorded daily in physical stock records and consolidated monthly in an excel spreadsheet or data log file ("Estadística de consumo..."). There is no major variation in consumption since it is very little, generally only for backup electricity system heating once a week for 10 minutes. Records were included in the ER spreadsheet.

#### Documentation provided by project participant

- 210416\_MR\_Hidropantasma\_TC.docx
- 210416\_ER\_HidroPantasma-MDL.xlsx
- Imagen de Medidor tanque combustible
- "Planta de emergencias" folder

#### DOE assessment

Date: 17/06/2021

1. As per PDD the diesel consumption has to be measured by a meter, nevertheless the PP didn't performed the monitoring as per PDD. A temporary deviation has been properly reported in the MR. The method applied by the PP to determine the PE is correct and conservative.

2. The equipment type installed in the project is described in the MR. The VT checked the reported equipment versus the technical sheets of the equipment. It is confirmed that the description is correct and in line with the registered PDD.

3. As described above as the PP didn't monitored the diesel consumption, an alternative method has been applied by the PP, which is reported as a Temporary deviation.

Finding is closed

CAR ID	CAR 05	Section no.	D.2	Date: 10/02/2021
<b>Description of CAR</b>				
<b>Parameter <math>\eta_m</math></b>				
It is stated that the default values are provide in the Tool to calculate the emission factor for an electricity system" version 2.2.1, nevertheless version 7 of the TOOL07 was not considered. Furthermore, the applied $\eta_m$ values have to be provided				
<b>Project participant response</b>				Date: 09/03/2021
During this monitoring period, option A2 was not applied for the OM simple calculation therefore this parameter was not monitored. MR was updated.				
<b>Documentation provided by project participant</b>				
210315_MR_Hidropantasma_TC.docx				
<b>DOE assessment</b>				Date: 18/03/2021
The statement provided by the PP is correct. As option A2 is applied then no $\eta_m$ are required				
Finding is closed				

CAR ID	CAR 06	Section no.	E.2	Date: 10/02/2021
<b>Description of CAR</b>				
<b>Parameter <math>A_{pj}</math></b>				
It has not been explained how the area of the reservoir has been calculated.				
<b>Project participant response</b>				Date: 09/03/2021
Explanation provided in the MR, please refer section E.2				
<b>Documentation provided by project participant</b>				

210315_MR_Hidropantasma_TC.docx	
<b>DOE assessment</b>	<b>Date:</b> 18/03/2021
It has been properly documented how the $A_{pj}$ and power density have been determined. Finding is closed	

<b>CAR ID</b>	CAR 07	<b>Section no.</b>	E.1	<b>Date:</b> 10/02/2021
<b>Description of CAR</b>				
<b>EFgrid,OM,y</b>				
<ol style="list-style-type: none"> <li>1. The identification of the selected interconnected system is not clearly documented</li> <li>2. It is not documented whether off-grid power plants have been included</li> <li>3. It is not demonstrated whether the LCMR set of power plants is less than the 50% of the total electricity system generation</li> </ol>				
<b>Project participant response</b>				<b>Date:</b> 09/03/2021
MR was updated accordingly.				
<b>Documentation provided by project participant</b>				
210315_MR_Hidropantasma_TC.docx				
<b>DOE assessment</b>				<b>Date:</b> 18/03/2021
<ol style="list-style-type: none"> <li>1. The selected interconnected system is clearly identified</li> <li>2. Off-grid power plants have not been included</li> <li>3. Issue 3 has not been demonstrated as per §40 of the TOOL07. Issue remains open</li> </ol>				
<b>Project participant response Round 2</b>				<b>Date:</b> 09/03/2021
3. Based on long-term averages for LCMR production (minimum time frame of 15 years) it is determined that these constitute less than 50 per cent of total grid generation (excluding electricity generated by off-grid power plants). Please see ER spreadsheet – tap “OM method_LCMR-Analysis”. MR was updated.				
<b>Documentation provided by project participant Round 2</b>				
<ul style="list-style-type: none"> <li>- 210416_MR_Hidropantasma_TC.docx</li> <li>- 210416_ER_HidroPantasma-MDL.xlsx</li> <li>- “OM method análisis” folder.</li> </ul>				
<b>DOE assessment Round 2</b>				<b>Date:</b> 17/06/2021
3.The PP applied the option 2 of the TOOL to demonstrate that the long-term averages for LCMR production (minimum time frame of 15 years) is less than 50% so that the simple approach to determine the OM is correct. Finding is closed				

<b>CAR ID</b>	CAR 08	<b>Section no.</b>	D.2	<b>Date:</b> 24/02/2021
<b>Description of CAR</b>				
<b>Parameter EG<sub>facility,y</sub> (EG<sub>BL,y</sub>)</b>				
It is stated that the entire monitoring period had a gap calibration nevertheless by the calibration certificates is confirmed that the calibration gap includes the following periods only: From:14/08/2017 To:25/08/2017 And From: 25/08/2019 To: 29/08/2019 Correction is requested				
<b>Project participant response</b>				<b>Date:</b> 09/03/2021
MR was corrected accordingly.				
<b>Documentation provided by project participant</b>				
210315_MR_Hidropantasma_TC.docx				
<b>DOE assessment</b>				<b>Date:</b> 17/06/2021
Calibration gaps have been considered in the ER calculation by applying the maximum permissible error of the meters to the electricity values. It was confirmed by calibration certificates that the actual error during calibration didn't surpass the maximum permissible error. The error has been applied to all values during the missing calibration period. Finding is closed				

<b>CAR ID</b>	CAR 09	<b>Section no.</b>	E.1	<b>Date:</b> 10/02/2021
<b>Description of CAR</b>				



**Parameter EG<sub>facility,y</sub> (EG<sub>BL,y</sub>)**

In the calculation, the energy generation reported was using the gross energy instead of the net energy. The energy consumed was not included. Correction is necessary.

- Pending evidence: cross check between generation data versus generation invoices have to be provided.

**Project participant response****Date:** 09/03/2021

The calculation was corrected using the net energy. And cross-check is provided.

**Documentation provided by project participant**

210315\_MR\_Hidropantasma\_TC.docx

210315\_Meter and Invoicing data\_crosscheck

**DOE assessment Round 1****Date:** 18/03/2021

ER sheet : *Meter and Data cross check*:

1. Original data from meter is required to confirm traceability of data applied in sheet Meter and Data cross check.
2. It is not traceable how data in cells G5 and G89 are calculated.
3. In column F, it look like five values have been added, but the original source has not been provided. Finding remains open

**Project participant response Round 2****Date:** 09/03/2021

1. Original meter data is provided.
2. As billing is monthly, the values recorded in the original meter data for the respective days were used. See document support.
3. Original meter data (source) is provided.

**Documentation provided by project participant Round 2**

210329\_Meter and Invoicing data\_crosscheck

**DOE assessment Round 2****Date:** 17/06/2021

1. The original data has been provided. The VT cross checked the data to confirm that the applied data in the ER calculation is consistent with the original data.
  2. The calculation of the **EG<sub>facility,y</sub>** is traceable.
  3. The invoices have been provided. The VT cross checked the data to confirm that the applied data in the ER calculation is consistent with the invoices.
- Finding is closed

<b>CAR ID</b>	CAR 10	<b>Section no.</b>	MR form	<b>Date:</b> 03/03/2021
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**Description of CAR****Following issues w.r.t. MR filling have been identified:**

1. The title page is not in line with the related UNFCCC template. Background colour of the cells to be filled is different and the UNFCCC logo at top left end is deleted. Hence, the template has been altered. Therefore, this is not in line with instructions to fill the MR and hence revision is requested.
2. Pls clarify why title page under Applied methodologies and standardized baselines is not referencing to any applied standardized baseline as required by the instructions to fill the MR. If no SB is applied please clarify why it is not stated that this is not applicable. Related specification is required.
3. Section A.2: the values stated in the right picture of figure 1 are not fully visible. Pls revise accordingly.
4. Section A.3: Pls clarify the description given und host country "ratified the Kyoto Protocol in 1999".
5. Section C: as per instructions to fill MR a "line diagrams showing all relevant monitoring points" is to be included. Related revision is requested.
6. Section E.4: no value is given in the table for GHG emission reductions from 01/01/2013. Related update is requested.
7. Section E.5.1: The crediting period start and end date is given along with total days of this monitoring period however, as per instructions to fill MR the "amount estimated ex ante for this monitoring period in the PDD" shall be described transparently. As no final result is given the requirement is not fulfilled.
8. Section E.7: The instructions to fill MR require to demonstrate that the SSC project activity was below the related threshold for each year during the monitoring period. The MR only provides a statement that this would be the case but does not provide a related demonstration.

<b>Project participant response</b>		<b>Date:</b> 16/04/2021	
<p>The MR was updated to the latest version (vs 08.0)</p> <ol style="list-style-type: none"> <li>1. The title page was corrected.</li> <li>2. There is not standardized baseline applicable to this project. Specification was included.</li> <li>3. The figure 1 was updated. The coordinates are mentioned in the previous paragraph.</li> <li>4. As included in the registered PDD, <a href="#">Nicaragua</a> ratified its commitment to the Kyoto Protocol in 1999, defined as a non-annex 1 party. This sentence was eliminated to avoid confusion.</li> <li>5. Line diagram was included in Section C showing the relevant monitoring point.</li> <li>6. Section E.4 was updated.</li> <li>7. Section E.5.1 was updated.</li> <li>8. Section E.7 was updated.</li> </ol>			
<b>Documentation provided by project participant</b>			
210416_MR_Hidropantasma_TC.docx			
<b>DOE assessment</b>		<b>Date:</b> 17/06/2021	
<ol style="list-style-type: none"> <li>1. Title of the MR form is corrected in line with the MR form</li> <li>2. It is confirmed that no standardized baseline is applied</li> <li>3. Section A.2. The provided figures are visible.</li> <li>4. Section A.3. The confirmation of the Kyoto Protocol ratification by Nicaragua is in line with the information in the UNFCCC website.</li> <li>5. Section C. The diagram showing the relevant monitoring points is in line with the actual situation of the project and the registered PDD.</li> <li>6. Section E.4. The provided values for GHG emission reductions from 01/01/2013 are in line with the ER calculation sheet.</li> <li>7. Section E.5.1. The ex ante ER calculation is correct and in line with the values in the PDD.</li> <li>8. Section E.7. the demonstration provided by the PP is correct. The project is not part of a debundled large project activity, and the project capacity as per actual plantes is lower than 15 MW.</li> </ol> <p>Finding is closed</p>			

<b>CAR ID</b>	CAR 11	<b>Section no.</b>	E.1 / ER calculation	<b>Date:</b> 03/03/2021
<b>Description of CAR</b>				

**Following issues w.r.t. ER calculation 210128\_ER\_HidroPantasma-MDL:**

1. The achieved total amount of ERs during this monitoring period on title page is inconsistent to the corresponding ER spreadsheet (201). Pls clarify the inconsistency and correct accordingly.
2. Section E.1 provides a sample calculation of BE calculation for year 2013. However, please clarify the inconsistency of the result stated in MR of 14,252 tCO<sub>2</sub> to related ER spreadsheet of 14,543 tCO<sub>2</sub>. Pls clarify and revise accordingly.
3. The ER spreadsheet tab "ER" shows several comments: For 2013 it is stated "HidroPantasma metering (conservative value): Estadística de Generación Diaria 2013 - 2020.xlsx". Pls clarify why the value is considered conservative.

**Tab BM:**

4. The determination of BM is not in line with related registered PDD and Tool which requires "For the first crediting period, the build margin emission factor shall be updated annually, ex-post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. [...] For the project the BM emission factor is calculated based on the vintage of data under option 2 (updated annually, ex-post approach). The option was chosen in order to use recent and public information from official sources up to the year of registration of the project activity." The ER determines BM not based on power units until date of registration on 24 Dec 2012 and then following related age regulation as per tool v 2.2.1 page 15 and 16 esp. points (d) to (f).
5. The determination of BM does not follow the procedure as per tool. The tool procedure requires as following:
  - (a) Identify the set of five power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently ( $SET_{5-units}$ ) and determine their annual electricity generation ( $AEG_{SET-5-units}$ , in MWh);
  - (b) Determine the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities ( $AEG_{total}$ , in MWh). Identify the set of power units, excluding power units registered as CDM project activities, that started to supply electricity to the grid most recently and that comprise 20% of  $AEG_{total}$  (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) ( $SET_{\geq 20\%}$ ) and determine their annual electricity generation ( $AEG_{SET-\geq 20\%}$ , in MWh);
  - (c) From  $SET_{5-units}$  and  $SET_{\geq 20\%}$  select the set of power units that comprises the larger annual electricity generation ( $SET_{sample}$ );
 Identify the date when the power units in  $SET_{sample}$  started to supply electricity to the grid. If none of the power units in  $SET_{sample}$  started to supply electricity to the grid more than 10 years ago, then use  $SET_{sample}$  to calculate the build margin. In this case, ignore steps (d), (e) and (f).
6. E.g. for all years the parameter  $AEG_{SET5-units}$  is not determined. A parameter  $AEG_{5-units}$  is calculated but for 2018 the generation of plant "Tichana Power (TP)" and "Empresa Generadora Ometepe, S.A. (EGOMSA)" are included with "0".

**Project participant response****Date:** 16/04/2021

1. The total of ERs were inconsistent because the ER spreadsheet had been updated after the first version of the MR. Now the MR was corrected accordingly.
2. The BE calculation was inconsistent because the ER spreadsheet had been updated after the first version of the MR. Now the MR was corrected accordingly.
3. At that time the "Estadística de Generación Diaria 2013 - 2020.xlsx" was the available information, however the ER calculations were updated according to meter and invoicing data, using the most conservative value.
- 4-5-6. ER spreadsheet and MR were updated accordingly.

**Documentation provided by project participant**

210416\_MR\_Hidropantasma\_TC.docx  
 210416\_ER\_HidroPantasma-MDL.xlsx  
 210329\_Meter and Invoicing data\_crosscheck.xlsx

**DOE assessment****Date:** 17/06/2021

1. The provide ER in the updated MR are consistent with the values in the updated ER calculation sheets
  2. Section E.1 The provide BE in the updated MR are consistent with the values in the updated BE calculation sheets
  3. ER Tab. The PP updated the calculation based on the original data and invoices as per PDD.
  4. The VT reviewed the correctness of the procedure applied to determine the BM as per applied TOOL07 version 7.
- Finding is closed.

<b>CAR ID</b>	CAR 12	<b>Section no.</b>	D.1	<b>Date:</b> 03/03/2021
<b>Description of CAR</b>				
<p><b>Following issues w.r.t. section D.1 have been identified:</b></p> <p>Under "Value applied" for each parameters <math>EG_{m,y}</math> and <math>FC_{i,m,y}</math> the MR states "Please refer to the PDD Annex 3." However, pls clarify whether reference to PDD is applicable in MR as per instructions to MR. besides, Annex 3 of PDD refers to the source of data for determination of the grid emission factor from year 2011 as of March 2012 whereas for this monitoring period different data has been used to calculate the grid emission factor. Hence, clarification and revision of related statement in MR under "Value applied" for the parameters is requested.</p>				
<b>Project participant response</b>				<b>Date:</b> 16/04/2021
<p><i>Following to the MR instructions the parameters <math>EG_{m,y}</math> and <math>FC_{i,m}</math> were included as these were fixed at the registration. Although the basis of these parameters should not change (fixed values), we have updated the "Value applied" by referencing the data used in this MR.</i></p>				
<b>Documentation provided by project participant</b>				
210416_MR_Hidropantasma_TC.docx				
<b>DOE assessment</b>				<b>Date:</b> 17/06/2021
<p>It is important to notice that the parameters <math>EG_{m,y}</math> and <math>FC_{i,m,y}</math> have to be monitored because those are used to calculate the EF combined margin, nevertheless at registered PDD those parameter were also fixed ex ante because those were used to determine the ex ante EF combined margin at registration time. The reference provided by the PP is the official one (INE).</p> <p>Finding is closed</p>				

<b>CAR ID</b>	CAR 13	<b>Section no.</b>	E.1	<b>Date:</b> 03/03/2021
<b>Description of CAR</b>				
<p>EFgrid determination and description in MR</p> <p>1. The MR doesn't specify the vintage y-1 or y-2 to be considered for the CP when calculating the OM ex post as required by the TOOL07 §42 (b)</p> <p>2. Further, as per provided ER calculation for years 2019 and 2020 the EFgrid of 2018 is applied however, as per related registered PDD under determination of EFOM it is stated that "... the emission factor should be updated for the year in which the power plant displaces electricity from the grid (applicable over the crediting period)." Besides, the related Tool requires the PP that "The data vintage chosen should be documented in the CDM-PDD and not be changed during the crediting periods." Hence, as per PDD and related tool vintage y-1 and y-2 data for calculating EF for 2019 and 2020 is not applicable and not the application of EF2018 for years 2019 and 2020.</p> <p>3. Finally, the MR does not describe the procedure of determining the sample group of power units m used to calculate the build margin emission factor.</p>				
<b>Project participant response</b>				<b>Date:</b> 16/04/2021
<p>1. MR was updated accordingly.</p> <p>2. Since data for calculating EF for 2019 and 2020 is not available, according to the Tool 07 "the emission factor of the year proceeding the previous year y-2 may be used. The same data vintage (y, y-1 or y-2) should be used throughout all crediting periods". Then a PRC was included accordingly in the MR and PDD was updated including this possibility.</p> <p>Regarding the data vintage it has not been changed during the credit period, in the recorded PDD the Ex post data vintage was documented and chosen, the data vintage used (y-2) in the MR is eligible for the Ex post option.</p> <p>3. MW was updated accordingly.</p>				
<b>Documentation provided by project participant</b>				
210416_MR_Hidropantasma_TC.docx				
210416_ER_HidroPantasma-MDL.xlsx				
<b>DOE assessment</b>				<b>Date:</b> 11/07/2021
<p>1 and 2. As PRC has been assessed in a separate report. As per updated PDD and in line with the TOOL 07 the EF can be calculated based on the electricity generation data vintage y or y-1 or y-2. As the available official information is vintage y.2 the PP has applied such information to determine the EF.</p> <p>3. The MR provides the procedure to determine the sample group m to determine the BM.</p> <p>Finding is closed</p>				

Table 6. FAR from this verification

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

## Appendix 5. Monitored Parameters

**Table A-5:** Periodic Verification Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<b>A. <math>EG_{\text{facility},y}</math> (<math>EG_{BL,y}</math>)</b>		Net electricity generated and supplied to the grid by the project activity in the year y		
<p><b>a) Measurement / Determination method (VVS, §§ 360-364)</b></p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM01/ /PDD/ /METH/ /XLS/ /EG/ /Meter/ /CC/ /MR/ /EF/ /LAW/ /Meter/</p>	<p><i>Description:</i> The quantity of electricity delivered to the grid is measured and recorded by one main meter and one back-up meter located in the Protection, Control and Monitoring room of the hydro power plant at the Hidropantasma Substation. Both meters are bi-directional and calibrated, sealed and belong to Hidropantasma.</p> <p>In the case a failure is detected in the main meter, the data would be taken from the back up meter.</p> <p>Extraordinary audits (including calibration) are possible if CNDC or Hidropantasma detect any failure in the measurement. The audit shall be performed by an auditor certified by CNDC.</p> <p>The INE defines the local standards and parameters to be followed in the electricity generation sector.</p> <p>Hidropantasma downloads daily the data from the main and back up meters and monitors the total electricity generation. Also, a monthly report of total generation is elaborated.</p> <p><i>Verifier's action:</i> The registered MP has been checked by the verification team against description in MR. Interviews were performed with personnel from Hidropantasma to confirm the measurement method. Also, the Operational Regulation requirements<sup>/LAW/</sup> were checked.</p> <p><i>Verifier's action:</i></p> <p>➤ The verifier remotely confirms the existence of both, main and back-up meters, checked the respective serial numbers and</p>	<p><del>CAR-03</del> <del>CAR-09</del> CL02</p>	OK

		<p>the correct functioning of both meters.</p> <ul style="list-style-type: none"> <li>➤ The VT reviewed the meters manufacturer's specifications and user's guide<sup>/Meter/</sup>.</li> <li>➤ Check the Monitoring Room and checked the monthly raw data from SCADA of the entire monitoring period, obtained in real time.</li> <li>➤ .</li> <li>➤ The obtained monthly information was corroborated to be the same in the MR and calculation spreadsheet.</li> </ul> <p>Finally, data was cross-checked against monthly invoices of the monitoring period, the auditor confirmed consistency.</p> <p><i>Conclusion:</i> By means of the above the verification team could confirm that:</p> <ul style="list-style-type: none"> <li>- Measurement method is in accordance with the registered PDD and applied methodology</li> <li>- The metering equipment complies with the PDD requirements.</li> <li>- Frequency of measurements are as per requirements in the PDD</li> <li>- No relevant discrepancies exist between the data from both meters (main and backup).</li> <li>- Equipment was not changed or replaced during the monitoring period.</li> </ul> <p>Nonetheless, a finding was raised.</p>														
<p><b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371)</b>  <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.  Describe whether all applicable QA/QC procedures are</i></p>	<p>/IM01/  /PDD/  /METH/    /XLS/  /EG/    /Meter/    /CC/</p>	<table border="1"> <tr> <td data-bbox="1016 1102 1093 1214"><input checked="" type="checkbox"/></td> <td data-bbox="1093 1102 1839 1214">In this context the following findings have been raised:</td> </tr> <tr> <td data-bbox="1016 1214 1093 1425"><input checked="" type="checkbox"/></td> <td data-bbox="1093 1214 1839 1425">CAR 03 and CAR 09 as well as CL 02</td> </tr> </table> <table border="1"> <tr> <td data-bbox="1016 1214 1093 1294"><input type="checkbox"/></td> <td data-bbox="1093 1214 1839 1294">It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</td> </tr> <tr> <td data-bbox="1016 1294 1093 1342"><input checked="" type="checkbox"/></td> <td data-bbox="1093 1294 1839 1342">For details regarding the accuracy and calibration details please refer to Appendix 6</td> </tr> <tr> <td data-bbox="1016 1342 1093 1390"><input type="checkbox"/></td> <td data-bbox="1093 1342 1839 1390">No delayed calibration has occurred</td> </tr> <tr> <td data-bbox="1016 1390 1093 1425"><input type="checkbox"/></td> <td data-bbox="1093 1390 1839 1425">As per the initial assessment the monitored value is deemed to be correct.</td> </tr> </table>	<input checked="" type="checkbox"/>	In this context the following findings have been raised:	<input checked="" type="checkbox"/>	CAR 03 and CAR 09 as well as CL 02	<input type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6	<input type="checkbox"/>	No delayed calibration has occurred	<input type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.	<p><del>CAR-08</del></p>	<p>OK</p>
<input checked="" type="checkbox"/>	In this context the following findings have been raised:															
<input checked="" type="checkbox"/>	CAR 03 and CAR 09 as well as CL 02															
<input type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan															
<input checked="" type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6															
<input type="checkbox"/>	No delayed calibration has occurred															
<input type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.															

<p>met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</p> <p>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</p>	/ MR / / EF /	<input type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
			<input checked="" type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: From: 14/08/2017 To: 25/08/2017  From: 25/08/2019 To: 29/08/2019  For both meters, the main and backup			
		<input checked="" type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
			<input type="checkbox"/>			The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration
			<input checked="" type="checkbox"/>			The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument
			<input type="checkbox"/>			The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument
			<input type="checkbox"/>			The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals
		<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.			
<input checked="" type="checkbox"/>	In this context the following findings have been raised:					
	<input checked="" type="checkbox"/>	CAR 08				
<b>B. FC<sub>i,j,y</sub></b>		Quantity of fuel type i combusted in process j during the year y				



<p><b>a) Measurement / Determination method (VVS, §§ 360-364)</b>  Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	/IM01/ /PDD/ /METH/  /XLS/  /EG/  /MR/  /L-B/  /TOOL/  /PRC/	<p><i>Description:</i> Two emergency diesel electricity generator exist in plant, which according to the operation logbooks and the interviews of the operative personnel, are tested regularly.</p> <p>As per registered PDD the diesel consumption of the generators has to be measures by a level meter which has to be calibrated regularly , nevertheless monitoring activities were not performed as per PDD and there is no reliable monitoring data, so that the PP reported a Temporary which is assessed in a separate PRC validation report. As per temporary deviation, the diesel consumption is calculated by applying the maximum fuel consumption as per generators manufacturers.</p> <p><i>Verifier's action:</i> the VT checked the following:</p> <ul style="list-style-type: none"> <li>- The physical emergency generators, the plates and technical sheets</li> <li>- Updated PDD and PRC validation report.</li> <li>- The operation logbooks<sup>/L-B/</sup> and</li> <li>- interviewed the operative personnel as well as MR versus PDD, methodology and related tool.</li> </ul> <p><i>Conclusion:</i> The determination of the <math>FC_{i,j,y}</math> is done as per alternative method and in line with the actual situation of the project activity. Nevertheless some data was missing in the MR.</p> <table border="1" data-bbox="1030 933 1839 1054"> <tr> <td><input checked="" type="checkbox"/></td> <td>In this context the following findings have been raised:</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>CAR 04</td> </tr> </table>		<input checked="" type="checkbox"/>	In this context the following findings have been raised:	<input checked="" type="checkbox"/>	CAR 04	CAR-04	OK						
<input checked="" type="checkbox"/>	In this context the following findings have been raised:														
<input checked="" type="checkbox"/>	CAR 04														
<p><b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371)</b>  In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring</p>	/IM01/ /PDD/ /METH/  /XLS/  /EG/	<table border="1"> <tr> <td><input type="checkbox"/></td> <td>It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</td> </tr> <tr> <td><input type="checkbox"/></td> <td>For details regarding the accuracy and calibration details please refer to Appendix 6</td> </tr> <tr> <td><input type="checkbox"/></td> <td>No delayed calibration has occurred</td> </tr> <tr> <td><input type="checkbox"/></td> <td>As per the initial assessment the monitored value is deemed to be correct.</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Based on calibration certificates checked it can be confirmed</td> </tr> </table>		<input type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	<input type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6	<input type="checkbox"/>	No delayed calibration has occurred	<input type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.	<input type="checkbox"/>	Based on calibration certificates checked it can be confirmed	CAR-04	OK
<input type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan														
<input type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6														
<input type="checkbox"/>	No delayed calibration has occurred														
<input type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.														
<input type="checkbox"/>	Based on calibration certificates checked it can be confirmed														

<p>equipment has been carried out in line with the latest EB guidance.</p> <p>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</p>		that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period:  For both meters, the main and backup		
		<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:		
		<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
		<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
		<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
		<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input checked="" type="checkbox"/>	In this context the following findings have been raised:		
		<input checked="" type="checkbox"/>	CAR 04		
<b>C. EG<sub>m,y</sub></b>		Net electricity generated by power units m in year y			

<p><b>a) Measurement / Determination method (VVS, §§ 360-364)</b>  Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	/IM01/ /PDD/ /METH/ /XLS/ /MR/ /EF/ /TOOL/	<p>Description: The parameter is used to determine the ex-post Grid emission factor. As per PDD the grid EF is calculated ex-post with the electricity data public available corresponding from the year to the monitoring period. As per published MR and related ER spreadsheet, the yearly grid EF is calculated for the years 2013 to 2018. As per initial MR and ER spreadsheet the data from year 2018 is the latest public available information at the time of the documents submission to the DOE for the verification, so that EF for the year 2018 is also applied for 2019 and 2020.</p> <p>No related measurement equipment is applied.</p> <p>The data of EGM,y is taken from the official data from the the Nicaraguan Energy Institute (Instituto Nicaragüense de la Energía-“INE”) <a href="https://www.ine.gob.ni/index.php/electricidad/serie-historica/">https://www.ine.gob.ni/index.php/electricidad/serie-historica/</a>.</p> <p>Verifier's action: The Verification team checked the data used in XLS calculation versus the original data from the INE reports and all data aggregation as well as MR against PDD, methodology and related tool.</p> <p>Conclusion: The generation data used in the EF calculation sheet is in line with the original data. The selected data for the EF<sub>grid,CM,y</sub> calculation has been done in line with applicable TOOL 07 ver. 2.2.1. and registered PDD. However, findings have been raised.</p> <table border="1" data-bbox="1025 906 1843 1050"> <tr> <td><input checked="" type="checkbox"/></td> <td>In this context the following findings have been raised:</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>CL 04</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>CAR 07, CAR 11, CAR 13</td> </tr> </table>	<input checked="" type="checkbox"/>	In this context the following findings have been raised:	<input checked="" type="checkbox"/>	CL 04	<input checked="" type="checkbox"/>	CAR 07, CAR 11, CAR 13	GL-04 CAR-13 CAR-11 CAR-07	OK				
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<p><b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371)</b>  In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring</p>	/IM01/ /PDD/ /METH/ /XLS/ /MR/ /EF/	<table border="1"> <tr> <td><input type="checkbox"/></td> <td>It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</td> </tr> <tr> <td><input type="checkbox"/></td> <td>For details regarding the accuracy and calibration details please refer to Appendix 6</td> </tr> <tr> <td><input type="checkbox"/></td> <td>No delayed calibration has occurred</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>As per the initial assessment the monitored value is deemed to be correct.</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Based on calibration certificates checked it can be confirmed</td> </tr> </table>	<input type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	<input type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6	<input type="checkbox"/>	No delayed calibration has occurred	<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.	<input type="checkbox"/>	Based on calibration certificates checked it can be confirmed	OK	OK
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<p>equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</p>		<p>that the monitoring equipment has been duly calibrated for this entire monitoring period.</p> <p><input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: For both meters, the main and backup</p> <p><input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:</p> <p><input type="checkbox"/> The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration</p> <p><input type="checkbox"/> The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument</p> <p><input type="checkbox"/> The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument</p> <p><input type="checkbox"/> The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals</p> <p><input type="checkbox"/> The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</p> <p><input type="checkbox"/> In this context the following findings have been raised:</p> <p><input type="checkbox"/> -</p>		
D. FC <sub>i,m,y</sub>		Amount of fossil fuel type i consumed by power plant/unit m in year y		
<p><b>a) Measurement / Determination method (VVS, §§ 360-364)</b> Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been</p>	<p>/IM01/ /PDD/ /METH/ /XLS/ /MR/ /EF//TOO L/</p>	<p>Description: The parameter is used to determine the ex-post Grid emission factor. As per PDD the grid EF is calculated ex-post with the electricity data public available corresponding from that year in the monitoring period. As per published MR and related ER spreadsheet, the yearly grid EF is calculated for the years 2013 to 2018. As per initial MR and ER spreadsheet the data for year 2018 is the latest public available information at the time of the documents submission to the DOE for the verification, so that EF for the year 2018 is also applied for the years 2019 and 2020.</p>	<p>CL-04 CAR-13 CAR-11 CAR-07</p>	<p>OK</p>

<p>used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	/TOOL/	<p>No related measurement equipment is applied.</p> <p>The data of <math>FC_{i,m,y}</math> is taken from the official data from the the Nicaraguan Energy Institute (Instituto Nicaragüense de la Energía-“INE”) <a href="https://www.ine.gob.ni/index.php/electricidad/serie-historica/">https://www.ine.gob.ni/index.php/electricidad/serie-historica/</a>.</p> <p><i>Verifier's action:</i> The Verification team checked the data used in XLS calculation versus the original data from the INE reports and all data aggregation as well as MR against PDD, methodology and related tool.</p> <p>Conclusion: The <math>FC_{i,m,y}</math> data used in the EF calculation sheet is in line with the original data. The selected data for the <math>EF_{grid,CM,y}</math> calculation has been done in line with applicable TOOL 07 ver. 2.2.1. and registered PDD. However, findings have been raised.</p> <table border="1" data-bbox="1037 619 1827 758"> <tr> <td><input checked="" type="checkbox"/></td> <td>In this context the following findings have been raised:</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>CL 04</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>CAR 07, CAR 11, CAR 13</td> </tr> </table>	<input checked="" type="checkbox"/>	In this context the following findings have been raised:	<input checked="" type="checkbox"/>	CL 04	<input checked="" type="checkbox"/>	CAR 07, CAR 11, CAR 13										
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<p><b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371)</b></p> <p>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</p> <p>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</p> <p>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</p>	/IM01/ /PDD/ /METH/  /XLS/ /MR/ /EF/	<table border="1"> <tr> <td><input type="checkbox"/></td> <td>It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</td> </tr> <tr> <td><input type="checkbox"/></td> <td>For details regarding the accuracy and calibration details please refer to Appendix 6</td> </tr> <tr> <td><input type="checkbox"/></td> <td>No delayed calibration has occurred</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>As per the initial assessment the monitored value is deemed to be correct.</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Based on calibration certificates checked a delay in calibration has been identified for the following period: For both meters, the main and backup</td> </tr> <tr> <td><input type="checkbox"/></td> <td>A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:</td> </tr> </table>	<input type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	<input type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6	<input type="checkbox"/>	No delayed calibration has occurred	<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.	<input type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.	<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: For both meters, the main and backup	<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:	OK	OK
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			<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration				
			<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument				
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			<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.				
			<input type="checkbox"/>	In this context the following findings have been raised:				
			<input type="checkbox"/>	-				
<b>E. NCV<sub>i,y</sub></b>			Net calorific value (energy content) of fossil fuel type i in year y / Weighted average net calorific value of fuel type i in year y					
<b>a) Measurement / Determination method (VVS, §§ 360-364)</b> Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/IM01/ /PDD/ /METH/ /XLS/ /MR/ /EF/ /TOOL/	Description: The parameter is used to determine the ex-post Grid emission factor. As per PDD the grid EF is calculated ex-post with the electricity data public available corresponding from the year to the monitoring period. As per published MR and related ER spreadsheet, the yearly grid EF is calculated for the years 2013 to 2018. As per initial MR and ER spreadsheet the data from year 2018 is the latest public available information at the time of the documents submission to the DOE for the verification, so that EF for the year 2018 is also applied for 2019 and 2020. No related measurement equipment is applied. The default NCV <sub>i,y</sub> were selected at validation stage, the following values are applied to the calculation: 41.4 (Diesel oil) 39.8 (Fuel oil) The values are taken from the IPCC 2006 Guidelines for National Greenhouse Gas Inventories, Table 1.2 of Chapter 1 of Vol. 2 (Energy).			GL-04 CAR-13 CAR-11 CAR-07	OK		

		<p><i>Verifier's action:</i> The VT checked the consistent and correct use of the <math>NCV_{i,y}</math> throughout the <math>EF_{grid,CM,y}</math> calculation as well as MR against PDD, methodology and related tool.</p> <p><i>Conclusion:</i> The <math>NCV_{i,y}</math> data for the <math>EF_{grid,CM,y}</math> calculation has been done in line with applicable TOOL 07 ver. 2.2.1 and registered PDD. However, findings have been raised.</p>								
		<input checked="" type="checkbox"/> In this context the following findings have been raised:								
		<input checked="" type="checkbox"/> CL 04, CAR 13, CAR 11, CAR 07								
<p><b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371)</b></p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	<p>/IM01/ /PDD/ /METH/  /XLS/ /EG/ /Meter/  /CC/ /MR/ /EF/</p>	<input type="checkbox"/> It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan  <input type="checkbox"/> For details regarding the accuracy and calibration details please refer to Appendix 6  <input type="checkbox"/> No delayed calibration has occurred  <input checked="" type="checkbox"/> As per the initial assessment the monitored value is deemed to be correct.  <input type="checkbox"/> Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.  <input type="checkbox"/> Based on calibration certificates checked a delay in calibration has been identified for the following period: For both meters, the main and backup  <input type="checkbox"/> A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the: <table border="1"> <tr> <td><input type="checkbox"/></td> <td>The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration</td> </tr> <tr> <td><input type="checkbox"/></td> <td>The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument</td> </tr> <tr> <td><input type="checkbox"/></td> <td>The error as identified during the delayed calibration has been applied as the error is beyond the maximum</td> </tr> </table>	<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration	<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument	<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum	OK	OK
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			permissible error of the instrument		
		<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
		<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/>	In this context the following findings have been raised:		
		<input type="checkbox"/>	-		
		<input type="checkbox"/>	-		
<b>F. <math>EF_{CO_2,i,y} / EF_{CO_2,m,i,y}</math></b>			CO2 emission factor of fossil fuel type i used in power unit m in year y / Weighted average CO2 emission factor of fuel type i in year y		
<b>a) Measurement / Determination method (VVS, §§ 360-364)</b> Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/IM01/ /PDD/ /METH/ /XLS/ /MR/ /EF/ /TOOL/		<b>Description:</b> The parameter is used to determine the ex-post Grid emission factor. In line with the PDD the default $EF_{CO_2,i,y} / EF_{CO_2,m,i,y}$ values are applied. Those are taken from the IPCC 2006 Guidelines for National Greenhouse Gas Inventories, Table 1.4 of Chapter 1 of Vol. 2 (Energy) and as required in the TOOL 07 the lower limit values of 0.0726 tCO <sub>2</sub> /GJ for Diesel oil and 0.0755 tCO <sub>2</sub> /GJ for Fuel oil are applied. 0.0755 tCO <sub>2</sub> /GJ for Fuel oil are taken. No related measurement equipment applicable.  <b>Verifier's action:</b> The VT checked the applied values in the $EF_{grid,CM,y}$ calculation as well as MR against PDD, methodology and related tool.  <b>Conclusion:</b> The emission factors applied for the $EF_{grid,CM,y}$ calculation has been done in line with applicable TOOL 07 ver. 2.2.1 and registered PDD. However, finding has been raised.	GL-04	OK
		<input checked="" type="checkbox"/>	In this context the following findings have been raised:		
		<input checked="" type="checkbox"/>	CL 04		
		<input type="checkbox"/>	-		
<b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371)</b> In case of measured (or estimated) values, check	/IM01/ /PDD/ /METH/	<input type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	OK	OK



<p><i>whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	/XLS/ /MR/ /EF/	<table border="1"> <tr> <td><input type="checkbox"/></td> <td>For details regarding the accuracy and calibration details please refer to Appendix 6</td> </tr> <tr> <td><input type="checkbox"/></td> <td>No delayed calibration has occurred</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>As per the initial assessment the monitored value is deemed to be correct.</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Based on calibration certificates checked a delay in calibration has been identified for the following period: For both meters, the main and backup</td> </tr> <tr> <td><input type="checkbox"/></td> <td>A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:</td> </tr> <tr> <td><input type="checkbox"/></td> <td>The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration</td> </tr> <tr> <td><input type="checkbox"/></td> <td>The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument</td> </tr> <tr> <td><input type="checkbox"/></td> <td>The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument</td> </tr> <tr> <td><input type="checkbox"/></td> <td>The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals</td> </tr> <tr> <td><input type="checkbox"/></td> <td>The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</td> </tr> <tr> <td><input type="checkbox"/></td> <td>In this context the following findings have been raised:</td> </tr> <tr> <td><input type="checkbox"/></td> <td>-</td> </tr> <tr> <td><input type="checkbox"/></td> <td>-</td> </tr> </table>	<input type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6	<input type="checkbox"/>	No delayed calibration has occurred	<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.	<input type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.	<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: For both meters, the main and backup	<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:	<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration	<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument	<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument	<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals	<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.	<input type="checkbox"/>	In this context the following findings have been raised:	<input type="checkbox"/>	-	<input type="checkbox"/>	-		
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<input type="checkbox"/>	-																															
<input type="checkbox"/>	-																															
G. $\eta_m$		Average net energy conversion efficiency of power unit m or k in year y																														

<p><b>a) Measurement / Determination method (VVS, §§ 360-364)</b>  Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	/IM01/ /PDD/ /METH/ /XLS/ /MR/ /EF/	<p><i>Description:</i> The parameter is used to determine the grid emission factor. In line with the registered PDD the <math>\eta_m</math> values are to be taken from the default vales as per TOOL07. Nevertheless, during this MP the PP calculated the emission factor for each power unit m applying option A1 as per tool is applied this parameter has not been used for the EFgrid and ER calculation of this monitoring period.</p> <p><i>Verifier's action:</i> By means of checking MR, PDD and ER spreadsheet besides considering related methodology and tools.</p> <p><i>Verifier's action:</i> checked the EF calculation versus the applied TOOL07 and PDD.</p> <p><i>Conclusion:</i> A finding was raised for clarification.</p> <table border="1" data-bbox="1023 592 1839 751"> <tr> <td><input checked="" type="checkbox"/></td> <td>In this context the following findings have been raised:</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>CL 04</td> </tr> <tr> <td><input type="checkbox"/></td> <td>-</td> </tr> </table>	<input checked="" type="checkbox"/>	In this context the following findings have been raised:	<input checked="" type="checkbox"/>	CL 04	<input type="checkbox"/>	-	GL-04	OK								
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<input checked="" type="checkbox"/>	CL 04																	
<input type="checkbox"/>	-																	
<p><b>b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371)</b>  In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.  Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.  Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</p>	/IM01/ /PDD/ /METH/ /XLS/ /MR/ /EF/	<table border="1"> <tr> <td><input type="checkbox"/></td> <td>It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan</td> </tr> <tr> <td><input type="checkbox"/></td> <td>For details regarding the accuracy and calibration details please refer to Appendix 6</td> </tr> <tr> <td><input type="checkbox"/></td> <td>No delayed calibration has occurred</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>As per the initial assessment the monitored value is deemed to be correct.</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Based on calibration certificates checked a delay in calibration has been identified for the following period: For both meters, the main and backup</td> </tr> <tr> <td><input type="checkbox"/></td> <td>A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:</td> </tr> </table>	<input type="checkbox"/>	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan	<input type="checkbox"/>	For details regarding the accuracy and calibration details please refer to Appendix 6	<input type="checkbox"/>	No delayed calibration has occurred	<input checked="" type="checkbox"/>	As per the initial assessment the monitored value is deemed to be correct.	<input type="checkbox"/>	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.	<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: For both meters, the main and backup	<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:	OK	OK
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<input type="checkbox"/>	Based on calibration certificates checked a delay in calibration has been identified for the following period: For both meters, the main and backup																	
<input type="checkbox"/>	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:																	

			<input type="checkbox"/>	The maximum permissible error of the instrument has been applied to the values during the period between scheduled date of calibration and the actual date of calibration		
			<input type="checkbox"/>	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			<input type="checkbox"/>	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			<input type="checkbox"/>	The error has been applied in a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed GHG emission reductions or net anthropogenic GHG removals		
			<input type="checkbox"/>	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		<input type="checkbox"/>	In this context the following findings have been raised:			
		<input type="checkbox"/>	-			
<input type="checkbox"/>	-					

## Appendix 6. Calibration dates and validity of installed monitoring equipment

**Table A-6:** Periodic Verification Checklist – Calibration details

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration: yes/no	Period of delayed calibration
SIEMENS Main	EG <sub>facility,y</sub>	SJ – 1111A176 - 02	ION-9610	0.2	16/08/2013	14/08/2015 25/08/2017 29/08/2019	15/08/2015 13/08/2017 24/08/2019 28/08/2021	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From: 14/08/2017 To: 25/08/2017  From: 25/08/2019 To: 29/08/2019
SIEMENS Back Up	EG <sub>facility,y</sub>	SJ – 1111A179 - 02	ION-9610	0.2	16/08/2013	14/08/2015 25/08/2017 29/08/2019	15/08/2015 13/08/2017 24/08/2019 28/08/2021	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From: 14/08/2017 To: 25/08/2017  From: 25/08/2019 To: 29/08/2019

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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
04.0	6 April 2021	Revision to: <ul style="list-style-type: none"> <li>• Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).</li> </ul>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"> <li>• Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN);</li> <li>• Make structural and editorial improvements.</li> </ul>
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		