Monitoring report form

(Version 05.1)

Complete this form in accordance with the Attachment "Instructions for filling out the monitoring report form" at the end of this form.

MONITORING REPORT		
Title of the project activity	Bethlehem Hydroelectric project	
UNFCCC reference number of the project activity	2692	
Version number of the monitoring report	4.1	
Completion date of the monitoring report	13/07/2017	
Monitoring period number and duration of this monitoring period	Second monitoring period: 01/12/2013 – 07/10/2016 Duration of Monitoring period: 34 months and 7 days	
Project participant(s)	Bethlehem Hydro (Pty) Ltd Statkraft Markets BV	
Host Party	South Africa	
Sectoral scope(s)	Sectoral scope: 01, Energy industries (renewable - /non-renewable sources)	
Selected methodology(ies)	AMS-1.D "Grid connected renewable electricity generation" (Version 18.0)	
Selected standardized baseline(s)	Standardised baseline: ASB0001 "Standardized baseline: Grid emission factor for the Southern African power pool" (Version 01.0)	
Estimated amount of GHG emission reductions or net GHG removals by sinks for this monitoring period in the registered PDD	92,175 metric tonnes CO_2 equivalent	
Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	0	111,491 metric tonnes CO_2 equivalent

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

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The Bethlehem Hydroelectric Project was registered on 08 October 2009. The project was implemented and the first crediting period starting from 08 October 2009 elapsed on 07 October 2016.

The purpose of the project activity is to generate hydroelectricity, which will be distributed into the currently coal intensive South African grid. The hydro power generated from the project site will be replacing electricity from the national grid, consequently avoiding CO_2 emissions from fossil fuelled power plants connected to the grid. Prior to the implementation of the project activity, there was no hydro-power generated at the project sites.

The project involves the development and operation of 5.8 MW of hydro generation capacity within the boundaries of the Dihlabeng Local Municipality (Free State Province, South Africa). The project will generate 37 GWh per annum and is comprised of two generation facilities i.e.

- A run of river site located on the As River, midway between Bethlehem and Clarens; and,
- Facility located at the existing concrete wall of the Sol Plaatje Dam, in the town of Bethlehem. The Sol Plaatje Dam supplies water to the town and is not used for hydropower generation so far.

The following dates are relevant to this project activity:

- Start date of project activity (defined in the PDD as the start of construction): 28 November 2006
- Commencement of Sol Plaatje unit generation based on the first metered power sales: 11 November 2009
- Commencement of the Merino unit generation based on the first metered power sales: 15 November 2010

The project involved the construction of these facilities as well as a 5km transmission line at 11kV, to the Panorama substation to link the project to the national grid. A step-up transformer was required at the power station in order to deliver power at 11kVA. Existing access roads to the site were upgraded.

The water resource in the As River is artificially fed from the Lesotho Highlands Water Project (LHWP). Water from the project is currently transferred from the Katse Dam in Lesotho to South Africa via the transfer tunnel and the delivery tunnel. During the transfer it is used to generate electricity for Lesotho in the Muela hydropower plant situated between the two tunnels. After driving the turbines the water flows to South Africa via the delivery tunnel, the outfall of which is located in the upper reaches of the As River (a tributary of the Liebenbergsvlei River). The flow rate in the river is therefore not seasonally dependent and remains almost constant throughout the year and over time.

An estimation in the project design document of the annual average GHG emissions reductions are 32,288 metric tonnes CO_2 equivalent. An estimation of the total GHG emission reductions for this crediting period is 111,491 metric tonnes CO_2 equivalent.

A.2. Location of project activity

>>

Host Party: South Africa
Region/State/Province: Free State Province
City/Town/Community: Bethlehem (Dihlabeng Municipality)

Physical/geographical location:

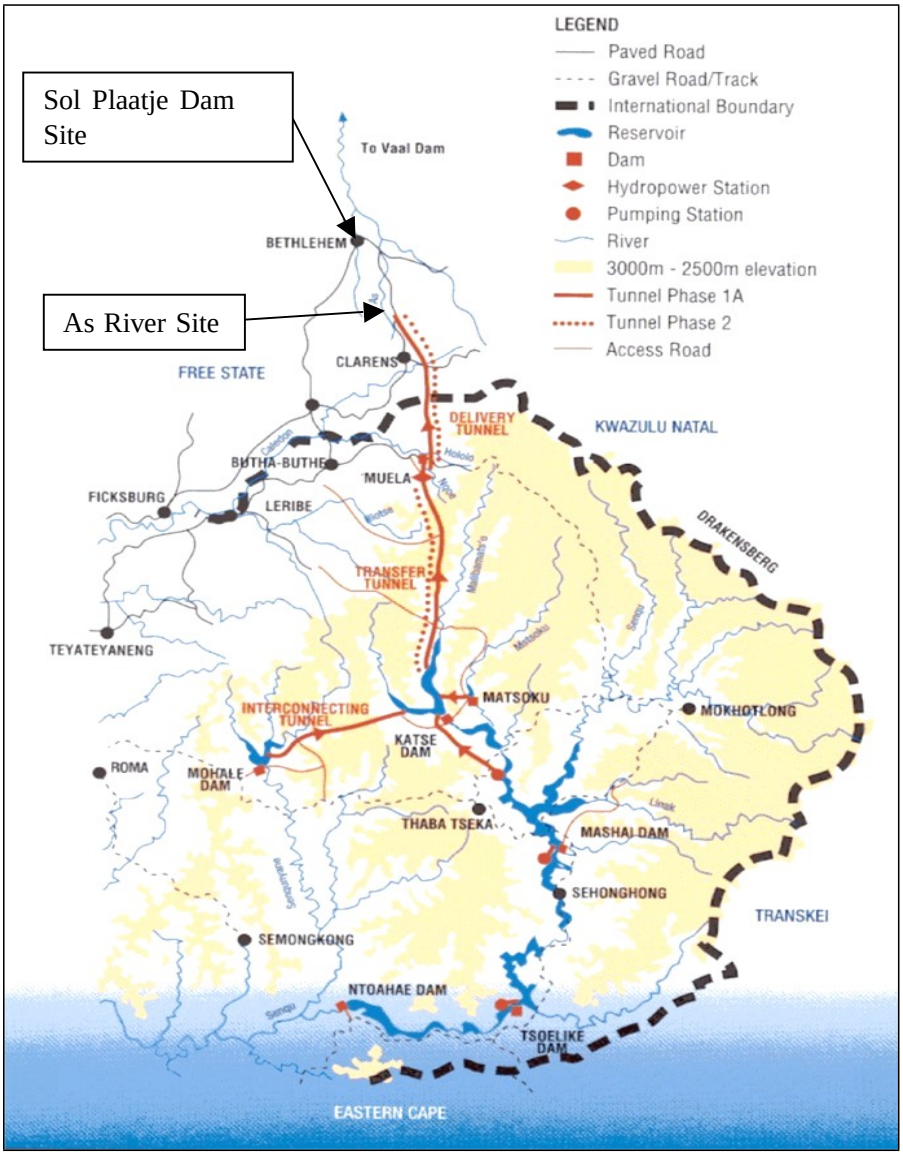
There are two facilities related to this project, Sol Plaatje and Merino.

The Sol Plaatje facility is located at the Sol Plaatje dam which is 5km from the centre of Bethlehem. The actual location is at the existing concrete dam wall adjacent to a pumping station, which supplies the town of Bethlehem with water.

The Merino site is located on farmland on the As River on the 'Merino' and 'De Burg Susan' farms, some 15 km outside Bethlehem in the direction of the town of Clarens.

The co-ordinates for the two sites are:
Merino: 28º 22' 09" S, 028º 21' 42" E
Sol Plaatje: 28º 12' 59" S, 028º 21' 50" E

Map showing project location:



A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
South Africa (host)	Bethlehem Hydro (Pty) Ltd (Private Entity)	No
The Netherlands	Statkraft Markets BV (Private Entity)	No

A.4. Reference of applied methodology and standardized baseline

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Methodology:

- AMS-I.D.: "Grid connected renewable electricity generation" (Version 18.0) https://cdm.unfccc.int/methodologies/DB/W3TINZ7KKWCK7L8WTXFQQOFQQH4SBK

Tools:

- "Methodological tool: Tool to determine the remaining lifetime of equipment" (Version 01) https://cdm.unfccc.int/EB/050/eb50_repan15.pdf
- "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/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf

Water reservoir calculations use:

- ACM0002: "Grid-connected electricity generation from renewable sources" (Version 17.0) https://cdm.unfccc.int/methodologies/DB/8W400U6E7LFHHYH2C4JR1RJWWO4PVN

Standardised baseline:

- 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

A.5. Crediting period of project activity

>>

Type: Renewable Crediting Period
Start date: 08/10/2009
Length: 7 years 0 months

A.6. Contact information of responsible persons/entities

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Contact information for the entity responsible for the application of the baseline and monitoring information:

Promethium Carbon (Pty) Ltd
Ballyoaks Office Park, Lacey Oak House
35 Ballyclare Drive
Bryanston 2021
Johannesburg
Telephone: +27 11 706 8185

This entity is not a project participant.

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

>>

The project activity has been implemented and has been operational during the monitoring period (01/12/2013 – 07/10/2016), producing electricity during this period.

Current Status of the project:

- The start date of the project is 28 November 2006.
- The project was registered by the CDM Executive Board on the 8 October 2009.
- The Sol Plaatje Power Plant has been fully operational from 11 November 2009. Generation of electricity and the export of power to the grid commenced on this date.
- The Merino power plant was commissioned in March 2012.
- The First crediting period runs from 8 October 2009 – 7 October 2016
- Credits have been issued for the period of 8 October 2009 – 30 November 2013.

The tables below lists shut down events of the plant.

Table 1: Sol Plaatje Plant shut down duration

Date	Duration	Reason for shutdown
February 2014	3 days	Planned shutdown - maintenance
March 2014	5 days	Planned shutdown – maintenance
February 2015	10 days	Planned shutdown – maintenance
April 2016	3 days	Planned shutdown - maintenance
August 2016	2 days	Unplanned – equipment failure

Table 2: Merino Plant shut down duration

Date	Duration	Reason for shutdown
December 2013	20 days	Unplanned – equipment failure
February 2014	1 day	Unplanned – flow related
November 2014	2 day	Planned shutdown - maintenance
December 2014	6 days	Planned shutdown - maintenance
February 2015	3 days	Planned – flow related*
May 2015	1 day	Planned shutdown - maintenance
September 2015	3 days	Unplanned – grid related
October 2015	4 days	Two unplanned events – one grid related and one flow related*
November 2015	6 days	Planned shutdown - maintenance
February 2016	12 days	Unplanned – equipment failure
March 2016	1 day	Planned shutdown - maintenance

* Water flow for the Merino hydro project is run of river and linked to South Africa – Lesotho agreement on the highland water scheme. This project is independent of this agreement.

The project is using small hydro technology at both of the following facilities:

1. Sol Plaatje unit – this unit is located at the outflow of the Sol Plaatje dam, and operates as a run-of-river power station and doesn't affect the water volumes of the dam. The facility uses a single 2.1m diameter, double-regulated horizontal axis Kaplan small hydro turbine with a 2.5 MW rating. The equipment was installed in 2009 and has been in operations for approximately 8 years. The lifespan of the equipment is in excess of 20 years. The overall efficiency at net operating head and maximum flow through the turbine is approximately 85.17%. The site has a generating head of approximately 11 meters.

2. Merino unit – located on the As River, is a run-of-river small hydro power plant that uses a single double-regulated horizontal axis Kaplan small hydro turbine with a 3.6 MW rating. The equipment was installed in 2010 and has been in operation for approximately 7 years. The lifetime of the equipment is in excess of 20 years. The overall efficiency at net operating head and maximum flow through the 3.6 MW Kaplan turbine installed at the Merino site is approximately 86.37%. The site has a generating head of approximately 13 meters.

Prior to the implementation of this project activity "the baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the grid-connected power plants and by the addition of new generation sources into the grid." The South African grid is predominantly coal-fired grid.

The arrangement of the two facilities in the project activity are as follows (Figure 1):

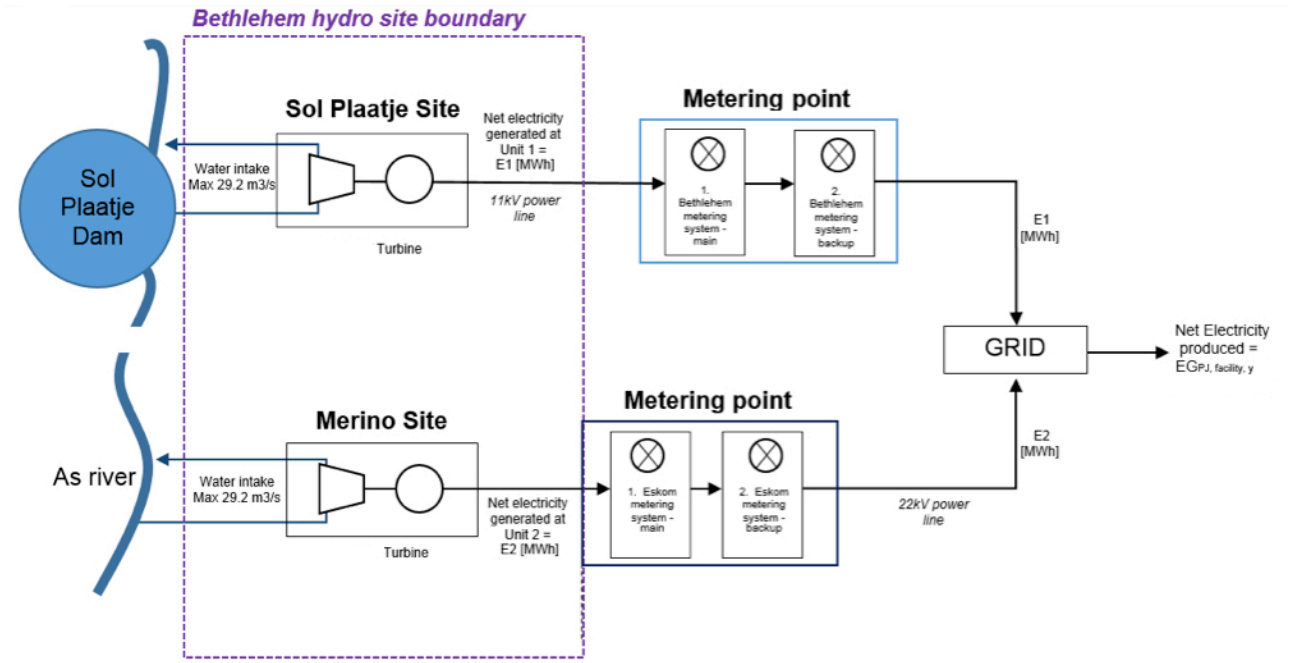

Figure 1: Project activity equipment arrangement

B.2. Post-registration changes

B.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

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Applicable. During this monitoring period the bidirectional meter at the Merino site did not record the electricity consumption on site. As such a conservative approach has been taken to estimate the electricity consumption on site, by assuming that the auxiliary equipment operated at maximum capacity for the full monitoring period. This equipment included lighting, sump pumps, battery charger, and a dewatering pump. As per the project standard, the estimation includes an additional 10% of electricity consumption to account for transmission and distribution losses. The calculations have been compared and cross checked with actual electricity consumption invoices billed by the utility.

B.2.2. Corrections

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Request for corrections were submitted to the EB during September 2016. The corrections were submitted prior to the submission of the first monitoring report. The version number of the revised PDD is version 12 and the completion date of the revised PDD is 05/08/2016. The latest PDD was submitted to the EB as part of the application to renew the crediting period, as well as for the purpose of requesting post registration changes. The DOE's assessment opinion was that the conclusion of the validation report shows that the project, as it was described in the project documentation was in line with all criteria applicable for the renewal of the crediting period. The reference number for the post registration change was not provided on the UNFCCC website.

The registered monitoring plan for electricity generation and consumption was updated to comply with the latest version of the monitoring methodology (AMS-I.D version 18), where the total net generation is now monitored, instead of monitoring import and export separately. In addition the revised PDD included the adoption of the standardised baseline grid emissions factor for Southern Africa (ASB0001 which provides fixed value of $EF_{GRID,y}$, fixed ex-ante),

The emission reduction calculations for this monitoring period reflects the post registration changes. As a result of the approval of the post registration changes and the standardised baseline grid emissions factor for Southern Africa.

B.2.3. Changes to start date of crediting period

>>
Not applicable.

B.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

>>
Not applicable.

B.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

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Not applicable.

B.2.6. Changes to project design of registered project activity

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Change to project design included the removal of the back-up diesel generators from site. During the previous verification onsite visit, the DOE inspected the diesel generators. The generators were not operational and not functional. The South African power grid is sufficient as a back-up and the

diesel generators were never used. The diesel generators were subsequently removed from the site. This was confirmed by an official affidavit signed at the South African Police Service. The diesel consumption was removed from the calculation of project emissions in the PDD, in order to account for the removal of the back-up diesel generators from site.

The version number of the revised PDD is version 12 and the completion date of the revised PDD is 05/08/2016. The DOE's assessment opinion was that the conclusion of the validation report shows that the project, as it was described in the project documentation was in line with all criteria applicable for the renewal of the crediting period.

B.2.7. Types of changes specific to afforestation or reforestation project activity

>>
Not applicable.

SECTION C. Description of monitoring system

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The monitoring plan ensures that the project emission reductions are accurately monitored, recorded and reported.

Note that in accordance with Version 03.0.0 of the 'Tool to calculate the emission factor of an electricity system', the grid emission factor is fixed ex-ante and is determined once at validation stage. No monitoring and recalculation of the emission factor during the crediting period is required.

The monitoring system includes the electricity meters installed at both the generating unit's connection point (Sol Plaatje and Merino sites). There is a bidirectional meter recording imports and exports of energy for each of the two facilities, as well as a check meter in each facility. The total net electricity generation is obtained from the sum of the net electricity generation from both main meters (Sol Plaatje and Merino).

The meters details for the Sol Plaatje Power Plant is as below:

Sol Plaatje	Main Meter:	Check Meter:
Meter type:	ISKRA MT860s	ISKRA MT831
Accuracy:	Class 0.2s	Class 0.5s
Serial number:	41506004	35597712
Last calibration:	2016/03/29	2016/03/29
Meter functionality:	Bidirectional	Bidirectional

The meters details for the Merino Power Plant is as below:

Merino	Main Meter:	Check Meter:
Meter type:	ELSTER A1700	ELSTER A1700
Accuracy:	Class 0.5s	Class 0.5s
Serial number:	41101303	41101301
Last calibration:	2015/07/10	2015/07/10
Meter functionality:	Bidirectional	Bidirectional

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

Data/parameter:	$EF_{grid,y}$
Unit	tCO2/MWh
Description	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
Source of data	ASB0001 “Standardized baseline: Grid emission factor for the Southern African power pool”, (Version 01.0)
Value(s) applied)	0.9488
Choice of data or measurement methods and procedures	No direct measurements are required. The combined margin emission factor “applicable to all project activities other than wind and solar for the second or third crediting period” from the ASB0001 “Standardized baseline: Grid emission factor for the Southern African power pool” (Version 01.0) has been used. This standardised baseline value will be used until its subsequent revision is made available.
Purpose of data	Used in the calculation of the baseline emissions.
Additional comments	This project activity meets the applicability criteria of the ASB0001 standardised baseline, in that it is situated in South Africa and is connected to the project electricity system. The grid emission factor is calculated ex-ante.

D.2. Data and parameters monitored

Data/parameter:	$EG_{PJ,facility,y}$
Unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)
Measured/calculated/default	Measured
Source of data	Electricity meters installed at both the generating unit’s connection point (Sol Plaatje and Merino sites).

Value(s) of monitored parameter

Month	$EG_{PJ,y}$	$EG_{facility\ Sol\ Plaatje,y}$	$EG_{facility\ Merino,y}$
	MWh/month	MWh/month	MWh/month
Dec-13	1 986	1 315	671
Jan-14	2 939	1 245	1 694
Feb-14	2 974	1 139	1 835
Mar-14	3 309	1 217	2 093
Apr-14	3 709	1 458	2 251
May-14	3 977	1 601	2 376
Jun-14	4 083	1 561	2 522
Jul-14	3 946	1 526	2 420
Aug-14	4 409	1 556	2 852
Sep-14	3 785	1 500	2 285
Oct-14	3 354	1 341	2 012
Nov-14	3 079	1 335	1 744
Dec-14	3 007	1 345	1 662
Jan-15	2 875	1 148	1 727
Feb-15	2 513	890	1 622
Mar-15	3 569	1 446	2 123
Apr-15	3 623	1 461	2 162
May-15	3 903	1 543	2 360
Jun-15	3 973	1 519	2 455
Jul-15	4 184	1 598	2 586
Aug-15	4 132	1 604	2 528
Sep-15	3 354	1 398	1 957
Oct-15	3 275	1 339	1 937
Nov-15	2 983	1 356	1 627
Dec-15	3 022	1 156	1 866
Jan-16	2 115	830	1 285
Feb-16	1 861	962	899
Mar-16	3 035	1 177	1 858
Apr-16	3 579	1 260	2 319
May-16	3 978	1 561	2 418
Jun-16	3 991	1 508	2 484
Jul-16	4 209	1 609	2 599
Aug-16	4 105	1 478	2 628
Sep-16	3 860	1 507	2 353
Oct-16	810	315	495
Total	117 507	46 803	70 704

<table>
<tr><td>Monitoring equipment</td><td>The meters details for the Sol Plaatje Power Plant is as below:
<table>
<tr><td><u>Sol Plaatje</u></td><td><u>Main Meter:</u></td><td><u>Check Meter:</u></td></tr>
<tr><td>Meter type:</td><td>ISKRA MT860s</td><td>ISKRA MT831</td></tr>
<tr><td>Accuracy:</td><td>Class 0.2s</td><td>Class 0.5s</td></tr>
<tr><td>Serial number:</td><td>41506004</td><td>35597712</td></tr>
<tr><td>Previous calibration</td><td>2011/06/02</td><td>2011/06/02</td></tr>
<tr><td>Last calibration:</td><td>2016/03/29</td><td>2016/03/29</td></tr>
<tr><td>Meter functionality:</td><td>Bidirectional</td><td>Bidirectional</td></tr>
</table>
The meters details for the Merino Power Plant is as below:
<table>
<tr><td><u>Merino</u></td><td><u>Main Meter:</u></td><td><u>Check Meter:</u></td></tr>
<tr><td>Meter type:</td><td>ELSTER A1700</td><td>ELSTER A1700</td></tr>
<tr><td>Accuracy:</td><td>Class 0.5s</td><td>Class 0.5s</td></tr>
<tr><td>Serial number:</td><td>41101303</td><td>41101301</td></tr>
<tr><td>Previous calibration</td><td>2012/03/19</td><td>2012/03/19</td></tr>
<tr><td>Last calibration:</td><td>2015/07/10</td><td>2015/07/10</td></tr>
<tr><td>Meter functionality:</td><td>Bidirectional</td><td>Bidirectional</td></tr>
</table>
During this monitoring period the bidirectional meter at the Merino site did not record the electricity consumption on site. As such a conservative approach has been taken to estimate the electricity consumption on site, by assuming that the auxiliary equipment operated at maximum capacity for the full monitoring period. This equipment included lighting, sump pumps, battery charger, and a dewatering pump. As per the project standard, the estimation included an additional 10% of electricity consumption to account for transmission and distribution losses. The calculations have been compared and cross checked with actual electricity consumption invoices billed by the utility.</td></tr>
<tr><td>Measuring/reading/recording frequency:</td><td>Continuous real time monitoring, with a daily download of data and monthly recording thereof.</td></tr>
<tr><td>Calculation method (if applicable):</td><td>The quantity of net electricity supplied by the project will be calculated by the difference between:
(a) The quantity of electricity supplied by the project plant to the grid; and
(b) The quantity of the electricity delivered to the project plant from the grid.</td></tr>
<tr><td>QA/QC procedures:</td><td>According to the National Standard for Metering (NRS-057), the meters need to be at least of Class 1. Meters' calibration to be checked by accredited calibration authority every 3 (three) years.</td></tr>
<tr><td>Purpose of data:</td><td>Used in the calculation of the project emission reductions</td></tr>
<tr><td>Additional comments:</td><td>Calibration of the Sol Plaatje meters took place on 2016/03/29. The previous calibrations of the Sol Plaatje meters were carried out on 2011/06/02. Calibration of the Merino meters took place on 2015/07/10. The previous calibrations of the Merino meters took place on 2012/03/19.

During the monitoring period the electricity meters had a delayed calibration test. No error over the permissible error was detected. As such, a conservative approach was taken and the maximum permissible error of the meters was applied to the electricity generation and consumption figures for the period of the delayed calibration. This is as per the "CDM validation and verification standard", Version 09.0, paragraph 395(a).</td></tr>
</table>

D.3. Implementation of sampling plan

>>

A sampling plan does not form part of this project activity. This section is not applicable.

SECTION E. Calculation of emission reductions or GHG removals by sinks

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

>>

According to the methodology AMS-I.D, version 18.0, the baseline emissions are calculated as the product of quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity multiplied by the grid emission factor (equation (1) of the methodology).

$$BE_y = EG_{PJ,y} * EF_{grid,y}$$

BE_y = Baseline emissions in year y (t CO_2)

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

$EF_{grid,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO_2/MWh)

As per the applied Southern African power pool standardized baseline, ASB0001, version 01.0:

$EF_{grid,y}$ = 0.9488 t CO_2/MWh

The calculation of $EG_{PJ,y}$ for greenfield power plants are calculated according to equation (2) of the methodology as:

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

Where:

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

A sample calculation of $EG_{PJ,y}$ for the full monitoring period is presented below.

$$EG_{PJ,y} = EG_{facility,y} = 46803 \frac{MWh_{Sol\ Plaatje}}{monitoring\ period} + 70704 \frac{MWh_{Merino}}{monitoring\ period}$$
$$= 117507 \frac{MWh}{monitoring\ period}$$

With this value BE_y was then calculated using Equation 1.

A sample calculation of BE_y for the full monitoring period is presented below.

$$BE_y = 117507 \frac{MWh}{monitoring\ period} * 0.9488 \frac{tCO_2e}{MWh} = 111491 \frac{tCO_2e}{monitoring\ period}$$

E.2. Calculation of project emissions or actual net GHG removals by sinks

>>

According to the AMS-I.D. methodology (version 18.0) project emissions (PE_y) for most renewable energy project activities are equal to zero.

However, for the following categories of project activities, project emissions have to be considered following the procedure described in the most recent version of "ACM0002: Grid-connected electricity generation from renewable sources" (Version 16.0):

a. Emissions related to the operation of geothermal power plants (e.g. non-condensable gases, electricity/fossil fuel consumption);
b. Emissions from water reservoirs of hydro power plants.

Point a) does not apply to this project activity as it is not a geothermal power plant. Point b) does apply to this project activity as there is an existing water reservoir, the Sol Plaatje Dam, at the one turbine. However the existing reservoir is not used as a storage facility for dispatch production of energy. Instead, the facility only utilises the water as and when the water flows out the dam, and thus the facility does not affect the water volumes of the dam.

According to ACM0002, version 16.0 the emissions from water reservoirs of hydro power plants ($PE_{HP,y}$) are calculated depending on the value of the power density (PD) of the project activity, which is calculated according to equation (3) of the methodology as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where:

PD	=	Power density of the project activity (W/m^2)
Cap_{PJ}	=	Installed capacity of the hydro power plant after the implementation of the project activity (W)
Cap_{BL}	=	Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero
A_{PJ}	=	Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m^2)
A_{BL}	=	Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero.

In this project activity the difference between $A_{PJ} - A_{BL}$ is zero as the project activity has not changed the water volume of the dam. The volume of water in the dam is not affected by the project activity but only by the water requirements of the town where the water is being delivered. Only as and when the water is transported to the town for consumption is the project activity able to produce power. The facility does not use the reservoir as a storage facility for dispatch energy production.

With power density (PD) equation being divide by zero it results in a PD = ∞, infinity. According to paragraph 45 of the large scale methodology ACM0002, version 16.0, if PD > 10 W/m^2 then $PE_{HP,y} = 0$, equation (6) of the methodology.

In addition, according to methodology AMS-I.D version 18.0, CO_2 emissions from on-site consumption of fossil fuels due to the project activity shall be calculated using the latest version of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion". However the

project activity does not consume any diesel on site. The project activity used to have a backup diesel generator on site. However this has now been removed and there are thus no project emissions related to fossil fuel consumption.

As such project emission for this project activity are equal to zero, $PE_y = 0$.

E.3. Calculation of leakage

>>

According to methodology AMS-I.D, version 18.0, leakage emissions only apply to biomass project activities. Thus leakage emissions are zero for this project activity.

E.4. Summary of calculation of emission reductions or net GHG removals by sinks

Item	Baseline emissions or baseline net GHG removals by sinks (t CO_2e)	Project emissions or actual net GHG removals by sinks (t CO_2e)	Leakage (t CO_2e)	GHG emission reductions or net GHG removals by sinks (t CO_2e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
Total	111,491	0	0	0	111,491	111,491

E.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO_2e)	92,175 metric tonnes CO_2 equivalent (prorated over the monitoring period = 34 months and 7 days)	111,491

E.6. Remarks on difference from estimated value in registered PDD

>>The calculated emission reductions achieved during this monitoring period is 21% higher than the PDD estimation of the emission reductions for this period. The increase is due to 21% higher generation by the power plants which is related to a greater plant availability during this period than assumed in the PDD. The increased generation is related to the increased water flows from the Lesotho Highlands Water Project during this monitoring period due to the extreme droughts in the region.

Appendix 1. Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	☒ Project participant ☐ Person/entity responsible for completing the CDM-MR-FORM
Organization name	Statkraft Markets BV
Street/P.O. Box	Gustav Mahlerplein 100
Building	ITO Building
City	Amsterdam
State/region	
Postcode	1082 MA
Country	The Netherlands
Telephone	+31 (20) 795 78 00
Fax	+31 (20) 795 78 99
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Project participant and/or responsible person/ entity	☒ Project participant ☐ Person/entity responsible for completing the CDM-MR-FORM
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Project participant and/or responsible person/ entity	☐ Project participant ☒ Person/entity responsible for completing the CDM-MR-FORM
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