




Validation report form for renewal of crediting period for CDM project activities

(Version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the validation report form for renewal of crediting period for CDM project activities" at the end of this form.

VALIDATION REPORT FOR RENEWAL OF CREDITING PERIOD (RCP)

Title of the project activity	Bethlehem Hydroelectric project
Reference number of the project activity	UNFCCC ID: 2692 TN P-No.: 8000458472– 16/037
Number and duration of the next crediting period	CP-No.: 2 08/10/2016 to 07/10/2023 (incl. both days)
Version number of the validation report for RCP	2.0
Completion date of the validation report for RCP	30/08/2016
Version number of PDD to which this report applies	12
Project participant(s)	Bethlehem Hydro (Pty) Ltd Statkraft Markets BV
Host Party	South Africa
Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)	Scope: 1 / Technical Area: 1.2 CDM Methodology: AMS-1.D, version 18.0: Grid connected renewable electricity generation Standardised baseline: ASB0001, Version 01.0: Grid emission factor for the Southern African power pool
Estimated annual average GHG emission reductions or net anthropogenic GHG removals in the next crediting period	32,288 t CO _{2e}
Name of DOE	TÜV NORD CERT GmbH
Name, position and signature of the approver of the validation report for RCP	 Stefan Winter Final Approver

SECTION A. Executive summary

Bethlehem Hydro (Pty) Ltd has commissioned the TÜV NORD JI/CDM Certification Program to carry out validation of the request for renewal of crediting period (RCP) for the project:

“Bethlehem Hydroelectric project”

with regard to the relevant requirements for CDM project activities.

The project has been registered on 08/10/2009 under the UNFCCC registration No. 2692. The PPs have chosen a 7 year crediting period which is now due for renewal. The PPs have thus notified the UNFCCC about their intention to request the renewal of the crediting period.

The objective of this RCP validation is the review by an independent entity whether the project is still compliant with the applicable sections of:

- the CDM project standard,
- the CDM cycle procedure
- the updated applied UNFCCC Methodology AMS-1.D, version 18.0 and
- the methodological tool “Assessment of the validity of the original / current baseline and update of the baseline at the renewal of the crediting period”.

As per the requirements of the CDM Validation and Verification Standard^{/VVS/} the validation is based on

- the registered and/or latest updated version of the PDD (including revisions of the monitoring plan)^{/PDD/},
- the updated emission reduction calculation spread sheet^{/XLS/},
- further supporting documents made available to the validator as well as
- information collected through performing interviews and during the on-site assessment.

Furthermore publicly available information, such as the host country legislation, was considered as far as available and required.

The purpose of the project activity is to generate electricity from a hydropower plan, which will delivered 37 GWh per year to the South African grid. The project involves the installation of 5.8 MW of hydro 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 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:	28° 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 Plaatje Turbine		
Manufacturer	-	Boving Fouress Limited (BFL)
Type	-	Kaplan horizontal
Capacity	MW	2.5
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*
Voltage	V	6600
Frequency	Hz	50
Merino Turbine		
Manufacturer	-	Boving Fouress Limited (BFL)
Type	-	Kaplan horizontal
Capacity	MW	3.6*
Merino Generator		
Manufacturer	-	Power System PVT. LTD
Type	-	WD140
Standard	-	IEC 34
Output	kVA	4000
Power Factor (PF)	%	0.85
Capacity	MW	3.4*
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; $P(kW) = S(kVA) \times PF$ (<http://www.rapidtables.com/convert/electric/kva-to-kw.htm>)

SECTION B. Validation team, technical reviewer and approver**B.1. Validation 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)	Validation findings
1.	Team Leader	EI	Kochaniewicz	Grzegorz	Technical Support Ltd	x	x	x	x

B.2. Technical reviewer and approver of the validation report for RCP

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

SECTION C. Means of validation**C.1. Desk review**

During the desk review all documents initially provided by the client and publicly available documents relevant for the validation 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.

C.2. On-site inspection

Duration of on-site inspection: 11/03/2016				
No.	Activity performed on-site	Site location	Date	Team member
1.	<ul style="list-style-type: none"> ○ Round of introductions ○ Attendance register ○ Procedure of the audit ○ Introduction of company and local facilities <ul style="list-style-type: none"> ○ Update of organisaiton, ○ Personal organisation and responsibilities ○ National policies, ○ History, size, future development ○ Plant characteristics 	Cape Town, PP office	11/03/2016	Grzegorz Kochaniewicz

Duration of on-site inspection: 11/03/2016				
No.	Activity performed on-site	Site location	Date	Team member
	(technology, plant capacity, permissions,) ○ Situation of electric production/export/ /import/back up ○ Update of PDD ○ Compliance/update of Baseline ○ Compliance of Monitoring Plan, Monitoring Report with Monitoring Methodology ○ Comparison of technical parameters with PDD ○ Meters/ type/ accuracy / data recording/calibration record ○ Back up source(s); diesel generator ○ Data management, quality control and quality assurance			

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Olivier	Anton-Louis	REH Group/Managing Director	11/03/2016	Update and changes to the project activity, national law and regulations, baseline situation, methodology and monitoring arrangements.	Grzegorz Kochaniewicz
2.	Wyngaard	Olga	REH/Compliance and communication officer	11/03/2016		

C.4. Clarification requests, corrective action requests and forward action requests raised

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	-	1	-
Application of baseline and monitoring methodology and standardized baseline	-	1	-
Validity of original baseline or its update	-	-	-
Estimated GHG emission reductions or net anthropogenic GHG removals	-	-	-
Validity of monitoring plan	2	-	-
Crediting period	-	-	-
Project participants	-	-	-
Others (please specify)	-	-	-
Total	2	2	

SECTION D. Validation findings

D.1. Compliance with PDD form

Means of validation	<p>A draft revised PDD was submitted to the validation team by the project participants. By means of the UNFCCC website it has been checked whether the latest applicable PDD template CDM-SSC-PDD-FORM has been used.</p> <p>Further it has been checked whether the latest instructions for filling out the PDD template have been followed. Every section has been checked against the respective guidance.</p>
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	The following sources of information have been used in this context:	
	<ul style="list-style-type: none"> • /PDD/ • /unfccc/ 	
Findings	<input checked="" type="checkbox"/>	The latest reporting template CDM-PDD-FORM as listed on the UNFCCC website has been used for the PDD.
	<input type="checkbox"/>	The latest instructions for filling out the PDD have been followed. No adverse finding has been identified in the course of this validation.
	<input checked="" type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context: CAR D.1
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

D.2. Application of baseline and monitoring methodology and standardized baseline

Means of validation	By means of comparison of the PDD with <ul style="list-style-type: none"> (i) the applied CDM methodology (ii) all applicable CDM Meth tools and (iii) if applicable, a standardized baseline the validation team has checked whether the updated PDD is in compliance with the requirements of the applied methodology/tools/SB. The following sources of information have been used in this context: <ul style="list-style-type: none"> • /PDD/ • /METH/ • /TOOL/ • /SB/ /unfccc/			
Findings	<input checked="" type="checkbox"/>	The updated PDD is completely in accordance with the approved methodology applicable for the CDM project		
	<input checked="" type="checkbox"/>	The breakdown of PDD accordance of the referenced tools is as follows:		
		1	Title (of the tool)	AMS-I.D.: Grid connected renewable electricity generation
			Version	18
			MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)
		2	Title (of the tool)	Methodological tool: Tool to determine the remaining lifetime of equipment
			Version	01
	MP compliance		<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A	
	<input checked="" type="checkbox"/>		Title (of the tool)	Methodological tool: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period
		3	Version	03.0.1
		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A	

	<input checked="" type="checkbox"/>		Title (of the tool)	ACM0002: Grid-connected electricity generation from renewable sources
	<input checked="" type="checkbox"/>	4	Version	16.0
	<input checked="" type="checkbox"/>		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A
	<input checked="" type="checkbox"/>	The breakdown of PDD accordance of the applicable SB is as follows:		
	<input checked="" type="checkbox"/>		Title (of the SB)	ASB0001 "Standardized baseline: Grid emission factor for the Southern African power pool"
	<input checked="" type="checkbox"/>	5	Version	01.0
	<input checked="" type="checkbox"/>		MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:		
	CAR D.2:			
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.		
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		

D.3. Validity of original baseline or its update

Means of validation	<p>The validity of baseline was assessed in line with "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).</p> <p>In order to check the validity of the original baseline or its updates the validation team has applied the following stepwise approach:</p> <p>Step 1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies</p> <p>Step 2: Assess the impact of circumstances</p> <p>Step 3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested.</p> <p>Step 4: Assessment of the validity of the data and parameters</p> <p>Step 5: Assessment the update the current baseline</p> <p>Step 6: Assess the Update the data and parameters.</p> <p>All necessary documentation has been either provided by the client or the validation team has acquired appropriate information required for assessment independently. For a detailed list of reviewed documentation please refer to appendix 3.</p>
Findings	<p><i>Step 1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies</i></p> <p>The baseline of the registered PDD has been assessed to be compliant with the national legislation and policies applicable for the project activity at the time of validation. During the first crediting period the PP has frequently reviewed the legal requirements and policies relevant for the baseline of the project. On the basis of this the PP has arrived at the conclusion that the baseline is still in line with all applicable legislations and policies.</p> <p>The validation team has independently reviewed the host country legislation as well as current policies, such as</p>

- National Environmental Management Act , 1998

On the basis of this analysis the validation team confirms that the baseline is still in compliance with the currently applicable national legislation and other national and/or sectoral policies. Therefore the baseline did not need to be adjusted due to changes in this respect.

Step 2: Assess the impact of circumstances.

As the baseline scenario might be affected by changed circumstances, e.g. market conditions, market prices etc. the PP has checked the baseline against such changes that have occurred since validation. This is of special importance if the baseline scenario is the continuation of the pre-project scenario.

In the current case no such changes have been identified by the project participants, that would affect the validity of the pre project baseline scenario.

The validation team has independently checked whether there are changes in circumstances which have an impact on the baseline. No such changes have been identified and thus it is deemed appropriate not to revise the baseline due to changes in circumstances.

Step 3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested.

If the baseline scenario has been identified as the continuation of the pre-project scenario it is necessary to assess whether an investment and/or exchange of the baseline equipment (e.g. due to expiry of the equipment's lifetime) during the upcoming crediting period is to be deemed the most likely scenario. If so the baseline needs to be updated.

In case of an hydropower project there is no baseline equipment which is to be exchanged. Furthermore no other reasons for a possible investment – other than possible legal requirements – have been identified.

Thus the validation team confirms the conclusion that no changes to the baseline are required due to the likeliness of investments in equipment which impacts the baseline.

Step 4: Assessment of the validity of the data and parameters

Step 4.1: Validity of ex-ante determined parameters:

The parameters which have been determined ex-ante in the registered PDD were changed/removed. The following changes were required:

Parameter	Previous value	Updated value	Reference
EF _{grid,y}	1.02 tCO ₂ e	0.9488 tCO ₂ e	ASB0001
NCV _{diesel}	43.3 GJ/ton	0	The parameter was removed due to applicability of ASB0001
EF _{CO₂,diesel}	0.0748 tCO ₂ /GJ	0	The parameter was removed due to applicability of ASB0001
ρ _{diesel}	0.75 kg/l	0	The parameter was removed due to applicability of ASB0001

These changes have been appropriately considered in the updated PDD.

Step 4.2: Validity of monitored parameters:

The parameters which have been determined for monitoring in the registered PDD were changed/removed. The following changes were required:

Parameter	Previous value	Updated value	Reference
E1g	15 084 882 kWh	0	The parameter was removed due to corrections on the monitoring plan in line with AMS –I.D.
E2g	18 946 229 kWh	0	The parameter was removed due to corrections on the monitoring plan in line with AMS –I.D.
FC1j	0 Gg	0	The parameter was removed due to corrections on the monitoring plan. The source of back up is electricity from the grid and the diesel generators were removed from project site.
FC2j	0 Gg	0	The parameter was removed due to corrections on the monitoring plan. The source of back up is electricity from the grid and the diesel generators were removed from project site.
E1i	0 kWh	0	The parameter was removed due to corrections on the monitoring plan in line with AMS –I.D. The electricity imported for back up is monitored via bi-directional meter and net electricity generation is monitored.
E2i	0 kWh	0	The parameter was removed due to corrections on the monitoring plan in line with AMS –I.D. The electricity imported for back up is monitored via bi-directional meter and net electricity generation is monitored.
EG _{PJ,facility,y}	0 MWh	34,031 MWh	The parameter was added replacing the removed parameters in line with AMS-I.D.

These changes have been appropriately considered in the updated PDD.

Step 5: Assessment the update the current baseline.

The current baseline is define in line with ASB0001 “Standardized baseline: Grid emission factor for the Southern African power pool”, (Version 01.0)

	Standardized baseline, ASB0001, is applicable to the project activity. This has been checked by an analysis of the current list of valid standardized baselines on the UNFCCC website ^{/unfccc/} .	
	<u>Step 6: Assess the Update the data and parameters.</u>	
	<u>Step 6.1: The parameter fixed ex-ante $EF_{grid,y}$ was defined in line with ASB0001 "Standardized baseline: Grid emission factor for the Southern African power pool", (Version 01.0)</u>	
	<u>Step 6.2: The parameter to be monitored $EGPJ, facility, y$ was defined in line with applied AMS –I.D.</u>	
Conclusion	<input type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context: -
	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	The ASB0001 provides fixed value of $EF_{GRID,y}$. PP has selected $EF_{GRID,y}$ fixed ex-ante. No recalculation of the value during 2 nd crediting period is required.	

D.4. Estimated GHG emission reductions or net anthropogenic GHG removals

Means of validation	For validation of the estimated GHG emission reductions the client has provided the validation team with the following documentation: - Updated PDD ^{/PDD/} - XLS spreadsheet ^{/XLS/} . Further, the validation team has downloaded from the UNFCCC website the applicable version of the CDM methodology and all referenced methodological tools ^{/unfccc/} . The XLS ER calculation has been duly checked. Further it has been checked whether the results have been correctly transferred to the updated PDD for determination of ex-ante ER. The validation team has further checked the updated PDD against the latest version of the applicable methodology incl. the referenced methodological tools for consistency. Special focus was laid on the changes against the previous crediting period.	
Findings	<input checked="" type="checkbox"/>	The calculation of ERs is done as per the applied methodology AMS-I.D.: Grid connected renewable electricity generation. The calculation in the Excel spreadsheet and the corresponding calculation tables in the PDD have been checked and no mistakes have been identified. The estimation of emission reductions for the 2 nd crediting period is deemed plausible and conservative.
	<input type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context: -
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

D.5. Validity of monitoring plan

Means of validation	<p>The validation team has checked the monitoring plan of the updated PDD against the required changes due to the update of the baseline and other methodological changes. Further, changes due to editorial updates of the applicable templates have been checked.</p> <p>In detail all parameters, ex-ante values and applicable formulae have been checked to determine the required changes for the next crediting period.</p> <p>Besides, based on conducted site-visit and interviews with related personnel the validation team has assessed the feasibility of the required changes.</p>	
Findings	<input checked="" type="checkbox"/>	<p>The monitoring plan in the PDD has been updated to comply with the latest applicable version of the monitoring methodology (AMS-I.D ver.18). The changes from the current crediting period can be summarized as follows:</p> <ol style="list-style-type: none"> Following monitored parameters monitored during the 1st crediting period were removed from monitoring plan: <ul style="list-style-type: none"> E1g (Total annual power generation at the Sol Plaatje generation unit) E2g (Total annual power generation at the Merino generation unit) E1i (Total power imported from the grid for use at Sol Plaatje generation unit.) E2i (Total power imported from the grid for use at Merino generation unit.) FC1,j (Quantity of Diesel consumed by stand by generator at the Sol Plaatje Unit during the crediting period j) FC2,j (Quantity of Diesel consumed by stand by generator at the Merino Unit during the crediting period j) <p>The removed parameters used to monitor exported and imported electricity were replaced by $EG_{P,J, Facility, y}$ (Quantity of net electricity generation supplied by the project plant/unit to the grid in year y).</p> <p>The section 7.1 and 7.3 of the corrected PDD provides explanations how the net electricity generation is measured and calculated in line with the applied methodology. The correction contributes to simplification and transparency and is in line with the methodology.</p> <p>The parameters FC1,j, FC2, were removed from the monitoring plan in order to account for the removal of the back up diesel generators. During the previous verification onsite visits the DOE inspected the diesel generators. The generators were not operational and not functional. The South African power grid is sufficient as a backup and the diesel generators were not used. The diesel generators were removed from the site. This was confirmed by an official affidavit signed at the South African Police Service.</p> <p>The validation team has duly assessed all the corrections and required changes due to the upgraded methodological requirements and the re-assessment of the baseline. The validation team has concluded that</p> <ul style="list-style-type: none"> - all necessary changes have been appropriately reflected in the updated PDD, - the monitoring plan in the updated PDD is in compliance with the applied monitoring methodology, - the monitoring arrangements described in the updated PDD can be implemented and are feasible within the project design.
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

D.6. Crediting period

Means of validation	The validation team has checked that the UNFCCC Secretariat has been notified within the specified timeframe, as detailed above.	
Findings	<input checked="" type="checkbox"/>	As the respective requirements are met, the project's 2 nd crediting period may start immediately after the expiration of the 1 st one, given that all other applicable criteria are met. It is further confirmed that the start date (08/10/2016) and the length of the crediting period (7 years) are in compliance with the project standard.
	<input type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context: -
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

D.7. Project participants

Means of validation	The validation team has checked the revised PDD ^{/PDD/} and the UNFCCC website ^{/unfccc/} esp. the latest version of the Modalities of Communication ^{/MOC/} to check whether the listed project participants have duly been authorized and if communication requirements are met.	
Findings	<input checked="" type="checkbox"/>	The names of the project participants as listed in the revised PDD (sections A.4. and appendix 1) are consistent with those listed on the dedicated UNFCCC project website as well as in the last version of the modalities of communication ^{/MOC/} .
	<input type="checkbox"/>	The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context: -
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

D.8. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline	N	-	-
Corrections	Y	01	20/05/2016
Inclusion of a monitoring plan to a registered project activity	N	-	-
Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline	N	-	-
Changes to the project design of a registered project activity	Y	01	20/05/2016
Types of changes specific to afforestation and reforestation project activities	N	-	-

SECTION E. Internal quality control

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

As a result of the technical review process the validation opinion and the topic specific assessments as prepared by the validation 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 validation has been carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the submission for requesting the renewal of crediting period is conducted.

SECTION F. Validation opinion

Bethlehem Hydro (Pty) Ltd has commissioned the TÜV NORD JI/CDM Certification Program to re-validate the project "Bethlehem Hydroelectric project" for the purpose of renewal of the crediting period. The validation is based on the relevant UNFCCC requirements.

The review of the updated project design documentation and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews have provided TÜV NORD JI/CDM Certification Program with sufficient evidence to validate the fulfillment of the stated criteria applicable for RCP.

In detail the conclusions can be summarized as follows:

- The current baseline of the project is in line with the national and/or sectoral policies and circumstances at the time of requesting renewal of crediting period.
- The monitoring plan is transparent and adequate and in line with the applicable monitoring methodology AMS-1.D, version 18.0.
- The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 32,288 tCO_{2e} are most likely to be achieved within the second renewable crediting period of 7 years.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the renewal of the crediting period.

Kigali, 30/08/2016




Dr. Grzegorz Kochaniewicz
TÜV NORD JI/CDM Certification Program
Validation Team Leader

Appendix 1. Abbreviations

BAU	Business as usual
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CO₂	Carbon dioxide
CO₂e	Carbon dioxide equivalent
CP	Certification Program // Crediting Period
DNA	Designated National Authority
EB	CDM Executive Board
ER	Emission Reductions
ETS	Emission Trading Scheme
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
LOA	Letter of Approval
MOC	Modalities of Communication
PCP	CDM Project Cycle Procedure
PDD	Project Design Document
PP	Project Participant
PS	CDM Project Standard
QC/QA	Quality control/Quality assurance
RCP	Renewal of Crediting Period
UNFCCC	United Nations Framework Convention on Climate Change
VVS	CDM Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers



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

Mr. Grzegorz Kochaniewicz


SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2019-02-08
VCS / ISO 14064-2	Senior Assessor	2019-02-08

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	5358692885
3.1	Energy Demand
14.1	8528863600 and Reforestation

173 - Rev. 7, Date: 2016-02-09

TUV NORD CERTIFICATION 2016-02-09-173



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

Ms. Christina Stöhr

SCHEME	STATUS	VALID UNTIL
CDM	Assessor (Validation, Verification) Technical Reviewer	2017-12-12
VCS / ISO 14064-2	Assessor / Technical Reviewer	

Authorization status for technical areas within sectoral scopes:

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

200 - Rev. 4 Date: 2015-06-09

TUV NORD CERTIFICATION 2015-06-09-200



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

Mr. Stefan Winter

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2014-06-30
VCS	Senior Assessor (Validation, Verification) Technical Reviewer	2014-06-30

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.1	Thermal energy generation	
1.2	Renewable Energy	1.2.1 Hydro 1.2.2 Wind 1.2.3 Geothermal 1.2.4 Solar 1.2.5 Total
2.2	Heat distribution	
3.1	Energy demand	
13.1	Waste handling and disposal	13.1.1 Waste management 13.1.2 Waste water management
13.2	Animal waste management	
15.2	Animal waste management	

163 - Rev. 2, Date: 2011-06-10

TUV NORD CERTIFICATION 2011-06-10-163

Appendix 3. Documents reviewed or referenced

No.	Author	Reference	Title	References to the document	Provider
1	South African DNA	/LOA1/	Letter of Approval from DNA of South Africa dated 30/04/2014	https://cdm.unfccc.int/Projects/DB/SGS-UKL1245061289.99/view	UNFCCC
2	Niederland DNA	/LoA2/	Letter of Approval from DNA of Nederland dated 06/12/2007	https://cdm.unfccc.int/Projects/DB/SGS-UKL1245061289.99/view	UNFCCC
3	PP	/MAIL1/	Notification mail by the PP to the UNFCCC indicating the intention to renew the crediting period, dt. 18/03/2016		PP
4	PP	/MAIL2/	Confirmation mail by the UNFCCC in response to /MAIL1/ dt. 22/03/2016		PP
5	PP	/MI/	List of Monitoring Instruments		PP
6	PP	/MOC/	Modalities of Communication	https://cdm.unfccc.int/Projects/DB/SGS-UKL1245061289.99/view	UNFCCC
7	PP	/PDD/	RCP Project Design document "Bethlehem Hydroelectric project" <ul style="list-style-type: none"> Version No. 9, dated 31/03/2016 Version No. 10, dated 06/05/2016 Version No. 11, dated 24/06/2016 Version No. 12, dated 05/08/2016 		PP
8	PP	/PDD-Reg/	Registered Project Design document "Bethlehem Hydroelectric project" (Version No. 8, dated 01/08/2013)	https://cdm.unfccc.int/Projects/DB/SGS-UKL1245061289.99/view	UNFCCC
9	PP	/XLS/	Emission reduction calculation spreadsheet		PP
10	DOE	/CPM/	TÜV NORD JI / CDM Certification Program Manual (incl. procedures and forms)		DOE
11	IPCC	/IPCC/	<ul style="list-style-type: none"> IPCC Good Practice Guidance & Uncertainty Management in National Greenhouse Gas Inventories, 2000 Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual 	www.ipcc-nggip.iges.or.jp	Others
12	UNFCCC	/KP/	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Others
13	UNFCCC	/MA/	Decision 3/CMP. 1 (Marrakesh – Accords & Annex to decision (17/CP.7))	http://cdm.unfccc.int/Reference/COPMOP/index.html	Others
14	UNFCCC	/METH-1/	AMS-I.D.: "Grid connected renewable electricity generation" (Version 18.0)	https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK	Others

No.	Author	Reference	Title	References to the document	Provider
15	UNFCCC	/METH-2/	ACM0002: "Grid-connected electricity generation from renewable sources" (Version 16.0)	https://cdm.unfccc.int/methodologies/DB/EY2CL7RTEHRC9V6YQHLAR6MJ6VEU83	Others
16	UNFCCC	/TOOL/	Tool to determine the remaining lifetime of equipment (Version 01)	https://cdm.unfccc.int/EB/050/eb50_repan15.pdf	Others
17	UNFCCC	/SB/	ASB0001 "Standardized baseline: Grid emission factor for the Southern African power pool" (Version 01.0)	https://cdm.unfccc.int/methodologies/standard_base/EB73_repan03_ASB-0001.pdf	Others
18	UNFCCC	/PCP/	CDM project cycle procedure, version 9.0	https://cdm.unfccc.int/Reference/Procedures/index.html	Others
19	UNFCCC	/PDD-T/	Project Design Document Form (CDM-PDD-FORM) - Version 08.0 including Attachment: Instructions for filling out the project design document form for CDM project activities	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Others
20	UNFCCC	/PS/	CDM project standard, version 9.0	http://cdm.unfccc.int/Reference/Standards/index.html	Others
21	UNFCCC	/TVB/	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/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf	Others
22	UNFCCC	/VVS/	CDM Validation and Verification Standard, Version 09.0	http://cdm.unfccc.int/Reference/Standards/index.html	Others
23	SGS	/VAL/	Validation Report for CDM project Bethlehem Hydroelectric project" (Version No. 7, dated 07/10/2009)	https://cdm.unfccc.int/Projects/DB/SGS-UKL1245061289.99/view	Others
24	UNFCCC	/ADB/	Assessment of De-bundling for small-scale project activities	https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-20-v1.pdf	Others
25	TN Cert	/PRC/	PRC Report for CDM project Bethlehem Hydroelectric project" (Version No. 7, dated 07/10/2009)	https://cdm.unfccc.int/Projects/DB/SGS-UKL1245061289.99/view	Other
26	TN Cert	/MR/	Verification Report for CDM project Bethlehem Hydroelectric project" (Version No. 1, dated 29/08/2014)	https://cdm.unfccc.int/Projects/DB/SGS-UKL1245061289.99/view	Other
27	REH Operations & Maintenance	/DIS/	Affidavit for removal of diesel generators		PP

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

Table 3. CL from this validation

CL ID	D.3	Section no.	B.3	Date: 31/03/2016
Description of CL				
PDD version 09.0, Section B.3				
It is stated under B.3 that electricity imports would be monitored from time to time. Please clarify why the same is not included in section B.7.1				
Project participant response (1st round)				Date: 06/05/2016
Removed statement under section B.3.regarding electricity imports monitoring. Revised PDD and monitoring plan will meet the latest requirements of the methodology applied.				
Documentation provided by project participant (1st round)				
<input checked="" type="checkbox"/>	Changes in PDD	Section(s): B.3	New version No.: 10	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment (1st round)				Date: 10/05/2016
The measuring methods and procedures for monitoring of net electricity generation supplied by the use of bidirectional meters installed at each of the sites was explained in section B.7.1. Nevertheless please explain the use of term „bilateral“ in relation to bidirectional meter in section B.7.1.				
Project participant response (2nd round)				Date: 24/06/2016
The word 'bilateral' was meant to be used as an equivalent to the term "bidirectional". However the PDD was updated to use "bidirectional" to maintain coherence in the document.				
Documentation provided by project participant (2nd round)				
<input checked="" type="checkbox"/>	Changes in PDD	Section(s): B.7.1	New version No.: 11	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment (2st round)				Date: 01/07/2016
Electricity imports will be monitored by the installed bidirectional meters, which is in line with the monitoring plan and the applicable methodology.				
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CL ID	D.4	Section no.	B.7.1	Date: 31/03/2016
Description of CL				
PDD version 09.0, Section B.7.1				
1. Corrections were conducted in order to separate monitoring of net electricity exported to the grid from the two power plants (E1g & E2g). It is unclear to the DOE how this parameter will be monitored in the new arrangement. 2. It is also not clear whether each plant has its own separate main meter and check meter				
Project participant response (1st round)				Date: 06/05/2016
The description was updated. Each site has a main and check meters. The accuracy class of the main and back-up meters at Sol Plaatje site is specified as 0.2s and 0.5s respectively. The meters at the Merino site are both of accuracy 0.5s. Evidence in the form of calibration certificates were provided and checked, in line with grid code of South Africa.				
Documentation provided by project participant (1st round)				
<input checked="" type="checkbox"/>	Changes in PDD	Section(s): B.7.1	New version No.: 10	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment (1st round)				Date: 10/05/2016

Each one of the project sites has a main meter and a backup meter, which separately monitors energy imports and exports. Net electricity from each site will be summed up for the total net electricity generation. Following interviews with the project participant and the check of calibration certificates of the meters, 0.2s and 0.5s accuracy class at Sol Platje site and 0.5s and 0.5s accuracy class meters at Merino site, were confirmed. Evidence in the form of calibration certificates were provided and crosschecked with picture from onsite assessment.

Conclusion

Tick the appropriate checkbox

- ☐ Additional action should be taken (finding remains open)
☒ The finding is closed

Table 4. CAR from this validation

CAR ID	D.1	Section No.	Title Page	Date: 31/03/2016
Description of CAR				
PDD version 09.0, Page 1				
1. The title of the project activity is incorrect				
2. The ER units is incorrect				
Section B.1				
3. Exact references to the methodology and tools is not included as required by the latest PDD template.				
4. The <i>Tool to calculate the emission factor for an electricity system</i> version indicated is not consistent with applied tool under standardized baseline ASB0001				
B.6.2, B.6.3				
5. The units for the fixed parameter EF _{grid,y} is incorrect				
6. The units for ER is incorrect				
Project participant response				Date: 06/05/2016
PDD version 10.0, Page 1				
1. The project number was removed from the project title on the cover page.				
2. All ER units across the document were corrected to use comma as a thousand separators and point as a decimal separator.				
Section B.1				
3. The exact references to the methodology and tools have been included, as well as the links to the online location, as required by the latest PDD template Version 06.0				
4. Mention to the “Tool to calculate the emission factor for an electricity system” has been removed as it is not used.				
B.6.2, B.6.3				
5. The units for the fixed parameter EF _{grid,y} was revised				
6. The units for ER was revised				
Documentation provided by project participant				
<input checked="" type="checkbox"/> Changes in the PDD		Section(s): Cover page B.4, B.6.3, B.6.4, B.7.1,		New version No.: 10
<input type="checkbox"/> Changes in XLS		Worksheet(s):		New version No.:
<input type="checkbox"/> Other:				
DOE assessment				Date: 10/05/2016

Page 1

1. The title of the project activity was corrected and is in line with the project site at the UNFCCC website.
2. The units were corrected to „tCO₂e“ SI units were correctly applied through the PDD.

Section B.1

3. The exact references to the methodologies and tools were provided. The UNFCCC website has been checked against the PDD.
4. The reference to the “Tool to calculate the emission factor for an electricity system” has been replaced by the reference to Standardized Baseline ASB0001. The UNFCCC website has been checked against the PDD.

B.6.2, B.6.3

5. The units for the fixed parameter EF_{grid,y} was revised. SI units were correctly applied through the PDD.
6. The units were corrected to „tCO₂e“ SI units were correctly applied through the PDD.

Nevertheless the PDD template was updated. The current valid revision shall be applied.

Project participant response		Date: 05/08/2016
The PDD was updated. The valid template version 08.0 was applied		
Documentation provided by project participant		
<input checked="" type="checkbox"/> Changes in the PDD	Section(s): -	New version No.: 12
<input type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.:
<input type="checkbox"/> Other:		
DOE assessment		Date: 05/08/2016
PP updated the PDD using valid Template version 08.0.		
Conclusion Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed	

CAR ID	D.2	Section No.	A.6	Date: 31/03/2016
Description of CAR				
PDD version 09, section A.6				
The <i>Guidelines on Assessment of De-bundling for SSC Project Activities</i> (version 03) is not the latest reference guideline.				
Project participant response				Date: 06/05/2016
Section A.6 updated to include the latest reference guideline				
Documentation provided by project participant				
<input type="checkbox"/> Changes in the MR	Section(s):		New version No.:	
<input type="checkbox"/> Changes in XLS	Worksheet(s):		New version No.:	
<input type="checkbox"/> Other:				
DOE assessment				Date: 10/05/2016
The correction was made. The guideline was reclassified to methodological tool. The latest version of Assessment of De-bundling for SSC Project Activities has been correctly applied. The UNFCCC website has been checked against the PDD.				
Conclusion Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed			

Table 5. FAR from this validation

FAR ID	-	Section no.		Date: DD/MM/YYYY
Description of FAR				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
<input type="checkbox"/> Changes in the PDD	Section(s):		New version No.:	
<input type="checkbox"/> Changes in MR	Section(s):		New version No.:	

<input type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.:
<input type="checkbox"/> Other:		
DOE assessment		Date: DD/MM/YYYY
Conclusion <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> Additional action should be taken (finding remains open) <input type="checkbox"/> The finding is closed	