PARK - Main Result

Calculation: AEP_enercon_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_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (12)

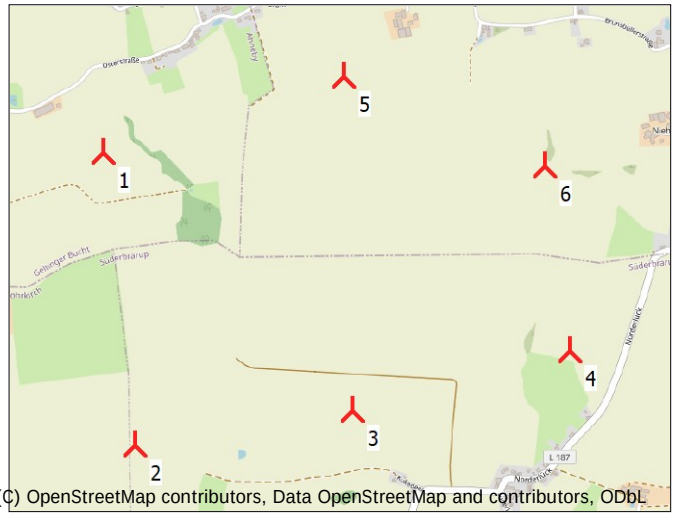
Scaler / wind data

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]	990.6	990.6	990.6			
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	70,245.5	63,221.0	97,246.7	24.2	3.5	24.0	10,536.8	2,107	7.0	6.9

¤) Based on Result-10.0%

Calculated Annual Energy for each of 6 new WTGs with total 30.0 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	No	ENERCON	E-147 EP5 E2-5,000	5,000	147.0	126.0	USER	Mode 00 - OM 0 s - 5000 kW	10,110.7	9,100	35.4	2.5	7.03	6.95
2	No	ENERCON	E-147 EP5 E2-5,000	5,000	147.0	126.0	USER	Mode 00 - OM 0 s - 5000 kW	15,626.3	14,064	2.1	1.8	7.03	6.97
3	No	ENERCON	E-147 EP5 E2-5,000	5,000	147.0	126.0	USER	Mode 00 - OM 0 s - 5000 kW	15,191.0	13,672	2.2	3.7	7.00	6.88
4	No	ENERCON	E-147 EP5 E2-5,000	5,000	147.0	126.0	USER	Mode 00 - OM 0 s - 5000 kW	9,810.4	8,829	35.1	4.0	7.00	6.86
5	No	ENERCON	E-147 EP5 E2-5,000	5,000	147.0	126.0	USER	Mode 00 - OM 0 s - 5000 kW	9,774.9	8,797	35.4	4.0	7.00	6.86
6	No	ENERCON	E-147 EP5 E2-5,000	5,000	147.0	126.0	USER	Mode 00 - OM 0 s - 5000 kW	9,732.2	8,759	35.2	5.3	7.05	6.87

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	547,702	6,061,711	60.0	01_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (12)	1/1/1994	1/1/2025
2	New	547,819	6,060,747	60.0	02_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (13)	1/1/1994	1/1/2025
3	New	548,537	6,060,868	60.0	03_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (14)	1/1/1994	1/1/2025
4	New	549,253	6,061,072	60.0	E04_NERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (15)	1/1/1994	1/1/2025
5	New	548,497	6,061,973	60.0	05_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (16)	1/1/1994	1/1/2025
6	New	549,164	6,061,683	60.0	06_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (17)	1/1/1994	1/1/2025

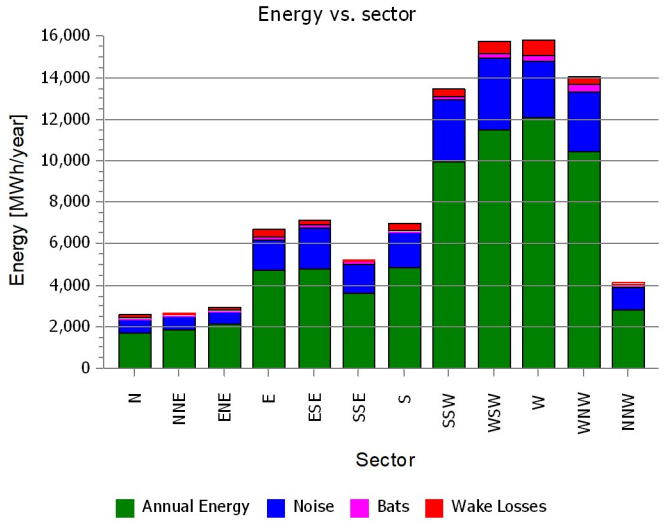
PARK - Production Analysis

Calculation: AEP_enercon_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]	2,564.3	2,612.0	2,964.6	6,653.4	7,140.4	5,246.6	6,948.5	13,415.0	15,712.9	15,802.3	14,034.3	4,152.3	97,246.7
-Decrease due to curtailments	[MWh]	775.2	700.6	663.6	1,618.0	2,123.7	1,538.4	1,756.0	3,166.0	3,687.3	3,027.1	3,241.8	1,271.2	23,568.9
Noise	[MWh]	697.4	631.4	544.7	1,437.2	1,959.5	1,435.6	1,654.0	2,990.5	3,427.6	2,680.2	2,913.4	1,117.0	21,488.4
Bats	[MWh]	77.8	69.2	118.9	180.8	164.2	102.8	102.0	175.5	259.7	346.9	328.4	154.2	2,080.5
-Decrease due to wake losses	[MWh]	109.0	59.6	156.7	328.9	240.4	135.2	331.6	329.4	569.2	709.2	378.4	84.5	3,432.2
Resulting energy	[MWh]	1,680.1	1,851.9	2,144.3	4,706.5	4,776.3	3,572.9	4,860.9	9,919.6	11,456.4	12,066.1	10,414.0	2,796.6	70,245.5
Specific energy	[kWh/m²]													690
Specific energy	[kWh/kW]													2,342
-Decrease due to curtailments	[%]	30.2	26.8	22.4	24.3	29.7	29.3	25.3	23.6	23.5	19.2	23.1	30.6	24.2
Noise	[%]	27.2	24.2	18.4	21.6	27.4	27.4	23.8	22.3	21.8	17.0	20.8	26.9	22.1
Bats	[%]	3.0	2.6	4.0	2.7	2.3	2.0	1.5	1.3	1.7	2.2	2.3	3.7	2.1
Decrease due to wake losses	[%]	4.3	2.3	5.3	4.9	3.4	2.6	4.8	2.5	3.6	4.5	2.7	2.0	3.53
Full Load Equivalent	[Hours/year]	56	62	71	157	159	119	162	331	382	402	347	93	2,342

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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PARK - Power Curve Analysis

Calculation: AEP_enercon_Noice_plus_bats WTG: 1 - ENERCON E-147 EP5 E2 5000 147.0 !O!, Hub height: 126.0 m

Name: Mode 00 - OM 0 s - 5000 kW
Source: ENERCON GmbH

Source/Date	Created by	Created	Edited	Stop wind speed [m/s]	Power control	CT curve type	Generator type	Specific power kW/m²
8/1/2019	USER	2/10/2020	2/25/2020	25.0	Pitch	User defined	Variable	0.29

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Enercon reserves the right to change the above specifications without prior notice.

HP curve comparison - Note: For standard air density

Vmean	[m/s]	5	6	7	8	9	10
HP value Pitch, variable speed (2013)	[MWh]	8,581	13,010	17,262	21,030	24,193	26,713
ENERCON E-147 EP5 E2 5000 147.0 !O! Mode 00 - OM 0 s - 5000 kW	[MWh]	8,091	12,179	16,183	19,811	22,914	25,414
Check value	[%]	6	7	7	6	6	5

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

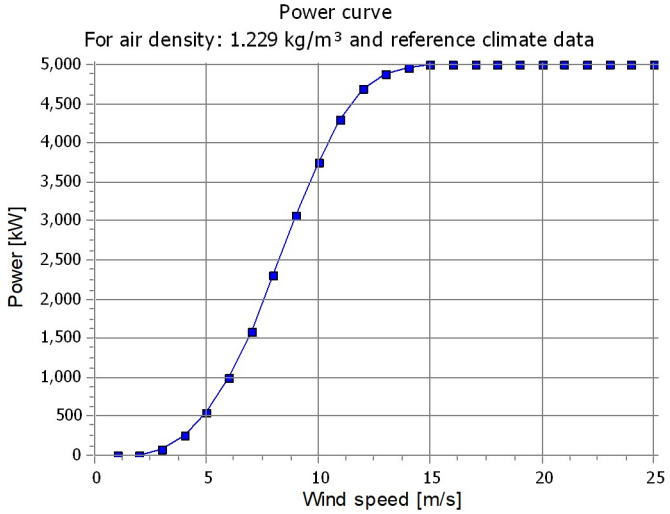
Original data, Air density: 1.225 kg/m³

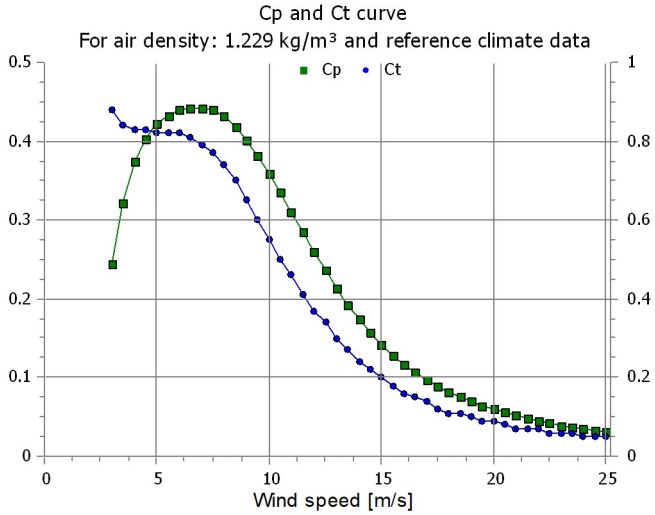
Wind speed [m/s]	Power [kW]	Cp	Wind speed [m/s]	Ct curve
3.0	68.0	0.24	3.0	0.88
3.5	143.0	0.32	3.5	0.84
4.0	248.0	0.37	4.0	0.83
4.5	382.0	0.40	4.5	0.83
5.0	548.0	0.42	5.0	0.82
5.5	748.0	0.43	5.5	0.82
6.0	986.0	0.44	6.0	0.82
6.5	1,263.0	0.44	6.5	0.81
7.0	1,578.0	0.44	7.0	0.79
7.5	1,926.0	0.44	7.5	0.77
8.0	2,297.0	0.43	8.0	0.74
8.5	2,676.0	0.42	8.5	0.70
9.0	3,050.0	0.40	9.0	0.65
9.5	3,406.0	0.38	9.5	0.60
10.0	3,736.0	0.36	10.0	0.55
10.5	4,036.0	0.34	10.5	0.50
11.0	4,297.0	0.31	11.0	0.46
11.5	4,514.0	0.29	11.5	0.41
12.0	4,682.0	0.26	12.0	0.37
12.5	4,804.0	0.24	12.5	0.34
13.0	4,886.0	0.21	13.0	0.30
13.5	4,937.0	0.19	13.5	0.27
14.0	4,967.0	0.17	14.0	0.24
14.5	4,984.0	0.16	14.5	0.22
15.0	4,993.0	0.14	15.0	0.20
15.5	4,997.0	0.13	15.5	0.18
16.0	4,999.0	0.12	16.0	0.16
16.5	5,000.0	0.11	16.5	0.15
17.0	5,000.0	0.10	17.0	0.14
17.5	5,000.0	0.09	17.5	0.12
18.0	5,000.0	0.08	18.0	0.11
18.5	5,000.0	0.08	18.5	0.11
19.0	5,000.0	0.07	19.0	0.10
19.5	5,000.0	0.06	19.5	0.09
20.0	5,000.0	0.06	20.0	0.09
20.5	5,000.0	0.06	20.5	0.08
21.0	5,000.0	0.05	21.0	0.07
21.5	5,000.0	0.05	21.5	0.07
22.0	5,000.0	0.05	22.0	0.07
22.5	5,000.0	0.04	22.5	0.06
23.0	5,000.0	0.04	23.0	0.06
23.5	5,000.0	0.04	23.5	0.06
24.0	5,000.0	0.03	24.0	0.05
24.5	5,000.0	0.03	24.5	0.05
25.0	5,000.0	0.03	25.0	0.05

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	68.5	0.24
4.0	249.2	0.37
5.0	550.3	0.42
6.0	989.8	0.44
7.0	1,583.5	0.44
8.0	2,303.9	0.43
9.0	3,057.7	0.40
10.0	3,744.1	0.36
11.0	4,304.2	0.31
12.0	4,686.8	0.26
13.0	4,888.1	0.21
14.0	4,967.7	0.17
15.0	4,993.2	0.14
16.0	4,999.0	0.12
17.0	5,000.0	0.10
18.0	5,000.0	0.08
19.0	5,000.0	0.07
20.0	5,000.0	0.06
21.0	5,000.0	0.05
22.0	5,000.0	0.05
23.0	5,000.0	0.04
24.0	5,000.0	0.03
25.0	5,000.0	0.03





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PARK - Wind Data Analysis

Calculation: AEP_enercon_Noice_plus_bats Wind data: 1 - 01_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (12); Hub height: 126.0

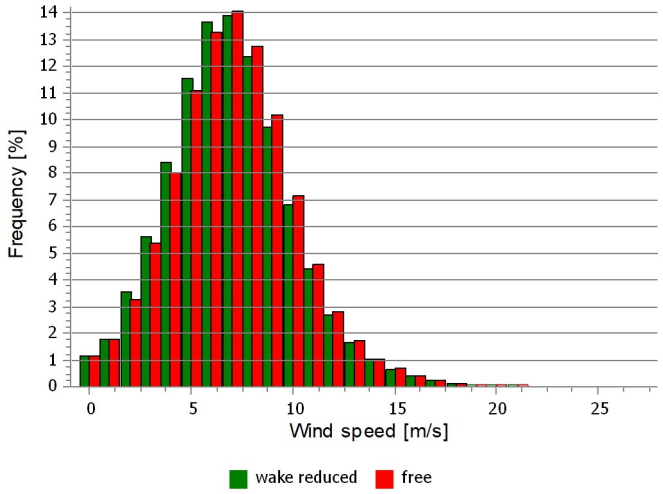
Site coordinates

UTM (north)-ETRS89 Zone: 32
East: 547,702 North: 6,061,711
01_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (12)
Masts used
Take nearest

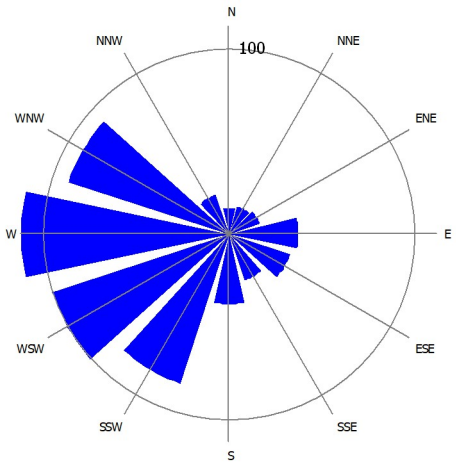
Winddata for site

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	5.7	4.5
3 E	6.7	6.5	7.6
4 ESE	6.6	6.4	8.3
5 SSE	6.5	6.3	6.2
6 S	7.0	6.7	7.0
7 SSW	7.6	7.6	12.0
8 WSW	7.7	7.7	13.7
9 W	7.5	7.5	14.7
10 WNW	7.3	7.3	13.4
11 NNW	6.1	6.1	5.4
All	7.0	6.9	100.0

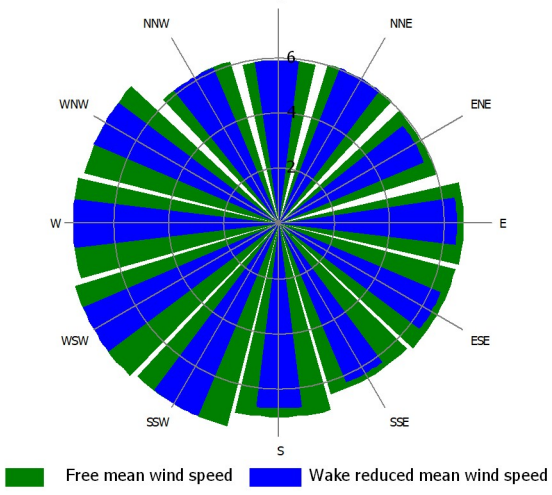
Wind distribution



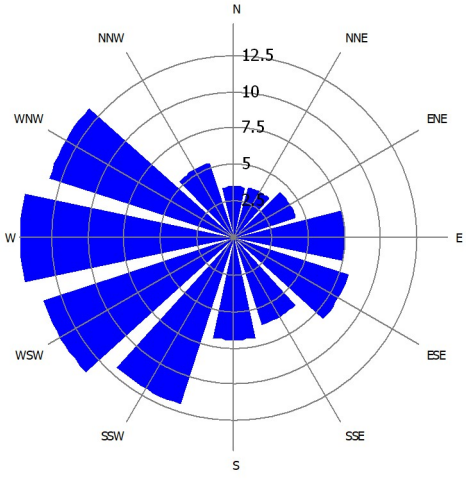
Energy Rose (WTG) (kWh/m²/year)



Mean wind speed (m/s)



Frequency (%)



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PARK - Wind Data Analysis

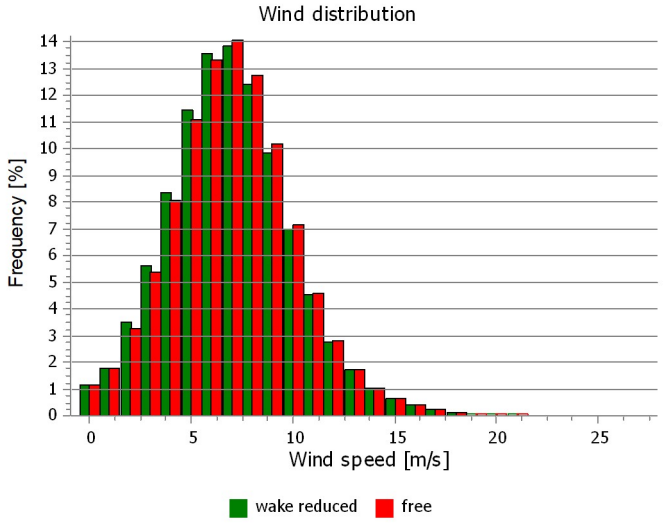
Calculation: AEP_enercon_Noice_plus_bats Wind data: 2 - 02_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (13); Hub height: 126.0

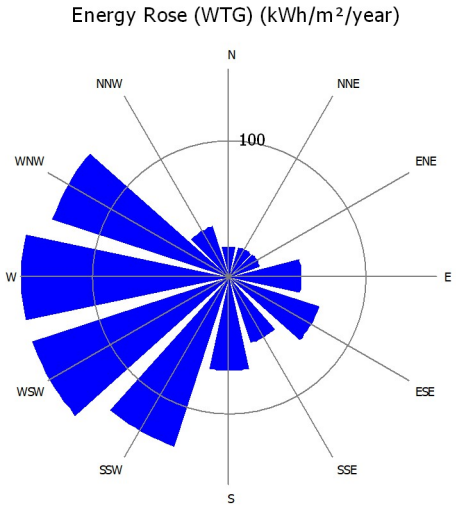
Site coordinates

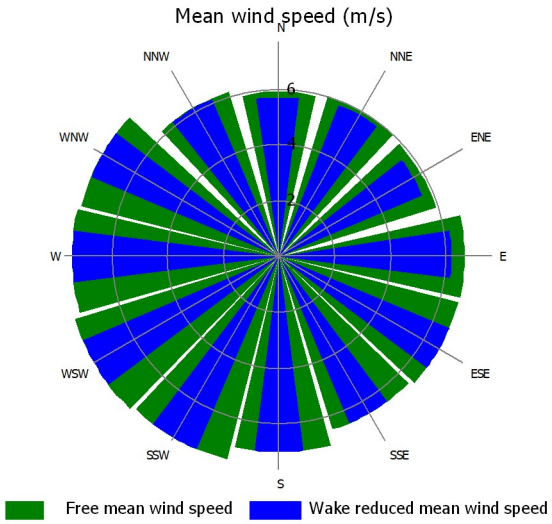
UTM (north)-ETRS89 Zone: 32
East: 547,819 North: 6,060,747
02_ENERCON E-147 EP5 E2 5000 147.0 !O! hub: 126.0 m (TOT: 199.5 m) (13)
Masts used
Take nearest

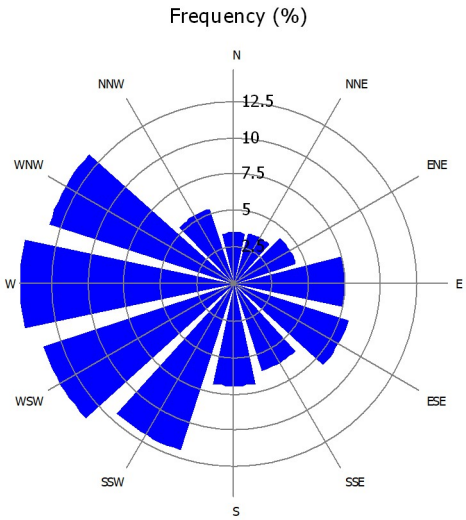
Winddata for site

Sector	Free mean wind speed [m/s]	Wake reduced mean wind speed [m/s]	Frequency [%]
0 N	5.9	5.7	3.6
1 NNE	6.0	5.9	3.6
2 ENE	5.9	5.6	4.5
3 E	6.7	6.2	7.6
4 ESE	6.7	6.7	8.3
5 SSE	6.5	6.5	6.2
6 S	7.0	7.0	7.0
7 SSW	7.5	7.5	12.0
8 WSW	7.7	7.7	13.7
9 W	7.5	7.5	14.7
10 WNW	7.4	7.4	13.4
11 NNW	6.2	6.2	5.4
All	7.0	7.0	100.0









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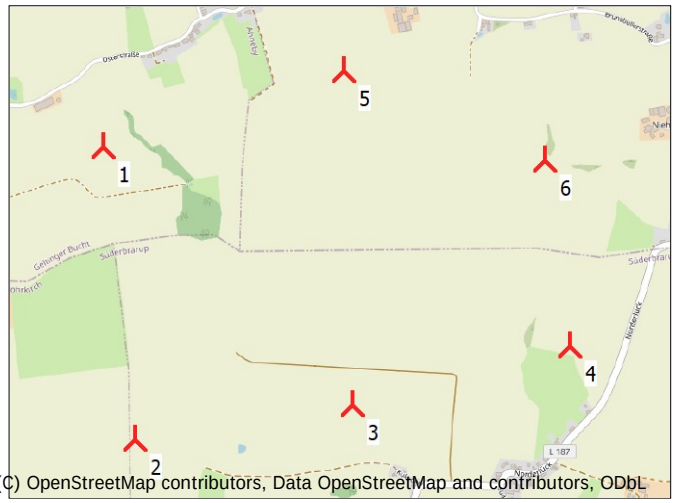
PARK - WTG distances

Calculation: AEP_enercon_Noice_plus_bats

WTG distances

	Z [m]	Nearest WTG	Z [m]	Horizontal distance [m]	Distance in rotor diameters
1	60.0	5	60.0	838	5.7
2	60.0	3	60.0	728	4.9
3	60.0	2	60.0	728	4.9
4	60.0	6	60.0	617	4.2
5	60.0	6	60.0	727	4.9
6	60.0	4	60.0	617	4.2
Min	60.0		60.0	617	4.2
Max	60.0		60.0	838	5.7



Scale 1:25,000

New WTG

PARK - Time varying AEP

Calculation: AEP_enercon_Noice_plus_bats

Windfarm: 30.0 MW based on 6 turbines of type ENERCON E-147 EP5 E2 5000 147.0 !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.

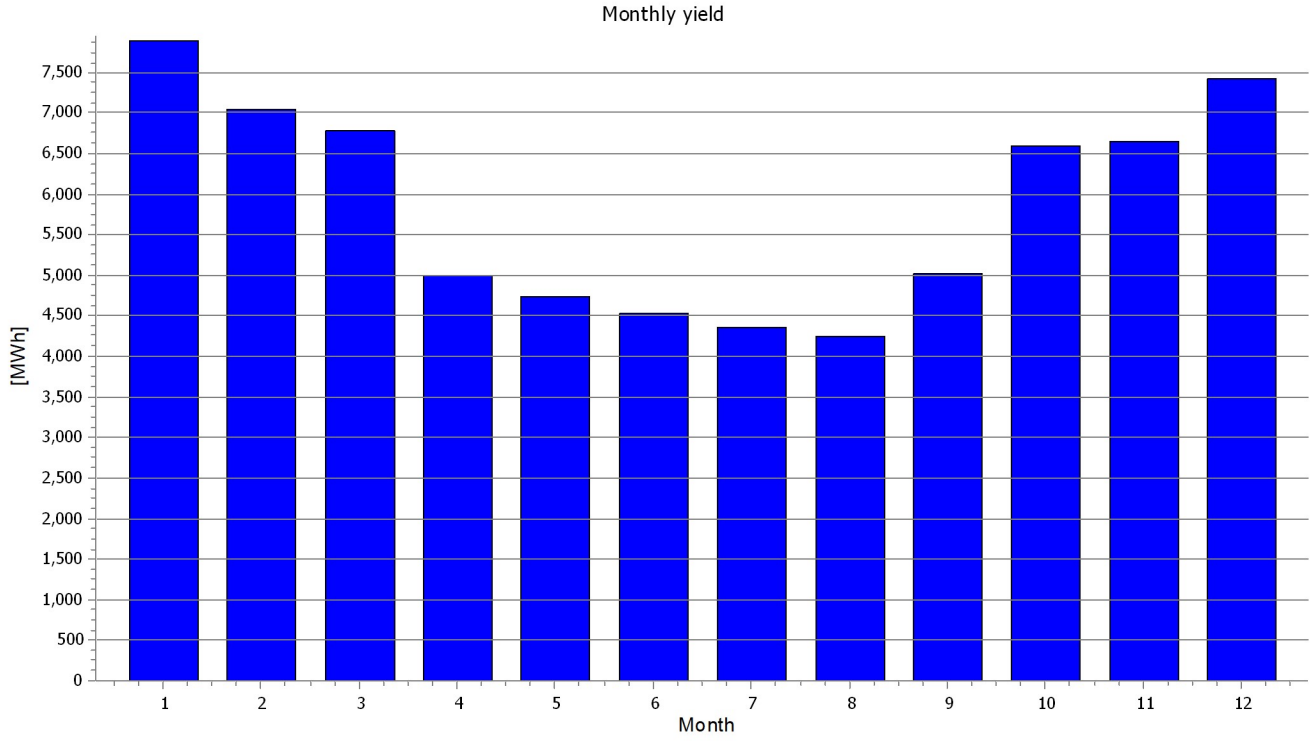
Hour/Month [MWh]	1	2	3	4	5	6	7	8	9	10	11	12	Grand Total
0	155	138	133	99	95	86	82	82	98	134	134	146	1,382
1	152	137	133	99	90	82	77	83	94	127	135	144	1,353
2	151	135	132	98	88	81	77	81	94	126	134	148	1,345
3	150	135	127	95	91	76	78	79	91	128	134	143	1,328
4	154	135	129	97	89	81	77	79	94	126	132	145	1,338
5	151	137	160	268	277	257	248	221	269	330	127	145	2,589
6	440	391	369	277	270	240	235	246	269	373	366	418	3,895
7	430	387	367	273	241	233	222	220	269	359	363	410	3,775
8	427	381	341	235	234	222	216	206	259	347	349	398	3,616
9	413	368	330	236	216	222	221	202	239	324	334	391	3,495
10	413	353	331	240	220	226	222	214	264	323	337	383	3,525
11	402	347	331	242	223	222	217	210	252	317	312	373	3,447
12	395	360	339	257	246	246	238	230	273	332	338	379	3,633
13	408	373	361	278	260	262	249	244	294	351	338	382	3,799
14	409	372	372	289	274	277	265	260	285	352	350	382	3,886
15	411	381	375	290	278	277	262	251	294	355	337	383	3,893
16	407	367	362	288	270	265	249	249	283	344	345	382	3,810
17	410	358	351	276	265	258	242	240	267	334	348	391	3,741
18	409	364	357	255	251	241	233	218	238	339	351	394	3,650
19	430	376	364	250	241	236	222	197	243	363	362	391	3,675
20	432	386	381	266	251	198	197	195	254	367	368	404	3,699
21	439	399	364	94	85	78	72	72	94	165	381	405	2,648
22	151	137	136	100	93	79	75	77	94	136	134	143	1,355
23	150	136	133	99	92	81	78	83	103	136	132	143	1,365
Grand Total	7,889	7,051	6,779	5,002	4,740	4,527	4,356	4,239	5,016	6,586	6,640	7,422	70,246

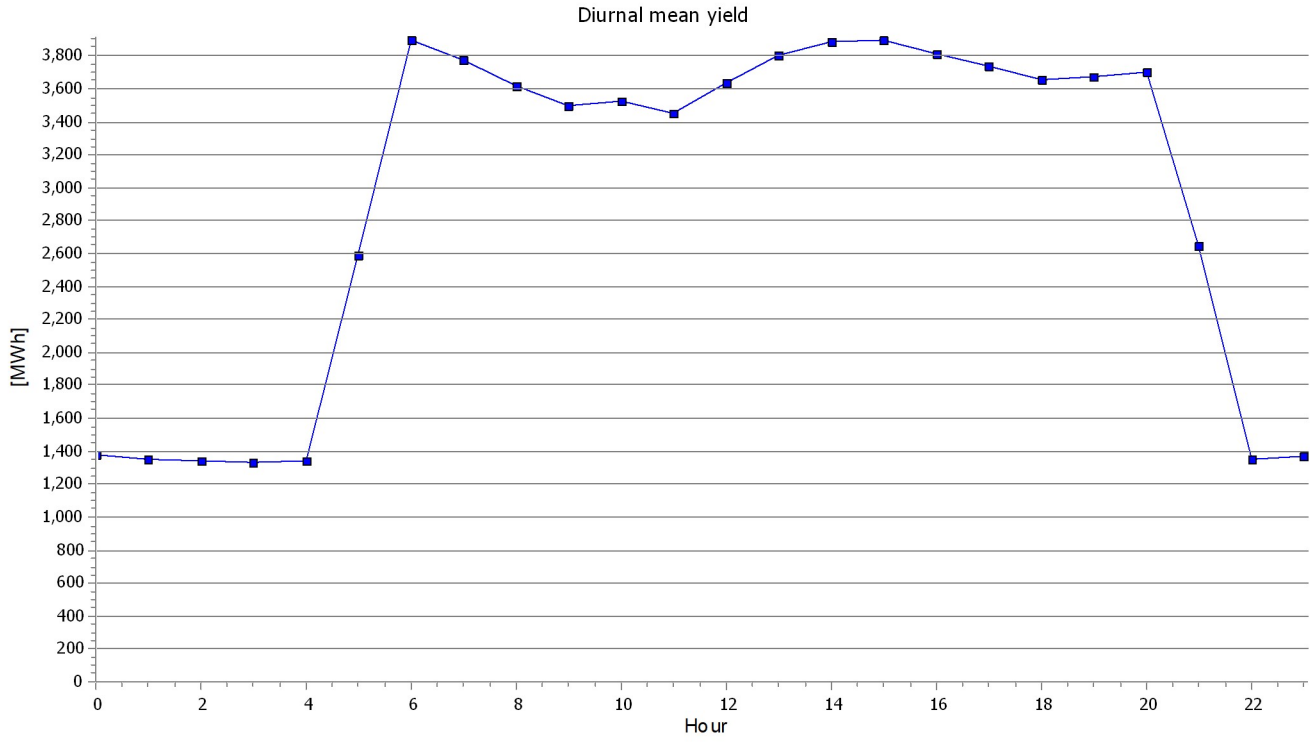
Hour/Month [MW]	1	2	3	4	5	6	7	8	9	10	11	12	Grand Total
0	5.0	4.9	4.3	3.3	3.1	2.9	2.6	2.6	3.3	4.3	4.5	4.7	3.8
1	4.9	4.9	4.3	3.3	2.9	2.7	2.5	2.7	3.1	4.1	4.5	4.6	3.7
2	4.9	4.8	4.3	3.3	2.8	2.7	2.5	2.6	3.1	4.1	4.5	4.8	3.7
3	4.8	4.8	4.1	3.2	2.9	2.5	2.5	2.6	3.0	4.1	4.5	4.6	3.6
4	5.0	4.8	4.2	3.2	2.9	2.7	2.5	2.6	3.1	4.1	4.4	4.7	3.7
5	4.9	4.9	5.2	8.9	8.9	8.6	8.0	7.1	9.0	10.6	4.2	4.7	7.1
6	14.2	14.0	11.9	9.2	8.7	8.0	7.6	7.9	9.0	12.0	12.2	13.5	10.7
7	13.9	13.8	11.8	9.1	7.8	7.8	7.2	7.1	9.0	11.6	12.1	13.2	10.3
8	13.8	13.6	11.0	7.8	7.6	7.4	7.0	6.6	8.6	11.2	11.6	12.9	9.9
9	13.3	13.1	10.6	7.9	7.0	7.4	7.1	6.5	8.0	10.5	11.1	12.6	9.6
10	13.3	12.6	10.7	8.0	7.1	7.5	7.2	6.9	8.8	10.4	11.2	12.3	9.7
11	13.0	12.4	10.7	8.1	7.2	7.4	7.0	6.8	8.4	10.2	10.4	12.0	9.4
12	12.7	12.9	10.9	8.6	7.9	8.2	7.7	7.4	9.1	10.7	11.3	12.2	10.0
13	13.2	13.3	11.6	9.3	8.4	8.7	8.0	7.9	9.8	11.3	11.3	12.3	10.4
14	13.2	13.3	12.0	9.6	8.8	9.2	8.5	8.4	9.5	11.4	11.7	12.3	10.6
15	13.2	13.6	12.1	9.7	9.0	9.2	8.5	8.1	9.8	11.4	11.2	12.3	10.7
16	13.1	13.1	11.7	9.6	8.7	8.8	8.0	8.0	9.4	11.1	11.5	12.3	10.4
17	13.2	12.8	11.3	9.2	8.5	8.6	7.8	7.8	8.9	10.8	11.6	12.6	10.2
18	13.2	13.0	11.5	8.5	8.1	8.0	7.5	7.0	7.9	10.9	11.7	12.7	10.0
19	13.9	13.4	11.7	8.3	7.8	7.9	7.1	6.3	8.1	11.7	12.1	12.6	10.1
20	13.9	13.8	12.3	8.9	8.1	6.6	6.4	6.3	8.5	11.9	12.3	13.0	10.1
21	14.2	14.2	11.7	3.1	2.7	2.6	2.3	2.3	3.1	5.3	12.7	13.1	7.3
22	4.9	4.9	4.4	3.3	3.0	2.6	2.4	2.5	3.1	4.4	4.5	4.6	3.7
23	4.8	4.9	4.3	3.3	3.0	2.7	2.5	2.7	3.4	4.4	4.4	4.6	3.7
Grand Total	10.6	10.5	9.1	6.9	6.4	6.3	5.9	5.7	7.0	8.9	9.2	10.0	8.0

PARK - Time varying AEP

Calculation: AEP_enercon_Noice_plus_bats

Windfarm: 30.0 MW based on 6 turbines of type ENERCON E-147 EP5 E2 5000 147.0 !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

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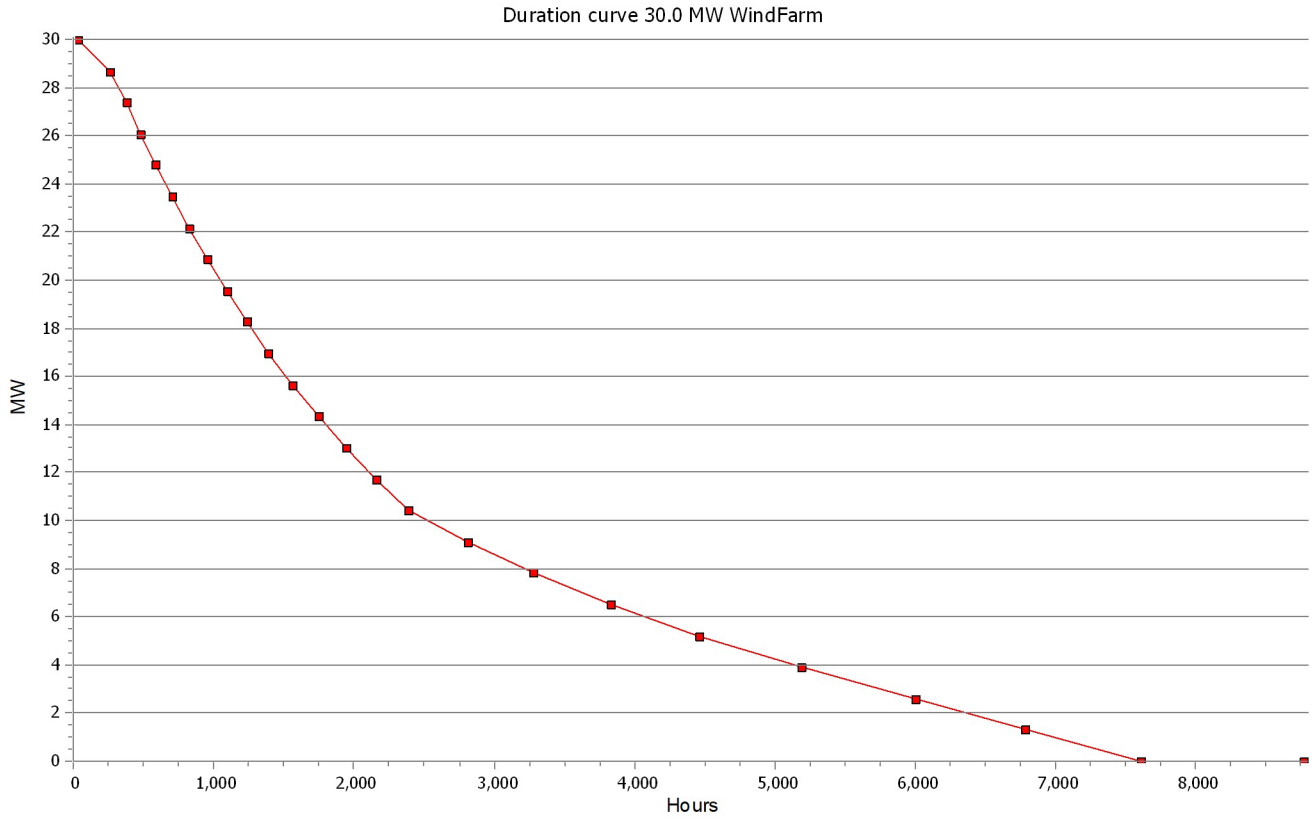
student / weti-lab-vt10@hs-flensburg.de
Calculated:
1/16/2025 5:42 PM/4.0.547

PARK - Time varying AEP

Calculation: AEP_enercon_Noice_plus_bats

Windfarm: 30.0 MW based on 6 turbines of type ENERCON E-147 EP5 E2 5000 147.0 !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)
31	0.4	31	30.0	5.0
233	2.7	264	28.7 - 30.0	4.8 - 5.0
114	1.3	378	27.4 - 28.7	4.6 - 4.8
104	1.2	482	26.1 - 27.4	4.3 - 4.6
108	1.2	590	24.8 - 26.1	4.1 - 4.3
114	1.3	704	23.5 - 24.8	3.9 - 4.1
122	1.4	826	22.2 - 23.5	3.7 - 3.9
126	1.4	951	20.9 - 22.2	3.5 - 3.7
141	1.6	1092	19.6 - 20.9	3.3 - 3.5
143	1.6	1235	18.3 - 19.6	3.0 - 3.3
156	1.8	1391	17.0 - 18.3	2.8 - 3.0
169	1.9	1560	15.7 - 17.0	2.6 - 2.8
186	2.1	1746	14.3 - 15.7	2.4 - 2.6
196	2.2	1941	13.0 - 14.3	2.2 - 2.4
214	2.4	2155	11.7 - 13.0	2.0 - 2.2
231	2.6	2386	10.4 - 11.7	1.7 - 2.0
426	4.9	2812	9.1 - 10.4	1.5 - 1.7
468	5.3	3280	7.8 - 9.1	1.3 - 1.5
551	6.3	3831	6.5 - 7.8	1.1 - 1.3
633	7.2	4464	5.2 - 6.5	0.9 - 1.1
720	8.2	5184	3.9 - 5.2	0.7 - 0.9
819	9.3	6003	2.6 - 3.9	0.4 - 0.7
782	8.9	6785	1.3 - 2.6	0.2 - 0.4
819	9.3	7604	0.0 - 1.3	0.0 - 0.2
1162	13.3	8766	0.0	0.0



PARK - Scaling info

Calculation: AEP_enercon_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_enercon_Noice_plus_bats

Curtailment signals

Signal	Signal source
Mean wind speed	Scaler

WTG Curtailments

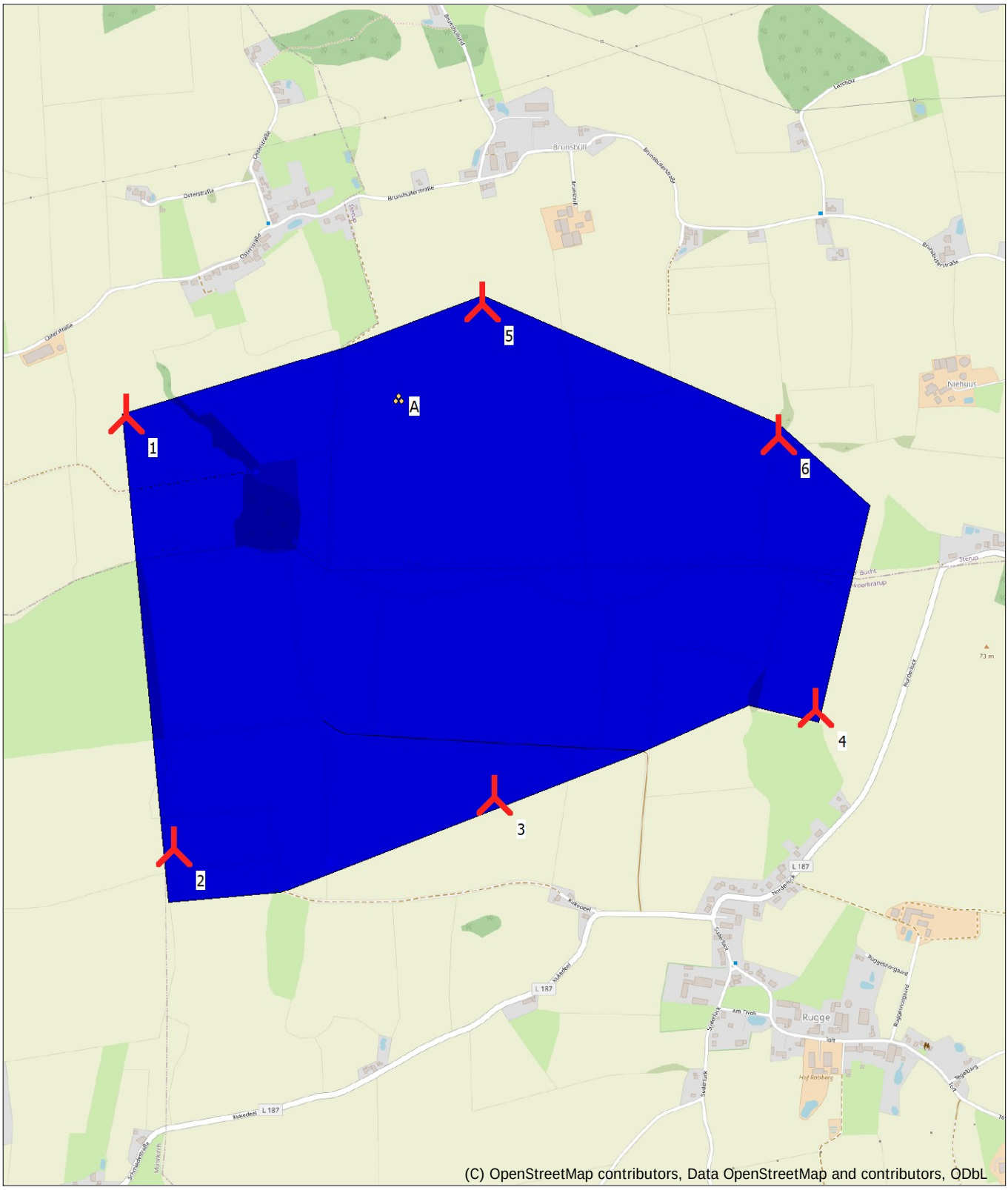
WTG	Name	Index	Priority	Type	Action	Conditions	Times fully applied	Time partially applied	Times skipped
1	Bats	1	1	Bats	Shut down	Date [4/1;9/30], SunRiseSet [1:00h before sunset;1:00h after sunrise], WS [0;6]	23575	0	0
1	Noise	2	2	Noise	Shut down	Date [1/1;12/31], Time [10:00 PM;6:00 AM]	71347	0	0
2	Bats	1	1	Bats	Shut down	Date [4/1;9/30], SunRiseSet [1:00h before sunset;1:00h after sunrise], WS [0;6]	23504	0	0
3	Bats	1	1	Bats	Shut down	Date [4/1;9/30], SunRiseSet [1:00h before sunset;1:00h after sunrise], WS [0;6]	24382	0	0
4	Bats	1	1	Bats	Shut down	Date [4/1;9/30], SunRiseSet [1:00h before sunset;1:00h after sunrise], WS [0;6]	24049	0	0
4	Noise	2	2	Noise	Shut down	Date [1/1;12/31], Time [10:00 PM;6:00 AM]	70941	0	0
5	Bats	1	1	Bats	Shut down	Date [4/1;9/30], SunRiseSet [1:00h before sunset;1:00h after sunrise], WS [0;6]	23924	0	0
5	Noise	2	2	Noise	Shut down	Date [1/1;12/31], Time [10:00 PM;6:00 AM]	71239	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]	23821	0	0
6	Noise	2	2	Noise	Shut down	Date [1/1;12/31], Time [10:00 PM;6:00 AM]	71405	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_enercon_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