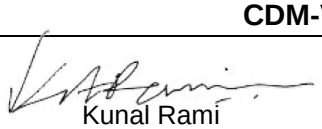
Verification and certification report form for CDM project activities

(Version 04.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the verification and certification report form for CDM project activities" at the end of this form.

VERICATION AND CERTIFICATION REPORT			
Title and UNFCCC reference number of the project activit	Bethlehem Hydroelectric Project UNFCCC ID: 2692		
Scale of the project activity	☐ Large-scale ☒ Small-scale		
Version number of the verification and certification report	1.1		
Completion date of the verification and certification report	13/09/2021		
Monitoring period number and duration of this monitoring period	3rd (1st in 2nd crediting period) Duration: 08/10/2016 to 31/12/2020 (1,546 days)		
Version number of monitoring report to which this report applies	6		
Crediting period of the project activity corresponding to this monitoring period	08/10/2016 to 07/10/2023		
Project participants	Bethlehem Hydro (Pty) Ltd Statkraft Markets BV		
Host Party	South Africa		
Applied methodologies and standardized baselines	AMS-1.D: Grid connected renewable electricity generation - version 18.0 Standardised baseline: ASB0001, "Standardized baseline: Grid emission factor for the Southern African power pool" (Version 01.0)		
Mandatory sectoral scopes	Scope: 1 Energy industries (renewable - /non-renewable sources)		
Conditional sectoral scopes, if applicable	n/a		
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	136,671 tCO_2e tCO_{2e}		
Certified amount of GHG emission reductions or GHG removals for this monitoring period	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020	Amount from 1 January 2021
	0	161,346 tCO2e	0
Name and UNFCCC reference number of the DOE	TÜV NORD CERT GmbH E-0022		

Name, position and signature of the approver of the verification and certification report	 Kunal Rami Final Approver

SECTION A. Executive summary

Bethlehem Hydro (Pty) Ltd has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 3th periodic (1st in 2nd crediting period) verification of the project:

"**Bethlehem Hydroelectric project**"

with regard to the relevant requirements for CDM project activities.

This verification covers the period from 08/10/2016 to 31/12/2020 (including both days).

The purpose of the project activity is to generate electricity from a hydropower plant, which can deliver 37 GWh per year to the South African grid. The project involves the installation of 5.8 MW of hydropower generation capacity within the boundaries of the Dihlabeng Local Municipality (Free State Province, South Africa). The project is comprised of two generation facilities:

1. Merino a run of river site located on the As River and
2. Sol Plaatje facility located at the existing concrete wall of the Sol Plaatje Dam.

The Sol Plaatje Dam was built prior to the project activity in order to supply water to the Bethlehem Municipality. The electricity produced by the Sol Plaatje site is evacuated via a dedicated 5 km transmission line at 11KV to the Panorama substation linking the site to the national grid. The power produced by the Merino unit is transmitted by a dedicated 22kV power line to the national grid.

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

Table A-1: Project Location

No.	Project Location
Host Country	South Africa
Region:	Free State Province
Project location address:	City of Bethlehem
Sol Plaatje Latitude:	28° 12' 59" South
Sol Plaatje Longitude:	028° 21' 50" East
Merino Latitude:	28° 22' 09" South
Merino Longitude:	028° 21'42" East

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

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

Parameter	Unit	Value
Sol PlaatjeTurbine		
Manufacturer	-	Boving Fouress Limited (BFL)
Type	-	Kaplan horizontal axis
Capacity	MW	2.5
Number of units	-	1
Diameter	m	2.1
Head	m	11
Maximum Flow	m^3/s	29.2
Sol Plaatje Generator		

Manufacturer	-	Power System PVT. LTD
Type	-	WD140
Standard	-	IEC 34
Output	kVA	3000
Power Factor (PF)	%	0.8
Capacity	MW	2.4*
Number of units	-	1
Voltage	V	6600
Frequency	Hz	50
Merino Turbine		
Manufacturer	-	Boving Fouress Limited (BFL)
Type	-	Kaplan horizontal axis
Capacity	MW	3.6*
Number of units	-	1
Maximum Flow	m^3/s	29.2
Merino Generator		
Manufacturer	-	Power System PVT. LTD
Type	-	WD140
Standard	-	IEC 34
Output	kVA	4000
Power Factor (PF)	%	0.85
Capacity	MW	3.4*
Number of units	-	1
Voltage	V	6600
Frequency	Hz	50

*Calculated. The real power P in kilowatts (kW) is equal to the apparent power S in kilovolt-amps (kVA), times the power factor PF; P(kW) = S(kVA) × PF (http://www.rapidtables.com/convert/electric/kva-to-kw.htm)

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, i.e., AMS-I.D, version 18.0.
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated and provisions of delayed calibration is applied as per requirements of para 366 (a) and 367 (a), (b) of VVS-PA version 02.0.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of this 3th periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: **161,346 tCO_2e**

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	Interview(s)	Validationfindings
1.	Team Leader	EI	Kochaniewicz	Grzegorz	-	x	x	x	x

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	EI	Winter	Stefan	TÜV NORD CERT GmbH
2.	Technical reviewer /Approver	IR	Rami	Kunal	TÜV NORD CERT GmbH

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
☐	**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[1];**
☐	**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;**
☐	**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;**
☒	**5 %**	**Emission reductions or removals for registered small-scale CDM project activities other than registered CDM project activities covered under next category below;**

[1] A year refers to a period of 12 consecutive months.

	Threshold	Related to
☐	**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.

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.	Transfer of data from electricity protocols and invoices to excel ER spreadsheet	Low	Possible human error during transfer of data to ER spreadsheets and MR	Thorough cross-check required on the transfer of data to the ER spreadsheet and MR.
2.	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.

On the basis of 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 site visit.

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*	*Findings reference*	*Corrected*	*Remaining verification risk*
$EG_{PJ,facility,y}$	*CDC*	☒	CAR 01 CAR 02	☒	*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 basically carried out as per the verification plan.

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

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: 04/02/2021 to 05/02/2021				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	• Opening Meeting, • Plant Inspection, • Control room inspection, • Meter inspection (point of delivery), • Generation records, • Check of logbook, • Interviews with operation staff, • Final Meeting	Merino Hydropower Plant	04/02/2021	Grzegorz Kochaniewicz
2.	• Opening Meeting, • Plant Inspection, • Control room inspection, • Meter inspection (point of delivery), • Generation records, • Check of logbook, • Interviews with operation staff, • Final Meeting	Sol Plaatje Hydropower Plant	05/02/2021	Grzegorz Kochaniewicz

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Hettingh	H	REH Operation and Maintainance	04/02/2021	Roles and responsibilities,Plant operations, Information flow, Data recording, Site inspection, Meter calibrations, Down times,	Grzegorz Kochaniewicz
2.	Tuchten	Olivia	Promethium Carbon/ Principal Carbon Advisor	04/02/2021 to 05/02/2021	Review MR, ER calculation, Site inspection, Documents and Reporting	Grzegorz Kochaniewicz
3.	Van Huyssteen	Roelof	Promethium Carbon/Senior Carbon Advisor	04/02/2021 to 05/02/2021	Review MR, ER calculation, Site inspection, Documents and Reporting	Grzegorz Kochaniewicz
4.	Boshoff de Bruyn		REH Group/Operation and Maintainance	05/02/2021	Roles and responsibilities,Plant operations, Information flow, Data recording, Site inspection, Meter calibrations, Down times	Grzegorz Kochaniewicz
5.	Olivier	Anton-Louis	REH Group-Bethelehem Hydro/CEO	05/02/2021	Roles and responsibilities,Plant operations, Information flow, Data recording, Site inspection, Meter calibrations, Down times,	Grzegorz Kochaniewicz
6.	Harris	S.	REH/Financial Manager	05/02/2021	Roles and responsibilities,Plant operations, Information flow, Data recording, Invoicing	Grzegorz Kochaniewicz
7.	Thorne	H.	REH/Group Legal	05/02/2021	Roles and responsibilities,Plant operations, Information flow, Data recording, Invoicing	Grzegorz Kochaniewicz

D.4. Sampling approach

D.4.1 Sampling during monitoring

☒	No sampling approach has been used by the PP to determine the monitored parameters
☐	A sampling approach has been taken for the following monitored parameter(s):

Parameter	Sampling approach [1)]	Sampling Type [2)]	Population	Sample Size
-	-	-		

[1)] *Sampling Approaches:*

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

[2)] *Sampling Types:*

PS: Parameter Sampling

D.4.2 Sampling approaches during verification

☒	No sampling approach has been used by the VT to verify the monitored parameters
☐	A sampling approach has been applied by the VT for the following monitored parameter(s):

Parameter	Sampling approach [1)]	Sampling Type [2)]	Population	Sample Size
-	-	-		

[1)] *Sampling Approaches:*

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

[2)] *Sampling Types:*

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

During the on-site verification, no sampling approach has been used by the verification team to verify the reported values for the monitored parameters as listed in section D.2 of the MR. All electricity data listed in the ER spreadsheet were 100% checked and reviewed against the submitted electricity protocol and cross-checked with the sales invoices.

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 (E.1)	1	0	0
Compliance of the project implementation with the registered PDD (E.3)	1	0	0
Post-registration changes (E.4)	0	0	0
Compliance of the monitoring plan with the monitoring methodologyies including applicable tools and standardized baselines (E.5)	1	0	0
Compliance of monitoring activities with the registered monitoring plan (E.6)	0	0	0
Compliance with the calibration frequency requirements for measuring instruments (E.7)	0	1	0
Assessment of data and calculation of emission reductions or net removals (E.8)	0	2	0
Global stakeholder consultation	0	0	0

Others (please specify)	0	0	0
Total	**3**	**3**	**0**

SECTION E. Verification findings

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

Means of verification	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. By means of the UNFCCC website it has been checked whether the latest applicable MR template CDM-MR-FORM has been used. 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. The following sources of information have been used in this context: • /MR/ • /MRT/ • /unfccc/	
Findings	☒	The latest reporting template CDM-MR-FORM as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.
	☐	The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification.
	☒	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:
		CL 03
Conclusion	☐	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.
	☒	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 reporting template CDM-MR-FORM as listed on the UNFCCC website has been used for the Monitoring Report. The PP has carried out the requested corrections so that it can be confirmed that the Monitoring report is complete and transparent and in accordance with the latest approved PDD /PDD/, other relevant requirements as well as with the applicable monitoring report form. The verification team has checked all sections of the MR and confirms by means of comparing the MR that has been used with the standardized MR template.	

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 /PDD/ and the previous verification report /VER/, where applicable, have been checked in order to identify any remaining forward action requests.For the current monitoring period the following applies:

(i) <u>Open issues from validation:</u>

☒	There were no open issues which have been addressed in the latest version of the validation report.
☐	All open issues from the validation have been appropriately addressed in the context of previous verifications.
☐	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)
☐	The following issues related to the validation have **not** yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

(ii) <u>Open issues from previous verifications:</u>

☐	N/A – as this is the first monitoring period for this CDM project activity.
☒	There were no open issues which have been addressed in the previous verification report
☐	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)
☐	The following issues related to the previous verification have **not** yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

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

Means of verification	By means of an in-depth review of the PDD in its latest form – as downloaded from the UNFCCC project site - and the checks carried out during the on-site visit 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. Further is 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. Interviews with operational personnel have been carried out, QMS records, maintenance records, instrument specifications were checked in this context. 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. Further it has been checked whether any observed deviations from the registered project design have been correctly addressed as PRCs. The following sources of information have been used in this context: • /PDD/ • /MR/ • /VVS/ • /XLS/ • /unfccc/	
Findings	☒	The project has been implemented 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.
	☐	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
	☒	In this context the following CARs, CLs have been raised:
		CL 02
	In case of phased implementation:	
	☒	N/A
	☐	The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.
	☐	The description in section 3.1 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 during the site inspection.
	☐	The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A
Conclusion	☐	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.
	☒	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.

	Site visit was carried out during verification process. On the basis of this site visit and the reviewed project documentation it can be confirmed that w.r.t. the realized technology, the project equipment, as well as the monitoring and metering equipment, the project has been implemented and operated as described in the latest approved PDD. Downtimes and operational issues as reflected in the generation data seen onsite have been articulated in section B.1 of the MR, in line with §256 of the CDM PS version 02.0. No events or situations that occurred during the monitoring period have impacted the applicability of the applied methodology.

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents[2]

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.

☐	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.		
☒	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC		
	1	Title	The electricity consumption at the Merino site was not captured by the bidirectional meter. Conservative assumption was applied.
		Status	☐under approval;☒approved
		Appr.date	05 October 2017
		Ref. No.	PRC-2692-002
	2	Title	
		Status	☐under approval;☐approved (approval No.:)
		Appr.date	
		Ref.No.	
☒	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		
☐	An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix 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:	
☐	The following TDfrMP or TDfMM for which appendix of the PS is applicable have been applied:		
	1	Issue:	-
	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.

[2] 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).

☒	During the verification of the current MP no need for corrections has been identified.		
☐	The following corrections have been applied:		
	1	Issue:	-
	2	Issue:	-
	☐ A related post registration change has been submitted prior to the issuance request. ☐ 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. Changes to the start date of the crediting period

☐	N/A - as this is not the first verification within the crediting period
☒	The PPs do not intend to change the start date of the crediting period.
☐	As the change in the start date was below the related time period as indicated in PS § 277 and § 278 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.
☐	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 § 279 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.
☐	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

☒	N/A - as this monitoring plan is part of the registered PDD
☐	In line with PS § 281 or § 282 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 § 282 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..
☐	In line with § 282 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 from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

☐	No PCfrMP,PCfMMor PCfSBhave been submitted to the UNFCCC prior to the current monitoring period		
☒	The following PCfrMP,PCfMMor PCfSBhave been approved or are under approval by the UNFCCC		
	1	Title	Several Permanent Changes to the Monitoring Plan: 1. Change in the calibration frequency and accuracy classes applicable for the electricity meters – In the revised Monitoring Plan, the calibration frequency is defined as once every three years, whereas the registered monitoring plan indicated that no calibration was needed. It has been confirmed with the equipment manufacturer that a recalibration of the equipment is not required. Also, the South African National Standards for electricity metering on electricity measurement do not require specific calibration beyond the manufacturer's recommendation. Only if any in-situ verification test shows that a meter is outside the required error limits, the meter shall be returned to an accredited calibration laboratory for calibration at reference conditions. 2. Change of power meter location – In the revised Monitoring Plan, the exact power meter location was newly defined as per the definition provided in the corresponding PPA to each power plant. The registered PDD stated that electricity meters are installed at each generation unit. The PPAs for Merino and Sol Plaatje define the power meters location at the power station and at the Panorama substation, respectively. 3. Addition of calculation of projects emissions due to use of back up diesel generator and addition of respective monitoring parameters FC1,j, FC2,j. 4. Addition of calculation of projects emissions for back up use of electricity and addition of respective monitoring parameters.
		Status	☐under approval;☒approved
		Appr.date	17 October 2013
		Ref. No.	PRC-2692-002
	2	Title	-
		Status	☐under approval;☐approved
		Appr.date	-
		Ref.No.	-
☒	During the verification of the current MP no need for a PCfrMP,PCfMMor PCfSBhas been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following PCfrMP,PCfMMor PCfSBis to be requested from the EB for the current MP as appendix of the project standard does not apply.		
	1	Issue:	-
	2	Issue:	-
☐	The following PCfrMP,PCfMMor PCfSBfor which appendix of the PS is applicable have been applied:		
	1	Issue:	-
	2	Issue:	-

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.

☐	No CoPD has been submitted to the UNFCCC prior to the current monitoring period
☒	The following CoPD have been approved or are under approval by the UNFCCC

	1	Title	Removal of the non-functional diesel generator equipment from site.
		Status	☐under approval;☒approved
		Appr.date	26 November 2016
		Ref. No.	n/a, The PRC was submitted along renewal of crediting period.
	2	Title	-
		Status	☐under approval;☐approved
		Appr.date	-
		Ref.No.	-
☒	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
☐	An approval of the following CoPD.is to be requested from the EB for the current MP as appendix of the project standard does not apply.		
	1	Issue:	-
	2	Issue:	-
☐	The following CoPD for which appendix of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	-

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

☒	N/A - as this is not afforestation and reforestation project activity

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

Means of verification	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: • /MR/ • /AMS1D/ • /TA/ • /unfccc/			
Findings	☒	The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD)		
	☒	The breakdown of MP accordance of the referenced tools is as follows:		
		1	Title (of the tool)	Tool to determine the remaining lifetime of equipment.
			Version	1.0
			MP compliance	☐ full compliance ☐ findings have been raised ☒ N/A (for MP)
		2	Title (of the tool)	Assessment of the validity of the original/current baseline and update of the baseline at the reneval of the creditiong period

			Version	3.0.1
			MP compliance	☐ full compliance ☐ findings have been raised ☒ N/A (for MP)
		3	Title (of the tool)	ACM0002 Grid-connected electricity generation from renewable sources
			Version	17
			MP compliance	☐ full compliance ☐ findings have been raised ☒ N/A
	☒	The breakdown of MP accordance of the applicable SB is as follows:		
		1	Title (of the SB)	ASB0001 Standardized baseline: Grid emission factor for the South African power pool
			Version	1.0
			MP compliance	☒ full compliance ☐ findings have been raised ☐ N/A
	☒	In this context the following CARs, CLs, FARs have been raised:		
		CL 01		
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	☒	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 applied methodology subscribed applicable tools and standardized baseline are consistent with the versions in UNFCCC website. Nevertheless PP applied in the submitted for verification MR multiple standized baselines. The application of the version of the standardized baseline was clarified in line with § 263 of the CDM Project Standard for Project Activities (Version 02.0).			

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

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

Means of verification	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 or at renewal of the crediting period have been applied correctly. As per approved PDD, there is one ex-ante determined parameter "Southern African standardised baseline grid emissions factor, ASB0001, applicable to all project activities other than wind and solar for the second or third crediting periods". This ex-ante determined parameters in the PDD are used to calculate the baseline emissions on account of electricity generation by renewable energy generation. This parameter is determined based on the ASB0001 "Standardized baseline: Grid emission factor for the Southern African power pool", (Version 01.0) and the corresponding value for this project activity is appropriately selected as 0.9488 $tCO_2/MWh^{/PDD/}$. The following sources of information have been used in this context: • /MR/ • /XLS/ • /PDD/ • /PS/ • /VVS/ • /unfccc/ • /ASB1/

Findings	☐	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.
	☒	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
	☒	In this context the following CARs, CLs, FARs have been raised:
		CL 01 (refer to secion E.5. above)
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	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 and parameters listed in the section D.1 of MR was cross checked with the applied methodology, subscribed tools, revised approved PDD, ER and are consistent.	

E.6.2. Data and parameters monitored

Means of verification	During the verification all relevant monitoring parameters (as listed in chapter B.7.1 of the PDD) have been verified with regard to the (i) appropriateness of the applied measurement / determination method, (ii) the correctness of the values applied for ER calculation, (iii) the accuracy, and applied QA/QC measures. Section B.7.1. of the related latest registered PDD states as following: The parameter **$EG_{PJ,facility,y}$** (Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)) is introduced in line with applied methodology AMS I.D version 18.0. The monitoring parameter represents the net electricity supplied to the grid. This electricity is supplied by both sites, Sol Plaatje and Merino. There are two bidirectional meters i.e. main and check meters to measure net electricity at each facility (Sol Plaatje and Merino). To simplify the calculations, the quantity of net electricity generation supplied by the project to the grid is obtained from the sum of the net electricity generation from both main meters separately for Sol Plaatje and Merino (refer ER worksheet). This complies with the monitoring requirements of the methodology AMS I.D version 18.0. There was change in the metering during the 3th monitoring period. Both a main meter and a check meter were replaced at both facilities. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5).	
Findings	CAR 01; CAR 02	
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	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.
	During the verification all relevant monitoring parameters (as listed in chapter B.7.1 of the registered PDD) have been verified with regard to the appropriateness of the applied measurement / determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. The results as well as the verification procedure are described parameter-wise in the project specific verification checklist. After closure of raised findings, it can be confirmed that the monitoring parameter ($EG_{PJ,facility,y}$) has been reported without material misstatements and in line with all applicable standards and relevant requirements.	

E.6.3. Implementation of sampling plan

Means of verification	The verification team has been checked whether the PPs have applied a sampling approach to determine the monitored values. Further it has been checked whether the PPs have correctly applied the implemented sampling plan including (i) description of the implemented sampling design (ii) collected data

	(iii) analysis of collected data (iv) demonstration on whether the required confidence/precision has been met. The following sources of information have been used in this context: • /MR/ • /XLS/ • /PDD/.			
Findings	☒	The PPs have not applied sampling approaches for the parameters monitored.		
	☐	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:	
	☐	In this context the following CARs, CLs, FARs have been raised:		
		-		
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	☐	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.		
	n/a			

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

Means of verification	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. The results as well as the verification procedure are described equipment-wise in the project specific verification checklist (Appendix 6). The following sources of information have been used in this context: • /PDD/ • /MR/ • /XLS/ • /CAL/.	
Findings	☐	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.
	☒	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. 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. For details please refer to appendix 6
	☒	In this context the following CARs, CLs, FARs have been raised:
		CAR 01
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.

	☒	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 accuracy of equipment used for monitoring is controlled and calibrated according to the National Standard for Metering (NRS-057). The calibrations of all monitoring equipments installed is every 3 years, and have been verified as listed in table given in Appendix 6 to this report. On both sites meters were exchanged during this monitoring period. Calibration certificates, meter manuals and confirmation on meter replacement from responsible companies were provided. Meters were inspected during onsite visit. Based on that the DOE can confirm that all installed monitoring equipment have been calibrated and provisions of delayed calibration is applied following the paragraphs 366 (a) and 367 (a), (b) of VVS-PA version 02.0. The metering diagram is in accordance with the actual situation implemented at project site.	

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

During the verification the calculation of baseline GHG emissions has been checked. In detail the following has been verified:

- *Transparency:* It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae.
- *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.
- *Correctness:* 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.
- *Completeness:* It has been checked whether all calculations are complete and without omissions.

The equation applied for the determination of baseline GHG emissions is consistent with the registered / revised PDD and methodology:

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

Where:

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

$EF_{grid,CM,y}$: Southern African standardised baseline grid emissions factor, ASB0001, applicable to all project activities other than wind and solar for the second or third crediting period

Month	$EG_{PJ,y}$	$EG_{facility\ Sol\ Plaatje,y}$	$EG_{facility\ Merino,y}$	BEy
	MWh/month	MWh/month	MWh/month	tCO_2e
2016	**10,277**	4,034	6,243	9,750
2017	**44,719**	17,183	27,535	42,429
2018	**45,756**	17,758	27,998	43,413
2019	**33,701**	13,367	20,334	31,975
2020	**35,600**	14,565	21,036	33,777
Total	**170,053**	**66,907**	**103,145**	**161,346**

$EG_{PJ,y}$= 170,053 MWh
EFy = 0.9488 tCO_{2e}/ MWh
BE_y= 170,053 MWh * 0.9488 tCO_{2e}/ MWh = 161,346 tCO_{2e}

	The following sources of information have been used in this context: • /MR/ • /XLS/. • /PDD/ • /AMS1D/	
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.
	☐	The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.
	☒	In this context the following CARs, CLs, FARs have been raised: CAR 02; CAR 03
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	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 information provided in the monitoring report has been cross-checked with other sources such as electricity logsheets/ELOG/ and invoices/BHM/. The values from the protocols were applied for the baseline emissions calculation in accordance to the registered PDD. Where corrections where required a revised baseline emissions calculation was prepared by the PPs and presented to the verification team. Moreover PP requested the extension of monitoring period up to the 31/12/2020. 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

Means of verification	During the verification the calculation of project GHG emissions has been checked. In detail the following has been verified: • Transparency: It has been checked whether the calculation of project emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • 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. • 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. • Completeness: It has been checked whether all calculations are complete and without omissions. The following sources of information have been used in this context: • /MR/ • /XLS/ • /AMS1D/ • /ACM2/	
Findings	☒	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.
	☐	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	☐	In this context the following CARs, CLs, FARs have been raised: -
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	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 already identified in registered PDD that Power Density > 10 W/m^2 then $PE_{HP,y}$ = 0 i.e. no emissions are applicable as per ACM0002, version 16, for the Sol Plaatje Dam. Thus, it was confirmed that no project emission occurred in the project activity.	

E.8.3. Calculation of leakage GHG emissions

Means of verification	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. The following sources of information have been used in this context: • /MR/ • /XLS/.	
-Findings	☒	No leakage emissions were to be considered (LE = 0).
	☐	The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see 8.1 and 8.2). 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. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.
	☐	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	☐	In this context the following CARs, CLs, FARs have been raised: -
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	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.
	No leakage has to be considered according to the registered PDD since the technology used in this project is hydropower and not a biomass project.	

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

Means of verification	The verification team has checked if the MR includes a summary table of the emission reductions calculation specifying separately - Total baseline emissions, - Total project emissions,

	- Total leakage, - Total emission reductions. $ER_y = BE_y – PE_y - LE_y$ $= 161{,}346\ tCO_2e – 0 – 0$ **$= 161{,}346\ tCO_2e$** ☒ The MR includes in section E.4 a summary table of the emission reductions calculation. ☒ The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately. ☒ 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. ☐ During the verification issues with impact on the ER calculation have been identified. Thus subject to the closure of above listed findings the summary table in E.4 needs to be revised.	
Findings	☒	Section E.4 of the MR includes in a summary table of the emission reductions calculation.
	☒	The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.
	☐	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.
	☒	During the verification issues with impact on the ER calculation have been identified.
	☒	In this context the following CARs, CLs, FARs have been raised: CAR 02; CAR 03
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	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 where required a revised emissions reduction calculation was prepared by the PP and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the emissions reduction calculation is overall correct. The summary table in the MR has been filled correctly and the values are in line with the related emissions reduction spreadsheet.	

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

Means of verification	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.	
Findings	☐	*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.
	☐	*Case 2:*The ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.
	☒	*Case 3:* The ex-ante estimated value was found to be proportionally lower than the ex-post determined value.
	☒	In this context the following CARs, CLs, FARs have been raised: CAR 02, (Assessment 2 point 2.v.ii)
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	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 MR includes a comparison of the calculated actual emission reductions with the ex-ante calculated values in the latest approved PDD. The ex-ante estimated value was found to be lower than ex-post determined value. PP has clarified the applicability of given power factor or the generator and power factor of the network. The reason for the higher ex-post generation was appropriately justified in the MR.

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

Means of verification	On the basis of the above comparison of actual values of the monitoring period with the estimations in the registered PDD (E.8.5) the verification team has checked whether (in case 3) an appropriate explanation is included in the MR.	
Findings	☐	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).
	☒	*For case 3:* The PP has provided a related justification in the MR. The reasons for the increase are as follows: - Increased water flows from the Lesotho Highlands Water Project during this monitoring period
	☒	In this context the following CARs, CLs, FARs have been raised:
		CAR 02, (Assessment 2 point 2.v.ii)
Conclusion	☐	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☒	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 justifications provided where found to be reasonable and the underlying facts have been verified by the team.	

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

Means of verification	The verification team has checked chapter E.7 of the MR and the emission reduction calculation sheet /XLS/.
Findings	☒ The MR in section E.7 includes a summary table of the ER breakdown *a) ER up to 2012-12-31 and* *b) ER from 2013-01-01 onwards* ☐ The breakdown of the ERs during the first commitment period and from 2013-01-01 onwards is as follows: ☐ The ER have completely been generated during the first commitment period ☒ The ERs have completely been generated from 2013-01-01 onwards, ☐ The ERs have partly been generated during the first commitment period and partly from 2013-01-01 onwards. ☒ The breakdown of the ERs is correct, considering the applicable guidance.
Conclusion	☒ No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.

Amount achieved during this monitoring period	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020[1)]	Amount from 1 January 2021
Emission reductions [tCO_{2e}]	-	**161,346**	**0**

1) Both days included

	☐	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 emission reductions generated for this monitoring period are from the 2nd commitment period from 01/01/2013 onwards. 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.	

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

Means of verification	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.
Findings	
Conclusion	

E.10. Global stakeholder consultation

Means of verification	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. The monitoring report has been published on 16/12/2020. The following sources of information have been used in this context: • /MR/ • /unfccc/.	
Findings	☒	No comments have been received within 14 days of the publication of the monitoring report for this monitoring period.
	☐	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.
	☐	Comments have been received. The DOE has - requested further information from the submitters of the comments - informed the project participants of the comments received, and requested their feedback within a specified timeframe, - considered the input received and has assessed whether such comments are relevant to the CDM project activity, - acknowledged receipt of all submitted comments on the MR of the proposed CDM project activity, - assessed whether the comments are related to the CDM rules and requirements (if so related findings have been raised as per below), - 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, - contacted the secretariat to make them publicly available (if only addressed to the DOE), - 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.
	☐	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:
		-
Conclusion	☒	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	☐	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 comments and how they have been treated by the DOE are listed below:	

	Nbr.	Original comment received	Feedback by the PP	Statement by DOE
	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

Bethlehem Hydro (Pty) Ltd has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 3th periodic verification (1st in 2nd CP) of the project: "Bethlehem Hydroelectric Project", with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to generation of renewable energy. This verification covers the period from 08/10/2016 to 31/12/2020 (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, i.e., AMS-I.D ver. 18,
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated and provisions of delayed calibration is applied as per requirements of 366 (a) and 367 (a), (b) of VVS-PA version 02.0,
- 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 follows:

Emission reductions: **161,346 tCO_{2e}.**

SECTION H. Certification statement

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

"Bethlehem Hydroelectric Project"

registered under

UNFCCC-No. : 2692

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

MP-No.: 3 (1st in 2nd CP)

from: 08/10/2016

to: 31/12/2020

(including both days) as follows:

Emission reductions: 161,346 tCO_{2e}.

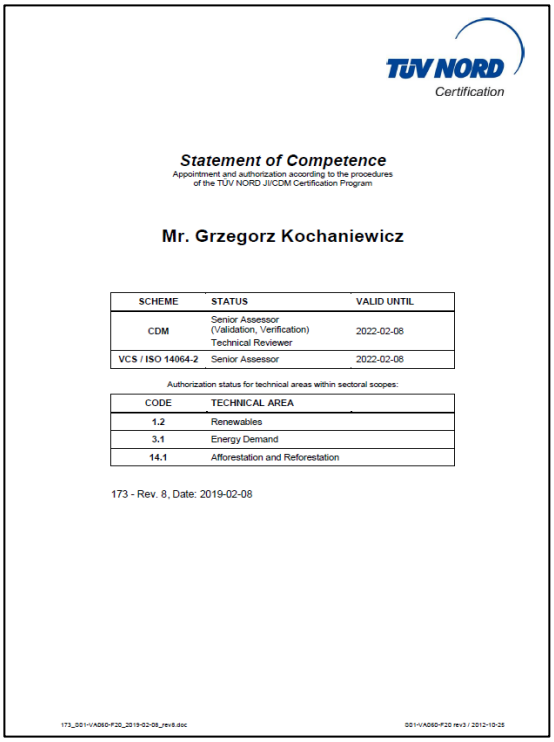
Freiburg, 13/09/2021

Dr Grzegorz Kochaniewicz
Team leader

Appendix 1. Abbreviations

Abbreviations	Full texts
ASB	Approved Standardized Baseline
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CO_2	Carbon dioxide
CO_{2eq}	Carbon dioxide equivalent
CL	Clarification Request
DVerR	DraftVerification Report
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IM	Interview Memo
MP	Monitoring Plan
MR	Monitoring Report
PA	Project Activity
PDD	Project Design Document
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
XLS	Emission Reduction Calculation Spread Sheet
IPCCC	Intergovermental Panel Convention for Climate Change

Appendix 2. Competence of team members and technical reviewers



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Grzegorz Kochaniewicz

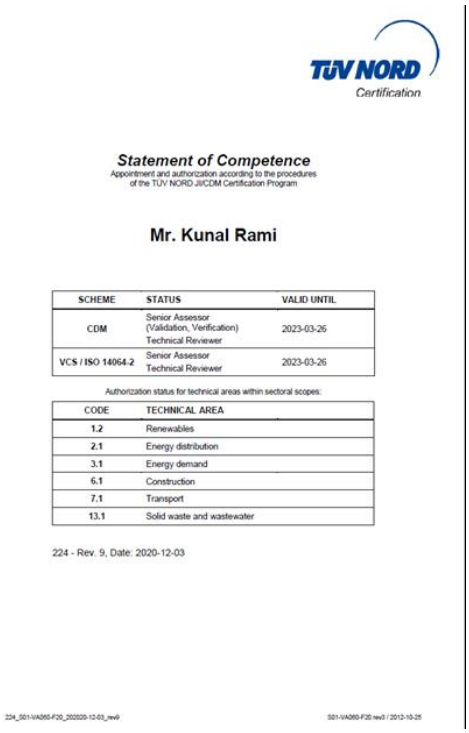
SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2022-02-08
VCS / ISO 14064-2	Senior Assessor	2022-02-08

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
3.1	Energy Demand
14.1	Afforestation and Reforestation

173 - Rev. 8, Date: 2019-02-08

173_S01-VA060-F20_2019-02-08_rev8.doc S01-VA060-F20 rev3 / 2012-10-25



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Kunal Rami

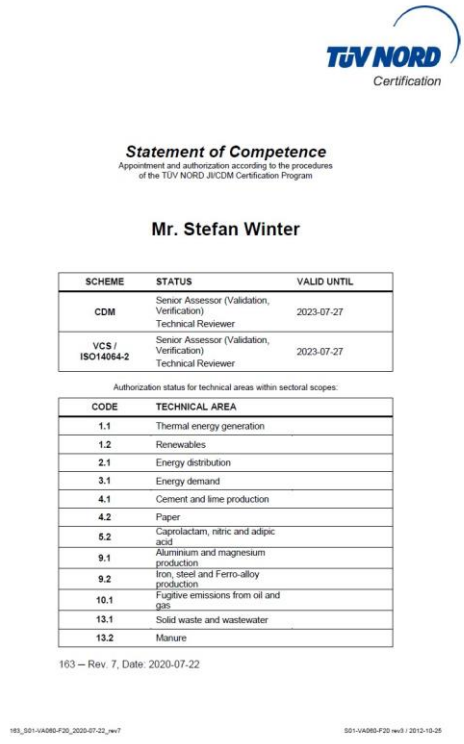
SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2023-03-26
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2023-03-26

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
2.1	Energy distribution
3.1	Energy demand
6.1	Construction
7.1	Transport
13.1	Solid waste and wastewater

224 - Rev. 9, Date: 2020-12-03

224_S01-VA060-F20_202020-12-03_rev9 S01-VA060-F20 rev3 / 2012-10-25



TÜV NORD Certification

Statement of Competence

Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

Mr. Stefan Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2023-07-27
VCS / ISO14064-2	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	Caprolactam, nitric and adipic acid
9.1	Aluminium and magnesium production
9.2	Iron, steel and Ferro-alloy production
10.1	Fugitive emissions from oil and gas
13.1	Solid waste and wastewater
13.2	Manure

163 – Rev. 7, Date: 2020-07-22

163_S01-VA060-F20_2020-07-22_rev7 S01-VA060-F20 rev3 / 2012-10-25

Appendix 3. Documents reviewed or referenced

No.	Author	Reference	Title	References to the document	Provider
1	UNFCCC	**/AMS1D/**	AMS-1.D, version 18.0: Grid connected renewable electricity generation	https://cdm.unfccc.int/methodologies/PAmethodologies/approved	Other
2	DOE	**/CPM/**	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)		Other
3	IPCC	**/IPCC/**	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	www.ipcc-nggip.iges.or.jp	Other
4	UNFCCC	**/KP/**	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Other
5	UNFCCC	**/MA/**	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/COPMOP/index.html	Other
6	UNFCCC	**/ACM2/**	ACM0002: Grid connected electricity generation from renevable sources, version 17.0	https://cdm.unfccc.int/methodologies/PAmethodologies/approved	Orher
7	UNFCCC	**/ASB1/**	ASB0001: Standardized baseline: Grid emission factor for the Southern Arican power pool version 1.	https://cdm.unfccc.int/methodologies/PAmethodologies/approved	Other
8	UNFCCC	**/TA/**	• "Methodological tool: Tool to determine the remaining lifetime of equipment" (Version 01) • "Methodological tool: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period" (Version 03.0.1)	https://cdm.unfccc.int/Reference/tools/index.html	Other
9	UNFCCC	**/GOT/**	Glossary "CDM terms" (version 10.0)	https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150226124447549-glos_CDM.pdf/glos_CDM.pdf?t=UmZ8bnFjODI3fDCW9A3vJwR03kQQh4sbLiYu	Other
10	UNFCCC	**/MRT/**	Monitoring Report Form (CDM-MR-FORM), Version 08.0	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
11	UNFCCC	**/PDD/**	Project Design Document for CDM project:"Bethlehem Hydroelectric Project" version 12, dated 05/08/2016		Other
12	UNFCCC	**/PS/**	CDM project standard for project activities (Version 2.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other

13	UNFCCC	**/VVS/**	CDM validation and verification standard for project activities (Version 2.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
14	PP	**/MR/**	• Monitoring Report for CDM project: "Bethlehem Hydroelectric Project" version 1, dated 15/12/2020 • Monitoring Report for CDM project:"Bethlehem Hydroelectric Project" version 2, dated 21/03/2021 • Monitoring Report for CDM project:"Bethlehem Hydroelectric Project" version 3, dated 20/04/2021 • Monitoring Report for CDM project:"Bethlehem Hydroelectric Project" version 4, dated 27/05/2021 • Monitoring Report for CDM project:"Bethlehem Hydroelectric Project" version 5, dated 05/07/2021 • Monitoring Report for CDM project:"Bethlehem Hydroelectric Project" version 6, dated 30/08/2021		Other
15	PP	**/VAL/**	Validation Report for CDM project "Bethlehem Hydroelectric Project"version 2, dated 30/08/2016	http://cdm.unfccc.int/Projects/DB/SGS-UKL1245061289.99/view?cp=1	Other
16	PP	**/VER/**	Documents of previous verifications (Monitoring report, verification report, ER calculation sheet)	http://cdm.unfccc.int/Projects/DB/SGS-UKL1245061289.99/view?cp=1	Other
17	UNFCCC	**/PRC/**	Assessment of Post Registration changes approved on date 26/11/2016 Validation report form for post-registration changes for CDM project activities, dated 24/07/2017	http://cdm.unfccc.int/Projects/DB/SGS-UKL1245061289.99/view	Other
18	PP	**/XLS/**	Bethlehem Hydro ER Calculations, version 01 Bethlehem Hydro ER Calculations, version 02 Bethlehem Hydro ER Calculations, version 03 Bethlehem Hydro ER Calculations, Version 4 Bethlehem Hydro ER Calculations, Version 5	-	Other

19	PP	**/BHM/**	Bethlehem Hydro muncipilaty billing details (invoice)	-	Other
20	PP	**/PPAS/**	Electricity supply agreement (PPA)	-	Other
21	PP	**/CAL/**	Merino, meter calibration, dated 2015/07/10 Merino, meter calibration, dated 2018/02/05 Sol Plaatje, meter calibration dated 2016/03/29 Sol Plaatje, meter calibration dated 2018/10/22	-	Other
22	PP	**/PPR/**	Summary of shutdown – Merino 2016-2020 Summary of shutdown – Sol Plaatje 2016-2020	-	Other
23	PP	**/ELOG/**	Electricity export and import report (Logsheet)	-	PP
24	PP	**/BHM/**	Electricity invoices (export)		PP
25	Eskom	**/IMP/**	Electricity invoices (import)		PP
26	Eskom	**/EXP/**	Confirmation of electricty export in March, April, May 2020		PP
27	Intrinsic Energy	**/IE/**	Meter installation and connection to LiveView platform at Sol-Plaatje Plant, 09/02/2021 Meter installation and commisioning at Sol-Plaatje Plant, 10/05/2021	-	Others
28	Ergon	**/ergon/**	Understanding Power Factor	https://www.ergon.com.au/network/manage-your-energy/business-resources/understanding-power-factor	Others
29	TD Power Systems Pvt.	**/MCC/**	Power Capacity Diagramme of AC Genertator-4000kVA (Merino Capacity Curve)	-	PP

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

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

FAR ID	xx	**Section no.**	E.2	**Date:**DD/MM/YYYY
Description of FAR				
-				

Project participant response (1st round)			Date:DD/MM/YYYY
Documentation provided by project participant(1st round)			
☐	Changes in the PDD	Section(s):	New version No.:
☐	Changes in MR	Section(s):	New version No.:
☐	Changes in XLS	Worksheet(s):	New version No.:
☐	Other:		
DOE assessment (1st round)			**Date:** DD/MM/YYYY
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☐ The finding is closed		

Table 2. CL from this verification

CL ID	01	Section no.	Cover Page/A.4/D.1	15/02/2021
Description of CL				
PP applied 2 Standardized Baselines during the crediting period. Please clarify how the application of 2 ASBs in verification of 1 monitoring period is in line the § 263 of the PS.				
Project participant response (1st round)				**Date:** 21/03/2021
The Monitoring Report and ex post calculations have been corrected to align with paragraph 263 of the CDM Project Standard for Project Activities (Version 02.0). In accordance with paragraph 263, the project participant shall apply, in the first monitoring report for the second crediting period, the version of the applied standardised baseline that contains the more conservative standardised value(s) of the parameter(s) between those latest version applicable on the submission date of the request for renewal of the crediting period, and those in the latest version applicable on the first day of the first monitoring period in the new crediting period. The revised monitoring report and ex ante calculations therefore reflect the application of the ASB0001 Standardized baseline throughout the project activity's second crediting period. This is aligned with the registered PDD for the project activity's second crediting period. Accordingly, the project activity's second crediting period commenced on 8 October 2016, which is within the validity period of the ASB0001 Standardized baseline: from 31 May 2013 to 30 May 2017. ASB0001 was therefore the latest version of the Standard Baseline on the submission date of the request for renewal of the crediting period ((8 September 2016). The ASB0001 Standardized baseline represents the more conservative value of the Standardized Baseline applicable on the first day of the this first monitoring period in the new crediting period.				
Documentation provided by project participant (1st round)				
☐	Changes in the PDD		Section(s):	New version No.:
☒	Changes in MR		Section(s):A.4.; C; D; E	New version No.: 2
☒	Changes in XLS		Worksheet(s): Inputs incl. delayed calibration	New version No.: 2
☐	Other:			
DOE assessment (1st round)				**Date:** 28/03/2021
The applicability of the version of applied Standardized Baseline was clarified and corrected as per requirements of the *263 of the CDM Project Standard for Project Activities (Version 02.0. The applicable version is ASB0001.*				
Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed			

CL ID	02	Section no.	B.1.	15/02/2021
Description of CL				
1. It is not clear if the reported shut downs were single or multiple summarized events. More details on time of shut downs are requested. 2. Moreover, on several occasions only residual generation was reported in the excel RawData. It shall be clarified what was the reason for that and if the HPPs were operating during the time. The events are missing in the shutdown table. 3. The event with missing PPA was not reported. 4. The reported efficiency/availability of the power plant is at odd with reported justification for high generation. Refer also to section E.6.				
Project participant response (1st round)				**Date:** 21/03/2021

1. The shutdowns reported in section B.1 of the Monitoring Report summarise significant shutdown events of the Sol Plaatje and Merino plants during the monitoring period. Most of the listed shutdown events reflect single shutdown events, summarised per month. A shutdown is considered to be significant where the plant is down for two or more hours during a 24-hour cycle. Accordingly, the durations listed in the tables in section B.1 are the sum of the significant shutdown hours that occurred during the month. The summary of the shutdown events and hours, per month, are also summarised in the Excel Emission Reduction Calculation spreadsheet, in tabs titled Sol Plaatje Shut Down Times and Merino Shut Down Times.
2. At Sol Plaatjie there was a major shut down period missing. The shutdown has now been captured at accounted for. For Merino, Eskom's data are used for the generation.
3. Section B.1 of the monitoring report has been revised to reflect the period in which there was no PPA related to power generated at the Sol Plaatjie plant. The plant did not shut down for the period and was generating electricty during this period which was fed into the electricity grid without remuneration from a receiving entity.
4. The PDD reports the maximum plant efficiency rather than the maximum plant availability. The plant efficiency refers to the maximum power that can be generated given the properties of the turbine and generator set [Sol Plaatjie: 85.17%; Merino: 86.37%]. The efficiency of the plant did not increase. above the maximum reported value. The plant availability relates to the amount of time and hence the volume of water that has flowed through the turbine for a given period (i.e. the number of hours the water flows in a year/total number of hours in a year). A higher availability was achieved in the monitoring period due to water being available more of the time. This could be related to more rain or runoff during the monitoring period.

Documentation provided by project participant (1st round)			
☐	Changes in the PDD	Section(s):	New version No.:
☒	Changes in MR	Section(s):B.1.	New version No.: 2
☐	Changes in XLS	Worksheet(s):	New version No.:

Other:

1. See subfolder titled 'Shutdown records'
2. ☒ n/a
3. See subfolder "Sol Plaatje PPA" containing the notice of termination and new PPA.
4. n/a

DOE assessment (1st round) **Date: :** 28/03/2021

1. It was clarified that the reported shut downs were single or multiple monthly summarized events. Additional details on time of shut downs were provided by PP crosschecked by DOE with data on power generation and found consistent.
2. The list of shut downs was updated. Nevertheless, in October 2018, mayor events of total 126.3 hours were reported for Sol Plaatje plant, the meter recorded "drop" in cumulative value resulting in -763877 KWh **negative** generation. Clarification on the event is requested.
3. Proof of termination and the date of start of new PPA was provided. There was no valid PPA from 28/11/2019 up to 01/06/2020. The event was reported in section B.1.
4. The power plants archived higher ER than estimated ex-ante. This is explained by higher availability than expected. The ex-ante calculation in the PDD was based on availability of 75% whereas, in 2017 availability of 97% and in 2018 99% calculated for 365 days/year was archived. Please clarify if this is realistic taking in to consideration hours of shut downs.

Project participant response (2nd round)

1. Noted

2. This was an error in the data collation from the meter. The data set has been corrected in ER calculations and subsequently in the Monitoring Report.

3. Noted

4. The availability calculated for 2017 and 2018 are 95% and 96% respectively for Sol Plaatje. Summing the shutdown hours for the years and expressing them as a percentage of the total hours in the year yields 5% and 4% for 2017 and 2018. The sum of the generation hours and the shutdown hours for 2017 and 2018 account for the whole year. Therefore, the actual uptime and actual downtime add up to 100%. This is reasonable as it accounts for the shutdowns at the plant. Section E.6. of the MR has been revised to reflect this calculation.

Documentation provided by project participant (1st round)			**Date:** 20/04/2021
☐	Changes in the PDD	Section(s):	New version No.:
☒	Changes in MR	Section(s): multiple	New version No.: 3
☒	Changes in XLS	Worksheet(s): multiple	New version No.: 3
☐	Other:		

DOE assessment (2nd round) **Date:** 26/04/2021

1. s.o. 2. The summarised values of corrected meter readings were provided, compared with invoices and found correct. 3. s.o. 4. The calculation of availability for Sol Plaatje was provided. Accounting for shut downs the Sol Plaatje power plant generated in 2017 and 2018 at full capacity. The archived ER is above the estimated in PDD due to high availability of plant and constantly high water flow.

Conclusion *ick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CL ID	03	**Section no.**	B.2.	15/02/2021

Description of CL

1. Pls clarify if the corrections were implemented at renewal of crediting period or after and if the PDD registered at renewal of crediting period was revised post renewal date (26/11/2016) to implement the corrections. For further instructions pls refer to Instructions for completing the MR form.
2. Pls clarify the date and the ref # of the PRC.

Project participant response (1st round) — **Date:** 21/03/2021

1. Section B.2. of the monitoring report has been revised to reflect the historic post registration changes via the prior approval track and also the changes that were implemented at the of renewal of crediting period. The changes made at the renewal of crediting period are the last post registration changes made to the PDD.
2. The date and the ref # of the PRCs have been revised accordingly in the monitoring report.

Documentation provided by project participant (1st round)

☐	Changes in the PDD	Section(s):	New version No.:
☒	Changes in MR	Section(s): B	New version No.: 2
☐	Changes in XLS	Worksheet(s):	New version No.:
☐	Other:		

DOE assessment (1st round) — **Date:** 30/03/2021

1. As per Instructions for completing of the MR form PP is requested to "list all the corrections **since** the registration of the project activity **or** renewal of crediting period…**".** PP is not required to list corrections to the PDD implemented before the registration/renewal of crediting period.
2. The date and the ref# of the PRC were provided.
3. Moreover, PP applied for temporary deviation from the monitoring plan to use REH invoices as source of monitoring of the net electricity generation from October 2016 to July 2017 at Merino site. As per registered monitoring plan the source of the net electricity generation shall be Eskom meters, but only values for electricity imported from the Eskom meters for the period are available. PP is requested to clarify why not PP own meters instead of invoices are used for the period.

Project participant response (2nd round)

1. The PRCs that were listed in section B.2.2. have been removed, as the PRCs that were listed were applicable **prior** to the renewal of the crediting period, and the Specific Instructions only require corrections to be listed **since** the renewal of the crediting period to be listed. No corrections are applicable since the renewal of the crediting period.
2. Noted.
3. The Eskom-metered data sets for the Merino Power Plant have been obtained for the full monitoring period and the use of the REH invoices is no longer necessary. The requirements of the monitoring plan have therefore been met. The temporary deviation is no longer applicable and has been removed.

Documentation provided by project participant (2nd round) — **Date:** 20/04/2021

☐	Changes in the PDD	Section(s):	New version No.:
☒	Changes in MR	Section(s): B2.1.; B2.2.; D.2.	New version No.: 3
☒	Changes in XLS	Worksheet(s): MerinoEskomData	New version No.: 3
☒	Other:	*See data in subfolder titled 'Eskom meter electricity data'*	

DOE assessment (2nd round) — **Date:** 26/04/2021

1. The list of post registration changes were removed. PP is not required to list corrections to the PDD implemented before the registration/renewal of crediting period. 2. Not applicable, See point 1 above. 3. Data from Eskom meters were provided, crosschecked with invoices and found correct. The temporary deviation was removed from the monitoring report.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Table 3. CAR from this verification

CAR ID	01	**Section no.**	Section C	**Date:** 15/02/2021

Description of CAR

Repetition of the meter information in section C and in D.2 shall be avoided.

Sol Plaatje HPP old meters:

1. Incorrect validity,
2. Moreover, as reported during onsite visit the meters were also calibrated in 2019. Respective certificate was not provided.

Sol Plaatje HPP new meters:

1. Incorrect accuracy,
2. Incorrect serial numbers
3. The provided calibration is not as per SANAS
4. The validity of calibration is incorrect.

Merino HPP old meters:

1. The calibration in 2019 was not listed.

Merino HPP new meters:

1. Incorrect accuracy,
2. The provided calibration is not as per SANAS
3. The validity of calibration is incorrect.

Project participant response (1st round)

Section C has been revised in order to limit duplication of information in section D.2.

Sol Plaatje HPP old meters:

1. The validity has been corrected.
2. Having reconfirmed, the last calibration on the old Iskra meters used at Sol Plaatje was 2016/03/29. No calibration occurred in 2019. Delayed calibration procedures have been applied accordingly in the ER Calculation sheet and the figures have been updated in the Monitoring Report.

Sol Plaatje HPP new meters:

1. The accuracy of the meters has been corrected to Class 0.5s,
2. The serial numbers have been double-checked and found to be correct in the monitoring report. (Main meter: 43474372, and Check meter: 43474374). The serial numbers can be found in the middle right area of the meter, as well as in the top right part of the meter, just below the accuracy classes.
3. The Monitoring Report has been amended and the SANAS calibration of 22/10/2018 has been provided.
4. The validity of the calibrations have been corrected to reflect and end validity date of 21/10/2021.

The Monitoring Report has been updated to reflect the use of the Eskom Elster meters as the main source of data, as provided for in the latest PDD (Version 12). The Eskom invoices for generation and consumption have been provided. The references to accuracies and calibration validities have all been amended.

Documentation provided by project participant (1st round)		**Date:** 21/03/2021
☐ Changes in the PDD	Section(s):	New version No.:
☒ Changes in MR	Section(s): C and D.2.	New version No.: 2

☒	Changes in XLS	Worksheet(s):Inputs incl.delayed calibration; SolPlaatjeRawData (see columns F and P)	New version No.: 2
☒	Other: - '2021-03-11 Timeline of calibrations' in 'Calibration certificates' subfolder - See files in the subfolder titled 'Sol Plaatje calibration certificates'. - See the Merino subfolders in the 'Electricity Invoices' subfolder.		

DOE assessment (1st round) **Date:** 28/03/2021

Meter information in section C was removed. Instead, only short information on meter replacement was provided.

Sol Plaatje HPP old meters:

1. Validity of calibration was corrected.
2. The meters were not calibrated in 2019 but in 2021. The recalibration did not result in meter error above the define meter accuracy. Respective procedure for delayed calibration were applied.
3. Additionally, pls clarify the application of delayed calibration up to 17/10/2019 taking in to consideration that the new meters were installed on 17/10/2019 but commissioned only on 20/03/2020.

Sol Plaatje HPP new meters:

1. The accuracy of the meters has been corrected.
2. The provided serial number of the meters refer to Eskom meters and not to PP own meters. The serial numbers of PP meters are: Main meter # 43474373 and Check meter # 43474371 (photographic evidences from onsite visit are available of request). The serial numbers of the meters are still incorrect.
3. The date of calibration was corrected.
4. The validity of calibration was corrected.

Assessment of Merino meters was not provided.

Merino HPP old meters:

1. The calibration in 2019 was not listed.

Merino HPP new meters:

1. Incorrect accuracy,
2. The provided calibration is not as per SANAS
3. The validity of calibration is incorrect.

Project participant response (2nd round)

Sol Plaatje HPP Old meters:

1. Noted.
2. Noted.
3. The delayed calibration has been revised to 2019/12/02. This coincides with the date that the new L&G meters begin recording data. The date of 2020/03/20 relates to the date on which the contract with the third-party service provider (named LiveView) for data management began.

Sol Plaatjie HPP new meters

1. Noted
2. The serial numbers have been corrected.

Merino HPP old meters:

1. All calibration certificates for the Eskom Elster meters used at Merino have been provided.

Merino HPP new meters:

1. The accuracy class of the Eskom Elster meters have been amended to Class 0.5s. This aligns with the spec sheet and is confirmed by the confirmation of installation provided.
2. The calibration certificates for the Eskom Meters have been supplied and the records of calibration have been updated in the monitoring report (section D.2).
3. The validity of the Eskom Elster meters are the main sources of data used in the emission reduction calculations. No delayed calibration procedures were required on these meters, as their periods of calibration were valid during the monitoring period.

Documentation provided by project participant (2ndround)		**Date:** 20/04/2021
☐ Changes in the PDD	Section(s):	New version No.:
☒ Changes in MR	Section(s): multiple; D.2.	New version No.: 3
☐ Changes in XLS	Worksheet(s): multiple	New version No.:

☒ Other:	*Merino - Eskom Meter Installation 18-02* *Merino calibration certificates\Eskom Elster meters*

DOE assessment (2nd round)	**Date:** 21/04/2021

Sol Plaatje HPP old meters:

1. S.o.
2. S.o.
3. Delayed calibration up to 02/12/2019 was applied. On that day the new meters started recording. Moreover the recorded generation from December 2019, January 2020 und February 2020 were not used in the ER calculation.

Sol Plaatje HPP new meters:

1. The accuracy of the meters has been corrected.
2. The serial number of the meters were corrected. Main meter # 43474373 and Check meter # 43474371.
3. The date of calibration was corrected.
4. The validity of calibration was corrected.

Merino HPP old meters:

1. Calibrations were provided. No delayed calibration was detected.

Merino HPP new meters:

1. Accuracy class of the meters was revised as evidenced.
2. The SANAS calibration was provided and evidenced.
3. The validity of calibration was corrected.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	02	**Section no.**	Excel	**Date:** 15/02/2021

Description of CAR

1. It was reported during onsite visit that since the installation of new meters only net electricity generation is recorded. Clarify if the data on export and import of electricity are available and how the consumption of the electricity from the grid is recorded in the time when no net or export of electricity is reported.
2. Moreover during onsite visit the installation of new meters at Sol Plaatje on 5/12/2019 was reported. Pls clarify the reporting of net generation only from the 03/2020.
3. From November 2019 until end of May 2020 no PPA for sales of power from Sol Plaatje site existed. Also, for the period of October 2019 until May 2020 no sales invoices for electricity produced by Sol Plaatje site were provided. Clarification on the dispatch of the produced electricity in this period is requested.
4. Significant differences between measured electricity imported and invoiced to the power plants were found. Clarification on the conservativeness of the data is requested.
5. From Merino HPP from November 2019 up to 20 of January 2020 only cumulative generation was reported in table RawData (and later export and import separately). Pls clarify the missing data on imported electricity and why by use of the same meters (column D) the different aggregated data is reported.

Project participant response (1st round)

1. At the Sol Plaatje site, net generation and consumption is recorded by the meters situated at the Panorama substation. The quantity of net electricity supplied by the project is calculated by the difference between:
   (a) The quantity of electricity supplied by the Sol Plaatjie plant to the grid; and
   (b) The quantity of the electricity delivered to the Sol Plaatjie plant from the grid.
   At the Merino plant, the Eskom Meters measure the generation and consumption for the plant. The net consumption is aggregated on monthly invoices received from the national utility (Eskom). The quantity of net electricity supplied by the project is calculated by the difference between:
   (a) The quantity of electricity supplied by the Merino plant to the grid; and
   (b) The quantity of the electricity delivered to the Merino plant from the grid.
   Both the Sol Plaatje as well as the Merino Plants only consume electricity during periods where the plant is shut down and no generation is taking place. During periods where the plant is operational, no grid-electricity is consumed by the plants because the renewable energy generated is used to power the hydro plants. No consumption of grid- electricity is therefor recorded on the respective electricity meters when the plants are generating electricity.
2. The new Landis+Gyr meters were not installed on 5 December 2019, but rather on 17 October 2019, as evidenced by the Proof of Installation provided by Intrinsic Energy. Although the new meter was installed in 17 October 2019, there was no electricity generation during 1 October 2019 - 5 December 2019, when the upstream water supplier, Lesotho Drylands Water Project, had a planned water shutdown. The new Landis+Gyr meters only started recording data on 5 December 2019 when water supply provided for electricity generation to commence again. The re-starting of generation can be seen in in column K of the 'SolPlaatjeRawData' tab of the ER calculation spreadsheet.
3. An explanation of the period during which no PPA was in place for Sol Plaatje has been added to section B.1. Although no Power Purchase Agreement was in place for the period from 28 November 2019 to 1 June 2019, the plant was still in operation and generating electricity, which was fed into the electricity grid without remuneration. However, as no offtaker existed for the electricity, no power generation invoices were generated during this period, although electricity was still being generated. This explains the discrepancy between the metered electricity generation for this period and the fact that there were no electricity generation invoices for such electricity. The notice of termination and the new PPA has been provided in support of this statement.
4. The Monitoring Report has been revised to reflect the use of the Eskom electricity meters to measure all generation and consumption at the plant, as provided for in the registered PDD. All calibration certificates and proof of installations have been provided in support of using the Eskom Meters. The use of the Eskom metered data is the most conservative approach.
5. The Eskom meters have been used as the primary data sources. As such, there is no longer in discrepancies in the data.

Documentation provided by project participant (1st round)		**Date:** 21/03/2021
☐ Changes in the PDD	Section(s):	New version No.:
☒ Changes in MR	Section(s):B.1.; C; D.2.	New version No.: 2
☐ Changes in XLS	Worksheet(s):	New version No.:

Other:

1. n/a
2. Proof of Installation provided by Intrinsic Energy, (Calibration certificates\Sol Plaatje calibration certificates\New meters). Also see proof of water shutdown provided – Projected Water Delivery and Electricity Generation 2019). In folder "Water outage"
3. "PPA Notice of Termination" and "Reinstatement and First Amendment Agreement between Power X and Bethlehem Hydro" (Sol Plaatjie PPA) in folder "Sol Plaatjie PPA";
4. ☒ See the supporting docs for Merino (Calibration certificates\Merino calibration certificates\Eskom Elster meters):
   - Spec Sheet for Elster A1700 meters confirming accuracy class of 0.5s
   - Old meters:
     - Verification Report for metering installations
   - New meters:
     - Proof of installation: Maintenance Report for HV and MV Metering Installations
     - Photos of new meters
     - Calibration: Meter data accuracy verification tests

DOE assessment (1st round)	**Date:** 30/03/2021

1. Sol Plaatje; Only net electricity generation are reported from the new L&G meter. Clarify if also separate export and import data are recorded by the new meters.
2. Sol Plaatje; As per statement provided by Intrinsic Energy, the new L+G meters were installed on 17/10/2019 but commissioned only on 20/03/2020. Meter readings from Iskra (old meter) was provided until 01/12/2019 and from L+G from 02/12/2019. Moreover generation was recorded on Iskra until 07/10/2019 and consumption until 01/12/2019. Metering on L+G, started before commissioning, which was on 20/03/2020 and values were provided from 02/12/2019, but first consumption values were recorded on 03/12/2019 and generation on 05/12/2019.
   i. The application of delayed calibration until 17/10/2019, when the new meter was installed, but not commissioned and the records were still from Iskra is incorrect.
   ii. Moreover, accounting for the electricity generation recorded by the new meter before commissioning seems incorrect.
   iii. PP is to clarify the missing record from 01/10/2019 to 07/10/2019,
   iv. PP is to clarify the record of electricity generation and consumption on 07/10/2019, recorded value of exported electricity of 29218 kW and
   v. PP is also to clarify the record of electricity generation on 08/11/2019 when the plant was not generating due to planned maintenance and no water flow.
   vi. Proof of termination and the date of start of new PPA was provided. There was no valid PPA from 28/11/2019 up to 01/06/2020. Please provide clarification on what basis the power plant exported electricity to displace emissions from electricity mix in the grid. Substantiate the export of electricity by evidences.
3. Merino; Data on net electricity generation from Eskom meter were used. This is in line with registered monitoring plan.
4. Merino; In line with registered monitoring plan the parameter “Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)” shall be monitored by Eskom electricity meters. Nevertheless, as the source of the value shall be meter, clarification is requested why PP applied for temporary deviation to use values from REH invoices and not from meters (refer also to CL 03 above)?

Project participant response (2nd round)

1. The new L&G meters record separate export and import data. The data management system used exports the net electricity generation recorded.

2. Dates of meter readings at Sol Plaatje during the monitoring period:

- "Sol Plaatje; The new L+G meters were installed on 17/10/2019 but commissioned only on 20/03/2020": The new L+G meters were installed on 17/10/2019 but did not start recording data (consumption only) until 2 December 2019. The LiveView platform was commissioned on 20/03/2020. However, LiveView is the platform that provides data management services to the project participant. LiveView is owned and operated by a third-party. Hence, the commissioning date of the platform is not relevant to these calculations as the electricity data sets from the L+G meter was still accessible to the project participant irrespective of the date of commissioning of the LiveView platform.
- "Meter readings from Iskra (old meter) was provided until 01/12/2019 and from L+G from 02/12/2019": correct. The Iskra meter readings were used up to 1 December 2019 because the L+G meters only started recording consumption data from 2 December 2019.
- "Moreover generation was recorded on Iskra until 07/10/2019 and consumption until 01/12/2019": correct. There was no generation during October 2019 – early December 2019 due to a planned shut down.
- "Metering on L+G, started before commissioning, which was on 20/03/2020 and values were provided from 02/12/2019, but first consumption values were recorded on 03/12/2019 and generation on 05/12/2019":
    - As per explanation above, the new L+G meters start recording data (consumption only) from 2 December 2019, which was not contingent on the commissioning of the third-party data management system on 20/03/2020, known as LiveView.
    - The L+G meter started to record consumption data from 2 December 2019. However the first date of generation data from the L+G meters, used in the emission reduction calculations, arises on 1 February 2020. This is because no emission reductions are accounted for during the period where there was no PPA, and hence no generation invoices, and where there was no record from Eskom of Sol Plaatje generation that was fed into the national grid. The records from Eskom relating to Sol Plaatje generation, sourced from Eskom's onsite meters, show that generation occurred and was fed into the grid for the period 1 February 2020 – 31 May 2020. Hence, the L+G generation data is accounted from 1 February 2020. Project emissions during the full period were accounted for.

Responses to points above:

i. The delayed calibration date has been revised to 02/12/2019 to align with the end of data recording on the Iskra meter.Before the L&G meter was connected to the LiveView platform the readings for import and export were provided separately in kW. As such the readings at the 30min level were divided by 2 and the net electricity calculated as Generation-Consumption.

i. The data was not extracted during this period however minimal generation occurred during this period.

ii. This occurs due to the data having not been extracted for the prior period. The generation has been made zero for this entry. The water was shut in this period and as such limited generation would have occurred. The consumption during this period is still accounted for by the meter as the cumulative reading still changed.

iii. Sol Plaatje is situated on a dam which is also used for water supply to town. On the 08/11/2019 some commissioning tests were conducted and used some of the residual water in the dam to do so. This resulted in the meter recording generation for that period.

iv. The data provided by Eskom includes both net generation for Sol Plaatje as well as Merino respectively. Emission Reductions were calculated for Sol Plaatje for the period 1 February 2020 to 31 May 2020 as evidence of the generation was supported by the Eskom data during this period.

3. Noted

4. The metered data from Eskom was received and is now used in the calculations for Merino, and therefor there is no further need for a temporary deviation.

Documentation provided by project participant (1st round)		**Date:** 20/04/2021
☐ Changes in the PDD	Section(s):	New version No.:
☐ Changes in MR	Section(s): multiple	New version No.: 3
☐ Changes in XLS	Worksheet(s): multiple	New version No.: 3
☒ Other:	*See files in subfolder titled 'Eskom meter electricity data'*	
DOE assessment (2nd round)		**Date:** 21/04/2021

1. Sol Plaatje; Only net electricity generation are reported from the new L&G meter. Nevertheless the meter can also report separate export and import. The reported net electricity generation is consistent with issued invoices.
2. Sol Plaatje; The new L+G meters were installed on 17/10/2019 but commissioned only on 20/03/2020. Meter readings from Iskra (old meter) was provided until 01/12/2019 and from L+G from 02/12/2019. Moreover generation was recorded on Iskra until 07/10/2019 and consumption until 01/12/2019. Metering on L+G, started before commissioning, which was on 20/03/2020 and values were provided from 02/12/2019, but first consumption values were recorded on 03/12/2019 and generation on 05/12/2019.
   i. The application of delayed calibration until 17/10/2019 was incorrect and was extended up to the 02/12/2019, the day when the data recording was change to new meter.
   ii. The explanation is not consistent with the provided data. As per explanation above the LiveView started monitoring and reported only net generation on 20/03/2020, but the reporting of only net electricity generation started already on 01/03/2020. Moreover, the generation of electricity from February 2020 was accounted in ER calculation. Please provide evidences for the date of connection to LiveView monitoring platform and clarify what this has to do with Intrinsic Energy confirmation on meter installation and commissioning.
   iii. No data was extracted during the period 01/10/2019 to 07/10/2019. The power plant was not operational. Moreover no ER was claimed for period (from October 2019 up to end of January 2020).
   iv. No generation from October 2019 up to end of January 2020 was used in the ER calculation. At the same time the electricity consumption was recorded. Provide the invoices for the electricity imported and clarify how the quantity of electricity imported was accounted for in the project emissions.
   v. Even if any generation occurred no ER was claimed for November 2019.
   vi. Clarification on what basis the power plant exported electricity to displace emissions from electricity mix in the grid was provided. From March 2020 up to May 2020 Electricity exported was confirmed by Eskom Wholesale Manager. MWh of electricity exported to the grid. In the email communication the export from Merino power plant was named.
   vii. It is not clear how Merino plant with turbine capacity of 3.6 MW and generator capacity of 3.4 MW could generate 2,6 GWh in March, April or May 2019.
   viii. Moreover it is not clear how any project emissions were accounted for during the months.
3. S.o.

1. Merino; In line with registered monitoring plan the parameter “Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)” was monitored by Eskom electricity meters. Export data from Eskom meter was provided. The temporary deviation was removed from the MR.
   Nevertheless please provide also values for import of electricity and clarify how the import of electricity was accounted for in the calculation of project emissions. Substantiate the values by invoices.

Project participant response (3rd round)

2.ii:

Commissioning date of the new L+G meters at Sol Plaatje has been clarified by the party responsible for the installation, Intrinsic Energy (see letter dated 10 May 2021). The meter installation date and commission date are the same: 17 October 2019.

Generation data for February 2019 was erroneously included in the ER calculations as values for February 2020. These values have been removed and there are no generation values for February 2020 in the ER calculations.

2.iv.:

No emission reductions are accounted for at Sol Plaatje from October 2019 up to end of February 2020. Project emission were however accounted for during this period. Sources of data on project emissions during this period:

- Electricity consumption was recorded by the Iskra meter from 1 October 2019 – 1 December 2019.
- Electricity consumption was recorded by the L+G meter from 2 December 2019 – 29 February 2020.

2.v.ii:

The Merino generator has an output capacity of 4 MVA. Hence the recorded values of 2.6 GWh are reasonable, especially during the colder months of production. The flow of the Ash River is often increased upstream, due to additional downstream electricity requirements. The values recorded by the Eskom-meter for generation at Merino for March, April and May 2019 have also been cross checked with the values recorded by the project participant's meters. These values are very similar i.e. less than 1% difference in values.

2.v.iii:

The consumption of electricity at Merino is accounted for using Eskom's metered kWh values, provided. The emission reduction calculations have been revised to account for these project emissions, as reflected in the Merino net generation (generation less consumption) values.

Documentation provided by project participant (3rd round)			**Date:** 27/05/2021
☐	Changes in the PDD	Section(s):	New version No.:
☒	Changes in MR	Section(s): multiple	New version No.: 4
☒	Changes in XLS	Worksheet(s): multiple	New version No.: 4
☐	Other: - 2021_05_10_REH_SolPlaatje_Metering_Intrinsic Energy - 2021-03-02 LiveView data explanation_email - See docs in folder: Eskom SP meter data_March - May 2020 - Sol Plaatje Raw Data spreadsheet - Merino Generator_2010		

DOE assessment (3rd round) **Date:** 08/06/2021

2.ii; As per second statement provided by meter installing entity Intrinsic Energy dated 10 of May 2021 the meters were installed and commissioned on installation on 17 of October 2019. As per provided explanation on the 20 of March 2020 the meters were connected to live view platform for online based monitoring of generation and consumption.

The meters were installed during shut down, started reporting electricity consumption from 2nd of December 2019 and generation from March 2020. Nevertheless, PP also reported under the point 2iv above that until 1st of December 2019 the old meters were still operating. The discrepancies in the statements related to commissioning of the new meters shall be clarified.

2.iv; Clarify how the import of electricity was recorded on Iskra meter in the period when the new LG meters were already installed and commissioned on 17/10/2019?

Moreover, the statement: "*No emission reductions are accounted for at Sol Plaatje from October 2019 up to end of February 2020"* is incorrect. For details pls refer to ER calculation table Sol Plaatje data, cell 45.

2.vii; The provided explanation is insufficient. The Meringo power plant has output capacity of 4 MVA which is not the same as 4 MW. To calculate the capacity of in MW the power factor provided by the manufacturer and visible on the technical data on the generator shall be multiped with the capacity in MVA (refer also to PRC at renewal of crediting period). The capacity of the generator is 3.4 MW which multiplied with 24 h/day and 31 days in March 2019 result in maximum generation of 2,529 MWh, in April 2019 2,44MWh etc. This all is under neglecting declared overall efficiency of the turbine of 0,8637%). Pls clarify.

Project participant response (4th round)

2.iv

Prior to 2 December 2019, Sol Plaatje data sets were recorded by the old Iskra meters. The data sets from the Iskra meters was used up to this date due to the upgrading on the old Sol Plaatje substation. The new Sol Plaatje substation was installed on the same 11 kV lines, next to the old substation. The data from the new L+G meters was used from 2 December 2019 when the lines between the upgraded substation were switched over.

The error in row 45 of the Sol Plaatje data has been revised. No emission reductions accounted for in that period.

2.vii

In response to query on calculation of power rating of the Merino generator:

The power factor rating provided by the manufacturer, 0.86, is the lowest network power factor under which the generator can operate without being damaged. In other words, the power factor of the network must be between 0.86 – 1 for the generator to operate within design specifications.

Two supporting documents are provided, illustrating the operating range of the installed Merino generator with respect to power factor. It is the load types on the electricity network that the generator is connected to that determine the power factor of the network. This includes induction type equipment such as electric motors and transformers connected elsewhere in the network. The power factor rating of the generator does not determine the electricity generated by the generator but defines the constraints related to the network it can be operated in, in this case between 0.86 and 1. The power factor of the network is accommodated by the meter connected to the generator which measures the active and reactive loads. If there is a kW reading from the meter it will include the power factor correction. Quite often the meters provide kVA, kVAr, kVAh as information which can be used to calculate the kW or kWh and adjust for the power factor of the network. The power factor exposed to the generator is a function of the network. This can be measured by the meters connected between the generator and network.

The capacity of the generator is therefore 4MVA x the network power factor. The network power factor must be measured. For example, the network power factor has been measured using the L+G meters, for November 2020 at Merino:

Gen. kWh for Nov 2020	kVAh for Nov 2020	Average power factor for Nov 2020
1 856 242	1 856 886	1

The power factor is calculated by dividing the kWh generated by the kVAh and is 1.

Documentation provided by project participant (1st round)		**Date:** 05/07/2021
☐ Changes in the PDD	Section(s):	New version No.:
☐ Changes in MR	Section(s):	New version No.:
☒ Changes in XLS	Worksheet(s): SolPlaatjeData	New version No.: 5
☒ Other: - Mer_2020Nov-Dec_example PF - Capability Curve Interpretation - Merino Capability Diagram		
DOE assessment (4th round)		**Date:** 07/07/2021

2.ii; During the onsite inspection an upgrade of the Sol Plaatje substation was inspected. Close to the old substation a new building and electrical installation in were erected. Meters in old and new buildings were inspected. Old meters were still in place, but were not recording anymore. In the new building new meters were operating. As per provided evidence the new installations were erected and installation commissioned on 17/10/2019, but as per provided generation and consumption record on the new meters started on 02/12/2010. 2.iv; The operation of old Iskra meters up to 02/12/2019 was clarified above. The recorded generation in December 2019 was removed from the ER calculation. 2.vii; As per provided explanation, supported by Merino Capacity Diagram/MCC/ the generator at Merino power plant has output capacity of 4MVA with power factor of 0.85. The output in the range of power factor between 0.85 and 1 is limited by the power factor of the network which usually is higher than the real power/ergon/. Therefor the generation of the Merino generator over the power factor of the generator, given in the technical specification, can be higher. As demonstrated by PP for some days the power factor of 1 (0.999) was archived. Moreover, the same was measured by Eskom meter and confirmed by invoices.

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

CAR ID	03	**Section no.**	MR/Excel	**Date:** 15/02/2021
Description of CAR				
PP requested extension of monitoring period up to the end of 2020. Updated documentation is requested.				
Project participant response (1st round)				
The monitoring report has been revised to reflect the extension of the monitoring period up to the end of 2020. The revised emission reduction calculation spread sheet has been provided.				
Documentation provided by project participant (1st round)				**Date:** 21/03/2021
☐	Changes in the PDD	Section(s):		New version No.:
☒	Changes in MR	Section(s): multiple		New version No.: 2
☒	Changes in XLS	Worksheet(s): multiple		New version No.: 2
☐	Other:			
DOE assessment (1st round)				**Date:** 08/06/2021
The monitoring report and the excel calculating sheet were updated. Nevertheless for October 2016 the ER calculation accounts for 31 days of generation at Merion power plant.				
Project participant response (2nd round)				
The ER calculation spreadsheet has been revised to only include generation from 8 October 2016.				
Documentation provided by project participant (1st round)				**Date:**05/07/2021
☐	Changes in the PDD	Section(s):		New version No.:
☒	Changes in MR	Section(s): cover page; A.1; D.2		New version No.:
☒	Changes in XLS	Worksheet(s): MerinoData		New version No.: 5
☐	Other:			
DOE assessment (2nd round)				**Date:** 07/07/2021
The monitoring report has been revised to reflect the extension of the monitoring period up to the end of 2020. The revised emission reduction calculation spread sheet has been provided crosschecked against the records from the meter and found correct.				

Conclusion *Tick the appropriate checkbox*	☐ Additional action should be taken (finding remains open) ☒ The finding is closed

Table 3. FAR from this verification

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

DOE assessment	**Date:** DD/MM/YYYY

Appendix 5. Monitored Parameters

Table A-5: Periodic Verification Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)	**Draft Concl.**	**Final Concl.**
$EG_{facility,y}$		Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)		
a) Measurement / Determination method (VVS, §§ 360-364) *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/ /MR/ /PPAS/ /BHM/	The net generated and supplied electricity is measured continuously and recorded by main meters with accuracy 0.2s and/or 0.5s located at the grid interconnection points. The meters are bidirectional. The export values are measured separately from the imports values and finally both values are used to calculate the monitoring parameter. The elelcitricity genearation is logged remotely to the computer system. Invoicing is done on monthly basis. *Verifier´s action:* Technical Data sheet of the meters were checked. Furthermore relevant regulation applicable to measurement equipment was considered. The verification team reviewed the data of energy generation obtained from the measurement point and has cross-checked it against the sales invoices/BHM/. *Conclusion:* The meter installed during the monitoring period comply with the requirements specified in the applied methodology and the registered monitoring plan. The measurement method is in line with the registered monitoring plan and the applied methodology.	~~CAR 01~~ ~~CAR 02~~	OK

Checklist Item (incl. guidance for the verification team)	**Refe-rence**	**Verification Team Comments** (Means and results of assessment)			**Draft Concl.**	**Final Concl.**
		☒	In this context the following findings have been raised:			
			CAR 01; CAR 02			
b) Accuracy, correctness and QA/QC Procedure (VVS, §§ 365-371) *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.*	/CAL/ /MR/ /LOG/	☒	It is confirmed that the accuracy of the equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan (Final assessment)		~~CAR 01~~ ~~CAR 02~~	OK
		☒	For details regarding the accuracy and calibration details please refer to Appendix 6			
		☐	No delayed calibration has occurred (Final assessment)			
		☐	As per the initial assessment the monitored value is deemed to be correct.			
		☐	Based on calibration certificates checked it can be confirmed that the monitoring equipment has been duly calibrated for this entire monitoring period.			
		☒	Based on calibration certificates checked a delay in calibration has been identified for the following period: Start date of delay: 29/03/2019 End date of delay: 01/12/2019			
		☒	A delay in calibration has been identified, the PP applied related actions and therefore the DOE can confirm that the:			
			☒	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		

Checklist Item (incl. guidance for the verification team)	Refe-rence	Verification Team Comments (Means and results of assessment)			Draft Concl.	Final Concl.
			☒	The result of the delayed calibration did not identify an error beyond the maximum permissible error of the instrument		
			☐	The error as identified during the delayed calibration has been applied as the error is beyond the maximum permissible error of the instrument		
			☒	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		
			☒	The error has been applied all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.		
		☒	In this context the following findings have been raised:			
			☒	CAR 01		

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
Main Meter (Merino)	$EG_{PJ,facility,y}$	41101303	Elster A1700	0.5s	10/07/2015	-	09/07/2018	☒ No ☐ Yes	From: To:
		3514211183055	Elster A1700	0.5s	-	05/02/2018 (day of replacement and calibration)	04/02/2021	☒ No ☐ Yes	From: To:
Check Meter (Merino)		41101301	Elster A1700	0.5s	10/07/2015	-	09/07/2018	☒ No ☐ Yes	From: To:
		3514211183063	Elster A1700	0.5s	-	05/02/2018 (day of replacement and calibration)	04/02/2021	☒ No ☐ Yes	From: To:
Main Meter (Sol Plaatje) HPP		41506004	ISKRA MT860S	0.2s	29/03/2016	-	28/03/2019 (calibrated on 19/03/2021)	☐ No ☒ Yes	From: 2019/03/29

									To: 2019/12/01
		43474373	Landis+Gyr ZMD402 CT	0.5s	-	22/10/2018 (replacement operating from 02/12/2019)	21/10/2021	☒ No ☐ Yes	From: To:
Check Meter (Sol Plaatje) HPP		35597712	ISKRA MT831	0.5s	29/03/2016	-	28/03/2019 (calibrated on 08/03/2021)	☐ No ☒ Yes	From: 2019/03/29 To: 2019/12/01
		43474371	Landis+Gyr ZMD402	0.5s	-	22/10/2018 (replacement operating from 02/12/2019)	21/10/2021	☒ No ☐ Yes	From: To:

- - - - -

Document information

Version	*Date*	*Description*
04.0	6 April 2021	Revision to: • Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).
03.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN); • Make structural and editorial improvements.
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.

Decision Class: Regulatory
Document Type: Form
Business Function: Issuance
Keywords: project activities, verifying and certifying