PARK - Main Result

Calculation: AEP_Vestas_Noice_plus_bats

Setup

AEP scaled to a full year based on number of samples
Scaling factor from 31.0 years to 1 year: 0.032

Calculation performed in UTM (north)-WGS84 Zone: 32
At the site centre the difference between grid north and true north is: 0.6°

Wake

Wake Model: N.O. Jensen (RISØ/EMD) Park 2 2018
Wake decay constant
Wake decay constant: 0.085 Mixed farmland Hub height dependent
Reference WTG: 01_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (1)

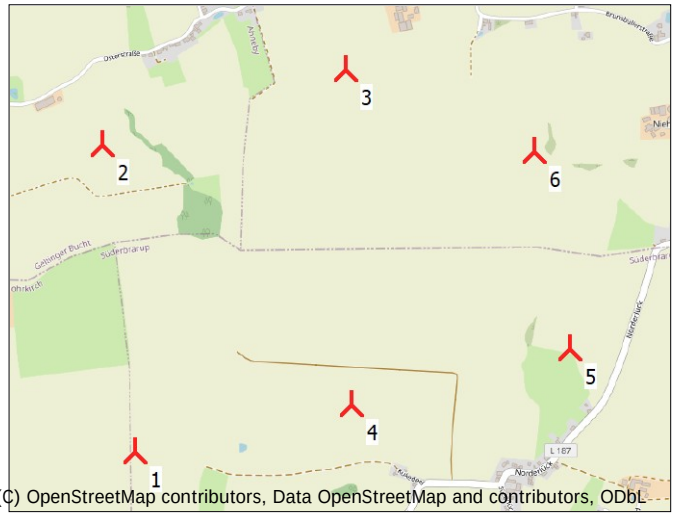
Scaler / wind data

Name	EMD Default Measurement Mast Scaler
Terrain scaling	Measured Data Scaling (WAsP Stability / A-Parameter)
Micro terrain flow model	WAsP IBZ from Site Data
Used period	1/1/1994 1:00:00 AM - 1/1/2025
Meteo object(s)	MCP LT - MCP session (1) - [Neural Network] (3), 125.00m - MCP LT - MCP session (1) - [Neural Network]
Displacement height	Omnidirectional from objects
WAsP version	WAsP 11 Version 11.04.0026

Power correction

Power curve correction (adjusted IEC method, improved to match turbine control)

		Min	Max	Avg	Corr. [%]	Neg. corr. [%]	Pos. corr. [%]
Air density							
From air density settings	[°C]	7.6	7.6	7.6			
From air density settings	[hPa]	990.7	990.7	990.7			
Resulting air density	[kg/m³]	1.229	1.229	1.229			
Relative to 15°C at sea level	[%]	100.4	100.4	100.4	0.2	0.0	0.2



Scale 1:25,000

New WTG

Calculated Annual Energy for Wind Farm

WTG combination	Result PARK	Result-10.0%	GROSS (no loss) Free WTGs	Curtailment loss	Wake loss	Specific results¤) Capacity factor	Mean WTG result	Full load hours	Wind speed free	wake reduced
	[MWh/y]	[MWh/y]	[MWh/y]	[%]	[%]	[%]	[MWh/y]	[Hours/year]	[m/s]	[m/s]
Wind farm	96,023.1	86,420.8	103,387.3	2.4	4.7	36.5	14,403.5	3,201	7.0	6.8

¤) Based on Result-10.0%

Calculated Annual Energy for each of 6 new WTGs with total 27.0 MW rated power

	WTG type Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Power curve Creator	Name	Annual Energy Result [MWh/y]	Result-10.0% [MWh/y]	Curtailment loss [%]	Wake loss [%]	Wind speed free [m/s]	reduced [m/s]
1	Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	USER	Level 0 - Calculated - PO4-0S & PO4 - 12-2021	16,834.0	15,151	0.4	2.1	7.01	6.94
2	Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	USER	Level 0 - Calculated - PO4-0S & PO4 - 12-2021	16,177.0	14,559	3.2	3.3	7.02	6.91
3	Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	USER	Level 0 - Calculated - PO4-0S & PO4 - 12-2021	15,548.7	13,994	3.4	5.9	6.99	6.79
4	Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	USER	Level 0 - Calculated - PO4-0S & PO4 - 12-2021	15,781.2	14,203	3.3	4.8	6.99	6.83
5	Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	USER	Level 0 - Calculated - PO4-0S & PO4 - 12-2021	16,224.5	14,602	0.5	4.9	6.98	6.82
6	Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	USER	Level 0 - Calculated - PO4-0S & PO4 - 12-2021	15,457.7	13,912	3.6	7.4	7.04	6.79

More power curves may be used due to curtailment. Please view Curtailment assumptions report.

WTG siting

	UTM (north)-ETRS89 Zone: 32 Easting	Northing	Z [m]	Row data/Description	Calculation period Start	End
1	New	547,816	6,060,703	60.0 01_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (1)	1/1/1994	1/1/2025
2	New	547,696	6,061,714	60.0 02_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (7)	1/1/1994	1/1/2025
3	New	548,500	6,061,972	60.0 03_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (8)	1/1/1994	1/1/2025
4	New	548,532	6,060,864	60.0 04_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (9)	1/1/1994	1/1/2025
5	New	549,254	6,061,058	60.0 05_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (10)	1/1/1994	1/1/2025
6	New	549,128	6,061,708	60.0 06_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (11)	1/1/1994	1/1/2025

PARK - Production Analysis

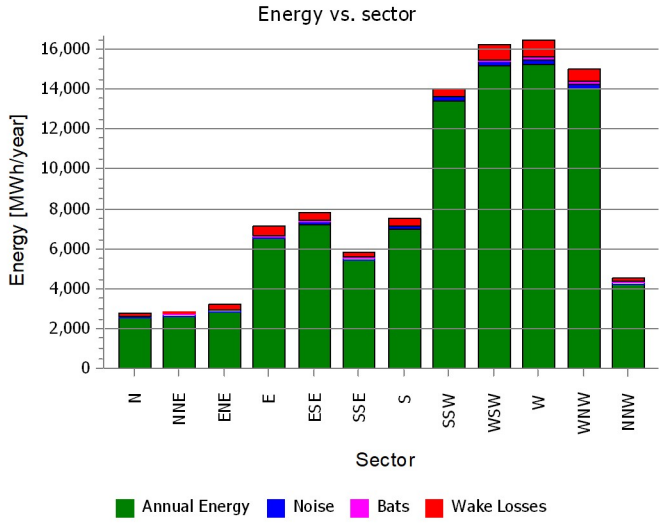
Calculation: AEP_Vestas_Noice_plus_bats WTG: All new WTGs, Air density 1.229 kg/m³

Directional Analysis

Sector		0 N	1 NNE	2 ENE	3 E	4 ESE	5 SSE	6 S	7 SSW	8 WSW	9 W	10 WNW	11 NNW	Total
Gross	[MWh]	2,790.7	2,830.7	3,186.8	7,143.1	7,831.3	5,797.2	7,538.9	14,040.7	16,209.6	16,464.9	15,035.0	4,518.4	103,387.3
-Decrease due to curtailments	[MWh]	95.8	95.0	141.6	199.0	212.8	147.2	152.8	237.1	289.0	366.8	384.9	164.8	2,486.6
Noise	[MWh]	73.9	70.9	96.0	128.6	142.9	109.5	119.9	179.5	209.3	204.5	224.3	113.8	1,673.0
Bats	[MWh]	21.9	24.1	45.6	70.4	69.8	37.7	32.9	57.6	79.7	162.3	160.6	50.9	813.5
-Decrease due to wake losses	[MWh]	187.0	109.1	244.4	459.5	432.2	245.0	412.2	377.7	724.9	859.1	655.0	171.6	4,877.7
Resulting energy	[MWh]	2,507.9	2,626.7	2,800.9	6,484.6	7,186.4	5,405.1	6,973.9	13,425.9	15,195.8	15,239.0	13,995.1	4,182.0	96,023.1
Specific energy	[kWh/m²]													906
Specific energy	[kWh/kW]													3,556
-Decrease due to curtailments	[%]	3.4	3.4	4.4	2.8	2.7	2.5	2.0	1.7	1.8	2.2	2.6	3.6	2.4
Noise	[%]	2.6	2.5	3.0	1.8	1.8	1.9	1.6	1.3	1.3	1.2	1.5	2.5	1.6
Bats	[%]	0.8	0.9	1.4	1.0	0.9	0.7	0.4	0.4	0.5	1.0	1.1	1.1	0.8
Decrease due to wake losses	[%]	6.7	3.9	7.7	6.4	5.5	4.2	5.5	2.7	4.5	5.2	4.4	3.8	4.72
Full Load Equivalent	[Hours/year]	93	97	104	240	266	200	258	497	563	564	518	155	3,556

Note:

- A turbines' curtailment losses are calculated based on the wake-reduced wind speed.
- The wake reduced wind speed includes curtailment of up-wind WTGs.



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1/16/2025 5:34 PM/4.0.547

PARK - Power Curve Analysis

Calculation: AEP_Vestas_Noice_plus_bats WTG: 1 - VESTAS V150-4.5 4500 150.0 !O!, Hub height: 125.0 m

Name: Level 0 - Calculated - PO4-0S & PO4 - 12-2021
Source: Manufacturer

Source/Date	Created by	Created	Edited	Stop wind speed [m/s]	Power control	CT curve type	Generator type	Specific power kW/m²
12/3/2021	USER	8/30/2022	8/30/2022	24.5	Pitch	User defined	Variable	0.25

Based on Document no.: 0067-7057.V04.

HP curve comparison - Note: For standard air density

Vmean	[m/s]	5	6	7	8	9	10
HP value Pitch, variable speed (2013)	[MWh]	8,677	12,863	16,760	20,128	22,908	25,089
VESTAS V150-4.5 4500 150.0 !O! Level 0 - Calculated - PO4-0S & PO4 - 12-2021	[MWh]	8,804	12,992	16,852	20,105	22,641	24,450
Check value	[%]	-1	-1	-1	0	1	3

The table shows comparison between annual energy production calculated on basis of simplified "HP-curves" which assume that all WTGs performs quite similar - only specific power loading (kW/m^2) and single/dual speed or stall/pitch decides the calculated values. Productions are without wake losses.
For further details, ask at the Danish Energy Agency for project report J.nr. 51171/00-0016 or see the windPRO manual.
The method is refined in EMD report "20 Detailed Case Studies comparing Project Design Calculations and actual Energy Productions for Wind Energy Projects worldwide", jan 2003.
Use the table to evaluate if the given power curve is reasonable - if the check value are lower than -5%, the power curve probably is too optimistic due to uncertainty in power curve measurement.

Power curve

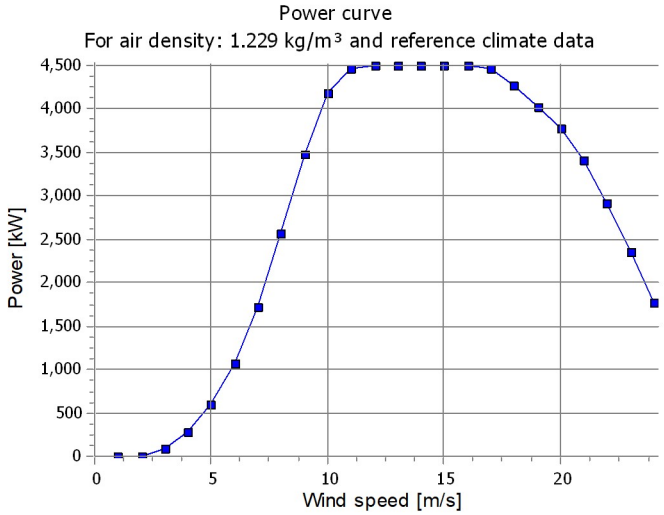
Original data, Air density: 1.225 kg/m³

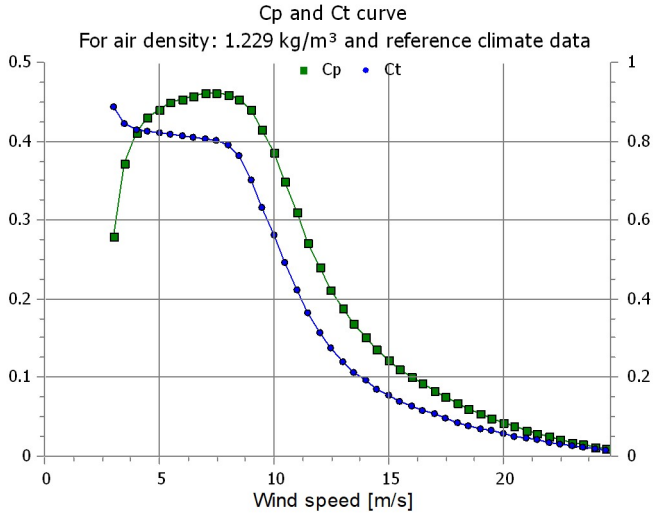
Wind speed [m/s]	Power [kW]	Cp	Wind speed [m/s]	Ct curve
3.0	81.0	0.28	3.0	0.89
3.5	172.0	0.37	3.5	0.85
4.0	285.0	0.41	4.0	0.83
4.5	424.0	0.43	4.5	0.83
5.0	596.0	0.44	5.0	0.82
5.5	808.0	0.45	5.5	0.82
6.0	1,061.0	0.45	6.0	0.81
6.5	1,360.0	0.46	6.5	0.81
7.0	1,710.0	0.46	7.0	0.81
7.5	2,106.0	0.46	7.5	0.80
8.0	2,549.0	0.46	8.0	0.79
8.5	3,021.0	0.45	8.5	0.76
9.0	3,471.0	0.44	9.0	0.70
9.5	3,861.0	0.42	9.5	0.63
10.0	4,180.0	0.39	10.0	0.56
10.5	4,372.0	0.35	10.5	0.49
11.0	4,470.0	0.31	11.0	0.42
11.5	4,494.0	0.27	11.5	0.36
12.0	4,500.0	0.24	12.0	0.31
12.5	4,500.0	0.21	12.5	0.27
13.0	4,500.0	0.19	13.0	0.24
13.5	4,500.0	0.17	13.5	0.22
14.0	4,500.0	0.15	14.0	0.19
14.5	4,500.0	0.14	14.5	0.17
15.0	4,500.0	0.12	15.0	0.16
15.5	4,500.0	0.11	15.5	0.14
16.0	4,500.0	0.10	16.0	0.13
16.5	4,498.0	0.09	16.5	0.12
17.0	4,473.0	0.08	17.0	0.11
17.5	4,394.0	0.08	17.5	0.10
18.0	4,268.0	0.07	18.0	0.09
18.5	4,139.0	0.06	18.5	0.08
19.0	4,031.0	0.05	19.0	0.07
19.5	3,909.0	0.05	19.5	0.06
20.0	3,771.0	0.04	20.0	0.06
20.5	3,607.0	0.04	20.5	0.05
21.0	3,408.0	0.03	21.0	0.05
21.5	3,180.0	0.03	21.5	0.04
22.0	2,917.0	0.03	22.0	0.04
22.5	2,645.0	0.02	22.5	0.03
23.0	2,363.0	0.02	23.0	0.03
23.5	2,070.0	0.01	23.5	0.02
24.0	1,782.0	0.01	24.0	0.02
24.5	1,561.0	0.01	24.5	0.02

Power and efficiency vs. wind speed

Data used in calculation, Mean air density: 1.229 kg/m³

Wind speed [m/s]	Power [kW]	Cp
1.0	0.0	0.00
2.0	0.0	0.00
3.0	81.6	0.28
4.0	286.3	0.41
5.0	598.5	0.44
6.0	1,065.2	0.45
7.0	1,716.5	0.46
8.0	2,557.8	0.46
9.0	3,479.6	0.44
10.0	4,185.1	0.39
11.0	4,470.6	0.31
12.0	4,500.0	0.24
13.0	4,500.0	0.19
14.0	4,500.0	0.15
15.0	4,500.0	0.12
16.0	4,499.9	0.10
17.0	4,473.0	0.08
18.0	4,268.0	0.07
19.0	4,031.0	0.05
20.0	3,771.0	0.04
21.0	3,408.0	0.03
22.0	2,917.0	0.03
23.0	2,363.0	0.02
24.0	1,782.0	0.01





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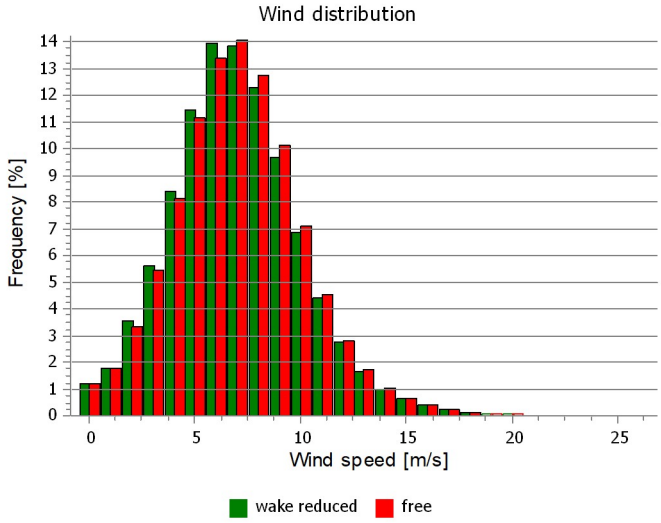
PARK - Wind Data Analysis

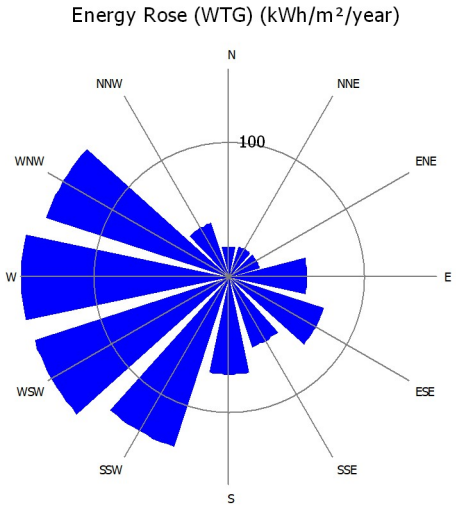
Calculation: AEP_Vestas_Noice_plus_bats Wind data: 1 - 01_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (1); Hub height: 125.0

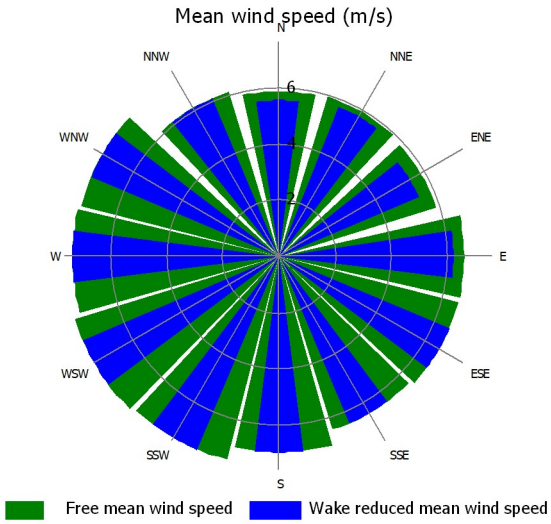
Site coordinates
UTM (north)-ETRS89 Zone: 32
East: 547,816 North: 6,060,703
01_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (1)
Masts used
Take nearest

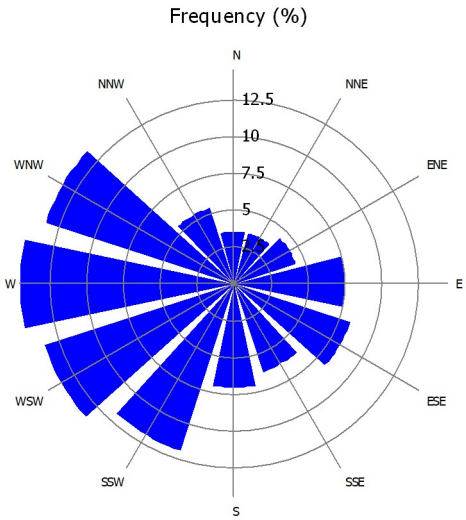
Winddata for site

Sector	Free mean wind speed [m/s]	Wake reduced mean wind speed [m/s]	Frequency [%]
0 N	5.9	5.6	3.6
1 NNE	6.0	5.8	3.6
2 ENE	5.9	5.4	4.4
3 E	6.7	6.3	7.5
4 ESE	6.6	6.6	8.3
5 SSE	6.5	6.5	6.3
6 S	7.0	7.0	7.1
7 SSW	7.5	7.5	12.0
8 WSW	7.7	7.7	13.6
9 W	7.4	7.4	14.6
10 WNW	7.3	7.3	13.5
11 NNW	6.2	6.2	5.5
All	7.0	6.9	100.0









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Calculated:
1/16/2025 5:34 PM/4.0.547

PARK - Wind Data Analysis

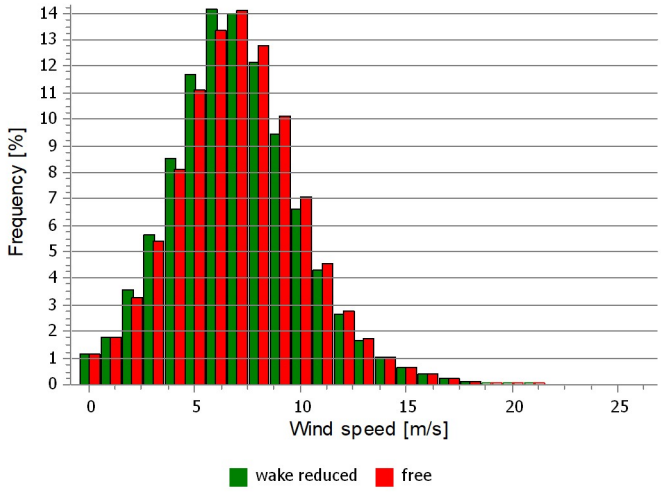
Calculation: AEP_Vestas_Noice_plus_bats Wind data: 2 - 02_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (7); Hub height: 125.0

Site coordinates
UTM (north)-ETRS89 Zone: 32
East: 547,696 North: 6,061,714
02_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (7)
Masts used
Take nearest

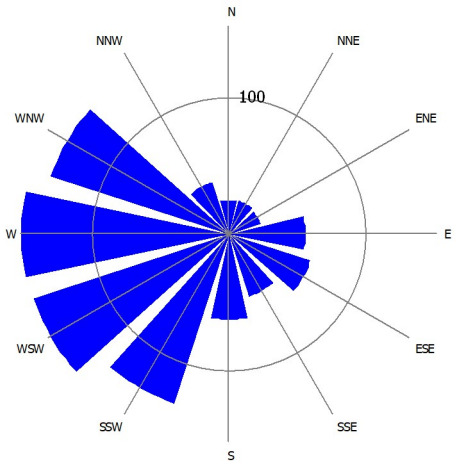
Winddata for site

Sector	Free mean wind speed [m/s]	Wake reduced mean wind speed [m/s]	Frequency [%]
0 N	5.9	5.9	3.6
1 NNE	6.0	6.0	3.6
2 ENE	6.0	5.6	4.4
3 E	6.7	6.3	7.5
4 ESE	6.6	6.3	8.3
5 SSE	6.5	6.3	6.3
6 S	7.0	6.7	7.1
7 SSW	7.6	7.6	12.0
8 WSW	7.7	7.7	13.6
9 W	7.5	7.5	14.6
10 WNW	7.3	7.3	13.5
11 NNW	6.1	6.1	5.5
All	7.0	6.9	100.0

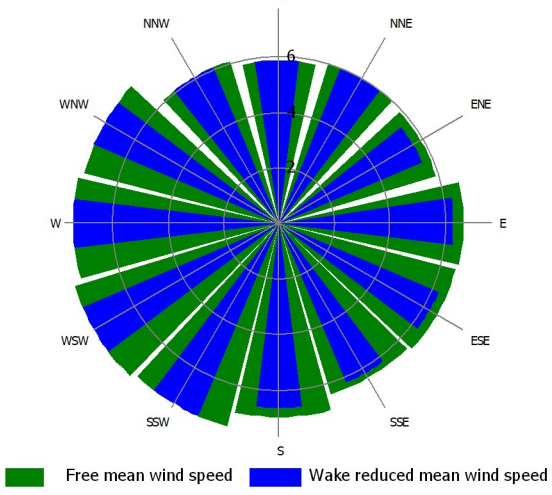
Wind distribution



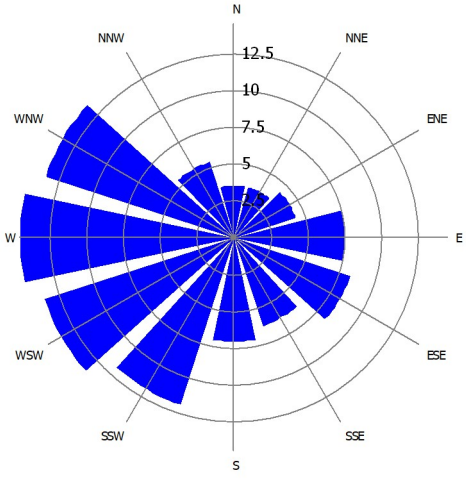
Energy Rose (WTG) (kWh/m²/year)



Mean wind speed (m/s)



Frequency (%)

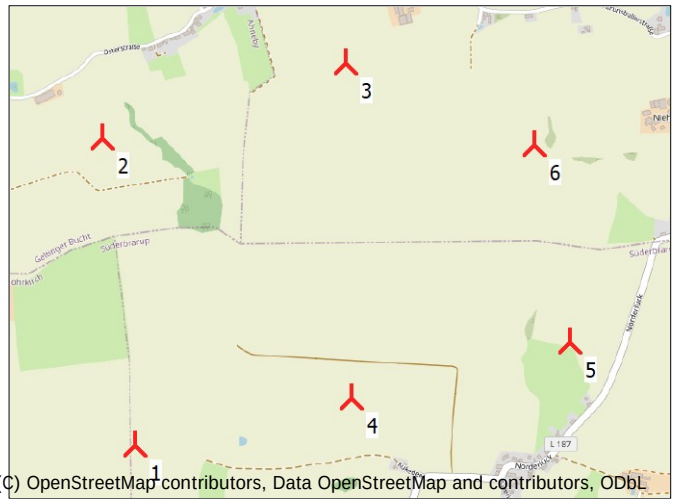


PARK - WTG distances

Calculation: AEP_Vestas_Noice_plus_bats

WTG distances

	Z [m]	Nearest WTG	Z [m]	Horizontal distance [m]	Distance in rotor diameters
1	60.0	4	60.0	734	4.9
2	60.0	3	60.0	844	5.6
3	60.0	6	60.0	681	4.5
4	60.0	1	60.0	734	4.9
5	60.0	6	60.0	662	4.4
6	60.0	5	60.0	662	4.4
Min	60.0		60.0	662	4.4
Max	60.0		60.0	844	5.6



Scale 1:25,000

New WTG

PARK - Time varying AEP

Calculation: AEP_Vestas_Noice_plus_bats

Windfarm: 27.0 MW based on 6 turbines of type VESTAS V150-4.5 4500 150.0 !O!.
Selection: All new WTGs
Calculated mean yield per month and hour [MWh]. The result includes wake losses and any curtailment losses.
Values are scaled to a full year, see correction factors at main result page.

Hour/Month [MWh]	1	2	3	4	5	6	7	8	9	10	11	12	Grand Total
0	456	409	396	318	308	279	266	264	313	398	400	430	4,237
1	448	404	394	316	293	265	250	269	303	374	405	427	4,148
2	448	401	394	316	289	264	254	263	303	373	399	439	4,141
3	444	402	380	306	296	251	257	257	294	376	400	423	4,087
4	455	403	387	313	289	254	253	257	302	376	394	427	4,110
5	446	406	384	314	308	278	272	266	314	387	376	429	4,180
6	458	409	393	308	291	260	255	269	309	396	390	437	4,176
7	447	403	389	294	261	252	241	238	291	383	385	428	4,013
8	444	397	360	253	251	238	234	223	278	369	370	416	3,833
9	427	383	348	252	232	238	237	218	256	345	355	408	3,698
10	427	368	347	255	236	242	239	231	281	341	355	399	3,722
11	415	359	348	258	241	239	233	227	267	335	329	388	3,638
12	406	372	354	273	262	262	255	248	291	350	354	392	3,822
13	418	384	374	294	277	280	267	263	311	368	353	395	3,984
14	419	383	389	305	291	296	283	278	301	371	366	395	4,078
15	425	394	393	306	296	296	281	268	314	373	354	397	4,097
16	421	379	378	304	289	282	266	267	302	362	363	397	4,011
17	424	372	369	294	284	275	260	258	283	353	367	407	3,946
18	424	378	375	273	271	258	252	235	252	360	372	412	3,860
19	445	390	385	268	260	253	239	212	270	385	383	409	3,899
20	447	400	402	300	270	213	213	218	298	389	388	423	3,959
21	454	412	416	303	272	241	224	235	301	388	403	422	4,072
22	442	406	405	320	299	254	245	250	302	400	396	420	4,140
23	440	399	394	320	297	263	255	267	327	403	388	419	4,172
Grand Total	10,482	9,414	9,155	7,063	6,662	6,231	6,030	5,979	7,063	8,957	9,046	9,941	96,023

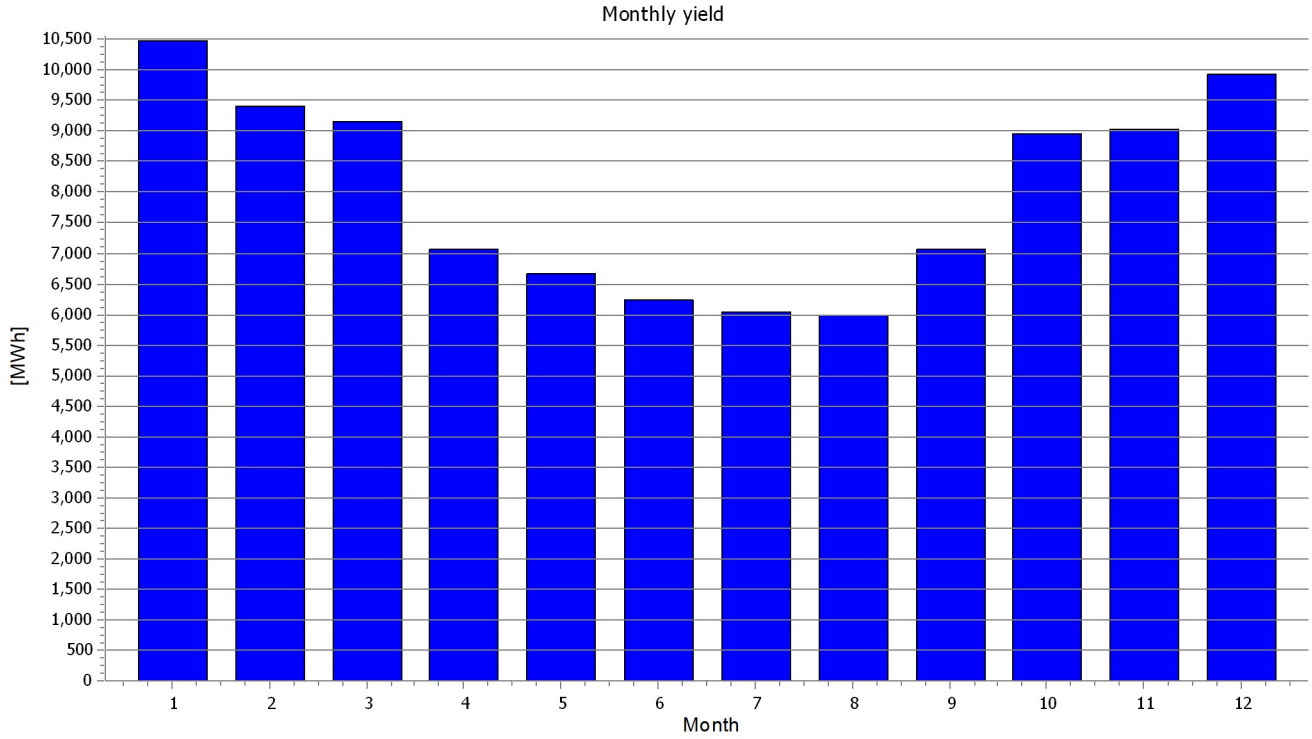
Hour/Month [MW]	1	2	3	4	5	6	7	8	9	10	11	12	Grand Total
0	14.7	14.6	12.8	10.6	9.9	9.3	8.6	8.5	10.4	12.8	13.3	13.9	11.6
1	14.5	14.4	12.7	10.5	9.5	8.8	8.1	8.7	10.1	12.1	13.5	13.8	11.4
2	14.5	14.3	12.7	10.5	9.3	8.8	8.2	8.5	10.1	12.0	13.3	14.2	11.3
3	14.3	14.4	12.3	10.2	9.5	8.4	8.3	8.3	9.8	12.1	13.3	13.6	11.2
4	14.7	14.4	12.5	10.4	9.3	8.5	8.2	8.3	10.1	12.1	13.1	13.8	11.3
5	14.4	14.5	12.4	10.5	9.9	9.3	8.8	8.6	10.5	12.5	12.5	13.8	11.5
6	14.8	14.6	12.7	10.3	9.4	8.7	8.2	8.7	10.3	12.8	13.0	14.1	11.4
7	14.4	14.4	12.6	9.8	8.4	8.4	7.8	7.7	9.7	12.3	12.8	13.8	11.0
8	14.3	14.2	11.6	8.4	8.1	7.9	7.5	7.2	9.3	11.9	12.3	13.4	10.5
9	13.8	13.7	11.2	8.4	7.5	7.9	7.6	7.0	8.5	11.1	11.8	13.2	10.1
10	13.8	13.1	11.2	8.5	7.6	8.1	7.7	7.5	9.4	11.0	11.8	12.9	10.2
11	13.4	12.8	11.2	8.6	7.8	8.0	7.5	7.3	8.9	10.8	11.0	12.5	10.0
12	13.1	13.3	11.4	9.1	8.5	8.7	8.2	8.0	9.7	11.3	11.8	12.7	10.5
13	13.5	13.7	12.1	9.8	8.9	9.3	8.6	8.5	10.4	11.9	11.8	12.7	10.9
14	13.5	13.7	12.5	10.2	9.4	9.9	9.1	9.0	10.0	12.0	12.2	12.7	11.2
15	13.7	14.1	12.7	10.2	9.6	9.9	9.1	8.6	10.5	12.0	11.8	12.8	11.2
16	13.6	13.5	12.2	10.1	9.3	9.4	8.6	8.6	10.1	11.7	12.1	12.8	11.0
17	13.7	13.3	11.9	9.8	9.2	9.2	8.4	8.3	9.4	11.4	12.2	13.1	10.8
18	13.7	13.5	12.1	9.1	8.7	8.6	8.1	7.6	8.4	11.6	12.4	13.3	10.6
19	14.4	13.9	12.4	8.9	8.4	8.4	7.7	6.8	9.0	12.4	12.8	13.2	10.7
20	14.4	14.3	13.0	10.0	8.7	7.1	6.9	7.0	9.9	12.6	12.9	13.7	10.8
21	14.6	14.7	13.4	10.1	8.8	8.0	7.2	7.6	10.0	12.5	13.4	13.6	11.2
22	14.2	14.5	13.1	10.7	9.6	8.5	7.9	8.1	10.1	12.9	13.2	13.6	11.3
23	14.2	14.3	12.7	10.7	9.6	8.8	8.2	8.6	10.9	13.0	12.9	13.5	11.4
Grand Total	14.1	14.0	12.3	9.8	9.0	8.7	8.1	8.0	9.8	12.0	12.6	13.4	11.0

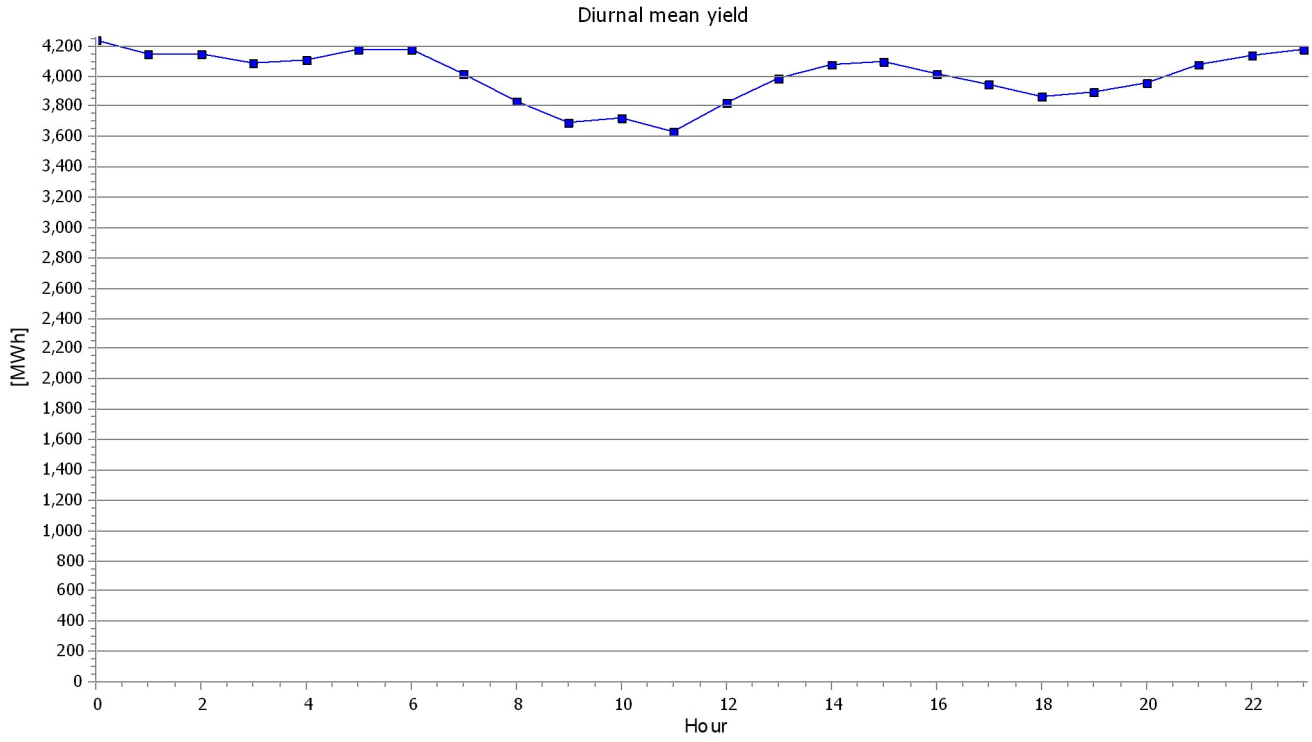
Calculated:
1/16/2025 5:34 PM/4.0.547

PARK - Time varying AEP

Calculation: AEP_Vestas_Noice_plus_bats

Windfarm: 27.0 MW based on 6 turbines of type VESTAS V150-4.5 4500 150.0 !O!.
Selection: All new WTGs
Calculated mean yield per month and hour [MWh]. The result includes wake losses and any curtailment losses.
Values are scaled to a full year, see correction factors at main result page.





Project:
Exam_16.01

Licensed user:
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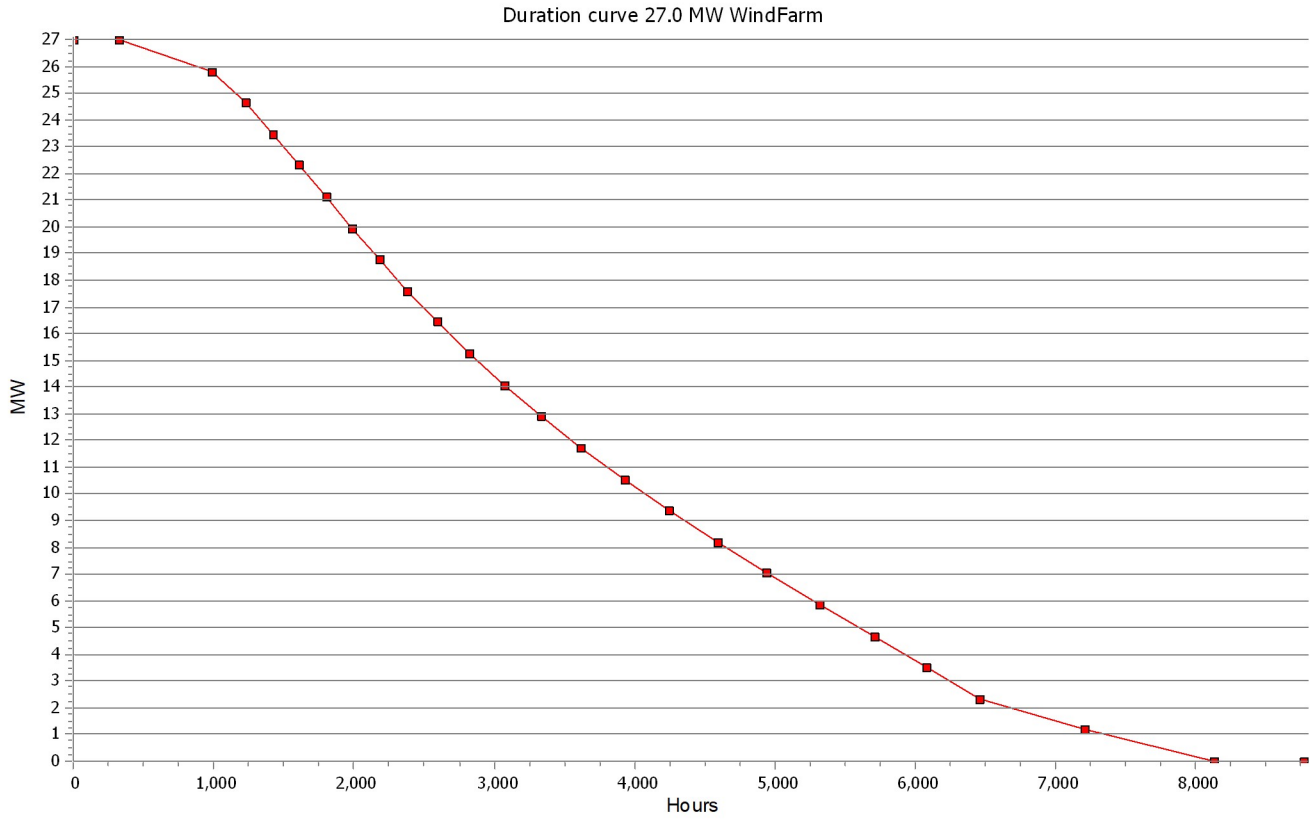
student / weti-lab-vt10@hs-flensburg.de
Calculated:
1/16/2025 5:34 PM/4.0.547

PARK - Time varying AEP

Calculation: AEP_Vestas_Noice_plus_bats

Windfarm: 27.0 MW based on 6 turbines of type VESTAS V150-4.5 4500 150.0 !O!.
Selection: All new WTGs
Calculated mean yield per month and hour [MWh]. The result includes wake losses and any curtailment losses.

Hours	Hours [%]	Hours accumulated	Power [MW]	Power (MW/WTG)
328	3.7	328	27.0	4.5
658	7.5	986	25.8 - 27.0	4.3 - 4.5
238	2.7	1224	24.7 - 25.8	4.1 - 4.3
193	2.2	1416	23.5 - 24.7	3.9 - 4.1
193	2.2	1610	22.3 - 23.5	3.7 - 3.9
187	2.1	1797	21.1 - 22.3	3.5 - 3.7
188	2.1	1985	20.0 - 21.1	3.3 - 3.5
194	2.2	2179	18.8 - 20.0	3.1 - 3.3
201	2.3	2380	17.6 - 18.8	2.9 - 3.1
215	2.5	2595	16.4 - 17.6	2.7 - 2.9
230	2.6	2825	15.3 - 16.4	2.5 - 2.7
240	2.7	3065	14.1 - 15.3	2.3 - 2.5
265	3.0	3330	12.9 - 14.1	2.2 - 2.3
286	3.3	3616	11.7 - 12.9	2.0 - 2.2
307	3.5	3923	10.6 - 11.7	1.8 - 2.0
320	3.7	4244	9.4 - 10.6	1.6 - 1.8
348	4.0	4592	8.2 - 9.4	1.4 - 1.6
349	4.0	4941	7.0 - 8.2	1.2 - 1.4
378	4.3	5319	5.9 - 7.0	1.0 - 1.2
384	4.4	5703	4.7 - 5.9	0.8 - 1.0
376	4.3	6079	3.5 - 4.7	0.6 - 0.8
380	4.3	6459	2.3 - 3.5	0.4 - 0.6
746	8.5	7205	1.2 - 2.3	0.2 - 0.4
923	10.5	8128	0.0 - 1.2	0.0 - 0.2
638	7.3	8766	0.0	0.0



PARK - Scaling info

Calculation: AEP_Vestas_Noice_plus_bats

Scaler settings

Name	EMD Default Measurement Mast Scaler
Terrain scaling	Measured Data Scaling (WAsP Stability / A-Parameter)
RIX correction	No RIX correction
Displacement height	from objects
Micro terrain flow model	Site data: RESGEN (5)

Site Data: Site data: RESGEN (5)

Obstacles:

All obstacles used

Roughness:

Terrain data files used in calculation:
C:\Users\student\Desktop\Exam_16_01_2025\Windpro_exam_16.01\ROUGHNESSLINE_ONLINEDATA_0.wpo
Min X: 518,359, Max X: 578,403, Min Y: 6,030,681, Max Y: 6,091,978, Width: 60,044 m, Height: 61,297 m

Orography:

Terrain data files used in calculation:
C:\Users\student\Desktop\Exam_16_01_2025\Windpro_exam_16.01\CONTOURLINE_ONLINEDATA_0.wpo
Min X: 538,612, Max X: 558,177, Min Y: 6,051,218, Max Y: 6,071,644, Width: 19,565 m, Height: 20,426 m

Post calibration

Overall factor	1.0000
Overall offset	0.0000
By sector	No
By month	No
By hour	No
By wind speed	No

PARK - Curtailment assumptions

Calculation: AEP_Vestas_Noice_plus_bats

Curtailment signals

Signal	Signal source
Mean wind speed	Scaler

WTG Curtailments

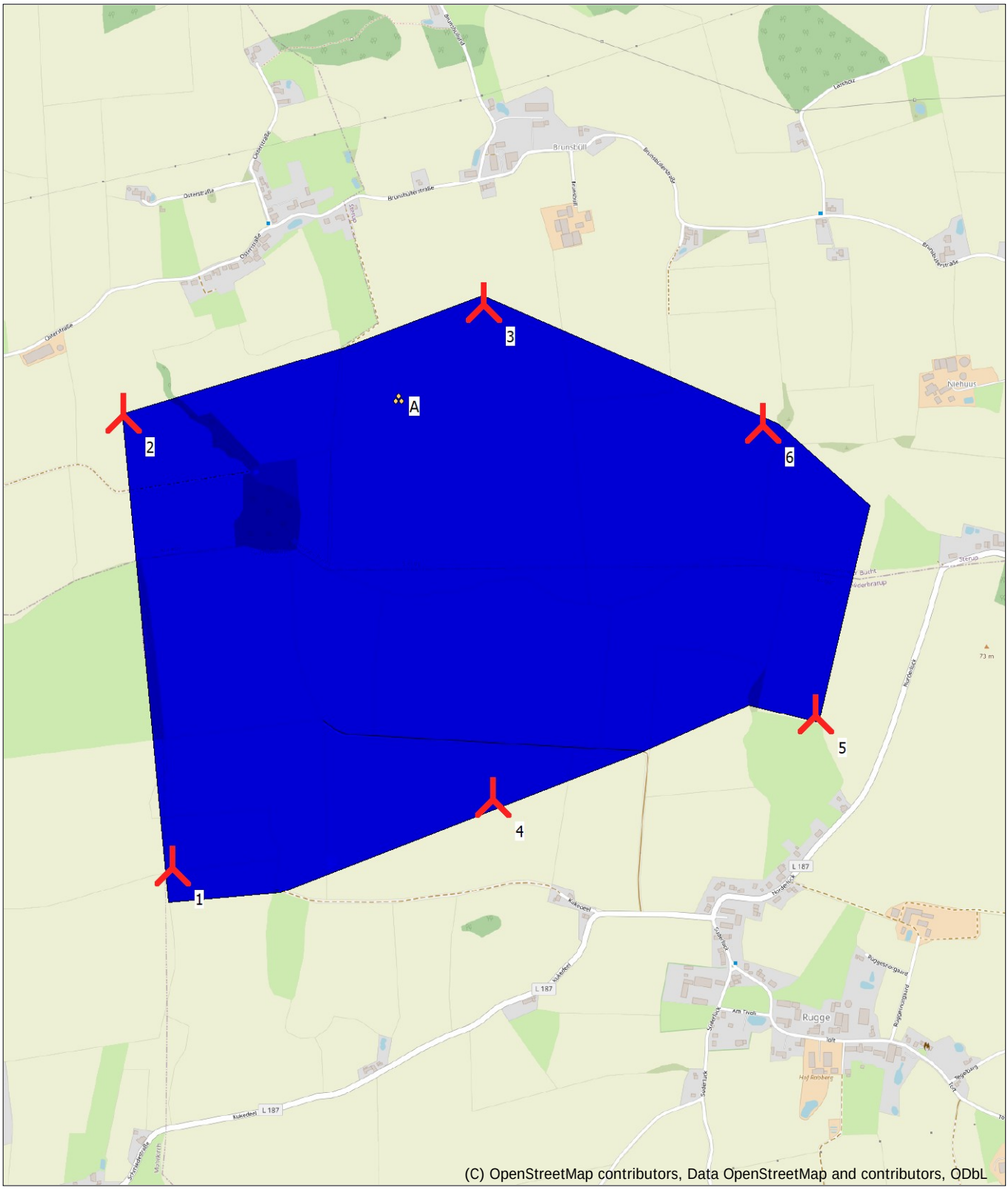
WTG	Name	Index	Priority	Type	Action	Conditions	Times fully applied	Time partially applied	Times skipped
1	Bats	1	1	Bats	Shut down	Date [4/1;9/30], SunRiseSet [1:00h before sunset;1:00h after sunset], WS [0;6]	6553	0	0
2	Bats	1	1	Bats	Shut down	Date [4/1;9/30], SunRiseSet [1:00h before sunset;1:00h after sunset], WS [0;6]	6713	0	0
2	Noise	2	2	Noise	Shut down	Date [1/1;12/31], Time [10:00 PM;6:00 AM], WS [0;6]	27258	0	0
3	Bats	1	1	Bats	Shut down	Date [4/1;9/30], SunRiseSet [1:00h before sunset;1:00h after sunset], WS [0;6]	6950	0	0
3	Noise	2	2	Noise	Shut down	Date [1/1;12/31], Time [10:00 PM;6:00 AM], WS [0;6]	29011	0	0
4	Bats	1	1	Bats	Shut down	Date [4/1;9/30], SunRiseSet [1:00h before sunset;1:00h after sunset], WS [0;6]	6992	0	0
4	Noise	2	2	Noise	Shut down	Date [1/1;12/31], Time [10:00 PM;6:00 AM], WS [0;6]	28362	0	0
5	Bats	1	1	Bats	Shut down	Date [4/1;9/30], SunRiseSet [1:00h before sunset;1:00h after sunset], WS [0;6]	6785	0	0
6	Bats	1	1	Bats	Shut down	Date [4/1;9/30], SunRiseSet [1:00h before sunset;1:00h after sunrise], WS [0;6]	27649	0	0
6	Noise	2	2	Noise	Shut down	Date [1/1;12/31], Time [10:00 PM;6:00 AM], WS [0;6]	11942	0	0

WTG curtailments using wind speeds interacts with the wake losses.

Multiple curtailment rules may have been sequentially applied in each time step

PARK - Map

Calculation: AEP_Vestas_Noice_plus_bats



0 250 500 750 1000m

Map: EMD OpenStreetMap , Print scale 1:12,500, Map center UTM (north)-ETRS89 Zone: 32 East: 548,534 North: 6,061,313

New WTG WTG area