Hochschule Flensburg, University of Applied Sciences Darf nur für Zwecke der Lehre verwendet werden

student / weti-lab-vt10@hs-flensburg.de 1/16/2025 3:23 PM/4.0.547

## PARK - Main Result

## Calculation: AEP\_Vestas\_Normal

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 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
Micro terrain flow model
Wash 18.7 from Site Data
1/1/1994 1.00:00 AM - 1/1/2025
Meteo object(s)
MCP LT - MCP session (1) - [Neural Network]
MCP LT - MCP session (1) - [Neural Network]
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/m <sup>3</sup> ]	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



New WTG

#### Calculated Annual Energy for Wind Farm

		03							
					Specific	results¤)		Wind s	peed
WTG combination	Result	Result-10.0%	GROSS (no loss)	Wake loss	Capacity	Mean WTG	Full load	free	wake reduced
	PARK		Free WTGs		factor	result	hours		
	[MWh/y]	[MWh/y]	[MWh/y]	[%]	[%]	[MWh/y]	[Hours/year]	[m/s]	[m/s]
Wind farm	98,137.1	88,323.4	103,401.0	5.1	37.3	14,720.6	3,271	7.0	6.8
a) Based on Result-10.0%	5								

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

WTG	WTG type					Power	curve	Annual E	Wind speed			
Valid	Manufact.	Type-generator	Power,	Rotor	Hub	Creator	Name	Result	Result-10.0%	Wake	free	reduced
			rated	diameter	height					loss		
			[kW]	[m]	[m]			[MWh/y]	[MWh/y]	[%]	[m/s]	[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	16,818.8	15,137	2.7	7.01	6.92
2 Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	USER	Level 0 - Calculated - PO4-0S & PO4 - 12-2021	16,683.4	15,015	3.5	7.02	6.90
3 Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	USER	Level 0 - Calculated - PO4-0S & PO4 - 12-2021	16,084.0	14,476	6.2	6.99	6.78
4 Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	USER	Level 0 - Calculated - PO4-0S & PO4 - 12-2021	16,286.4	14,658	5.2	6.99	6.81
5 Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	USER	Level 0 - Calculated - PO4-0S & PO4 - 12-2021	16,233.2	14,610	5.3	6.98	6.80
6 Yes	VESTAS	V150-4.5-4,500	4,500	150.0	125.0	USER	Level 0 - Calculated - PO4-0S & PO4 - 12-2021	16,031.3	14,428	7.7	7.04	6.77

## WTG siting

	UTM (nor	th)-ETRS8	39 Zc	ne: 32								Calculation perio			
	Easting	Northing	Z	Row data/D	escription							Start	End		
			[m]												
1 New	547,818	6,060,791	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	IOI hub.	125 0 m	(TOT:	200 0 m) (11)	1/1/1994	1/1/2025		

Hochschule Flensburg, University of Applied Sciences Darf nur für Zwecke der Lehre verwendet werden

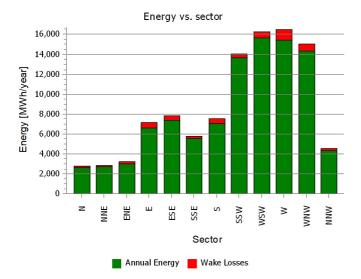
\_

student / weti-lab-vt10@hs-flensburg.de Calculated: 1/16/2025 3:23 PM/4.0.547

# PARK - Production Analysis

Calculation: AEP\_Vestas\_Normal  $\,$  WTG: All new WTGs, Air density 1.229 kg/m $^3$  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
Model based energy	[MWh]	2,785.3	2,833.5	3,195.2	7,166.3	7,816.4	5,786.5	7,521.2	14,032.4	16,256.5	16,497.3	15,005.9	4,504.6	103,401.0
-Decrease due to wake losses	[MWh]	207.9	119.5	217.2	589.9	448.0	255.7	428.8	403.3	622.5	1,086.0	694.6	190.4	5,263.9
Resulting energy	[MWh]	2,577.4	2,714.0	2,978.0	6,576.4	7,368.4	5,530.8	7,092.4	13,629.0	15,634.0	15,411.3	14,311.2	4,314.2	98,137.1
Specific energy	[kWh/m <sup>2</sup> ]													926
Specific energy	[kWh/kW]													3,635
Decrease due to wake losses	[%]	7.5	4.2	6.8	8.2	5.7	4.4	5.7	2.9	3.8	6.6	4.6	4.2	5.09
Full Load Equivalent	[Hours/year]	95	101	110	244	273	205	263	505	579	571	530	160	3,635





Exam\_16.01

Hochschule Flensburg, University of Applied Sciences Darf nur für Zwecke der Lehre verwendet werden

student / weti-lab-vt10@hs-flensburg.de 1/16/2025 3:23 PM/4.0.547

# PARK - Power Curve Analysis

Calculation: AEP\_Vestas\_Normal WTG: 1 - VESTAS V150-4.5 4500 150.0 !O!, Hub height: 125.0 m

Level 0 - Calculated - PO4-0S & PO4 - 12-2021

Source: Manufacturer

Source/Date Created by Created Edited Stop wind speed Power control CT curve type Generator type Specific power kW/m<sup>2</sup> [m/s]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

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/m<sup>3</sup>

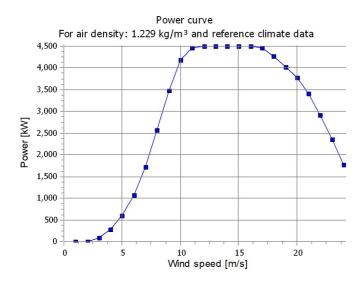
oga		.,		.,
Wind speed	Power	Ср	Wind speed	Ct curve
[m/s]	[kW]		[m/s]	
3.0	81.0	0.28	3.0	0.89
3.5	172.0	0.37	3.5	0.85
4.0	285.0	0.41	4.0	0.83
4.5	424.0	0.43	4.5	0.83
5.0	596.0	0.44	5.0	0.82
5.5	808.0	0.45	5.5	0.82
6.0	1,061.0	0.45	6.0	0.81
6.5	1,360.0	0.46	6.5	0.81
7.0	1,710.0	0.46	7.0	0.81
7.5	2,106.0	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 16.0	0.14
16.0 16.5	4,500.0 4,498.0	0.09	16.5	0.13 0.12
17.0	4,473.0	0.09	17.0	0.12
17.5	4.394.0	0.08	17.5	0.10
18.0	4.268.0	0.08	18.0	0.09
18.5	4,208.0	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

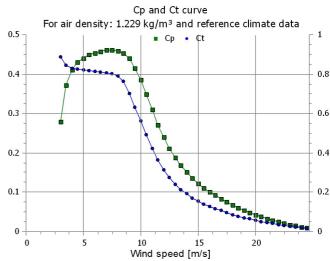
#### Power and efficiency vs. wind speed

Data used in calculation, Mean air density: 1.229 kg/m<sup>3</sup>

wina speea	Power	Ср
[m/s]	[kW]	
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

Wind speed Power Cn





Hochschule Flensburg, University of Applied Sciences Darf nur für Zwecke der Lehre verwendet werden

\_ .

student / weti-lab-vt10@hs-flensburg.de Calculated: 1/16/2025 3:23 PM/4.0.547

# PARK - Wind Data Analysis

Calculation: AEP\_Vestas\_Normal 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

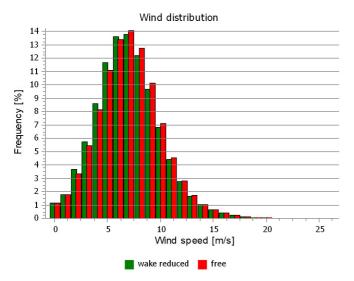
UTM (north)-ETRS89 Zone: 32 East: 547,818 North: 6,060,791

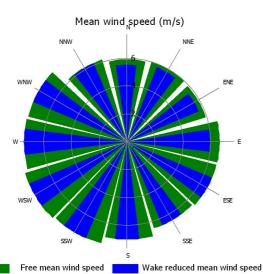
01\_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (1)

Masts used Take nearest

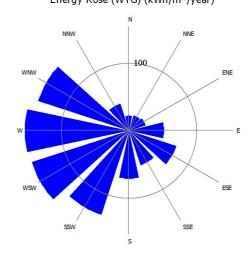
# Winddata for site

Sector	Free mean wind speed	Wake reduced mean	wind	Frequency
		speed		
	[m/s]	[m/s]		[%]
0 N	5.9		5.5	3.6
1 NNE	6.0		5.8	3.6
2 ENE	5.9		5.6	4.4
3 E	6.7		6.0	7.6
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	11.9
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		6.1	5.5
All	7.0		6.9	100.0

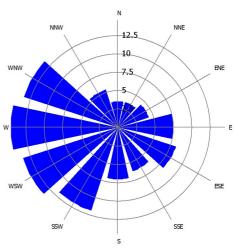




# Energy Rose (WTG) (kWh/m²/year)







Hochschule Flensburg, University of Applied Sciences Darf nur für Zwecke der Lehre verwendet werden

\_

student / weti-lab-vt10@hs-flensburg.de Calculated: 1/16/2025 3:23 PM/4.0.547

# PARK - Wind Data Analysis

Calculation: AEP\_Vestas\_Normal 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

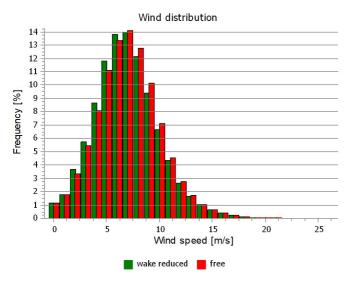
UTM (north)-ETRS89 Zone: 32 East: 547,696 North: 6,061,714

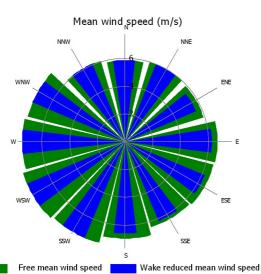
02\_VESTAS V150-4.5 4500 150.0 !O! hub: 125.0 m (TOT: 200.0 m) (7)

Masts used Take nearest

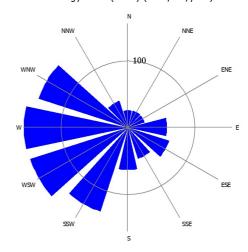
### Winddata for site

Sector	Free mean wind speed	Wake reduced mean wind speed	Frequency
	[m/s]	[m/s]	[%]
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	7.6
4 ESE	6.6	6.3	8.3
5 SSE	6.5	6.2	6.3
6 S	7.0	6.6	7.1
7 SSW	7.6	7.6	11.9
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

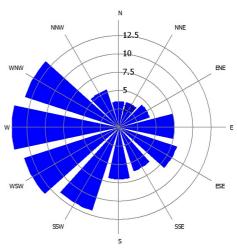




## Energy Rose (WTG) (kWh/m²/year)



## Frequency (%)



Hochschule Flensburg, University of Applied Sciences Darf nur für Zwecke der Lehre verwendet werden

student / weti-lab-vt10@hs-flensburg.de Calculated: 1/16/2025 3:23 PM/4.0.547

# PARK - WTG distances

Calculation: AEP\_Vestas\_Normal

WTG distances

	Z	Nearest WTG	Z	Horizontal	Distance in						
				distance	rotor diameters						
	[m]		[m]	[m]							
1	60.0	4	60.0	718	4.8						
2	60.0	3	60.0	844	5.6						
3	60.0	6	60.0	681	4.5						
4	60.0	1	60.0	718	4.8						
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						



New WTG

Scale 1:20,000



Exam\_16.01

Licensed user:

Hochschule Flensburg, University of Applied Sciences Darf nur für Zwecke der Lehre verwendet werden

\_

student / weti-lab-vt10@hs-flensburg.de Calculated: 1/16/2025 3:23 PM/4.0.547

# PARK - Time varying AEP

Calculation: AEP\_Vestas\_Normal

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	469	421	412	338	328	299	289	288	334	413	415	446	4,451
1	463	418	411	334	315	288	275	293	323	393	419	441	4,374
2	461	414	409	335	311	286	280	287	323	391	414	453	4,364
3	459	414	397	325	316	275	282	282	317	395	415	438	4,315
4	469	416	403	331	311	279	278	281	323	392	409	441	4,332
5	461	419	399	318	309	277	272	272	319	388	394	445	4,273
6	458	409	393	309	290	260	255	270	313	396	389	437	4,178
7	447	403	389	294	260	252	241	237	291	383	385	428	4,010
8	444	396	360	253	251	238	233	223	277	369	369	416	3,829
9	427	383	348	252	232	237	237	217	255	345	355	408	3,695
10	427	367	347	255	235	241	239	231	281	341	355	399	3,718
11	415	359	348	257	240	238	232	226	266	335	329	388	3,633
12	406	372	354	272	262	261	254	248	290	350	354	392	3,817
13	418	383	374	294	276	279	266	262	311	368	353	395	3,979
14	419	382	388	304	290	295	283	277	301	370	366	395	4,071
15	424	393	392	305	295	294	280	267	313	373	354	397	4,088
16	421	378	377	304	288	281	265	266	301	362	363	397	4,002
17	423	371	368	293	283	274	259	257	295	353	367	407	3,949
18	423	377	374	291	270	256	250	242	288	359	371	411	3,913
19	445	390	384	299	282	254	246	246	293	385	383	408	4,014
20	446	399	402	315	302	248	252	250	303	389	388	423	4,117
21	453	412	418	324	300	273	259	263	323	403	403	422	4,254
22	456	419	420	339	319	277	269	277	322	420	411	437	4,366
23	455	412	409	339	317	286	278	290	346	419	405	436	4,393
Grand Total	10,589	9,509	9,276	7,281	6,884	6,448	6,273	6,252	7,308	9,093	9,164	10,060	98,137

Hour/Month	1	2	3	4	5	6	7	8	9	10	11	12	Grand Total
[MW]													
0	15.1	15.0	13.3	11.3	10.6	10.0	9.3	9.3	11.1	13.3	13.8	14.4	12.2
1	14.9	14.9	13.3	11.1	10.2	9.6	8.9	9.5	10.8	12.7	14.0	14.2	12.0
2	14.9	14.8	13.2	11.2	10.0	9.5	9.0	9.2	10.8	12.6	13.8	14.6	12.0
3	14.8	14.8	12.8	10.8	10.2	9.2	9.1	9.1	10.6	12.8	13.8	14.1	11.8
4	15.1	14.9	13.0	11.0	10.0	9.3	9.0	9.1	10.8	12.7	13.6	14.2	11.9
5	14.9	15.0	12.9	10.6	10.0	9.2	8.8	8.8	10.6	12.5	13.1	14.4	11.7
6	14.8	14.6	12.7	10.3	9.4	8.7	8.2	8.7	10.4	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	9.2	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	13.1	10.1
10	13.8	13.1	11.2	8.5	7.6	8.0	7.7	7.4	9.4	11.0	11.8	12.9	10.2
11	13.4	12.8	11.2	8.6	7.8	7.9	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	12.6	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	10.1	9.4	9.8	9.1	8.9	10.0	11.9	12.2	12.7	11.2
15	13.7	14.0	12.6	10.2	9.5	9.8	9.0	8.6	10.4	12.0	11.8	12.8	11.2
16	13.6	13.5	12.2	10.1	9.3	9.4	8.5	8.6	10.0	11.7	12.1	12.8	11.0
17	13.6	13.3	11.9	9.8	9.1	9.1	8.3	8.3	9.8	11.4	12.2	13.1	10.8
18	13.6	13.5	12.1	9.7	8.7	8.5	8.1	7.8	9.6	11.6	12.4	13.3	10.7
19	14.3	13.9	12.4	10.0	9.1	8.5	7.9	7.9	9.8	12.4	12.8	13.2	11.0
20	14.4	14.3	13.0	10.5	9.7	8.3	8.1	8.1	10.1	12.5	12.9	13.6	11.3
21	14.6	14.7	13.5	10.8	9.7	9.1	8.4	8.5	10.8	13.0	13.4	13.6	11.7
22	14.7	14.9	13.6	11.3	10.3	9.2	8.7	8.9	10.7	13.5	13.7	14.1	12.0
23	14.7	14.7	13.2	11.3	10.2	9.5	9.0	9.4	11.5	13.5	13.5	14.1	12.0
Grand Total	14.2	14.2	12.5	10.1	9.3	9.0	8.4	8.4	10.1	12.2	12.7	13.5	11.2



Project:

Exam\_16.01

Licensed user:

Hochschule Flensburg, University of Applied Sciences Darf nur für Zwecke der Lehre verwendet werden

\_

student / weti-lab-vt10@hs-flensburg.de calculated: 1/16/2025 3:23 PM/4.0.547

# PARK - Time varying AEP

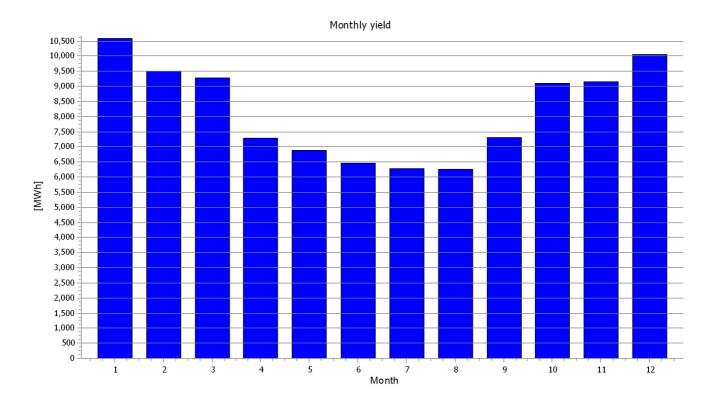
Calculation: AEP\_Vestas\_Normal

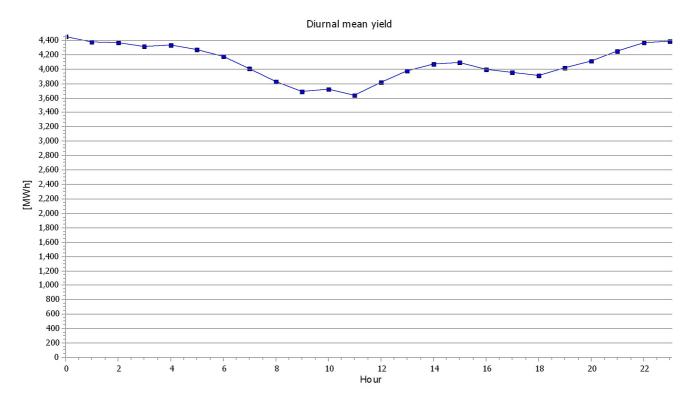
Windfarm: 27.0 MW based on 6 turbines of type VESTAS V150-4.5 4500 150.0 !O!.

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.





Hochschule Flensburg, University of Applied Sciences Darf nur für Zwecke der Lehre verwendet werden

\_ .

student / weti-lab-vt10@hs-flensburg.de Calculated: 1/16/2025 3:23 PM/4.0.547

# PARK - Time varying AEP

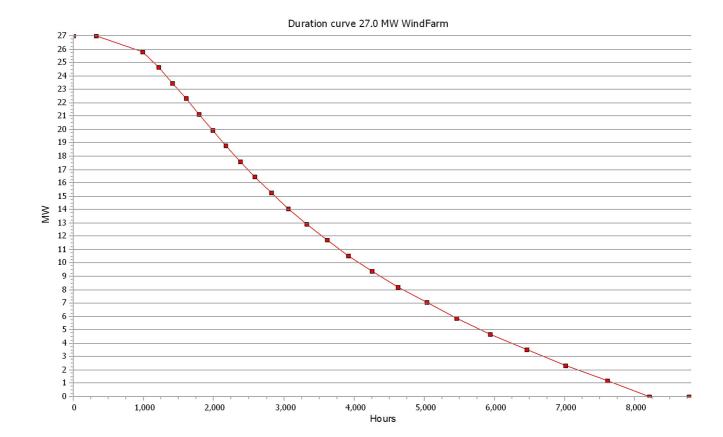
Calculation: AEP\_Vestas\_Normal

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)
326	3.7	326	27.0	4.5
658	7.5	984	25.8 - 27.0	4.3 - 4.5
235	2.7	1219	24.7 - 25.8	4.1 - 4.3
195	2.2	1414	23.5 - 24.7	3.9 - 4.1
191	2.2	1605	22.3 - 23.5	3.7 - 3.9
185	2.1	1790	21.1 - 22.3	3.5 - 3.7
190	2.2	1980	20.0 - 21.1	3.3 - 3.5
194	2.2	2174	18.8 - 20.0	3.1 - 3.3
200	2.3	2374	17.6 - 18.8	2.9 - 3.1
213	2.4	2587	16.4 - 17.6	2.7 - 2.9
231	2.6	2818	15.3 - 16.4	2.5 - 2.7
239	2.7	3057	14.1 - 15.3	2.3 - 2.5
266	3.0	3322	12.9 - 14.1	2.2 - 2.3
285	3.3	3607	11.7 - 12.9	2.0 - 2.2
309	3.5	3917	10.6 - 11.7	1.8 - 2.0
338	3.9	4254	9.4 - 10.6	1.6 - 1.8
367	4.2	4621	8.2 - 9.4	1.4 - 1.6
409	4.7	5030	7.0 - 8.2	1.2 - 1.4
431	4.9	5461	5.9 - 7.0	1.0 - 1.2
473	5.4	5934	4.7 - 5.9	0.8 - 1.0
519	5.9	6453	3.5 - 4.7	0.6 - 0.8
557	6.4	7010	2.3 - 3.5	0.4 - 0.6
594	6.8	7604	1.2 - 2.3	0.2 - 0.4
597	6.8	8201	0.0 - 1.2	0.0 - 0.2
565	6.4	8766	0.0	0.0



Project

Exam\_16.01

Licensed user-

Hochschule Flensburg, University of Applied Sciences Darf nur für Zwecke der Lehre verwendet werden

\_

student / weti-lab-vt10@hs-flensburg.de Calculated: 1/16/2025 3:23 PM/4.0.547

# PARK - Scaling info

Calculation: AEP\_Vestas\_Normal

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

Exam\_16.01

Licensed user:

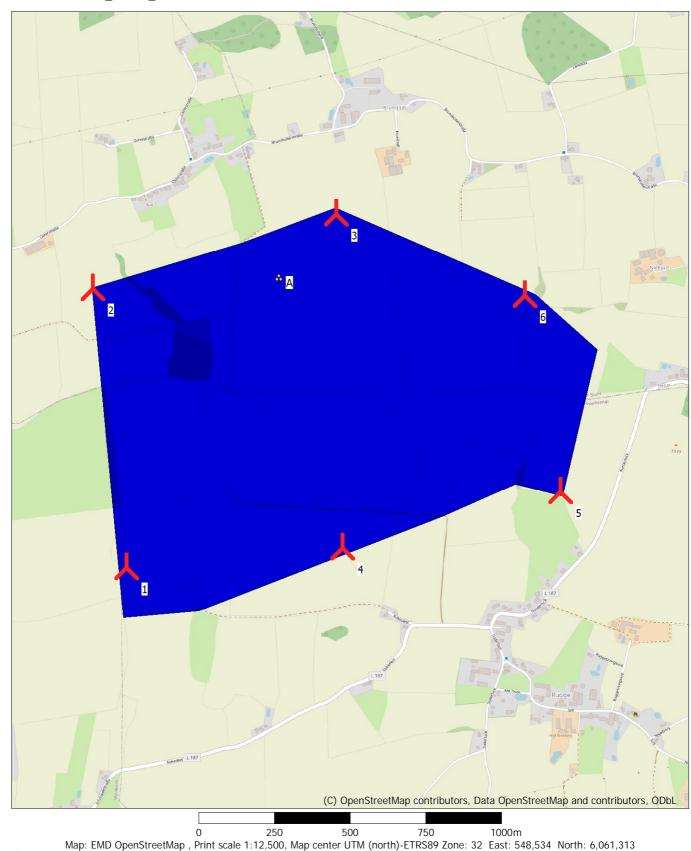
Hochschule Flensburg, University of Applied Sciences Darf nur für Zwecke der Lehre verwendet werden

\_ .

student / weti-lab-vt10@hs-flensburg.de Calculated: 1/16/2025 3:23 PM/4.0.547

PARK - Map

Calculation: AEP\_Vestas\_Normal



& WTG area

New WTG