Botterblom Wind Farm

Wake Impact Assessment Report

September 2022

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Prepared by:	EnergieTEAM and Genesis
Verified by:	Genesis

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Executive summary

The purpose of this wake impact report is to provide an indication of the expected wake impact of the proposed Botterblom Wind Energy facility (WEF) on seven surrounding WEFs. This assessment is based on work conducted by EnergieTEAM towards an energy production assessment based on:

- Data provided by the meteorological mast specifically erected for the Botterblom WEF project. The wind campaign started in September 2020 and is still in operation.
- A long-term correlation done between 12 months of the met mast data (October 2020-October 2021) and 32 years of data from ERA5 source (January 1990-January 2022).
- One preliminary layout on Botterblom project with 30 Nordex N163 5700 with 118 m hub height.
- The layouts communicated by developers of the neighbouring WEF projects.
- For these reasons the research of this wake effect study can't be considerate as a final energy production assessment, or a final wake effect calculation. This report indicates the wish to collaborate with GENESIS on the matter of the wake effect between wind farms and must be updated once the wind campaign finishes and the final layout decided.

Project description

The Botterblom project is located on the Remaining Extent of the Farm Sous 226, approximately 3 kilometers of Helios substation in the Northern Cape province.

The site is situated in the Hantam local municipality near Loeriesfontein within the Namakwa subregion of the Northern Cape. Botterblom turbine base elevations range between 900 m to 1000 m above sea level.

A map showing the site is presented below, including the proposed turbines and the surrounding wind farms.

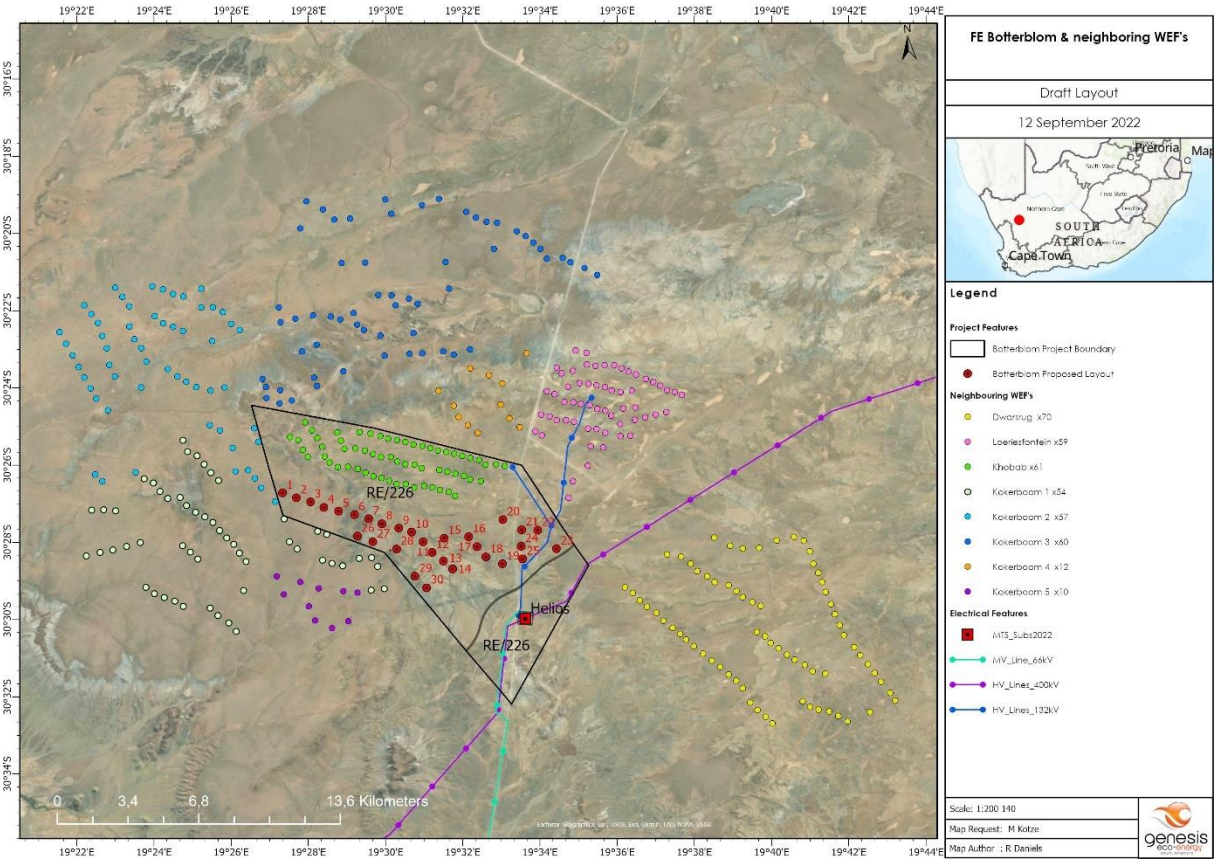


Figure 1. Location FE Botterblom

The coordinates of the proposed turbines are as follows:

Preliminary Botterblom layout for 30 turbines					
NAME	**POINT_X (Geo – WGS 84)**	**POINT_Y (Geo – WGS 84)**	**NAME**	**POINT_X (Geo – WGS 84)**	**POINT_Y (Geo – WGS 84)**
1	19,4555	-30,4453	**16**	19,5359	-30,4642
2	19,4615	-30,4474	**17**	19,5395	-30,4685
3	19,4676	-30,4492	**18**	19,5433	-30,4729
4	19,4734	-30,4516	**19**	19,5505	-30,4759
5	19,4797	-30,4532	**20**	19,5507	-30,4569
6	19,4866	-30,4547	**21**	19,5588	-30,4613
7	19,4927	-30,4564	**22**	19,5657	-30,4614
8	19,4984	-30,4586	**23**	19,5738	-30,4694
9	19,5057	-30,4605	**24**	19,5586	-30,4683
10	19,5112	-30,4622	**25**	19,5592	-30,4738
11	19,5162	-30,4664	**26**	19,4879	-30,4639
12	19,5201	-30,4710	**27**	19,4945	-30,4663
13	19,5250	-30,4747	**28**	19,5048	-30,4695
14	19,5290	-30,4781	**29**	19,5127	-30,4813
15	19,5253	-30,4649	**30**	19,5177	-30,4863

Table 1. Turbines coordinates FE Botterblom WEF

The configuration of eight wind farms considered in the wake assessments are:

- **Khobab** (operational)- Turbine locations and turbine model are provided by Mainstream consisting of 61 Siemens SWT 108 2.3 MW, with a hub height of 99 m.
- **Loeriesfontein** (operational) – Turbine locations and turbine model are provided by Mainstream consisting of 59 Siemens SWT 108 2.3 MW, with a hub height of 99 m.
- **Kokerboom 1** (proposed) - Turbine locations and turbine model are provided by Africa Clean Energy Development (ACED) consisting of 54 Vestas V162 5.6 MW, with a hub height of 119 m.
- **Kokerboom 2** (proposed) - Turbine locations and turbine model are provided by Africa Clean Energy Development (ACED) consisting of 57 Vestas V162 5.6 MW, with a hub height of 119m.
- **Kokerboom 3** (proposed) - Turbine locations and turbine model are provided by Africa Clean Energy Development (ACED) consisting of 60 Vestas V162 5.6 MW, with a hub height of 119 m.
- **Kokerboom 4** (proposed) - Turbine locations and turbine model are provided by Africa Clean Energy Development (ACED) consisting of 12 Vestas V162 5.6 MW, with a hub height of 119 m.

- **Kokerboom 5** (proposed) - Turbine locations and turbine model are provided by Africa Clean Energy Development (ACED) consisting of 10 Vestas V162 5.6 MW, with a hub height of 119 m.
- **Dwarsrug** (proposed) - Turbine locations are provided by Mainstream. EnergieTEAM has made the assumption that the turbine model for this project may be the Siemens SWT 108 2.3 MW, with a hub height of 99 m.

The coordinates for the above mentioned turbines are indicated in Appendix 1.

Wake Analysis

Modelled wake losses

Wind turbine extract energy from the wind and downstream there is a wake from the wind turbine where the wind speed is reduced. As the flow proceeds downstream, there is a spreading of the wake and the wake recovers towards free stream conditions. The wake effect loss is the aggregated influence on the energy production of the wind farm which results from changes in wind speed caused by the impact of the turbines on each other. These effects are calculated using the WindPro computational model. The wind flow modelling is calculated after processing of site data.

Conventional Eddy Viscosity wake calculation

The Eddy Viscosity wake model is a CFD calculation representing the development to the velocity deficit field using a finite-difference solution of the thin shear layer equation of the Navier-Stokes equation in axi-symmetric co-ordinates.

The Eddy Viscosity model automatically observes the conservation of mass and momentum in the wake.

An Eddy Viscosity, averaged across each downstream wake section, is used to relate the shear stress to gradient of velocity deficit.

The mean filed can be obtained by a linear superposition of the wake deficit field and the incident wind flow.

The Eddy Viscosity model with WindPro is employed in a scheme which, taking each wind speed and direction in turn calculates the wake loss and power production of a project. The important parameters used in the process are:

- Turbine layout and inter-turbine spacing;
- Adjusted wind speed rom site wind flow calculations;
- Ambien turbulence profile;
- Wind turbine thrust characteristic;
- Wind turbine power characteristic; and
- Rotor speed characteristic.

Any air density adjustments required due to differences between the hub-height air density at the turbine locations and at the reference mast location is applied and included in the array effect.

The Large Wind Farm (LWF) had no effect on the wake effect. For this reason, it wasn't considered in the calculation.

External wake estimates

To assess the magnitude of the effect of Botterblom Wind Farm on the energy production of neighbouring wind farms, the methodology described above has been applied and the results are shown in the tables and graphs below:

Khobab	% wake loss
Khobab with all wind farms except Botterblom	12,10%
Khobab with all wind farms (including Botterblom 30xN163 5.7 MW)	13,80%
Impact Botterblom 30xN163 5.7 MW	**1,70%**

Loeriesfontein	% wake loss
Loeriesfontein with all wind farms except Botterblom	10,80%
Loeriesfontein with all wind farms (including Botterblom 30xN163 5.7 MW)	11,40%
Impact Botterblom 30xN163 5.7 MW	**0,60%**

Kokerboom 1	% wake loss
Kokerboom 1 with all wind farms except Botterblom	8,10%
Kokerboom 1 with all wind farms (including Botterblom 30xN163 5.7 MW)	8,70%
Impact Botterblom 30xN163 5.7 MW	**0,60%**

Kokerboom 2	% wake loss
Kokerboom 2 with all wind farms except Botterblom	9,00%
Kokerboom 2 with all wind farms (including Botterblom 30xN163 5.7 MW)	9,10%
Impact Botterblom 30xN163 5.7 MW	**0,10%**

Kokerboom 3	% wake loss
Kokerboom 3 with all wind farms except Botterblom	8,20%
Kokerboom 3 with all wind farms (including Botterblom 30xN163 5.7 MW)	8,20%
Impact Botterblom 30xN163 5.7 MW	**0,00%**

Kokerboom 4	% wake loss
Kokerboom 4 with all wind farms except Botterblom	9,30%

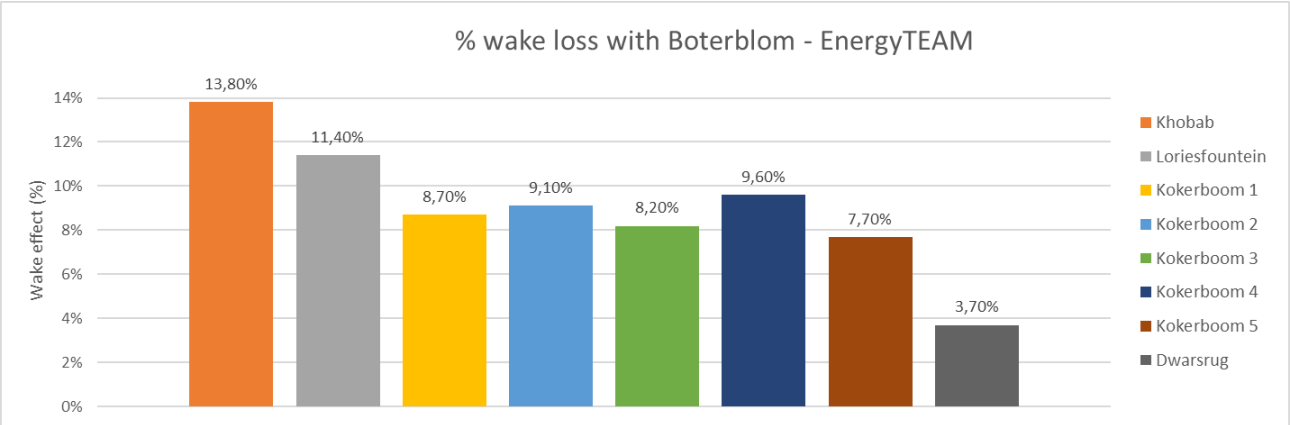
Kokerboom 4 with all wind farms (including Botterblom 30xN163 5.7 MW)	9,60%
Impact Botterblom 30xN163 5.7 MW	**0,30%**

Kokerboom 5	**% wake loss**
Kokerboom 5 with all wind farms except Botterblom	7,10%
Kokerboom 5 with all wind farms (including Botterblom 30xN163 5.7 MW)	7,70%
Impact Botterblom 30xN163 5.7 MW	**0,60%**

Dwarsrug	**% wake loss**
Dwarsrug with all wind farms except Botterblom	3,70%
Dwarsrug with all wind farms (including Botterblom 30xN163 5.7 MW)	3,70%
Impact Botterblom 30xN163 5.7 MW	**0,00%**

Figure 2. Predicted external wake loss of Botterblom on neighbouring wind farms

The main conclusion is that Khobab wind farm will be affected by Botterblom in terms of wake effect as it has a **1,70%** wake loss. Loeriesfontein, Kokerboom 1 and Kokerboom 5 are all likely to have a 0.6% For Kokerboom 2, Kokerboom 3, Kokerboom 4 and Dwarsrug WEFs influence would be negligible.



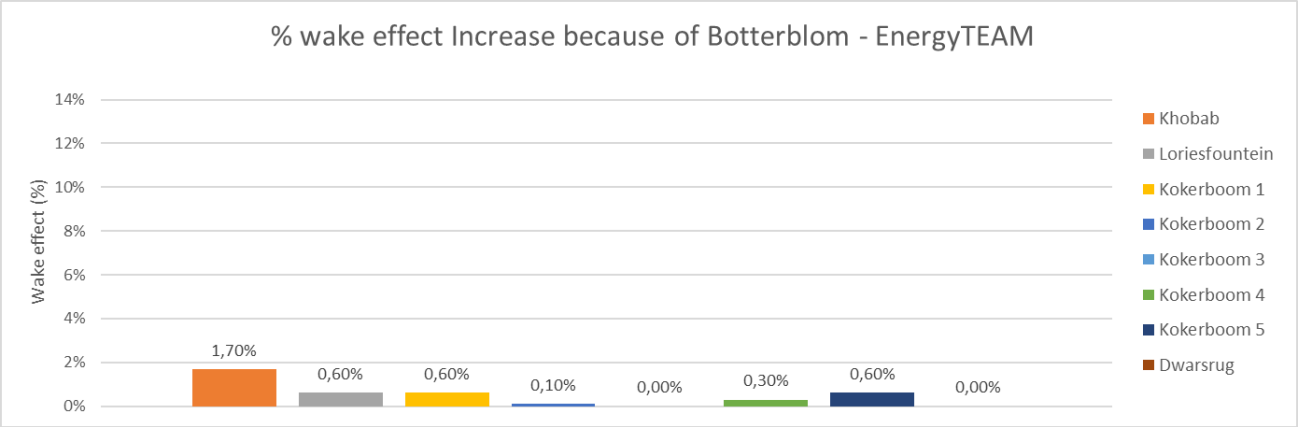


Figure 3. Summary predicted external wake loss of Botterblom on neighbouring wind farms

Appendix 1: turbines' coordinates

Khobab turbines coordinates	Longitude (Geo - WGS84)	Latitude (Geo - WGS84)
E1	19,4669	-30,4296
E2	19,4643	-30,4266
E3	19,4624	-30,4225
E4	19,4588	-30,4212
E5	19,4682	-30,4184
E6	19,4701	-30,4217
E7	19,4722	-30,4255
E8	19,4733	-30,4297
E9	19,4792	-30,4192
E10	19,4758	-30,4323
E11	19,4807	-30,4228
E12	19,4822	-30,4264
E13	19,4870	-30,4262
E14	19,4910	-30,4271
E15	19,4799	-30,4340
E16	19,4945	-30,4286
E17	19,4838	-30,4341
E18	19,4914	-30,4367
E19	19,4980	-30,4299
E20	19,5019	-30,4299
E21	19,4885	-30,4193
E22	19,4935	-30,4197
E23	19,4977	-30,4208
E24	19,5012	-30,4218
E25	19,5049	-30,4225
E26	19,5087	-30,4235
E27	19,5121	-30,4245
E28	19,5159	-30,4251
E29	19,5193	-30,4260
E30	19,5226	-30,4271
E31	19,5261	-30,4276
E32	19,5296	-30,4285
E33	19,5331	-30,4293
E34	19,5366	-30,4302
E35	19,5404	-30,4311

E36	19,5431	-30,4331
E37	19,5477	-30,4330
E38	19,5515	-30,4338
E39	19,5409	-30,4405
E40	19,5367	-30,4396
E41	19,5338	-30,4380
E42	19,5302	-30,4371
E43	19,5267	-30,4361
E44	19,5232	-30,4356
E45	19,5156	-30,4347
E46	19,5090	-30,4329
E47	19,5051	-30,4318
E48	19,4879	-30,4349
E49	19,4947	-30,4381
E50	19,4982	-30,4390
E51	19,5015	-30,4401
E52	19,5048	-30,4414
E53	19,5087	-30,4415
E54	19,5124	-30,4429
E55	19,5167	-30,4423
E56	19,5203	-30,4430
E57	19,5235	-30,4441
E58	19,5273	-30,4448
E59	19,5300	-30,4466
E5	19,4653	-30,4148
E46	19,5126	-30,4331

Loeriesfontein turbines coordinates	**Longitude (Geo - WGS84)**	**Latitude (Geo - WGS84)**
E1	19,5791	-30,4474
E2	19,5809	-30,4403
E3	19,5873	-30,4336
E4	19,5940	-30,4257
E5	19,5885	-30,4252
E6	19,6057	-30,4206
E7	19,6014	-30,4208
E8	19,5948	-30,4194
E9	19,5911	-30,4178
E10	19,5874	-30,4176
E11	19,5814	-30,4146

E12	19,5778	-30,4140
E13	19,5739	-30,4139
E14	19,5709	-30,4124
E15	19,5673	-30,4115
E16	19,5674	-30,4205
E17	19,5647	-30,4187
E18	19,5729	-30,4027
E19	19,5697	-30,4015
E20	19,5773	-30,4060
E21	19,5811	-30,4062
E22	19,5845	-30,4069
E23	19,5883	-30,4074
E24	19,5914	-30,4091
E25	19,5949	-30,4098
E26	19,5975	-30,4119
E27	19,6013	-30,4156
E28	19,6027	-30,4089
E29	19,6077	-30,4085
E30	19,6077	-30,4137
E31	19,6121	-30,4127
E32	19,6166	-30,4114
E33	19,6213	-30,4103
E34	19,6014	-30,4017
E35	19,6063	-30,4011
E36	19,5977	-30,4012
E37	19,5947	-30,3997
E38	19,5911	-30,3988
E39	19,5876	-30,3983
E40	19,5838	-30,3979
E41	19,5788	-30,3995
E42	19,5738	-30,3913
E43	19,5760	-30,3937
E44	19,5808	-30,3927
E45	19,5869	-30,3899
E46	19,5905	-30,3904
E47	19,5946	-30,3902
E48	19,5987	-30,3902
E49	19,6018	-30,3915
E50	19,6049	-30,3930
E51	19,6080	-30,3942
E52	19,6124	-30,3962

E53	19,6155	-30,3976
E54	19,6186	-30,3990
E55	19,6279	-30,4030
E56	19,6253	-30,4015
E57	19,6215	-30,4010
E58	19,5867	-30,3848
E59	19,5821	-30,3837

Kokerboom 1 turbines coordinates	**Longitude (Geo - WGS84)**	**Latitude (Geo - WGS84)**
E1	19,4189	-30,4739
E2	19,4158	-30,4709
E3	19,4123	-30,4681
E4	19,4126	-30,4226
E5	19,4145	-30,4274
E6	19,4186	-30,4293
E7	19,4216	-30,4330
E8	19,4246	-30,4366
E9	19,4278	-30,4399
E10	19,4563	-30,4566
E11	19,4584	-30,4664
E12	19,4619	-30,4694
E13	19,4707	-30,4618
E14	19,4746	-30,4633
E15	19,4728	-30,4744
E16	19,4770	-30,4758
E17	19,4815	-30,4769
E18	19,4886	-30,4736
E19	19,4940	-30,4732
E20	19,4966	-30,4771
E21	19,4939	-30,4873
E22	19,4995	-30,4867
E23	19,3958	-30,4392
E24	19,3998	-30,4411
E25	19,4027	-30,4447
E26	19,4060	-30,4477
E27	19,4114	-30,4472
E28	19,4140	-30,4508
E29	19,4180	-30,4537
E30	19,4219	-30,4557

E31	19,4255	-30,4581
E32	19,4284	-30,4615
E33	19,4314	-30,4647
E34	19,4345	-30,4675
E35	19,4369	-30,4714
E36	19,4397	-30,4749
E37	19,4387	-30,4875
E38	19,3834	-30,4530
E39	19,3782	-30,4527
E40	19,3730	-30,4527
E41	19,3708	-30,4725
E42	19,3768	-30,4711
E43	19,3823	-30,4699
E44	19,3882	-30,4684
E45	19,3940	-30,4668
E46	19,3966	-30,4861
E47	19,4002	-30,4888
E48	19,4045	-30,4904
E49	19,4090	-30,4920
E50	19,4127	-30,4943
E51	19,4243	-30,4951
E52	19,4276	-30,4983
E53	19,4324	-30,5015
E54	19,4355	-30,5051

Kokerboom 2 turbines coordinates	**Longitude (Geo - WGS84)**	**Latitude (Geo - WGS84)**
E1	19,3922	-30,4364
E2	19,3776	-30,4403
E3	19,3833	-30,3567
E4	19,3967	-30,3886
E5	19,3993	-30,3561
E6	19,4039	-30,3575
E7	19,4039	-30,3720
E8	19,4083	-30,3736
E9	19,4125	-30,3754
E10	19,4082	-30,3594
E11	19,4127	-30,3604
E12	19,4204	-30,3572
E13	19,4204	-30,3653

E14	19,4255	-30,3652
E15	19,4298	-30,3672
E16	19,4334	-30,3724
E17	19,4371	-30,3750
E18	19,3893	-30,3735
E19	19,3915	-30,3788
E20	19,3945	-30,3829
E21	19,4004	-30,3691
E22	19,3699	-30,3643
E23	19,3729	-30,3681
E24	19,3758	-30,3720
E25	19,3776	-30,3775
E26	19,3796	-30,3828
E27	19,3807	-30,3901
E28	19,3831	-30,3951
E29	19,3863	-30,3607
E30	19,3894	-30,3647
E31	19,4060	-30,3918
E32	19,4101	-30,3950
E33	19,4140	-30,3974
E34	19,4183	-30,3995
E35	19,4244	-30,4012
E36	19,4304	-30,3998
E37	19,3801	-30,4097
E38	19,4241	-30,4161
E39	19,4285	-30,4184
E40	19,3944	-30,3998
E41	19,4433	-30,4174
E42	19,3592	-30,3759
E43	19,3619	-30,3810
E44	19,3649	-30,3859
E45	19,3675	-30,3910
E46	19,3700	-30,3956
E47	19,3726	-30,4002
E48	19,3752	-30,4046
E49	19,4252	-30,3796
E50	19,4340	-30,4260
E51	19,4352	-30,4360
E52	19,4407	-30,4355
E53	19,4435	-30,4390
E54	19,4464	-30,4431

E55	19,4524	-30,4490
E56	19,3746	-30,4373
E57	19,4451	-30,4233

Kokerboom 3 turbines coordinates	Longitude (Geo - WGS84)	Latitude (Geo - WGS84)
E1	19,4469	-30,3962
E2	19,4485	-30,3996
E3	19,4486	-30,4044
E4	19,4545	-30,4009
E5	19,4542	-30,4067
E6	19,4596	-30,4053
E7	19,4692	-30,3954
E8	19,4704	-30,3992
E9	19,4639	-30,3843
E10	19,4702	-30,3814
E11	19,4817	-30,3928
E12	19,4540	-30,3652
E13	19,4547	-30,3716
E14	19,4611	-30,3701
E15	19,4687	-30,3687
E16	19,4763	-30,3692
E17	19,4803	-30,3703
E18	19,4862	-30,3677
E19	19,4878	-30,3727
E20	19,4907	-30,3750
E21	19,4978	-30,3773
E22	19,4997	-30,3861
E23	19,5121	-30,3763
E24	19,5104	-30,3853
E25	19,5158	-30,3849
E26	19,5249	-30,3843
E27	19,5294	-30,3855
E28	19,5364	-30,3833
E29	19,4969	-30,3599
E30	19,5026	-30,3601
E31	19,5042	-30,3644
E32	19,5101	-30,3614
E33	19,5138	-30,3637
E34	19,4811	-30,3460

E35	19,4913	-30,3459
E36	19,5259	-30,3456
E37	19,5275	-30,3572
E38	19,4633	-30,3311
E39	19,4658	-30,3194
E40	19,4730	-30,3229
E41	19,4778	-30,3273
E42	19,4847	-30,3268
E43	19,4999	-30,3186
E44	19,5025	-30,3248
E45	19,5157	-30,3211
E46	19,5231	-30,3183
E47	19,5349	-30,3240
E48	19,5390	-30,3264
E49	19,5436	-30,3282
E50	19,5481	-30,3286
E51	19,5468	-30,3399
E52	19,5567	-30,3324
E53	19,5605	-30,3345
E54	19,5639	-30,3372
E55	19,5669	-30,3400
E56	19,5697	-30,3442
E57	19,5765	-30,3439
E58	19,5799	-30,3457
E59	19,5859	-30,3481
E60	19,5913	-30,3512

Kokerboom 4 turbines coordinates	**Longitude (Geo - WGS84)**	**Latitude (Geo - WGS84)**
E1	19,5398	-30,4194
E2	19,5316	-30,4126
E3	19,5580	-30,4170
E4	19,5229	-30,4013
E5	19,5356	-30,4161
E6	19,5497	-30,4073
E7	19,5535	-30,4131
E8	19,5294	-30,4076
E9	19,5446	-30,3947
E10	19,5366	-30,3915
E11	19,5610	-30,3850

E12	19,5505	-30,3981

Kokerboom 5 turbines coordinates	Longitude (Geo - WGS84)	Latitude (Geo - WGS84)
E1	19,4879	-30,4884
E2	19,4818	-30,4877
E3	19,4712	-30,4865
E4	19,4632	-30,4838
E5	19,4560	-30,4891
E6	19,4530	-30,4813
E7	19,4839	-30,5006
E8	19,4769	-30,5037
E9	19,4696	-30,5004
E10	19,4668	-30,4942

Dwarsrug turbines coordinates	Longitude (Geo - WGS84)	Latitude (Geo - WGS84)
E9	19,6272	-30,5060
E11	19,6301	-30,5085
E13	19,6334	-30,5114
E17	19,6409	-30,5176
E20	19,6447	-30,5207
E27	19,6543	-30,4905
E28	19,6544	-30,5293
E29	19,6576	-30,5357
E30	19,6584	-30,4921
E31	19,6603	-30,5053
E32	19,6608	-30,5389
E34	19,6620	-30,4940
E35	19,6635	-30,5074
E36	19,6639	-30,5414
E37	19,6664	-30,5099
E38	19,6673	-30,5444
E40	19,6695	-30,5124
E41	19,6729	-30,5149
E42	19,6761	-30,4641

E43	19,6763	-30,5175
E44	19,6796	-30,5350
E45	19,6803	-30,5195
E47	19,6827	-30,4703
E48	19,6828	-30,5376
E49	19,6839	-30,5219
E50	19,6843	-30,4757
E51	19,6863	-30,4797
E53	19,6879	-30,4837
E54	19,6892	-30,4879
E55	19,6894	-30,5231
E56	19,6912	-30,5394
E57	19,6918	-30,4932
E58	19,6935	-30,4973
E60	19,6954	-30,5023
E61	19,6975	-30,5068
E62	19,6988	-30,5440
E63	19,7016	-30,5119
E64	19,7042	-30,5150
E65	19,7074	-30,5191
E66	19,7087	-30,5397
E67	19,7102	-30,5229
E68	19,7130	-30,5266
E69	19,7170	-30,5314
E70	19,7193	-30,5347

Appendix 2: ULs' July 2022 Monthly Summary Report

JULY 2022 MONTHLY SUMMARY REPORT

UL's Data Management Dashboards

PREPARED FOR:
ENERGY TEAM

SAF.00006 - LOERIESFONTEIN
FRANCE

ISSUE DATE
01-AUG-2022

EXECUTIVE SUMMARY

This report summarizes the July 2022 wind resource of the proposed SAF.00006 - Loeriesfontein Wind Project. Site information, monthly statistics, and a map of the project area with the location of each mast are presented below. The following pages provide a more in-depth summary of the campaign.

Automatic quality controls have excluded invalid data (i.e. icing, or unphysical values). Statistics presented in this report are informative only. Data is fully reviewed and properly cleaned by a wind engineer prior to a resource or energy assessment.

1. PROJECT CHARACTERISTICS

Table 1.1: Site Information

Mast Name	Site Coordinates		Elevation (m)	Period of Record
	Latitude	Longitude		
SAF.00006 - Loeriesfontein	-30.471	19.552	957	04-Sep-2020 - 31-Jul-2022

Table 1.2: July 2022 Summary Statistics

Mast Name	Wind Resource				Environmental Parameters	
	Monitoring Height (m)	Average Wind Speed (m/s)	Average Wind Shear Exponent* (Heights)	Prevailing Wind Direction	Temperature** (°C)	Air Density (kg/m^3)
SAF.00006 - Loeriesfontein	124	8.14	0.14 (120 m / 40 m)	SW	13.0	1.102

* Only Speeds > 4 m/s in calculation

** Monthly average temperature taken from highest valid sensor

2. JULY 2022 OBSERVED WIND RESOURCE

Figure 2.1: Daily Mean Wind Speeds

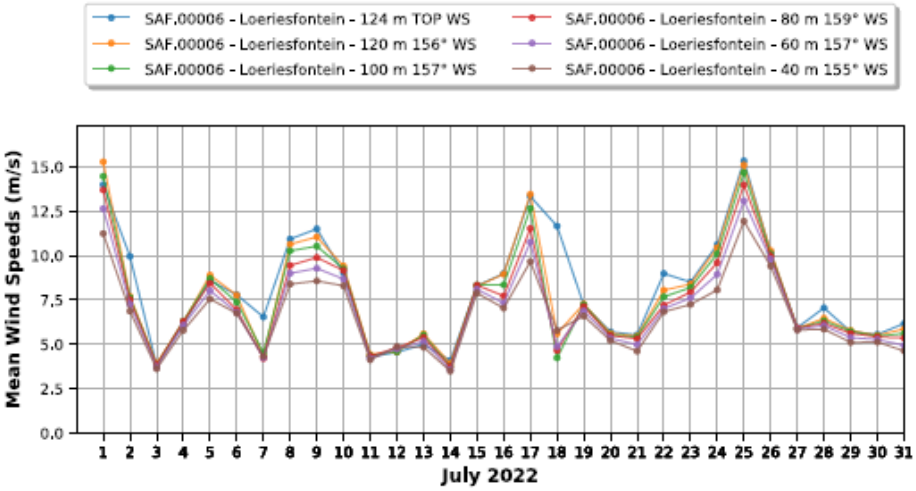


Figure 2.2: Daily Mean Wind Directions

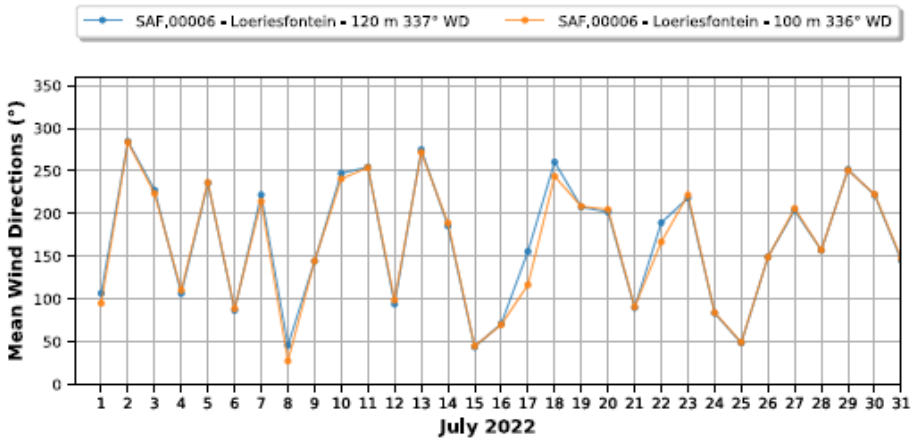


Figure 2.3: Daily Temperature Profile

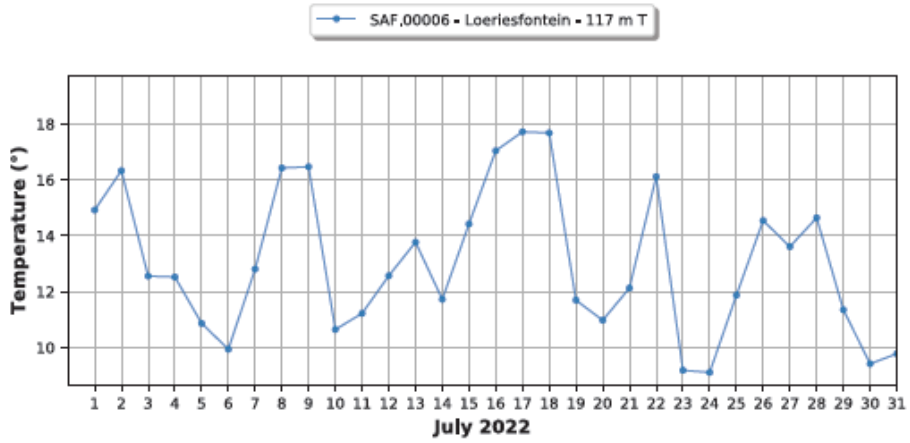


Figure 2.4: Diurnal Profile

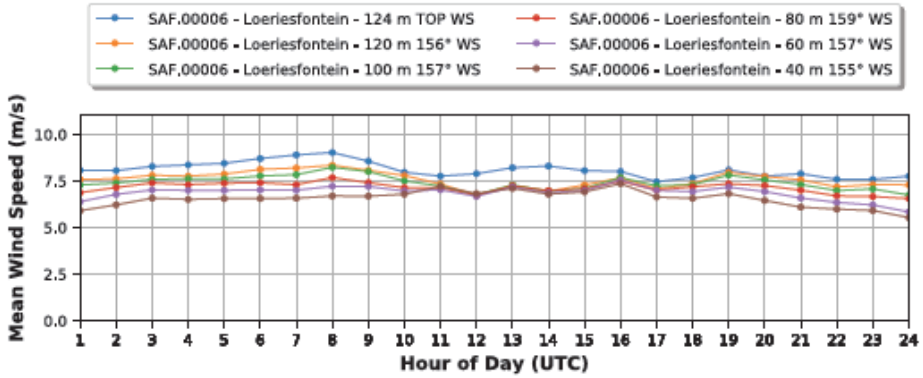


Figure 2.5: Shear Profile

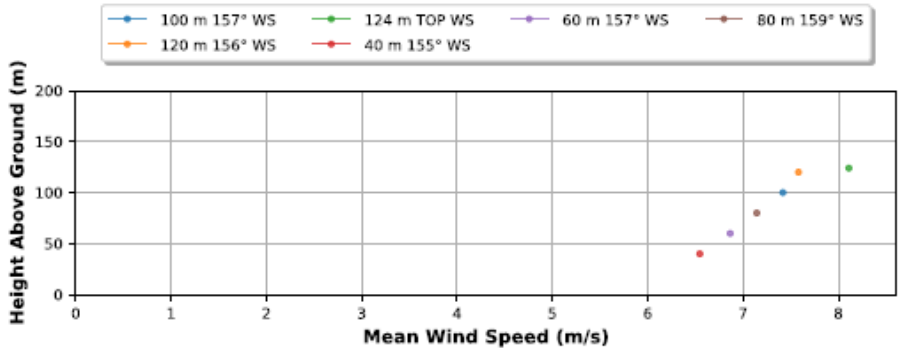


Figure 2.6: SAF.00006 - Loeriesfontein Observed Monthly Wind Frequency Distribution at 124m

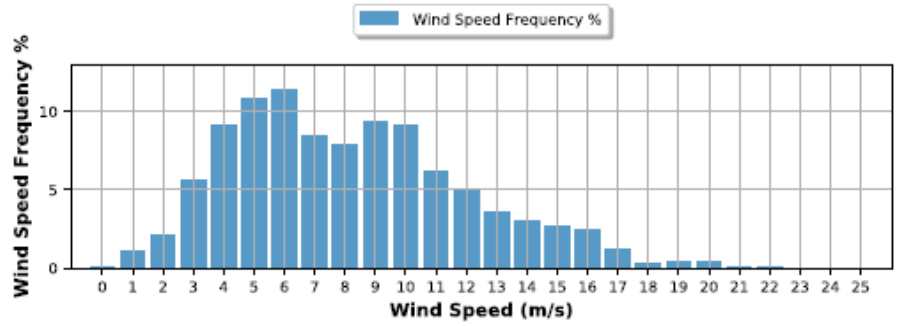
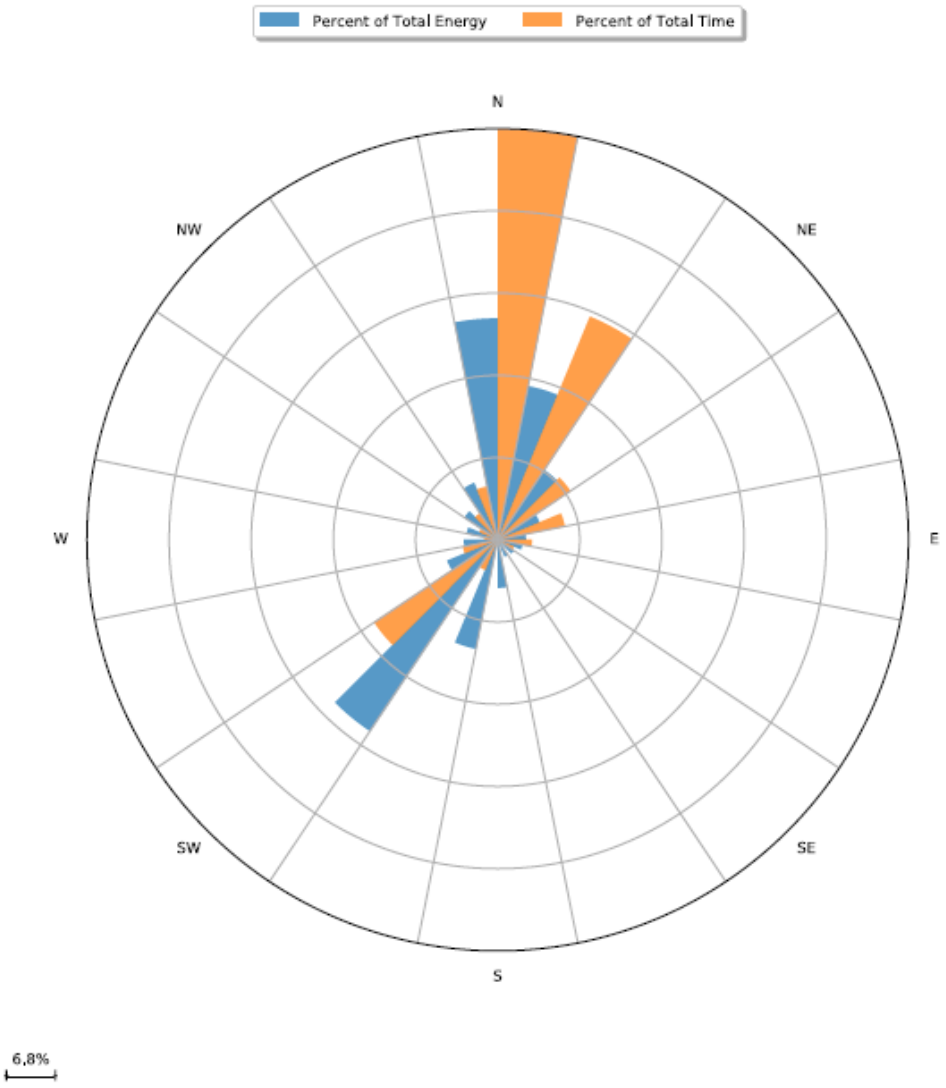


Figure 2.7: Wind Frequency and Energy Rose
SAF.00006 - Loeriesfontein at 120m



3. JULY 2022 SENSOR SUMMARY

Table 3.1: SAF.00006 - Loeriesfontein Sensor Summary

Sensor Type	Stream Name	Height (m)	Operation Status	Monthly Average			Data Recovery (%)	Sensor Manufacturer	Installation Date
				Value	Std. Dev	Unit			
Anemometer	124 m TOP WS	124.0	✔	8.14	0.55	m/s	99	Thies	04-Sep-2020
	120 m 156° WS	120.0	✔	7.66	0.5	m/s	77.2	Thies	04-Sep-2020
	100 m 157° WS	100.0	✔	7.47	0.51	m/s	77.4	Thies	04-Sep-2020
	80 m 159° WS	80.0	✔	7.23	0.51	m/s	75.9	Thies	04-Sep-2020
	60 m 157° WS	60.0	✔	6.92	0.52	m/s	77.5	Thies	04-Sep-2020
	40 m 155° WS	40.0	✔	6.6	0.55	m/s	77.6	Thies	04-Sep-2020
Wind Vane	120 m 337° WD	120.0	✔	170	6	°	96.9	Thies	04-Sep-2020
	100 m 336° WD	100.0	✔	167	5	°	97.3	Thies	04-Sep-2020
Temperature	117 m T	117.0	✔	13.0	0.0	°C	100	Default TEMP	04-Sep-2020
Relative Humidity	117 m H	117.0	✔	56.1	0.0	%	99.9	Default RH	04-Sep-2020
Barometer	117 m P	117.0	✔	902.0	0.0	mbar	100	SETRA	08-Oct-2020