

Loss&Uncertainty - Main result

Calculation: Enschede_Senvion 3.4M140

Main data for PARK

PARK calculation 3.2.712: Enschede_Senvion 3.4M140

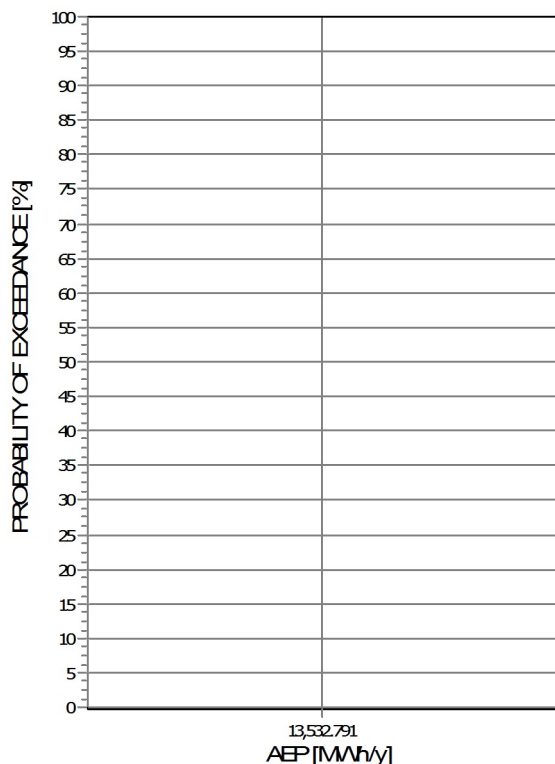
Count 1
Rated power 3.4 MW
Mean wind speed 7.3 m/s at hub height
Sensitivity 1.4 %AEP / %Mean Wind Speed
Expected lifetime 20 Years

RESULTS

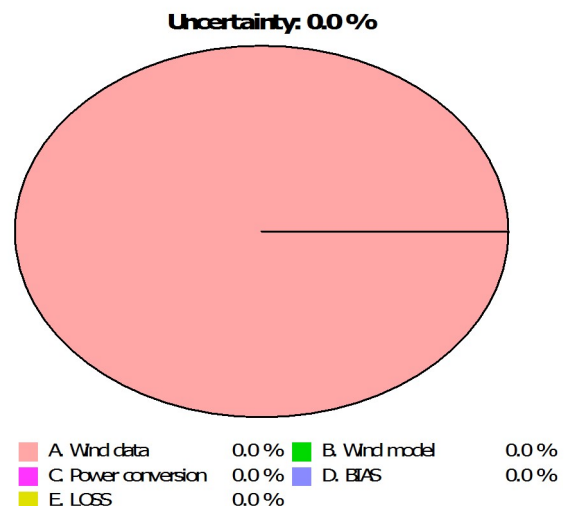
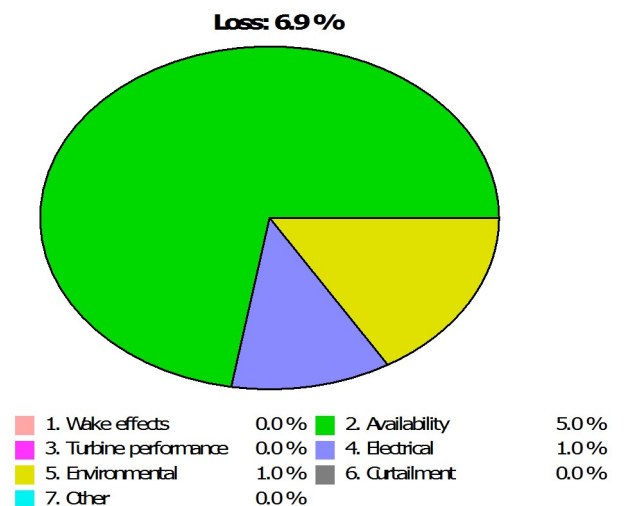
		P50	P84	P90
NET AEP	[MWh/y]	13,533	13,533	13,533
Capacity factor	[%]	45.4	45.4	45.4
Full load hours	[h/y]	3,980	3,980	3,980

Result details

	P50	Uncertainty
GROSS AEP *)	14,534 MWh/y	0.0 %
Bias correction	0 MWh/y	0.0 %
Loss correction	-1,001 MWh/y	-6.9 %
Wake loss	0.0 %	0.0 %
Other losses	-6.9 %	0.0 %
NET AEP	13,533 MWh/y	0.0 %



Scale: 25,000



*) Calculated Annual Energy Production before any bias or loss corrections
Assumptions: Uncertainty and percentiles (PXX values) are calculated for the expected lifetime

Loss&Uncertainty - Assumptions and results

Calculation: Enschede_Senvion 3.4M140

ASSUMPTIONS

LOSS	Method *)	Loss [%]	Loss [MWh/y]	Std dev**) [%]	Comment
1. Wake effects					
Wake effects, all WTGs	Calculation	0.0	0	0.0	
2. Availability					
Turbine availability	Estimate	5.0	727	0.0	
3. Turbine performance					No input
4. Electrical					
Electrical losses	Estimate	1.0	145	0.0	
5. Environmental					
Performance degradation not due to icing	Estimate	0.5	73	0.0	
Performance degradation due to icing	Estimate	0.5	73	0.0	
6. Curtailment					No input
7. Other					No input
LOSS, total		6.9	1,001	0.0	

UNCERTAINTY	Method *)	Std dev, wind speed [%]	Std dev, AEP [%]	Comment
A. Wind data				
Wind measurement/Wind data				
Long term correction				
Year-to-year variability				
Future climate				
Other wind related				
B. Wind model				
Vertical extrapolation				
Horizontal extrapolation				
Other wind model related				
C. Power conversion				
Power curve uncertainty				
Metering uncertainty				
Other AEP related uncertainties				
D. BIAS, total uncertainty			0.0	
E. LOSS, total uncertainty			0.0	
UNCERTAINTY, total (1y average)			0.0	
UNCERTAINTY, total (20y average)			0.0	

VARIABILITY

Years	Variability (std dev) [%]	Total std dev [%]
1	0.00	0.0
5	0.00	0.0
10	0.00	0.0
20	0.00	0.0

RESULTS

AEP versus exceedance level / time horizon

PXX [%]	1 y [MWh/y]	5 y [MWh/y]	10 y [MWh/y]	20 y [MWh/y]
50	13,533	13,533	13,533	13,533
75	13,533	13,533	13,533	13,533
84	13,533	13,533	13,533	13,533
90	13,533	13,533	13,533	13,533
95	13,533	13,533	13,533	13,533

*) Calculation means that a calculation method available in the windPRO software is used. This still typically involve a user judgement and user data where the quality of those decides the accuracy. If calculation method is used, the values will often be different from turbine to turbine, here the average is shown, but at page "WTG results" the individual turbine results are shown.

**) For totals the std dev refers to the full AEP, otherwise std dev refers to the bias or loss component which is a fraction of the total AEP.

Loss&Uncertainty - WTG results

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Main data for PARK

PARK calculation 3.2.712: Enschede_Senvion 3.4M140
Count 1
Rated power 3.4 MW
Mean wind speed 7.3 m/s at hub height
Sensitivity 1.4 %AEP / %Mean Wind Speed
Expected lifetime 20 Years



Scale: 25,000

Expected AEP per WTG including bias, loss and uncertainty evaluation

Description	Calculated GROSS*)	Bias	Loss	20 years averaging			
				Unc.	P50	P84	P90
	[MWh/y]	[%]	[%]	[%]	[MWh/y]	[MWh/y]	[MWh/y]
1 SENVION 3.4M140 3400 140.0 !O! hub: 160.0 m (TOT: 230.0 m) (1)	14,533.9	0.0	6.9	0.0	13,532.8	13,532.8	13,532.8
PARK	14,533.9	0.0	6.9	0.0	13,532.8	13,532.8	13,532.8