Longyuan Mulilo De Aar 2 North Wind Energy Facility Monitoring Report (01/01/2022 – 31/12/2022)

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Project Title	Longyuan Mulilo De Aar 2 North Wind Energy Facility
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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The project comprises only one activity – a single wind farm with the total installed capacity of 144 MW, which was implemented close to the town of De Aar in the Northern Cape Province of the Republic of South Africa (RSA). 96 x UP86 turbines, supplied by United Power, are employed by the project.

The EPC contract was signed on 06/02/2015. The wind farm started commercial operation on 31/10/2017 and continues operating. The project lifetime is 20 years.[1]

The total GHG emission reductions covered in this monitoring report are 409,302 tCO2e.

Audit Type	Period	Program	VVB Name	Number of years
Validation	22-February-2021	VCS	Carbon Check (India) Pvt. Ltd.	-
Verification	01-November-2017 -- 31-December-2020	VCS	Carbon Check (India) Pvt. Ltd.	3 years and 2 months
Verification	01-January-2021 -- 31-December-2021	VCS	TÜV SÜD South Asia Pvt. Ltd.	1
Verification	01-January-2022 -- 31-December-2022	VCS	EcoLance Private Limited	1
Total	01-November-2017 --31-December-2022	VCS	-	5 years and 2 months

1.2 Sectoral Scope and Project Type

This project falls under sectoral scope: 1. Energy (renewable/non-renewable).

[1] Please refer to the Project Description (version 02, 26/10/2019) for the references to the information provided in Section 1 of this Monitoring Report

Project type is Renewable energy. Displacement of electricity that would be provided to the grid by more-GHG-intensive means.

This is not a grouped project.

1.3 Project Proponent

Organization name	Blue World Carbon Asset Management (Pty) Ltd (Primary project Proponent)
Contact person	Ilya Goryashin
Title	General Manager
Address	37 Danville Avenue, Durban North, Kwa-Zulu Natal Province, South Africa, 4051
Telephone	+27790908139
Email	Ilya.goryashin@blueworldcarbon.com

Organization name	Longyuan Mulilo De Aar 2 North (RF) (Pty) Ltd
Contact person	Frank Galant
Title	Asset Manager
Address	1st Floor, Mazars house, Rialto road, Grand Moorings Precinct, Century City, 7441
Telephone	+27(0) 21 685 3240
Email	info@mulilo.com

1.4 Other Entities Involved in the Project

Not applicable

1.5 Project Start Date

31/10/2017, the day when the wind farm started commercial operation.

1.6 Project Crediting Period

01 November 2017 (00:00) – 31 October 2027 (24:00); 10-year fixed total period.

1.7 Project Location

The project is located on Farm 136 (Portion 1 and Portions 6), 148 (Portions 2, 4 and Remainder), 165 (Portion 1 and Portion 7), 149 (Portion 1), 150 (Portion 4 and Remainder), 151 (Portion 1 and Portion 2) outside of the town of De Aar. De Aar is the main town of the Emthanjeni Local Municipality located in the Northern Cape Province of the RSA (Figure 1.7-1 and Figure 1.7-2).

Geographical latitude: -30.538320. Geographical longitude: 24.262329. Time zone: UTC+2.

Figure 1.7-1: Location of De Aar in the Republic of South Africa

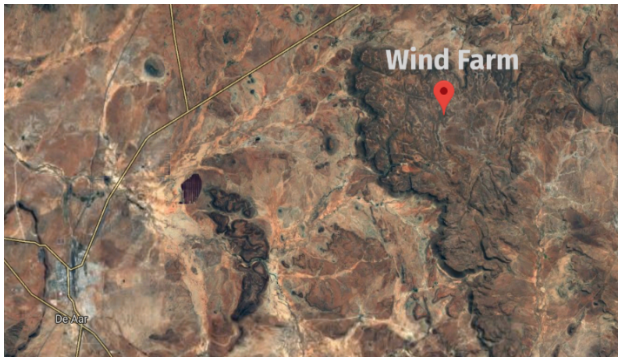


Figure 1.7-2: The wind farm site

The GPS coordinates of wind turbines is specified in Table below:

Item	As Built (Latitude & Longitude)	Item	As Built (Latitude & Longitude)	Item	As Built (Latitude & Longitude)
1	S30°30'39.18" E24°13'41.82"	33	S30°32'0.6" E24°24'34.68"	65	S30°32'19.62" E24°17'59.46"
2	S30°31'30.3" E24°13'58.26"	34	S30°31'45.18" E24°24'16.26"	66	S30°32'41.52" E24°17'14.1"
3	S30°31'39.84" E24°13'30.42"	35	S30°32'52.86" E24°14'50.88"	67	S30°30'56.52" E24°24'20.34"
4	S30°31'22.02" E24°23'10.92"	36	S30°32'35.16" E24°15'15.18"	68	S30°32'45.72" E24°17'40.08"
5	S30°32'24.18" E24°13'50.88"	37	S30°32'21.54" E24°15'17.22"	69	S30°31'26.58" E24°24'1.8"
6	S30°33'1.14" E24°18'51.96"	38	S30°31'48.12" E24°13'51.3"	70	S30°31'57.9" E24°18'26.04"

Item	As Built (Latitude & Longitude)	Item	As Built (Latitude & Longitude)	Item	As Built (Latitude & Longitude)
7	S30°30'32.7" E24°13'50.82"	39	S30°31'11.46" E24°23'34.68"	71	S30°31'29.34" E24°18'22.68"
8	S30°30'52.08" E24°13'38.76"	40	S30°32'25.68" E24°15'51.84"	72	S30°31'11.88" E24°18'22.5"
9	S30°31'22.74" E24°13'37.2"	41	S30°31'10.92" E24°24'4.8"	73	S30°30'54.96" E24°18'30.66"
10	S30°31'29.46" E24°13'26.76"	42	S30°31'53.76" E24°16'22.02"	74	S30°30'53.28" E24°18'48.66"
11	S30°31'54.42" E24°13'25.8"	43	S30°31'41.34" E24°16'32.64"	75	S30°31'10.98" E24°18'37.5"
12	S30°30'58.44" E24°14'0"	44	S30°31'24.84" E24°16'41.28"	76	S30°31'40.2" E24°18'38.28"
13	S30°30'39.96" E24°14'17.76"	45	S30°31'11.28" E24°16'58.62"	77	S30°32'22.32" E24°25'10.44"
14	S30°30'40.38" E24°14'39.18"	46	S30°30'57.24" E24°16'59.22"	78	S30°32'44.04" E24°18'53.46"
15	S30°30'40.68" E24°14'54.9"	47	S30°31'5.58" E24°17'23.58"	79	S30°31'28.8" E24°24'48.18"
16	S30°30'54.6" E24°14'59.1"	48	S30°30'46.8" E24°23'47.82"	80	S30°33'0.12" E24°19'21.24"
17	S30°30'55.8" E24°14'43.14"	49	S30°31'45.18" E24°16'51.54"	81	S30°32'25.08" E24°24'42.3"
18	S30°30'53.16" E24°14'23.88"	50	S30°31'41.52" E24°17'53.28"	82	S30°33'44.7" E24°19'17.52"
19	S30°31'12.42" E24°14'30.18"	51	S30°30'59.82" E24°23'44.04"	83	S30°33'27.72" E24°19'19.62"
20	S30°31'21.66" E24°14'55.38"	52	S30°31'53.76" E24°17'31.44"	84	S30°31'26.58" E24°24'22.56"
21	S30°31'12.24" E24°15'12.24"	53	S30°32'7.98" E24°17'423.6"	85	S30°32'13.44" E24°24'21.42"
22	S30°31'1.26" E24°15'31.68"	54	S30°32'27.36" E24°16'46.02"	86	S30°31'28.44" E24°25'11.4"
23	S30°31'19.5" E24°15'36.36"	55	S30°32'46.98" E24°16'19.8"	87	S30°31'18.72" E24°25'25.2"
24	S30°31'34.68" E24°15'14.76"	56	S30°33'43.98" E24°16'33.72"	88	S30°31'36.84" E24°25'39.9"
25	S30°31'18" E24°23'22.44"	57	S30°33'27.24" E24°15'53.46"	89	S30°32'11.82" E24°23'53.1"
26	S30°32'0.84" E24°15'44.88"	58	S30°33'29.94" E24°16'22.14"	90	S30°32'28.26" E24°23'54.84"
27	S30°31'48.18" E24°15'52.44"	59	S30°33'7.44" E24°16'26.4"	91	S30°32'25.32" E24°25'3.42"
28	S30°31'18.24" E24°16'5.76"	60	S30°30'33.78" E24°23'48.48"	92	S30°31'50.28" E24°25'3.42"
29	S30°31'45.18" E24°24'16.26"	61	S30°32'25.08" E24°17'12.6"	93	S30°32'4.74" E24°25'16.86"
30	S30°32'20.46" E24°14'27.36"	62	S30°30'42.48" E24°24'23.58"	94	S30°32'12.72" E24°25'35.22"
31	S30°32'3" E24°14'28.98"	63	S30°32'0.78" E24°18'2.34"	95	S30°32'8.76" E24°23'30"

Item	As Built (Latitude & Longitude)	Item	As Built (Latitude & Longitude)	Item	As Built (Latitude & Longitude)
32	S30°32'9.84" E24°14'46.08"	64	S30°31'44.34" E24°18'25.02"	96	S30°31'55.8" E24°23'38.4"

1.8 Title and Reference of Methodology

ACM0002: "Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources" (Version 19.0)[2]

TOOL01: "Methodological tool: Tool for the demonstration and assessment of additionality" (Version 07.0.0)[3]

TOOL05: "Methodological tool: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (Version 03.0)[4]

TOOL24: "Methodological tool: Common practice" (Version 03.1)[5]

TOOL27: "Methodological tool: Investment analysis" (Version 09.0)[6]

1.9 Participation under other GHG Programs

The project was not seeking registration under Other GHG Programs.

1.10 Other Forms of Credit and Supply Chain (Scope 3) Emissions

The project has never been included in an emissions trading program or any other Binding Limits.

The project has nether sought or received other Forms of Environmental Credit.

The project does not affect emissions associated with a good or service.

1.11 Sustainable Development Contributions

The project comprises only one activity – a single wind farm with the total installed capacity of 144 MW, which was implemented close to the town of De Aar in the Northern Cape Province of the Republic of South Africa. 96 x UP86-1.5MW turbines, supplied by Guodian United Power, are employed by the project.

[2] https://cdm.unfccc.int/methodologies/DB/VJI9AX539D9MLOPXN2AY9UR1N4IYGD (this version of the methodology will be applied throughout the whole document)

[3] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf (this version of the tool will be applied throughout the whole document)

[4] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v3.0.pdf (this version of the tool will be applied throughout the whole document)

[5] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-24-v1.pdf (this version of the tool will be applied throughout the whole document)

[6] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-27-v9.0.pdf (this version of the tool will be applied throughout the whole document)

Electricity generated by the project is fed into the electricity grid of the Southern African Power Pool (SAPP), where South Africa is represented by Eskom, displacing energy that would have otherwise be generated by the operation of the grid-connected power plants of the SAPP and by the addition of new generation sources that is reflected in the combined margin CO_2 emission factor of 0.9871 t CO_2/MWh adopted for the electricity system of the SAPP.

As part of regional development efforts associated with this wind project and the sister registered VCS project 1949, Longyuan Mulilo De Aar 2 North (RF) (Pty) Ltd (Longyuan Mulilo) has:

- Initiated a Longyuan Mulilo Health Project to provide health services, including primary healthcare, dental, eye clinic and COVID-19 related services to students, educators and community members around the project using a Mobile Health Clinic (MHC), which was donated to the Department of Health to screen up to 8 800 learners annually on a permanent base. Areas visited by the MHC to date include St Johns Primary School, Emthanjeni Primary School, Orion High School, Monwabisi High School, Veritas High School, De Aar Town Clinic, Hoerskool Theron School, Montana Clinic, Nonzwakazi Clinic etc.;
- Launched Maths Enrichment Program aiming at improving the results of the subjects in the local schools through resourcing the learners, stimulating interest in the subjects, and creating opportunities to study further in subject related tertiary courses. The enrichment program also aims to encourage more leaners to take Maths and Science to Grade 12 level. Longyuan Mulilo's funding contributions went for salaries, student allowances, student study sponsorship, running cost and management fees;
- Launched a Bursary Programme for tertiary studies to support students, which among others includes covering of tuition fees, institution's registration fees and accommodation fees, as well as book allowance per annum, food stipend (if the student applied and qualified) and laptops. Students are selected based on financial circumstances and targeting those that could not have attended tertiary education without support of the bursary programme. Annual budget of R4 000 000 was allocated to the Bursary Programme;
- Renovated the 3 Early Childhood Development (ECD) Centres: Kaalvoet Akademie ECD, Karoo Druppels ECD and Mthuthuzeli Daycare ECD, with the long term impact to provide quality early childhood development programmes and services for the benefit of young children, their families and the communities and by also improving quality of early childhood development in Emthenjeni and Renosterberg regions of South Africa. Longyuan Mulilo contributes towards salaries, food and other support;

- Upgraded the house and assisted with reparations of the Safe Haven located in Philipstown, which aim is to serve and help the abused women and children of Philipstown;
- Funded the rehabilitation of the water supply system of Philipstown. 5 existing boreholes were cleaned and re-equipped, 1 new borehole was drilled.

Furthermore, Longyuan Mulilo has:

- Increased the share of renewable energy in the energy mix (South African and global);
- Contributed to the development of the resilient grid infrastructure of South Africa by reducing the pressure on the generation capacity of the grid-connected power plants;
- Prevented the release of CO_2 emissions into the atmosphere.

Table 1: Sustainable Development Contributions[7]

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	3.8	3.8.1 Coverage of essential health services	Implemented activities to increase	8,029 people have been screened. The total number of services is 32,116 which include 8,029 dental, 8,029 optometry screenings, 8,029 primary healthcare screenings, and 8,029 COVID-19 screenings.	1 mobile health clinic was donated to the Department of Health to screen up to 8,800 learners annually on a permanent base by both this Project 1949 and sister Project 1950. 51,098 people have been screened over the project lifetime due to this Project 1950.
2)	4.1	4.1.1 Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex	Implemented activities to increase	2,700 leaners (from grades 1-7 and 10-12) went through the Math enrichment program in 2022, a further 90 leaners added benefit to in the form of exposure to robotics offerings	Maths enrichment program was launched for learners in the 10 primary schools and 4 high schools by both this Project 1950 and sister Project 1949. 1,158 leaners went through the programme in 2018, 1,416 in 2019, 1,461 in 2020, 5 in 2021, and 2,700 in 2022 due to this Project 1950.

[7] Between this Project 1950 and sister Project 1949, the following Sustainable Development Contributions were allocated to this Project 1950.

3)	4.2	The number of children enrolled in early childhood development centers	Implemented activities to increase	Kaalvoet Akademie: 41 children were enrolled in 2022. 22 children finished school.	3 Early Childhood Development Centers were renovated by both this Project 1950 and sister Project 1949. Longyuan Mulilo contributes towards salaries, food, supporting children between the ages of 2 and 6 years. Over 172 underprivileged children attended the ECD from the community due to this Project 1950.
4)	4.3	4.3.1 Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex	Implemented activities to increase	Bursary Programme supported 25 students (including 10 new) in 2022.	65 students were supported by the Bursary programme due to this Project 1950.
5)	4.b	4.b.1 Volume of official development assistance flows for scholarships	Implemented activities to increase	Bursary Programme budget was R 2,500,000 in 2022	Bursary programme has spent a total of R 9,338,350.22 to the end of 2022 due to this Project 1950.

6)	6.1	6.1.1 Proportion of population using safely managed drinking water services	Implemented activities to increase	-	The estimated current water demand for Philipstown is 1,130 kl per day. Previously they could only extract about 580 kl per day which did not meet the demand. When all five new pumps are running the total ground water abstraction amounts to 1,236 kl per day which does meet the demand. The water is provided to 3,251 people due to this Project 1950.
7)	7.2	By 2030, increase substantially the share of renewable energy in the global energy mix	Implemented activities to increase	The project has supplied 414,708 MWh of wind-generated electricity into the grid of South Africa in 2022.	The project has supplied 2,333,893 MWh of wind-generated electricity into the grid of South Africa.

8)	9.1	Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all	Implemented activities to increase	The project has supplied 414,708 MWh of wind-generated electricity into the grid of South Africa in 2022	The total installed capacity of the project is 144 MW. The project has supplied 2,333,893 MWh of wind-generated electricity into the grid of South Africa.
9)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to decrease	By supplying wind-generated electricity to the grid, the project has prevented the release of 409,302 tCO_2e into the atmosphere during the reporting period	Prevented the release of 2,303,532 t CO_2e into the atmosphere due to this Project 1950

2 SAFEGUARDS

2.1 No Net Harm

The wind power is one of the cleanest sources of renewable energy, with no associated emissions and waste products. Socio-economic impact is positive. Possible negative impacts are discussed in the ensuing paragraphs below:

1) Impact on biodiversity and ecosystems

Reptiles may be forced out of their underground shelters during the construction phase. Birds and bats may be impacted through collision with the blades of the wind turbines as well as collision with the associated power line during the operational phase.

Proposed mitigation measures: Length of road and cable trenches shall be reduced; relocation of facility to a lower sensitivity area; adjusting the schedule of operational turbines according to the results of ongoing monitoring of the bird and bat numbers and movement in the area; minimising the length of any new power lines.

2) Noise impact

The noise from construction machines has some impact on the surrounding area during the construction phase, which will only have a localized effect and is not expected to increase the ambient noise levels in nearest towns.

Proposed mitigation measures: all equipment should be maintained regularly and have appropriately filled silencers; personal should be specially trained. When working near to potentially sensitive receptor, coordinate the working time with periods when the receptors are not at home where possible.

During the operation phase the cumulative contribution of the wind turbines and the transformer substation on the noise environment at the communities around the site will be within acceptable levels.

3) Impact on natural resources

The impact on the natural resources is the loss of arable land due to the construction of the turbines and associated infrastructure. However, most of the current cultivation or grazing practices will still be possible between the structures.

Proposed mitigation measures: Monitoring of the noise level

4) Impact on the atmosphere

The main impact is related to formation of dust during the construction period from land excavation and transportation vehicles. It should be mentioned that combustion of fossil fuels (mostly coal) at the Eskom power stations and hereby emissions of the harmful substances into the atmosphere, such as flue ash, oxides of sulphur and nitrogen will be reduced due to the project implementation.

Proposed mitigation measures: Dust pollution monitoring and following procedures for dealing with dust pollution

2.2 Local Stakeholder Consultation

The project owner appointed Aurecon South Africa (Pty) Ltd to undertake the Scoping and Environmental Impact Assessment and associated Public Participation Process (PPP) in terms of the NEMA EIA Regulations and VCS requirement.

Public Advertisements were placed in Local newspapers, the Echo and Die Volksblad, notifying the broader public of the initiation of the EIA and inviting them to register as Interested and Affected Parties (I&APs) from 4 November 2011.

Holding a public meeting on Wednesday, 30 November 2011 to present and discuss the findings of the DSR at the De Aar Civic Hall from 16:00-18:00. Notes of the public meeting were sent to all those who attended on 8 November 2011.

I&APs had 40 days, until the 5 January 2012 to submit their written comments on the DSR, however due to a mailing error the period was extended to 9 January 2012. Cognisance was taken of all comments when compiling the final report, and the comments, together with the project team and proponent's responses thereto, were included in final report.

The Final Scoping Report (FSR) was made available to the public for review and comments until 7 February 2012 at the same locations as the DSC from 18 January 2012. All registered I&APs were informed of the lodging of the FSR by means of a letter posted on 17 January 2012. The FSR outlined the full range of potential environmental impacts and feasible project alternatives and how these were derived. Moreover, it included a Plan of Study for EIA, which outlined the proposed approach to the EIA phase, including the requisite specialist investigations to be undertaken.

The further details are given in the final EIA report.

Longyuan Mulilo has a Grievance Procedure in place, which is also used for documenting the outcomes of the local stakeholder communication. Grievance Procedure explains the mechanism for on-going communication with local stakeholders.

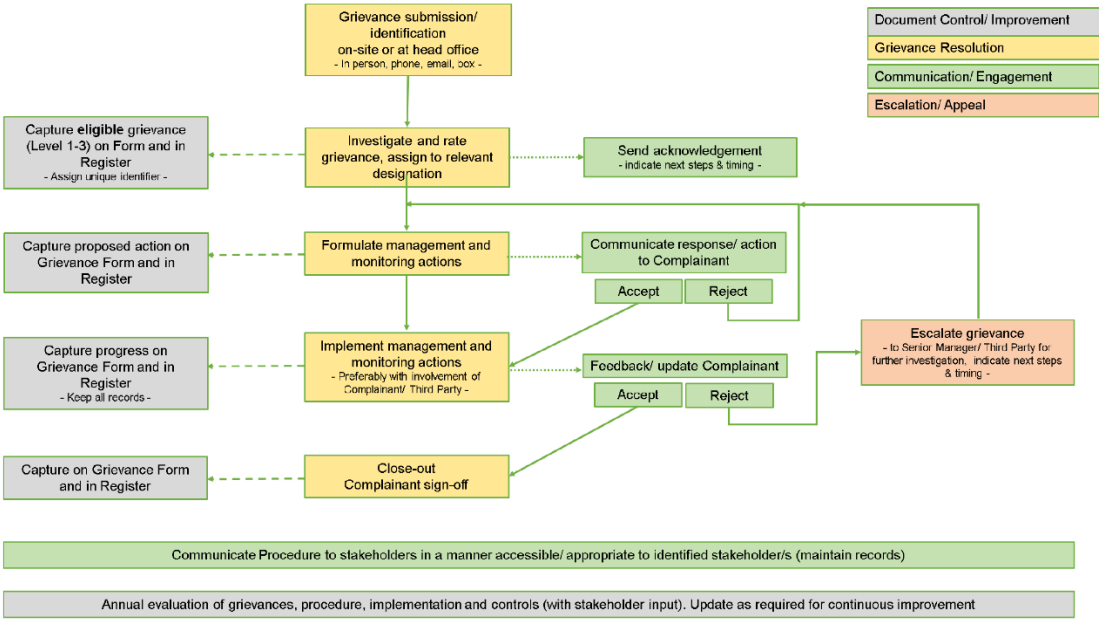
Stakeholders can submit grievances or complaints using any of the methods made available that they feel comfortable with. A range of submission methods are available given the varying capabilities and access to resources across the diverse stakeholder groups. The submission methods that are available include:

- office telephone line that is available during office hours:
    - De Aar: 021 300 3487;
    - Cape Town: 021 685 3240.
- email to bertus@mulilo.com
- formal letter at the following addresses:
    - 20 van der Merwe Street, De Aar, 7000
- in-person to the following personnel; and
    - Beverley Horak (Project Administrator);
    - Andrew Doughty (SHEQ Manager).
- self-identification of external grievances by operational personnel/ representatives; this is encouraged as a pro-active approach to identify potential grievances.

Grievances, whether submitted via letter, e-mail or telephonically, must be captured on the Grievance form by the designated operational representatives listed above. Stakeholders will be encouraged to use a Grievance form that are available on request (via telephone call, e-mail) and at the office address specified above.

Anonymous submissions are acceptable.

Grievance Management Process are as follows:



No issues, concerns, problems, or claims have been lodged or raised through the Grievance Procedure.

2.3 AFOLU-Specific Safeguards

Not applicable, this is not an AFOLU project.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project was implemented without any changes comparing with the VCS PD. The wind farm started commercial operation on 31/10/2017 and has being operating without events that could impact the GHG emission reductions or removals and monitoring.

In this monitoring period there were some downtime due to planned repairs.

This is not an AFOLU project.

3.2 Deviations

3.2.1 Methodology Deviations

Not applicable, there are no methodology deviations applied during this monitoring period.

3.2.2 Project Description Deviations

Not applicable, there are no project description deviations applied during this monitoring period. There were no project description deviations applied in previous monitoring reports (this is the third monitoring report).

3.3 Grouped Projects

Not applicable, this is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$EF_{grid,CM,y}$
Data unit	tCO_2/MWh

Description	Combined margin CO_2 emission factor for grid connected power generation calculated ex ante
Source of data	ASB0040-2018, Table 1, page 5
Value applied	0.9871
Justification of choice of data or description of measurement methods and procedures applied	Standardized baseline ASB0040-2018 is selected for the project. Table 1 of this standardized baseline provides the value of the combined margin CO_2 emission factor for the project electricity system applicable to wind and solar power generation for the determination of baseline emissions of 0.9871 t CO_2/MWh
Purpose of Data	Calculation of baseline emissions
Comments	This value was appointed as a constant for the whole crediting period

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{PJ,y}$
Data unit	MWh
Description	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project in year *y*
Source of data	On-site measurement by electricity meters, yielding the net electricity supplied to the grid of the RSA. There are two main meters installed in the De Aar 2 North IPP Substation on 132kV side. Each meter is accompanied with the check meter. Monthly reports with the records for delivered electricity to the Ndhlovu Eskom Substation are submitted by Eskom to PP
Description of measurement methods and procedures to be applied	There are two main meters installed in De Aar 2 North IPP Substation on 132kV side. Each meter measures the grid electricity export and the import from grid. PP calculates the difference between the measured quantities of the grid electricity export and the import from grid. Each meter is accompanied with the check meter for the cross check. The exported and imported electricity is continuously measured and recorded. Data are digitally archived at least on a monthly basis. On the Ndhlovu Eskom Substation measurement of the electricity supplied to the grid is also carried out by Eskom.

<table>
<tr><td></td><td>Monthly reports with the records for delivered electricity to the Ndhlovu Eskom Substation are submitted by Eskom to PP.

PP compares and calculates the difference between two measurements. The lowest value shall be used for calculations of the baseline emissions.

Longyuan Mulilo’s personal, including the plant manager, is responsible for implementation and overall control as well as collection of all data, and submits the data to BWC.</td></tr>
<tr><td>Frequency of monitoring/recording</td><td>Continuous measurement</td></tr>
<tr><td>Value monitored</td><td>Actual values for the purpose of calculation of GHG emission reductions archived:
<table><tr><th>Month</th><th>Month</th><th>Year</th><th>Value</th></tr><tr><td>January</td><td>1</td><td>2022</td><td>29,752.632000</td></tr><tr><td>February</td><td>2</td><td>2022</td><td>25,139.976000</td></tr><tr><td>March</td><td>3</td><td>2022</td><td>26,151.360001</td></tr><tr><td>April</td><td>4</td><td>2022</td><td>27,475.296010</td></tr><tr><td>May</td><td>5</td><td>2022</td><td>26,811.023991</td></tr><tr><td>June</td><td>6</td><td>2022</td><td>32,619.096019</td></tr><tr><td>July</td><td>7</td><td>2022</td><td>43,174.344005</td></tr><tr><td>August</td><td>8</td><td>2022</td><td>42,308.112011</td></tr><tr><td>September</td><td>9</td><td>2022</td><td>42,723.504009</td></tr><tr><td>October</td><td>10</td><td>2022</td><td>36,677.448000</td></tr><tr><td>November</td><td>11</td><td>2022</td><td>39,328.919989</td></tr><tr><td>December</td><td>12</td><td>2022</td><td>42,494.303982</td></tr></table></td></tr>
<tr><td>Monitoring equipment</td><td>The meter class is 0.2S.

Landis+Gyr E650 (or similar) electricity meters shall be used.

Serial numbers of currently installed main meters are: 37108386 and 37108384. Meters are installed at the on-site substation.</td></tr>
<tr><td>QA/QC procedures to be applied</td><td>Electricity meters are calibrated as per the requirements of the Power Purchase Agreement, clause 12.6.7, when the difference between measurements at the Ndhlovu Eskom Substation and De Aar 2 North IPP Substation is more than 0.5%. The meters were calibrated in 2017.</td></tr>
<tr><td>Purpose of the data</td><td>Calculation of baseline emissions</td></tr>
</table>

Calculation method	PP compares and calculates the difference between measurements in the De Aar 2 North IPP Substation and measurements in the Ndhlovu Eskom Substation. The lowest value shall be used for calculations of the baseline emissions.
Comments	-

4.3 Monitoring Plan

The following monitoring procedures are applied:

1. Monitoring period

This monitoring report covers the following monitoring period: 01-January-2022 to 31-December-2022.

2. Data monitored and sources

The generated electricity is continuously measured and recorded at least on monthly basis by the wind farm personnel. The quantity of net electricity generation that is produced and fed into the grid in year y is determined on the basis of electricity meters. There are two main meters installed in De Aar 2 North IPP Substation on 132kV side. Each meter is accompanied with the check meter (Figure 4.3-1).

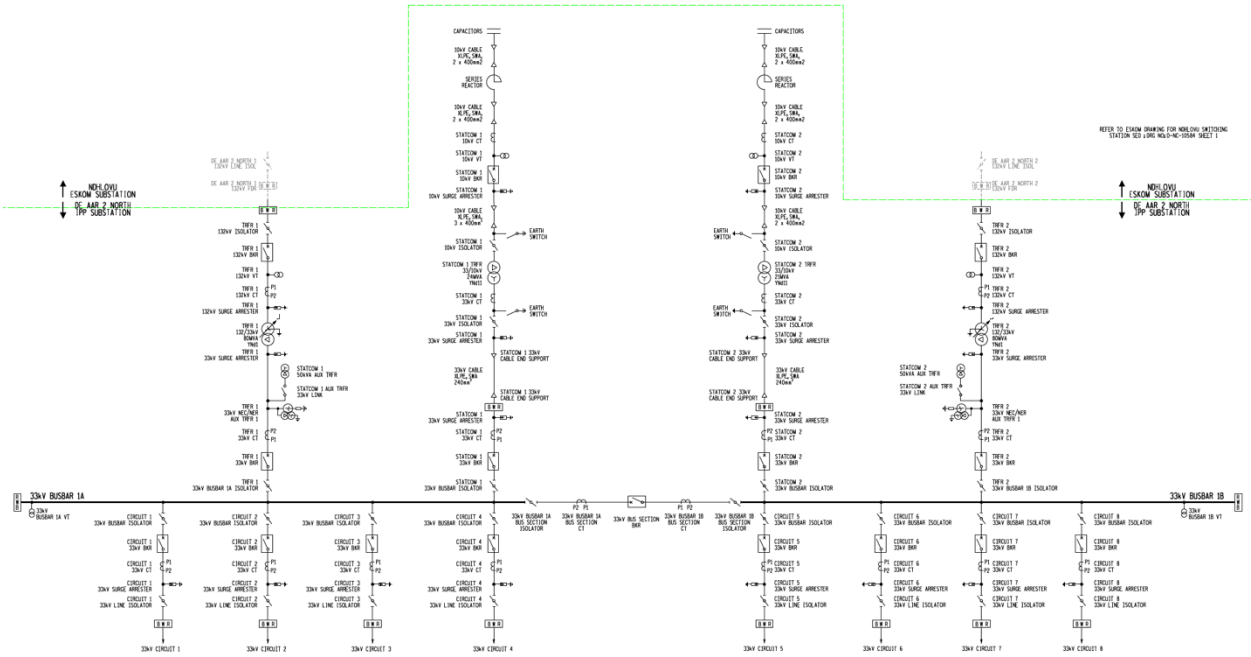


Figure 4.3-1: 132/33kV De Aar 2 North IPP Substation. Single Line Diagram

The metering instruments are installed in accordance with the requirements of the Grid and the Distribution Metering Codes at the point of supply which defines the commercial

boundary between the wind farm owner and the grid. Readings of the electricity meters are cross-checked with tax invoices and Eskom's monthly reports. Data on electricity supply are digitally archived and submitted to BWC.

The sources of data for calculation of GHG emission reductions in the course of monitoring are the records for delivered electricity to the RSA grid.

The emission reductions are calculated using the formulas in Section 3.2 of the VCS-PD.

3. The monitoring team

The wind farm staff underwent the necessary training related to operation and maintenance of the wind farm. The maintenance personnel of the wind farm are responsible for daily control over the monitoring plan implementation.

The Plant Manager of the wind farm is responsible for timely calibration of all instrumentation in accordance with the requirements of the power purchase agreement. Longyuan Mulilo's personal are responsible for implementation and overall control as well as collection and submission of all data to BWC.

Specialists of BWC calculate GHG emission reductions with data that are provided by Longyuan Mulilo.

In case of any doubts as to the accuracy of the data, the specialists of Longyuan Mulilo check and correct the data. The preliminary version of the monitoring report is submitted to the specialists of Longyuan Mulilo for review. In case any mistakes are found in the calculations of GHG emission reductions, the specialists of BWC correct these calculations accordingly.

4. Data storage

All data collected as part of monitoring plan are archived electronically and kept at least for 2 years after the end of the crediting period.

5. Instrumentation calibration

The instrumentation calibration and check-out are carried out in accordance with the requirements of the power purchase agreement. Longyuan Mulilo is responsible for the calibration or replacement of the meters.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The baseline emissions are calculated as follows:

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

Where:

BE_y = Baseline emissions in year *y* (tCO_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 project in year *y* (MWh)

$EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year *y* (tCO_2/MWh)

Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project

The following Tariff Meters are installed in the De Aar 2 NorthIPP Substation on 132kV side:

Tariff Meter	Serial Number
132/33KV TRFR1_(Main)	37108384
132/33KV TRFR1_(Check)	37108385
132/33KV TRFR2_(Main)	37108386
132/33KV TRFR2_(Check)	37108387

The tariff meters are equipped with the check meters.

The measured data from Tariff Meter 1 (main and check):

Month	Month	Year	Net electricity generation from the on-site meters (kWh)		
			TRFR1 (main) (37108384)	TRFR1 (check) (37108385)	BWC's Check 1
January	1	2022	15,382,128	15,382,845	-0.005%
February	2	2022	13,103,760	13,103,550	0.002%
March	3	2022	13,532,520	13,533,070	-0.004%
April	4	2022	14,034,792	14,035,745	-0.007%
May	5	2022	14,100,528	14,104,270	-0.027%
June	6	2022	16,756,464	16,756,100	0.002%
July	7	2022	22,196,856	22,194,195	0.012%
August	8	2022	22,099,632	22,104,205	-0.021%
September	9	2022	22,231,320	22,242,145	-0.049%

Month	Month	Year	Net electricity generation from the on-site meters (kWh)		
			TRFR1 (main) (37108384)	TRFR1 (check) (37108385)	BWC's Check 1
October	10	2022	19,209,192	19,200,200	0.047%
November	11	2022	20,081,472	20,081,340	0.001%
December	12	2022	21,857,448	21,864,355	-0.032%

The difference in meter readings does not exceed 0.049%.

The measured data from Tariff Meter 2 (main and check):

Month	Month	Year	Net electricity generation from the on-site meters (kWh)		
			TRFR2 (main) (37108386)	TRFR2 (check) (37108387)	BWC's Check 2
January	1	2022	14,370,504	14,368,175	0.016%
February	2	2022	12,036,216	12,028,405	0.065%
March	3	2022	12,619,920	12,611,600	0.066%
April	4	2022	13,442,520	13,437,930	0.034%
May	5	2022	12,719,832	12,718,545	0.010%
June	6	2022	15,865,200	15,853,125	0.076%
July	7	2022	20,991,312	20,981,705	0.046%
August	8	2022	20,226,384	20,215,720	0.053%
September	9	2022	20,493,984	20,495,255	-0.006%
October	10	2022	17,468,256	17,450,115	0.104%
November	11	2022	19,249,224	19,245,055	0.022%
December	12	2022	20,639,256	20,640,120	-0.004%

The difference in meter readings does not exceed 0.104%.

On the Ndhlovu Eskom Substation measurement of the electricity supplied to the grid is also carried out by Eskom and captured on the Eskom's Payment Certificates:

Month	Month	Year	Eskom Payment Certificates		BWC's Check 3
			Metered	Commercial Energy	
January	1	2022	29,752,632.011	29,752,632.010	0.000%
February	2	2022	25,139,976.006	25,139,976.010	0.000%
March	3	2022	26,151,360.001	26,151,360.000	0.000%
April	4	2022	27,475,296.010	27,475,296.010	0.000%
May	5	2022	26,811,023.991	26,811,023.990	0.000%
June	6	2022	32,619,096.019	32,619,096.020	0.000%
July	7	2022	43,174,344.005	43,174,344.010	0.000%
August	8	2022	42,308,112.011	42,308,112.01	0.000%
September	9	2022	42,723,504.009	42,723,504.010	0.000%
October	10	2022	36,677,448.005	36,677,448.010	0.000%
November	11	2022	39,328,919.989	39,328,919.990	0.000%
December	12	2022	42,494,303.982	42,494,303.980	0.000%

The lowest values between the measured by Eskom and the on-site measured by Tariff Meters are used for the calculations of the baseline emissions:

Month	Month	Year	KWh used to calculate the baseline emissions		
			Total TRFR1 (main) + TRFR2 (main)	Metered by Eskom	Minimum value
January	1	2022	29,752,632.000	29,752,632.011	29,752,632.000
February	2	2022	25,139,976.000	25,139,976.006	25,139,976.000
March	3	2022	26,152,440.000	26,151,360.001	26,151,360.001
April	4	2022	27,477,312.000	27,475,296.010	27,475,296.010
May	5	2022	26,820,360.000	26,811,023.991	26,811,023.991
June	6	2022	32,621,664.000	32,619,096.019	32,619,096.019
July	7	2022	43,188,168.000	43,174,344.005	43,174,344.005
August	8	2022	42,326,016.000	42,308,112.011	42,308,112.011
September	9	2022	42,725,304.000	42,723,504.009	42,723,504.009
October	10	2022	36,677,448.000	36,677,448.005	36,677,448.000
November	11	2022	39,330,696.000	39,328,919.989	39,328,919.989
December	12	2022	42,496,704.000	42,494,303.982	42,494,303.982

Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project in year y (MWh):

Month	Month	Year	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project in year *y* (MWh)
January	1	2022	29,752.632000
February	2	2022	25,139.976000
March	3	2022	26,151.360001
April	4	2022	27,475.296010
May	5	2022	26,811.023991
June	6	2022	32,619.096019
July	7	2022	43,174.344005
August	8	2022	42,308.112011
September	9	2022	42,723.504009
October	10	2022	36,677.448000
November	11	2022	39,328.919989
December	12	2022	42,494.303982

Combined margin CO_2 emission factor for grid connected power generation

Standardized baseline ASB0040-2018 is selected for the project. The value of the combined margin CO_2 emission factor for the project electricity system applicable to wind and solar power generation for the determination of baseline emissions is 0.9871 t CO_2/MWh.

Baseline emissions

Baseline emissions in year *y* (tCO_2):

Month	Month	Year	Baseline emissions in year *y* (tCO_2)
January	1	2022	29,368
February	2	2022	24,815
March	3	2022	25,814
April	4	2022	27,120
May	5	2022	26,465
June	6	2022	32,198
July	7	2022	42,617

Month	Month	Year	Baseline emissions in year *y* (tCO_2)
August	8	2022	41,762
September	9	2022	42,172
October	10	2022	36,204
November	11	2022	38,821
December	12	2022	41,946
		Total for 2022:	409,302

5.2 Project Emissions

Since the project activity uses wind energy to generate electricity the project emissions are equal to zero: $PE_y = 0$.

5.3 Leakage

No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing and transport). These emissions sources are neglected: $LE_y = 0$.

5.4 Net GHG Emission Reductions and Removals

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2022 (01-January-2022 - 31-December-2022)	*409,302*	*0*	*0*	*409,302*
Total	*409,302*	*0*	*0*	*409,302*

Ex-ante emissions reductions /removals	Achieved emissions reductions /removals	Percent difference	Justification for the difference
433,929	*409,302*	*-5,7%*	The achieved emission reductions are 5.7% less. This is mostly due to low wind conditions as well

			as severe thunderstorms in the area and downtimes due to planned repairs