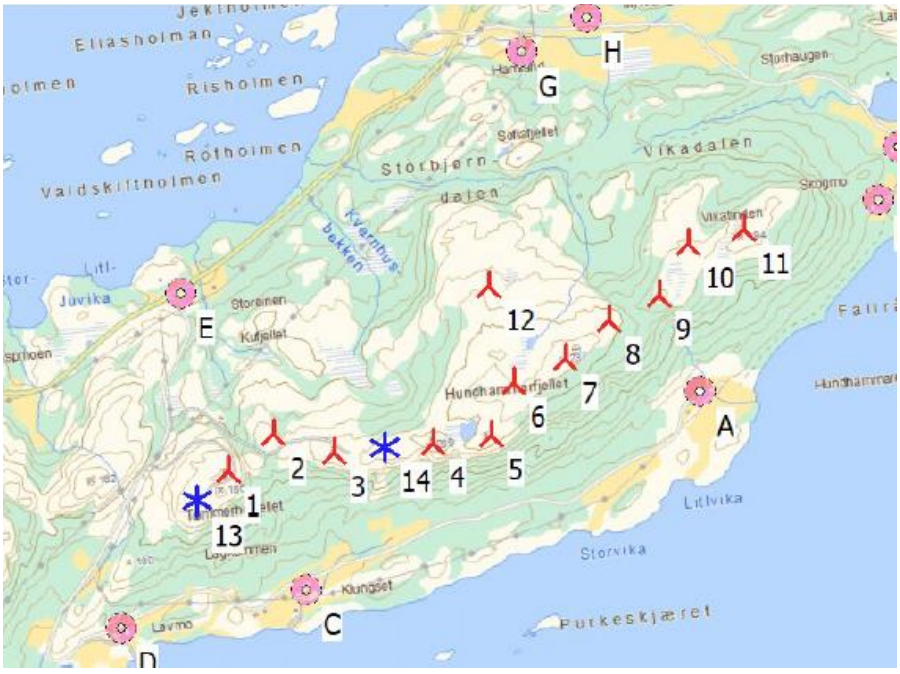
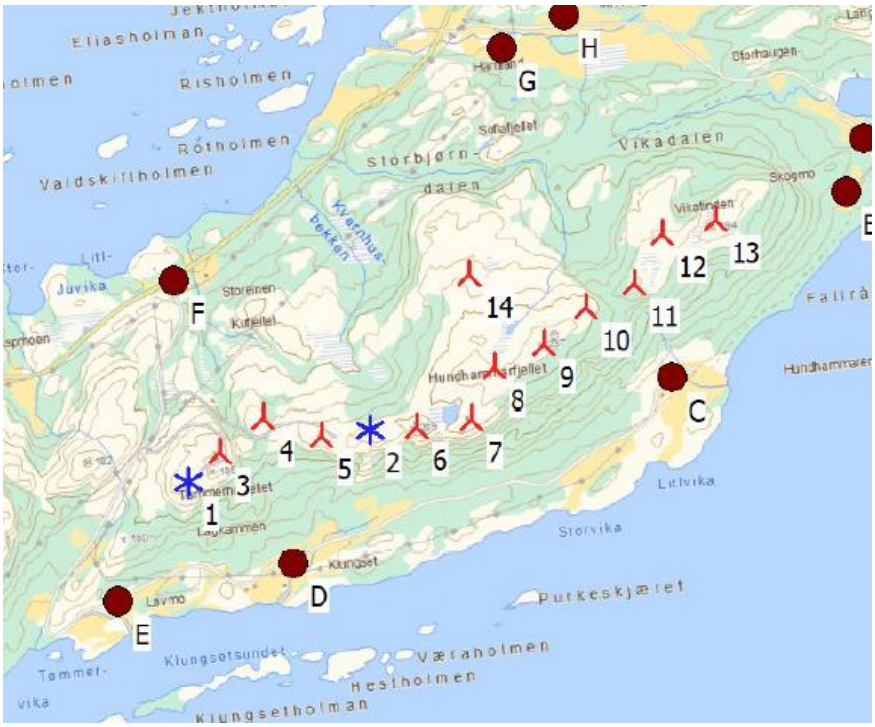
Project:

Hundhammerfjellet Reetablering

NTE Energi AS

Støy- og skyggekastberegninger – vedlegg 6, MTA





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Hundhammerfjellet Reetablering

NTE Energi AS

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Calculated:
19.12.2018 21.51/3.2.737

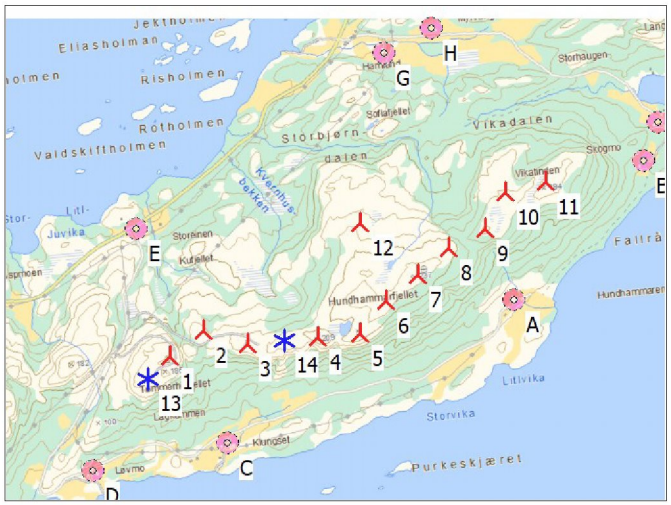
NORD2000 - Main Result

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

Assumptions

Weather stability	
Relative humidity	50,0 %
Air temperature	15,0 °C
Height for air temperature	2,0 m
Stability parameters	Night;Clear sky
Inverse Monin Obukhov lenght	0,0100
Temperature scale T*	0,0500
Terrain	
Elevation based on object	
Height Contours 2013	
Roughness based on area object	
Area object (Roughness): ROUGH_REGIONS_Hundhammerfjellet vindpark_6.w2r (25)	
Terrain type based on area object	
Area object (Nord2000): Terrain hardness	
Month for calculation	July
Wind speed criteria	
Uniform wind speed at 10 m agl.	
Wind speed	Max noise wind speed
Max noise wind speed	All receptors downwind
Wind direction	4,0 m
Height above ground level for receiver	
Wind speed has been extrapolated to calculation height using	
Fixed shear: 0,1300	
No stability correction	5.022
Version	

All coordinates are in
ETRS 89 Zone: 32



WTGs

	X(East)	Y(North)	Z [m]	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Noise data Setting	Creator	Name
1	611 497	7 182 974	178,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
2	611 722	7 183 142	145,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
3	612 015	7 183 056	170,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
4	612 478	7 183 097	205,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
5	612 757	7 183 128	199,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
6	612 927	7 183 340	225,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
7	613 136	7 183 515	234,1	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
8	613 342	7 183 694	199,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
9	613 584	7 183 818	198,3	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
10	613 714	7 184 057	184,6	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
11	613 981	7 184 127	174,1	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
12	612 753	7 183 853	175,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
13	611 350	7 182 825	170,0	M1-E-70 E4 2000 71.0	Yes	ENERCON	E-70 E4-2 000	2 000	71,0	65,0	Day	USER	8m/s, 64m Hub, Man. guaranteed 10/2004
											Evening	USER	8m/s, 64m Hub, Man. guaranteed 10/2004
											Night	USER	8m/s, 64m Hub, Man. guaranteed 10/2004
14	612 257	7 183 083	190,0	M5- E-70 E4 2,3 MW 2300	Yes	ENERCON	E-70 E4 2,3 MW-2 300	2 300	71,0	64,0	Day	EMD	Level 0 - guaranteed - OM II- 02/2006
											Evening	EMD	Level 0 - guaranteed - OM II- 02/2006
											Night	EMD	Level 0 - guaranteed - OM II- 02/2006

Calculation Results

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Calculated:
19.12.2018 21.51/3.2.737

NORD2000 - Main Result

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

Sound level

Noise sensitive area						Demands	Sound level	Demands fulfilled?
No.	Name	X(East)	Y(North)	Z [m]	Imission height [m]	Noise [dB(A)]	From WTGs [dB(A)]	Noise [dB(A)]
A	Hundhammer	613 769	7 183 346	24,8	4,0	45,0	51,1	No
A	Day						44,7	
A	Evening						44,7	
A	Night						44,7	
B	Skogmo	614 630	7 184 268	28,5	4,0	45,0	44,5	Yes
B	Day						38,2	
B	Evening						38,2	
B	Night						38,2	
C	Klungset	611 877	7 182 400	10,0	4,0	45,0	49,1	No
C	Day						42,7	
C	Evening						42,7	
C	Night						42,7	
D	Løvmo	610 992	7 182 219	12,0	4,0	45,0	46,3	No
D	Day						39,9	
D	Evening						39,9	
D	Night						39,9	
E	Storeienen	611 279	7 183 819	37,0	4,0	45,0	46,2	No
E	Day						39,8	
E	Evening						39,8	
E	Night						39,8	
F	Hamlandsvika	614 727	7 184 523	12,2	4,0	45,0	41,7	Yes
F	Day						35,3	
F	Evening						35,3	
F	Night						35,3	
G	Hamland	612 918	7 184 980	23,2	4,0	45,0	43,2	Yes
G	Day						36,8	
G	Evening						36,8	
G	Night						36,8	
H	Myhrvang	613 225	7 185 144	33,1	4,0	45,0	43,2	Yes
H	Day						36,8	
H	Evening						36,8	
H	Night						36,8	

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NORD2000 - Assumptions for NORD2000 calculation

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

Assumptions

Weather stability	
Relative humidity	50,0 %
Air temperature	15,0 °C
Height for air temperature	2,0 m
Stability parameters	Night;Clear sky
Inverse Monin Obukhov lenght	0,0100
Temperature scale T*	0,0500

Terrain
Elevation based on object
Height Contours 2013
Roughness based on area object
Area object (Roughness): ROUGH_REGIONS_Hundhammerfjellet vindpark_6.w2r (25)
Terrain type based on area object
Area object (Nord2000): Terrain hardness

Month for calculation	July

Wind speed criteria
Uniform wind speed at 10 m agl.

Wind speed	Max noise wind speed
Max noise wind speed	All receptors downwind
Wind direction	4,0 m
Height above ground level for receiver	

Wind speed has been extrapolated to calculation height using
Fixed shear: 0,1300

No stability correction	
Version	5.022

All coordinates are in
ETRS 89 Zone: 32

Setup for Lden calculation

Variant	Name	From hour	To hour	Hours	Penalty [dB]	Days per year
1	Day	7	19	12	0	365
2	Evening	19	23	4	5	365
3	Night	23	7	8	10	365

WTG: VESTAS V136-4.2 4200 136.0 !O!
Noise: Mode 0/0-0S (HWO)

Source	Source/Date	Creator	Edited
0067-7065 V05	21.12.2017	USER	08.06.2018 09.03

Wind speed [m/s]	LwA,ref [dB(A)]
3,0	90,9
4,0	91,1
5,0	92,9
6,0	96,0
7,0	99,6
8,0	102,8
9,0	103,9
10,0	103,9
11,0	103,9
12,0	103,9
13,0	103,9
14,0	103,9
15,0	103,9
16,0	103,9
17,0	103,9
18,0	103,9
19,0	103,9
20,0	103,9

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Calculated:
19.12.2018 21.51/3.2.737

NORD2000 - Assumptions for NORD2000 calculation

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6
WTG: ENERCON E-70 E4 2000 71.0 !O!
Noise: 8m/s, 64m Hub, Man. guaranteed 10/2004

Source	Source/Date	Creator	Edited
Enercon	07.10.2004	USER	17.09.2018 14.20

Wind speed [m/s]	LwA,ref [dB(A)]
6,0	91,1
7,0	93,6
8,0	97,4
9,0	99,5
10,0	101,1
11,0	102,2
12,0	102,7
13,0	103,2

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NORD2000 - Assumptions for NORD2000 calculation

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6
WTG: ENERCON E-70 E4 2,3 MW 2300 71.0 !O!
Noise: Level 0 - guaranteed - OM II- 02/2006

Source	Source/Date	Creator	Edited
Enercon	07.10.2004	EMD	12.07.2006 12.26

Noise data corresponding to 95 % production are based on Report WICO 314SEA05/01

Wind speed [m/s]	LwA,ref [dB(A)]
6,0	92,0
7,0	94,6
8,0	98,4
9,0	100,5
10,0	102,1

NSA: Hundhammer-A
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

NSA: Skogmo-B
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): Use standard value from calculation model

Distance demand: 700,0 m

NSA: Klungset-C
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

NSA: Løvmo-D
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

NSA: Storeienen-E
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

NSA: Hamlandsvika-F
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

NSA: Hamland-G
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

NSA: Myhrvang-H
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

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NORD2000 - Details

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

Calculation Results

Noise sensitive area: A Hundhammer

WTG No.	Distance	Wind speed at hub height	Variant	Sound level	Octave data [Hz]								Source noise	Octave data [Hz]							
					63	125	250	500	1000	2000	4000	8000	LwA,ref	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]		**[dB(A)]**	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]
1	2 302	20,0	Day	**19,56**	6,1	10,5	15,4	14,7	10,3	-6,1	-62,1	-137,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	2 302	20,0	Evening	**19,56**	6,1	10,5	15,4	14,7	10,3	-6,1	-62,1	-137,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	2 302	20,0	Night	**19,56**	6,1	10,5	15,4	14,7	10,3	-6,1	-62,1	-137,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	2 057	20,0	Day	**6,95**	-0,5	0,5	2,7	-0,4	-7,7	-24,6	-67,6	-142,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	2 057	20,0	Evening	**6,95**	-0,5	0,5	2,7	-0,4	-7,7	-24,6	-67,6	-142,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	2 057	20,0	Night	**6,95**	-0,5	0,5	2,7	-0,4	-7,7	-24,6	-67,6	-142,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	1 778	20,0	Day	**25,11**	9,8	16,8	20,0	20,8	16,7	1,3	-43,6	-125,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	1 778	20,0	Evening	**25,11**	9,8	16,8	20,0	20,8	16,7	1,3	-43,6	-125,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	1 778	20,0	Night	**25,11**	9,8	16,8	20,0	20,8	16,7	1,3	-43,6	-125,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	1 315	9,0	Day	**28,53**	13,5	16,5	23,8	24,3	21,1	8,7	-28,0	-108,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	1 315	9,0	Evening	**28,53**	13,5	16,5	23,8	24,3	21,1	8,7	-28,0	-108,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	1 315	9,0	Night	**28,53**	13,5	16,5	23,8	24,3	21,1	8,7	-28,0	-108,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 035	9,0	Day	**32,04**	15,0	21,4	27,0	27,8	24,7	14,0	-17,1	-92,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 035	9,0	Evening	**32,04**	15,0	21,4	27,0	27,8	24,7	14,0	-17,1	-92,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 035	9,0	Night	**32,04**	15,0	21,4	27,0	27,8	24,7	14,0	-17,1	-92,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	842	20,0	Day	**33,14**	11,5	24,8	26,9	28,7	26,6	17,1	-10,1	-79,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	842	20,0	Evening	**33,14**	11,5	24,8	26,9	28,7	26,6	17,1	-10,1	-79,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	842	20,0	Night	**33,14**	11,5	24,8	26,9	28,7	26,6	17,1	-10,1	-79,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	655	20,0	Day	**35,69**	12,5	27,7	29,0	31,2	29,3	21,0	-2,4	-64,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	655	20,0	Evening	**35,69**	12,5	27,7	29,0	31,2	29,3	21,0	-2,4	-64,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	655	20,0	Night	**35,69**	12,5	27,7	29,0	31,2	29,3	21,0	-2,4	-64,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	551	20,0	Day	**38,40**	16,0	30,7	32,1	33,7	31,7	23,9	3,0	-53,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	551	20,0	Evening	**38,40**	16,0	30,7	32,1	33,7	31,7	23,9	3,0	-53,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	551	20,0	Night	**38,40**	16,0	30,7	32,1	33,7	31,7	23,9	3,0	-53,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	507	9,0	Day	**39,12**	18,0	30,6	33,4	34,3	32,4	24,9	5,0	-49,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	507	9,0	Evening	**39,12**	18,0	30,6	33,4	34,3	32,4	24,9	5,0	-49,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	507	9,0	Night	**39,12**	18,0	30,6	33,4	34,3	32,4	24,9	5,0	-49,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	713	20,0	Day	**35,00**	12,4	27,2	28,1	30,6	28,6	20,1	-4,1	-67,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	713	20,0	Evening	**35,00**	12,4	27,2	28,1	30,6	28,6	20,1	-4,1	-67,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	713	20,0	Night	**35,00**	12,4	27,2	28,1	30,6	28,6	20,1	-4,1	-67,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	809	20,0	Day	**34,53**	13,5	26,5	28,5	30,0	27,7	18,4	-7,8	-75,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	809	20,0	Evening	**34,53**	13,5	26,5	28,5	30,0	27,7	18,4	-7,8	-75,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	809	20,0	Night	**34,53**	13,5	26,5	28,5	30,0	27,7	18,4	-7,8	-75,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 136	20,0	Day	**6,44**	-8,0	1,4	-2,1	-1,2	0,7	-5,2	-36,2	-112,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 136	20,0	Evening	**6,44**	-8,0	1,4	-2,1	-1,2	0,7	-5,2	-36,2	-112,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 136	20,0	Night	**6,44**	-8,0	1,4	-2,1	-1,2	0,7	-5,2	-36,2	-112,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
13	2 475	13,0	Day	**7,45**	-0,5	1,5	2,6	0,8	-6,9	-28,8	-83,8	-151,3	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	2 475	13,0	Evening	**7,45**	-0,5	1,5	2,6	0,8	-6,9	-28,8	-83,8	-151,3	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	2 475	13,0	Night	**7,45**	-0,5	1,5	2,6	0,8	-6,9	-28,8	-83,8	-151,3	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
14	1 536	10,0	Day	**16,65**	2,2	6,0	12,1	12,4	8,3	-5,8	-46,9	-129,8	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	1 536	10,0	Evening	**16,65**	2,2	6,0	12,1	12,4	8,3	-5,8	-46,9	-129,8	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	1 536	10,0	Night	**16,65**	2,2	6,0	12,1	12,4	8,3	-5,8	-46,9	-129,8	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3

Noise sensitive area: B Skogmo

WTG No.	Distance	Wind speed at hub height	Variant	Sound level	Octave data [Hz]								Source noise	Octave data [Hz]							
					63	125	250	500	1000	2000	4000	8000	LwA,ref	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]		**[dB(A)]**	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]
1	3 389	20,0	Day	**5,19**	-5,6	1,3	0,2	-2,4	-11,4	-38,1	-104,6	-159,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	3 389	20,0	Evening	**5,19**	-5,6	1,3	0,2	-2,4	-11,4	-38,1	-104,6	-159,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	3 389	20,0	Night	**5,19**	-5,6	1,3	0,2	-2,4	-11,4	-38,1	-104,6	-159,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	3 118	20,0	Day	**-2,34**	-13,3	-6,1	-7,7	-9,9	-17,1	-38,8	-94,5	-152,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	3 118	20,0	Evening	**-2,34**	-13,3	-6,1	-7,7	-9,9	-17,1	-38,8	-94,5	-152,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	3 118	20,0	Night	**-2,34**	-13,3	-6,1	-7,7	-9,9	-17,1	-38,8	-94,5	-152,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	2 882	20,0	Day	**3,67**	-8,5	-1,3	-1,3	-2,6	-8,4	-28,6	-90,0	-158,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	2 882	20,0	Evening	**3,67**	-8,5	-1,3	-1,3	-2,6	-8,4	-28,6	-90,0	-158,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	2 882	20,0	Night	**3,67**	-8,5	-1,3	-1,3	-2,6	-8,4	-28,6	-90,0	-158,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	2 450	20,0	Day	**19,67**	0,6	11,8	14,9	15,5	9,9	-9,5	-64,5	-138,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	2 450	20,0	Evening	**19,67**	0,6	11,8	14,9	15,5	9,9	-9,5	-64,5	-138,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	2 450	20,0	Night	**19,67**	0,6	11,8	14,9	15,5	9,9	-9,5	-64,5	-138,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	2 192	20,0	Day	**21,86**	4,3	15,5	16,9	17,0	12,0	-5,9	-57,2	-135,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	2 192	20,0	Evening	**21,86**	4,3	15,5	16,9	17,0	12,0	-5,9	-57,2	-135,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	2 192	20,0	Night	**21,86**	4,3	15,5	16,9	17,0	12,0	-5,9	-57,2	-135,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 939	20,0	Day	**23,27**	5,6	16,3	18,3	18,6	14,0	-2,3	-49,8	-130,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 939	20,0	Evening	**23,27**	5,6	16,3	18,3	18,6	14,0	-2,3	-49,8	-130,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 939	20,0	Night	**23,27**	5,6	16,3	18,3	18,6	14,0	-2,3	-49,8	-130,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 673	20,0	Day	**24,97**	6,5	17,5	19,8	20,5	16,4	1,7	-41,3	-123,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 673	20,0	Evening	**24,97**	6,5	17,5	19,8	20,5	16,4	1,7	-41,3	-123,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 673	20,0	Night	**24,97**	6,5	17,5	19,8	20,5	16,4	1,7	-41,3	-123,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 410	20,0	Day	**26,92**	8,1	18,9	21,6	22,5	19,0	6,0	-32,2	-113,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 410	20,0	Evening	**26,92**	8,1	18,9	21,6	22,5	19,0	6,0	-32,2	-113,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 410	20,0	Night	**26,92**	8,1	18,9	21,6	22,5	19,0	6,0	-32,2	-113,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	1 138	20,0	Day	**29,27**	9,2	21,4	23,6	24,9	21,9	10,6	-22,2	-99,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	1 138	20,0	Evening	**29,27**	9,2	21,4	23,6	24,9	21,9	10,6	-22,2	-99,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	1 138	20,0	Night	**29,27**	9,2	21,4	23,6	24,9	21,9	10,6	-22,2	-99,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	940	20,0	Day	**31,30**	10,1	23,4	25,3	26,8	24,3	14,4	-14,3	-86,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	940	20,0	Evening	**31,30**	10,1	23,4	25,3	26,8	24,3	14,4	-14,3	-86,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	940	20,0	Night	**31,30**	10,1	23,4	25,3	26,8	24,3	14,4	-14,3	-86,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	664	20,0	Day	**34,86**	12,5	27,3	27,9	30,5	28,3	20,1	-2,6	-63,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	664	20,0	Evening	**34,86**	12,5	27,3	27,9	30,5	28,3	20,1	-2,6	-63,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1

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NORD2000 - Details

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

...continued from previous page

WTG No.	Distance	Wind speed at hub height	Variant	Sound level	Octave data [Hz]								Source noise	Octave data [Hz]							
					63	125	250	500	1000	2000	4000	8000	LwA,ref	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]		**[dB(A)]**	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]
11	664	20,0	Night	**34,86**	12,5	27,3	27,9	30,5	28,3	20,1	-2,6	-63,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 922	20,0	Day	**2,60**	-9,9	-0,6	-3,5	-5,6	-9,5	-18,2	-59,5	-138,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 922	20,0	Evening	**2,60**	-9,9	-0,6	-3,5	-5,6	-9,5	-18,2	-59,5	-138,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 922	20,0	Night	**2,60**	-9,9	-0,6	-3,5	-5,6	-9,5	-18,2	-59,5	-138,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
13	3 584	13,0	Day	**-6,48**	-14,8	-10,0	-12,1	-16,0	-22,8	-40,8	-101,5	-154,9	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	3 584	13,0	Evening	**-6,48**	-14,8	-10,0	-12,1	-16,0	-22,8	-40,8	-101,5	-154,9	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	3 584	13,0	Night	**-6,48**	-14,8	-10,0	-12,1	-16,0	-22,8	-40,8	-101,5	-154,9	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
14	2 653	10,0	Day	**-6,90**	-22,2	-18,1	-17,8	-13,0	-9,5	-23,7	-79,2	-149,1	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	2 653	10,0	Evening	**-6,90**	-22,2	-18,1	-17,8	-13,0	-9,5	-23,7	-79,2	-149,1	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	2 653	10,0	Night	**-6,90**	-22,2	-18,1	-17,8	-13,0	-9,5	-23,7	-79,2	-149,1	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3

Noise sensitive area: C Klungset

WTG No.	Distance	Wind speed at hub height	Variant	Sound level	Octave data [Hz]								Source noise	Octave data [Hz]							
					63	125	250	500	1000	2000	4000	8000	LwA,ref	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]		**[dB(A)]**	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]
1	688	20,0	Day	**36,18**	16,1	28,7	29,9	31,6	29,2	20,6	-3,1	-65,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	688	20,0	Evening	**36,18**	16,1	28,7	29,9	31,6	29,2	20,6	-3,1	-65,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	688	20,0	Night	**36,18**	16,1	28,7	29,9	31,6	29,2	20,6	-3,1	-65,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	758	20,0	Day	**34,57**	14,4	27,5	28,3	29,9	27,4	18,5	-6,2	-71,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	758	20,0	Evening	**34,57**	14,4	27,5	28,3	29,9	27,4	18,5	-6,2	-71,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	758	20,0	Night	**34,57**	14,4	27,5	28,3	29,9	27,4	18,5	-6,2	-71,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	670	20,0	Day	**34,73**	12,4	27,1	28,0	30,3	28,1	19,9	-3,1	-64,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	670	20,0	Evening	**34,73**	12,4	27,1	28,0	30,3	28,1	19,9	-3,1	-64,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	670	20,0	Night	**34,73**	12,4	27,1	28,0	30,3	28,1	19,9	-3,1	-64,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	920	20,0	Day	**32,37**	13,2	25,6	26,3	27,7	24,8	14,8	-13,7	-85,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	920	20,0	Evening	**32,37**	13,2	25,6	26,3	27,7	24,8	14,8	-13,7	-85,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	920	20,0	Night	**32,37**	13,2	25,6	26,3	27,7	24,8	14,8	-13,7	-85,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 142	20,0	Day	**30,18**	10,8	23,5	24,5	25,4	22,2	10,8	-22,2	-99,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 142	20,0	Evening	**30,18**	10,8	23,5	24,5	25,4	22,2	10,8	-22,2	-99,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 142	20,0	Night	**30,18**	10,8	23,5	24,5	25,4	22,2	10,8	-22,2	-99,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 409	20,0	Day	**26,96**	7,4	19,8	21,4	22,5	18,9	5,9	-32,4	-113,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 409	20,0	Evening	**26,96**	7,4	19,8	21,4	22,5	18,9	5,9	-32,4	-113,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 409	20,0	Night	**26,96**	7,4	19,8	21,4	22,5	18,9	5,9	-32,4	-113,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 681	20,0	Day	**24,93**	6,3	17,8	19,7	20,4	16,3	1,5	-41,7	-123,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 681	20,0	Evening	**24,93**	6,3	17,8	19,7	20,4	16,3	1,5	-41,7	-123,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 681	20,0	Night	**24,93**	6,3	17,8	19,7	20,4	16,3	1,5	-41,7	-123,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 954	20,0	Day	**23,18**	5,6	16,2	18,2	18,5	13,9	-2,5	-50,2	-130,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 954	20,0	Evening	**23,18**	5,6	16,2	18,2	18,5	13,9	-2,5	-50,2	-130,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 954	20,0	Night	**23,18**	5,6	16,2	18,2	18,5	13,9	-2,5	-50,2	-130,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	2 219	20,0	Day	**21,68**	4,6	15,2	16,8	16,9	11,7	-6,3	-58,0	-135,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	2 219	20,0	Evening	**21,68**	4,6	15,2	16,8	16,9	11,7	-6,3	-58,0	-135,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	2 219	20,0	Night	**21,68**	4,6	15,2	16,8	16,9	11,7	-6,3	-58,0	-135,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	2 473	20,0	Day	**20,56**	3,9	14,7	15,7	15,5	9,8	-9,8	-65,1	-138,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	2 473	20,0	Evening	**20,56**	3,9	14,7	15,7	15,5	9,8	-9,8	-65,1	-138,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	2 473	20,0	Night	**20,56**	3,9	14,7	15,7	15,5	9,8	-9,8	-65,1	-138,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	2 721	20,0	Day	**19,34**	3,4	14,0	14,4	14,0	7,9	-13,1	-71,6	-141,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	2 721	20,0	Evening	**19,34**	3,4	14,0	14,4	14,0	7,9	-13,1	-71,6	-141,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	2 721	20,0	Night	**19,34**	3,4	14,0	14,4	14,0	7,9	-13,1	-71,6	-141,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 696	20,0	Day	**23,20**	2,9	16,1	16,7	19,0	15,8	1,4	-41,9	-123,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 696	20,0	Evening	**23,20**	2,9	16,1	16,7	19,0	15,8	1,4	-41,9	-123,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 696	20,0	Night	**23,20**	2,9	16,1	16,7	19,0	15,8	1,4	-41,9	-123,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
13	677	13,0	Day	**34,82**	13,5	27,9	28,1	30,3	27,8	19,5	-3,5	-64,7	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	677	13,0	Evening	**34,82**	13,5	27,9	28,1	30,3	27,8	19,5	-3,5	-64,7	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	677	13,0	Night	**34,82**	13,5	27,9	28,1	30,3	27,8	19,5	-3,5	-64,7	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
14	780	10,0	Day	**31,45**	9,5	24,0	24,8	27,1	24,7	15,8	-9,5	-75,5	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	780	10,0	Evening	**31,45**	9,5	24,0	24,8	27,1	24,7	15,8	-9,5	-75,5	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	780	10,0	Night	**31,45**	9,5	24,0	24,8	27,1	24,7	15,8	-9,5	-75,5	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3

Noise sensitive area: D Løvmo

WTG No.	Distance	Wind speed at hub height	Variant	Sound level	Octave data [Hz]								Source noise	Octave data [Hz]							
					63	125	250	500	1000	2000	4000	8000	LwA,ref	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]		**[dB(A)]**	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]
1	908	9,0	Day	**32,53**	16,2	20,2	27,2	28,4	25,9	16,1	-12,3	-83,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	908	9,0	Evening	**32,53**	16,2	20,2	27,2	28,4	25,9	16,1	-12,3	-83,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	908	9,0	Night	**32,53**	16,2	20,2	27,2	28,4	25,9	16,1	-12,3	-83,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	1 176	10,0	Day	**30,72**	15,5	18,0	26,2	26,4	23,2	11,6	-22,2	-100,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	1 176	10,0	Evening	**30,72**	15,5	18,0	26,2	26,4	23,2	11,6	-22,2	-100,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	1 176	10,0	Night	**30,72**	15,5	18,0	26,2	26,4	23,2	11,6	-22,2	-100,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	1 321	9,0	Day	**28,51**	13,4	16,5	23,8	24,3	21,1	8,6	-28,1	-108,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	1 321	9,0	Evening	**28,51**	13,4	16,5	23,8	24,3	21,1	8,6	-28,1	-108,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	1 321	9,0	Night	**28,51**	13,4	16,5	23,8	24,3	21,1	8,6	-28,1	-108,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	1 726	9,0	Day	**25,85**	11,8	15,3	21,5	21,4	17,2	2,1	-42,1	-123,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	1 726	9,0	Evening	**25,85**	11,8	15,3	21,5	21,4	17,2	2,1	-42,1	-123,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	1 726	9,0	Night	**25,85**	11,8	15,3	21,5	21,4	17,2	2,1	-42,1	-123,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 985	9,0	Day	**23,78**	10,6	13,5	19,4	19,3	14,8	-1,8	-50,3	-130,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 985	9,0	Evening	**23,78**	10,6	13,5	19,4	19,3	14,8	-1,8	-50,3	-130,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 985	9,0	Night	**23,78**	10,6	13,5	19,4	19,3	14,8	-1,8	-50,3	-130,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1

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NORD2000 - Details

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

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WTG				Sound level	Octave data [Hz]								Source noise	Octave data [Hz]							
No.	Distance	Wind speed at hub height	Variant		63	125	250	500	1000	2000	4000	8000	LwA,ref	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]		**[dB(A)]**	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]
6	2 236	20,0	Day	**22,31**	5,5	14,8	17,6	17,7	12,7	-5,5	-57,8	-135,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	2 236	20,0	Evening	**22,31**	5,5	14,8	17,6	17,7	12,7	-5,5	-57,8	-135,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	2 236	20,0	Night	**22,31**	5,5	14,8	17,6	17,7	12,7	-5,5	-57,8	-135,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	2 505	20,0	Day	**20,93**	4,3	14,0	16,3	16,2	10,6	-9,2	-65,3	-138,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	2 505	20,0	Evening	**20,93**	4,3	14,0	16,3	16,2	10,6	-9,2	-65,3	-138,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	2 505	20,0	Night	**20,93**	4,3	14,0	16,3	16,2	10,6	-9,2	-65,3	-138,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	2 774	20,0	Day	**19,79**	3,7	13,8	15,0	14,7	8,7	-12,7	-72,1	-141,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	2 774	20,0	Evening	**19,79**	3,7	13,8	15,0	14,7	8,7	-12,7	-72,1	-141,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	2 774	20,0	Night	**19,79**	3,7	13,8	15,0	14,7	8,7	-12,7	-72,1	-141,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	3 045	20,0	Day	**18,67**	2,8	13,3	13,8	13,3	6,8	-16,1	-78,7	-143,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	3 045	20,0	Evening	**18,67**	2,8	13,3	13,8	13,3	6,8	-16,1	-78,7	-143,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	3 045	20,0	Night	**18,67**	2,8	13,3	13,8	13,3	6,8	-16,1	-78,7	-143,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	3 284	20,0	Day	**17,97**	5,0	13,1	12,9	12,1	5,1	-19,1	-84,0	-144,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	3 284	20,0	Evening	**17,97**	5,0	13,1	12,9	12,1	5,1	-19,1	-84,0	-144,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	3 284	20,0	Night	**17,97**	5,0	13,1	12,9	12,1	5,1	-19,1	-84,0	-144,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	3 546	20,0	Day	**16,95**	4,1	12,3	11,9	10,9	3,4	-22,3	-89,5	-146,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	3 546	20,0	Evening	**16,95**	4,1	12,3	11,9	10,9	3,4	-22,3	-89,5	-146,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	3 546	20,0	Night	**16,95**	4,1	12,3	11,9	10,9	3,4	-22,3	-89,5	-146,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	2 402	20,0	Day	**23,05**	10,2	17,7	17,7	17,6	12,0	-7,3	-62,0	-137,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	2 402	20,0	Evening	**23,05**	10,2	17,7	17,7	17,6	12,0	-7,3	-62,0	-137,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	2 402	20,0	Night	**23,05**	10,2	17,7	17,7	17,6	12,0	-7,3	-62,0	-137,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
13	703	13,0	Day	**36,35**	18,2	26,1	30,5	32,1	29,8	21,1	-2,8	-65,9	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	703	13,0	Evening	**36,35**	18,2	26,1	30,5	32,1	29,8	21,1	-2,8	-65,9	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	703	13,0	Night	**36,35**	18,2	26,1	30,5	32,1	29,8	21,1	-2,8	-65,9	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
14	1 531	10,0	Day	**25,05**	10,5	13,5	20,5	20,8	17,1	3,4	-37,1	-119,4	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	1 531	10,0	Evening	**25,05**	10,5	13,5	20,5	20,8	17,1	3,4	-37,1	-119,4	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	1 531	10,0	Night	**25,05**	10,5	13,5	20,5	20,8	17,1	3,4	-37,1	-119,4	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3

Noise sensitive area: E Storeienen

WTG				Sound level	Octave data [Hz]								Source noise	Octave data [Hz]							
No.	Distance	Wind speed at hub height	Variant		63	125	250	500	1000	2000	4000	8000	LwA,ref	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]		**[dB(A)]**	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]
1	873	20,0	Day	**33,12**	12,0	26,2	26,9	28,6	25,7	16,1	-11,1	-80,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	873	20,0	Evening	**33,12**	12,0	26,2	26,9	28,6	25,7	16,1	-11,1	-80,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	873	20,0	Night	**33,12**	12,0	26,2	26,9	28,6	25,7	16,1	-11,1	-80,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	809	15,0	Day	**33,64**	13,3	26,4	27,5	29,0	26,5	17,3	-8,4	-75,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	809	15,0	Evening	**33,64**	13,3	26,4	27,5	29,0	26,5	17,3	-8,4	-75,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	809	15,0	Night	**33,64**	13,3	26,4	27,5	29,0	26,5	17,3	-8,4	-75,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	1 060	20,0	Day	**30,15**	9,6	22,5	24,2	25,7	22,9	12,2	-18,9	-94,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	1 060	20,0	Evening	**30,15**	9,6	22,5	24,2	25,7	22,9	12,2	-18,9	-94,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	1 060	20,0	Night	**30,15**	9,6	22,5	24,2	25,7	22,9	12,2	-18,9	-94,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	1 400	9,0	Day	**27,78**	10,5	19,1	22,9	23,4	19,6	6,5	-31,5	-112,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	1 400	9,0	Evening	**27,78**	10,5	19,1	22,9	23,4	19,6	6,5	-31,5	-112,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	1 400	9,0	Night	**27,78**	10,5	19,1	22,9	23,4	19,6	6,5	-31,5	-112,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 632	20,0	Day	**25,32**	6,8	17,9	20,1	20,8	16,8	2,4	-39,7	-121,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 632	20,0	Evening	**25,32**	6,8	17,9	20,1	20,8	16,8	2,4	-39,7	-121,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 632	20,0	Night	**25,32**	6,8	17,9	20,1	20,8	16,8	2,4	-39,7	-121,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 716	20,0	Day	**25,75**	9,4	19,3	20,7	20,8	16,4	1,4	-42,4	-123,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 716	20,0	Evening	**25,75**	9,4	19,3	20,7	20,8	16,4	1,4	-42,4	-123,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 716	20,0	Night	**25,75**	9,4	19,3	20,7	20,8	16,4	1,4	-42,4	-123,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 882	20,0	Day	**24,37**	6,6	17,7	19,3	19,6	15,0	-1,1	-47,7	-128,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 882	20,0	Evening	**24,37**	6,6	17,7	19,3	19,6	15,0	-1,1	-47,7	-128,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 882	20,0	Night	**24,37**	6,6	17,7	19,3	19,6	15,0	-1,1	-47,7	-128,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	2 067	20,0	Day	**22,54**	5,0	15,8	17,6	17,8	13,0	-4,1	-53,5	-132,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	2 067	20,0	Evening	**22,54**	5,0	15,8	17,6	17,8	13,0	-4,1	-53,5	-132,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	2 067	20,0	Night	**22,54**	5,0	15,8	17,6	17,8	13,0	-4,1	-53,5	-132,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	2 305	20,0	Day	**21,24**	4,0	14,9	16,4	16,4	11,1	-7,4	-60,4	-136,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	2 305	20,0	Evening	**21,24**	4,0	14,9	16,4	16,4	11,1	-7,4	-60,4	-136,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	2 305	20,0	Night	**21,24**	4,0	14,9	16,4	16,4	11,1	-7,4	-60,4	-136,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	2 447	20,0	Day	**20,54**	3,6	14,4	15,7	15,6	10,0	-9,4	-64,3	-138,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	2 447	20,0	Evening	**20,54**	3,6	14,4	15,7	15,6	10,0	-9,4	-64,3	-138,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	2 447	20,0	Night	**20,54**	3,6	14,4	15,7	15,6	10,0	-9,4	-64,3	-138,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	2 720	9,0	Day	**20,09**	6,4	12,4	16,0	15,1	8,8	-12,4	-71,1	-141,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	2 720	9,0	Evening	**20,09**	6,4	12,4	16,0	15,1	8,8	-12,4	-71,1	-141,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	2 720	9,0	Night	**20,09**	6,4	12,4	16,0	15,1	8,8	-12,4	-71,1	-141,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 475	20,0	Day	**27,25**	9,1	20,0	22,1	22,7	18,8	5,3	-34,0	-115,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 475	20,0	Evening	**27,25**	9,1	20,0	22,1	22,7	18,8	5,3	-34,0	-115,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 475	20,0	Night	**27,25**	9,1	20,0	22,1	22,7	18,8	5,3	-34,0	-115,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
13	997	13,0	Day	**30,17**	11,8	21,3	24,6	25,8	23,1	12,8	-16,8	-90,1	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	997	13,0	Evening	**30,17**	11,8	21,3	24,6	25,8	23,1	12,8	-16,8	-90,1	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	997	13,0	Night	**30,17**	11,8	21,3	24,6	25,8	23,1	12,8	-16,8	-90,1	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
14	1 224	10,0	Day	**26,68**	9,1	17,4	21,5	22,4	19,2	7,5	-26,9	-105,7	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	1 224	10,0	Evening	**26,68**	9,1	17,4	21,5	22,4	19,2	7,5	-26,9	-105,7	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	1 224	10,0	Night	**26,68**	9,1	17,4	21,5	22,4	19,2	7,5	-26,9	-105,7	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3

NORD2000 - Details

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

Noise sensitive area: F Hamlandsvika

WTG No.	Distance [m]	Wind speed at hub height [m/s]	Variant	Sound level [dB(A)]	Octave data [Hz] 63 [dB(A)]	125 [dB(A)]	250 [dB(A)]	500 [dB(A)]	1000 [dB(A)]	2000 [dB(A)]	4000 [dB(A)]	8000 [dB(A)]	Source noise LwA,ref [dB(A)]	Octave data [Hz] 63 [dB(A)]	125 [dB(A)]	250 [dB(A)]	500 [dB(A)]	1000 [dB(A)]	2000 [dB(A)]	4000 [dB(A)]	8000 [dB(A)]
1	3 582	20,0	Day	**2,03**	-7,7	-0,6	-4,2	-7,9	-17,6	-42,1	-102,9	-154,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	3 582	20,0	Evening	**2,03**	-7,7	-0,6	-4,2	-7,9	-17,6	-42,1	-102,9	-154,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	3 582	20,0	Night	**2,03**	-7,7	-0,6	-4,2	-7,9	-17,6	-42,1	-102,9	-154,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	3 307	20,0	Day	**-0,47**	-10,3	-3,2	-6,4	-11,1	-18,7	-36,2	-95,1	-153,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	3 307	20,0	Evening	**-0,47**	-10,3	-3,2	-6,4	-11,1	-18,7	-36,2	-95,1	-153,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	3 307	20,0	Night	**-0,47**	-10,3	-3,2	-6,4	-11,1	-18,7	-36,2	-95,1	-153,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	3 083	20,0	Day	**0,51**	-9,8	-3,0	-4,7	-8,0	-17,0	-37,7	-92,7	-151,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	3 083	20,0	Evening	**0,51**	-9,8	-3,0	-4,7	-8,0	-17,0	-37,7	-92,7	-151,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	3 083	20,0	Night	**0,51**	-9,8	-3,0	-4,7	-8,0	-17,0	-37,7	-92,7	-151,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	2 663	20,0	Day	**3,58**	-12,5	-3,0	-2,6	-1,3	-3,8	-22,0	-80,6	-152,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	2 663	20,0	Evening	**3,58**	-12,5	-3,0	-2,6	-1,3	-3,8	-22,0	-80,6	-152,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	2 663	20,0	Night	**3,58**	-12,5	-3,0	-2,6	-1,3	-3,8	-22,0	-80,6	-152,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	2 414	20,0	Day	**2,23**	-7,8	-2,4	-2,6	-4,8	-12,5	-34,3	-91,6	-169,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	2 414	20,0	Evening	**2,23**	-7,8	-2,4	-2,6	-4,8	-12,5	-34,3	-91,6	-169,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	2 414	20,0	Night	**2,23**	-7,8	-2,4	-2,6	-4,8	-12,5	-34,3	-91,6	-169,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	2 154	20,0	Day	**8,04**	-5,4	1,4	3,4	3,0	-2,8	-21,9	-74,8	-155,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	2 154	20,0	Evening	**8,04**	-5,4	1,4	3,4	3,0	-2,8	-21,9	-74,8	-155,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	2 154	20,0	Night	**8,04**	-5,4	1,4	3,4	3,0	-2,8	-21,9	-74,8	-155,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 884	20,0	Day	**23,10**	3,4	16,6	17,8	18,4	14,0	-1,8	-48,2	-128,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 884	20,0	Evening	**23,10**	3,4	16,6	17,8	18,4	14,0	-1,8	-48,2	-128,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 884	20,0	Night	**23,10**	3,4	16,6	17,8	18,4	14,0	-1,8	-48,2	-128,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 614	20,0	Day	**24,81**	3,8	17,5	19,5	20,3	16,5	2,4	-39,4	-121,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 614	20,0	Evening	**24,81**	3,8	17,5	19,5	20,3	16,5	2,4	-39,4	-121,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 614	20,0	Night	**24,81**	3,8	17,5	19,5	20,3	16,5	2,4	-39,4	-121,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	1 343	20,0	Day	**27,00**	8,1	19,8	21,3	22,5	19,2	6,8	-30,0	-110,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	1 343	20,0	Evening	**27,00**	8,1	19,8	21,3	22,5	19,2	6,8	-30,0	-110,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	1 343	20,0	Night	**27,00**	8,1	19,8	21,3	22,5	19,2	6,8	-30,0	-110,6	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	1 115	20,0	Day	**29,05**	8,9	21,8	23,1	24,5	21,7	10,8	-21,4	-98,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	1 115	20,0	Evening	**29,05**	8,9	21,8	23,1	24,5	21,7	10,8	-21,4	-98,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	1 115	20,0	Night	**29,05**	8,9	21,8	23,1	24,5	21,7	10,8	-21,4	-98,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	845	20,0	Day	**31,95**	11,2	24,5	25,4	27,5	25,1	16,0	-10,6	-79,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	845	20,0	Evening	**31,95**	11,2	24,5	25,4	27,5	25,1	16,0	-10,6	-79,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	845	20,0	Night	**31,95**	11,2	24,5	25,4	27,5	25,1	16,0	-10,6	-79,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	2 085	20,0	Day	**12,14**	-2,4	8,4	6,6	5,5	-1,5	-21,0	-71,7	-145,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	2 085	20,0	Evening	**12,14**	-2,4	8,4	6,6	5,5	-1,5	-21,0	-71,7	-145,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	2 085	20,0	Night	**12,14**	-2,4	8,4	6,6	5,5	-1,5	-21,0	-71,7	-145,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
13	3 781	13,0	Day	**-6,05**	-14,1	-9,3	-12,3	-16,1	-21,0	-39,8	-104,2	-155,4	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	3 781	13,0	Evening	**-6,05**	-14,1	-9,3	-12,3	-16,1	-21,0	-39,8	-104,2	-155,4	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	3 781	13,0	Night	**-6,05**	-14,1	-9,3	-12,3	-16,1	-21,0	-39,8	-104,2	-155,4	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
14	2 860	10,0	Day	**-7,67**	-15,4	-12,3	-14,6	-16,2	-16,1	-29,3	-85,2	-151,7	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	2 860	10,0	Evening	**-7,67**	-15,4	-12,3	-14,6	-16,2	-16,1	-29,3	-85,2	-151,7	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	2 860	10,0	Night	**-7,67**	-15,4	-12,3	-14,6	-16,2	-16,1	-29,3	-85,2	-151,7	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3

Noise sensitive area: G Hamland

WTG No.	Distance [m]	Wind speed at hub height [m/s]	Variant	Sound level [dB(A)]	Octave data [Hz] 63 [dB(A)]	125 [dB(A)]	250 [dB(A)]	500 [dB(A)]	1000 [dB(A)]	2000 [dB(A)]	4000 [dB(A)]	8000 [dB(A)]	Source noise LwA,ref [dB(A)]	Octave data [Hz] 63 [dB(A)]	125 [dB(A)]	250 [dB(A)]	500 [dB(A)]	1000 [dB(A)]	2000 [dB(A)]	4000 [dB(A)]	8000 [dB(A)]
1	2 458	20,0	Day	**14,37**	0,6	6,5	8,7	10,0	6,3	-11,1	-64,4	-137,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	2 458	20,0	Evening	**14,37**	0,6	6,5	8,7	10,0	6,3	-11,1	-64,4	-137,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	2 458	20,0	Night	**14,37**	0,6	6,5	8,7	10,0	6,3	-11,1	-64,4	-137,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	2 192	20,0	Day	**14,78**	1,1	6,6	10,5	9,9	5,1	-11,8	-62,3	-139,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	2 192	20,0	Evening	**14,78**	1,1	6,6	10,5	9,9	5,1	-11,8	-62,3	-139,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	2 192	20,0	Night	**14,78**	1,1	6,6	10,5	9,9	5,1	-11,8	-62,3	-139,3	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	2 125	20,0	Day	**17,61**	2,3	8,5	12,4	13,2	10,0	-5,5	-54,2	-132,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	2 125	20,0	Evening	**17,61**	2,3	8,5	12,4	13,2	10,0	-5,5	-54,2	-132,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	2 125	20,0	Night	**17,61**	2,3	8,5	12,4	13,2	10,0	-5,5	-54,2	-132,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	1 933	9,0	Day	**22,91**	5,4	13,9	18,3	18,9	13,3	-2,5	-49,3	-129,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	1 933	9,0	Evening	**22,91**	5,4	13,9	18,3	18,9	13,3	-2,5	-49,3	-129,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	1 933	9,0	Night	**22,91**	5,4	13,9	18,3	18,9	13,3	-2,5	-49,3	-129,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 859	12,0	Day	**23,50**	6,9	15,2	18,8	19,1	14,4	-1,2	-47,2	-127,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 859	12,0	Evening	**23,50**	6,9	15,2	18,8	19,1	14,4	-1,2	-47,2	-127,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	1 859	12,0	Night	**23,50**	6,9	15,2	18,8	19,1	14,4	-1,2	-47,2	-127,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 640	20,0	Day	**25,23**	8,6	17,7	20,0	20,7	16,7	2,2	-40,2	-122,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 640	20,0	Evening	**25,23**	8,6	17,7	20,0	20,7	16,7	2,2	-40,2	-122,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 640	20,0	Night	**25,23**	8,6	17,7	20,0	20,7	16,7	2,2	-40,2	-122,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 481	20,0	Day	**26,32**	8,2	18,3	21,1	21,9	18,2	4,7	-34,9	-116,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 481	20,0	Evening	**26,32**	8,2	18,3	21,1	21,9	18,2	4,7	-34,9	-116,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 481	20,0	Night	**26,32**	8,2	18,3	21,1	21,9	18,2	4,7	-34,9	-116,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 354	20,0	Day	**28,36**	11,6	20,5	23,3	23,8	20,0	7,3	-29,9	-110,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 354	20,0	Evening	**28,36**	11,6	20,5	23,3	23,8	20,0	7,3	-29,9	-110,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 354	20,0	Night	**28,36**	11,6	20,5	23,3	23,8	20,0	7,3	-29,9	-110,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	1 339	20,0	Day	**27,59**	10,6	19,4	22,4	23,1	19,7	7,1	-29,7	-110,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	1 339	20,0	Evening	**27,59**	10,6	19,4	22,4	23,1	19,7	7,1	-29,7	-110,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	1 339	20,0	Night	**27,59**	10,6	19,4	22,4	23,1	19,7	7,1	-29,7	-110,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	1 219	20,0	Day	**28,50**	10,5	19,8	23,1	24,2	21,0	9,3	-25,2	-104,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	1 219	20,0	Evening	**28,50**	10,5	19,8	23,1	24,2	21,0	9,3	-25,2	-104,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	1 219	20,0	Night	**28,50**	10,5	19,8	23,1	24,2	21,0	9,3	-25,2	-104,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	1 363	9,0	Day	**27,94**	12,4	17,9	23,3	23,5	19,9	7,2	-30,1	-111,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	1 363	9,0	Evening	**27,94**	12,4	17,9	23,3	23,5	19,9	7,2	-30,1	-111,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	1 363	9,0	Night	**27,94**	12,4	17,9	23,3	23,5	19,9	7,2	-30,1	-111,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 139	20,0	Day	**29,25**	12,1	20,1	23,8	25,0	21,9	10,7	-22,1	-99,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1

To be continued on next page...

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Calculated:
19.12.2018 21.51/3.2.737

NORD2000 - Details

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

...continued from previous page

WTG No.	Distance	Wind speed at hub height	Variant	Sound level	Octave data [Hz] 63	125	250	500	1000	2000	4000	8000	Source noise LwA,ref	Octave data [Hz] 63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]		**[dB(A)]**	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]
12	1 139	20,0	Evening	**29,25**	12,1	20,1	23,8	25,0	21,9	10,7	-22,1	-99,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 139	20,0	Night	**29,25**	12,1	20,1	23,8	25,0	21,9	10,7	-22,1	-99,4	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
13	2 665	13,0	Day	**8,69**	-3,8	1,1	4,6	3,5	-2,2	-23,4	-82,0	-154,2	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	2 665	13,0	Evening	**8,69**	-3,8	1,1	4,6	3,5	-2,2	-23,4	-82,0	-154,2	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	2 665	13,0	Night	**8,69**	-3,8	1,1	4,6	3,5	-2,2	-23,4	-82,0	-154,2	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
14	2 009	10,0	Day	**11,09**	-0,9	2,9	7,3	5,6	0,5	-17,4	-67,5	-148,3	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	2 009	10,0	Evening	**11,09**	-0,9	2,9	7,3	5,6	0,5	-17,4	-67,5	-148,3	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	2 009	10,0	Night	**11,09**	-0,9	2,9	7,3	5,6	0,5	-17,4	-67,5	-148,3	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3

Noise sensitive area: H Myhrvang

WTG No.	Distance	Wind speed at hub height	Variant	Sound level	Octave data [Hz] 63	125	250	500	1000	2000	4000	8000	Source noise LwA,ref	Octave data [Hz] 63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]		**[dB(A)]**	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]	[dB(A)]
1	2 774	20,0	Day	**19,14**	3,4	13,9	14,1	13,7	7,5	-13,7	-72,9	-141,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	2 774	20,0	Evening	**19,14**	3,4	13,9	14,1	13,7	7,5	-13,7	-72,9	-141,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
1	2 774	20,0	Night	**19,14**	3,4	13,9	14,1	13,7	7,5	-13,7	-72,9	-141,8	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	2 504	20,0	Day	**20,43**	4,9	14,8	15,3	15,2	9,6	-10,1	-65,8	-139,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	2 504	20,0	Evening	**20,43**	4,9	14,8	15,3	15,2	9,6	-10,1	-65,8	-139,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
2	2 504	20,0	Night	**20,43**	4,9	14,8	15,3	15,2	9,6	-10,1	-65,8	-139,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	2 413	20,0	Day	**20,77**	4,1	14,8	15,8	15,8	10,2	-8,9	-63,4	-138,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	2 413	20,0	Evening	**20,77**	4,1	14,8	15,8	15,8	10,2	-8,9	-63,4	-138,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
3	2 413	20,0	Night	**20,77**	4,1	14,8	15,8	15,8	10,2	-8,9	-63,4	-138,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	2 179	20,0	Day	**21,92**	4,8	15,4	17,0	17,1	12,1	-5,7	-56,9	-134,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	2 179	20,0	Evening	**21,92**	4,8	15,4	17,0	17,1	12,1	-5,7	-56,9	-134,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
4	2 179	20,0	Night	**21,92**	4,8	15,4	17,0	17,1	12,1	-5,7	-56,9	-134,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	2 070	20,0	Day	**22,53**	5,3	15,8	17,6	17,8	13,0	-4,1	-53,6	-132,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	2 070	20,0	Evening	**22,53**	5,3	15,8	17,6	17,8	13,0	-4,1	-53,6	-132,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
5	2 070	20,0	Night	**22,53**	5,3	15,8	17,6	17,8	13,0	-4,1	-53,6	-132,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 829	9,0	Day	**24,55**	9,5	15,7	20,2	20,0	15,4	-0,3	-46,0	-127,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 829	9,0	Evening	**24,55**	9,5	15,7	20,2	20,0	15,4	-0,3	-46,0	-127,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
6	1 829	9,0	Night	**24,55**	9,5	15,7	20,2	20,0	15,4	-0,3	-46,0	-127,0	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 632	9,0	Day	**25,55**	8,4	18,4	20,5	20,9	16,8	2,4	-39,9	-121,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 632	9,0	Evening	**25,55**	8,4	18,4	20,5	20,9	16,8	2,4	-39,9	-121,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
7	1 632	9,0	Night	**25,55**	8,4	18,4	20,5	20,9	16,8	2,4	-39,9	-121,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 455	20,0	Day	**27,80**	9,0	21,6	22,2	23,0	19,0	5,6	-33,4	-115,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 455	20,0	Evening	**27,80**	9,0	21,6	22,2	23,0	19,0	5,6	-33,4	-115,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
8	1 455	20,0	Night	**27,80**	9,0	21,6	22,2	23,0	19,0	5,6	-33,4	-115,1	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	1 374	9,0	Day	**27,51**	9,4	20,2	22,1	22,9	19,4	6,6	-30,8	-111,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	1 374	9,0	Evening	**27,51**	9,4	20,2	22,1	22,9	19,4	6,6	-30,8	-111,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
9	1 374	9,0	Night	**27,51**	9,4	20,2	22,1	22,9	19,4	6,6	-30,8	-111,9	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	1 192	20,0	Day	**28,95**	8,3	22,0	22,9	24,5	21,3	9,8	-24,1	-102,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	1 192	20,0	Evening	**28,95**	8,3	22,0	22,9	24,5	21,3	9,8	-24,1	-102,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
10	1 192	20,0	Night	**28,95**	8,3	22,0	22,9	24,5	21,3	9,8	-24,1	-102,5	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	1 267	18,0	Day	**29,27**	10,1	22,5	23,7	24,6	21,0	8,8	-26,5	-106,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	1 267	18,0	Evening	**29,27**	10,1	22,5	23,7	24,6	21,0	8,8	-26,5	-106,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
11	1 267	18,0	Night	**29,27**	10,1	22,5	23,7	24,6	21,0	8,8	-26,5	-106,2	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 375	20,0	Day	**27,26**	8,5	19,3	21,9	22,9	19,4	6,7	-30,7	-111,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 375	20,0	Evening	**27,26**	8,5	19,3	21,9	22,9	19,4	6,7	-30,7	-111,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
12	1 375	20,0	Night	**27,26**	8,5	19,3	21,9	22,9	19,4	6,7	-30,7	-111,7	103,89	85,5	92,5	95,9	98,5	98,3	95,4	90,6	81,1
13	2 983	13,0	Day	**17,43**	3,2	11,6	12,9	12,0	5,4	-17,0	-78,5	-144,1	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	2 983	13,0	Evening	**17,43**	3,2	11,6	12,9	12,0	5,4	-17,0	-78,5	-144,1	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
13	2 983	13,0	Night	**17,43**	3,2	11,6	12,9	12,0	5,4	-17,0	-78,5	-144,1	103,23	84,8	91,8	95,2	97,8	97,6	94,7	89,9	80,4
14	2 278	10,0	Day	**19,84**	5,9	11,8	15,6	15,0	9,6	-8,8	-61,3	-138,0	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	2 278	10,0	Evening	**19,84**	5,9	11,8	15,6	15,0	9,6	-8,8	-61,3	-138,0	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3
14	2 278	10,0	Night	**19,84**	5,9	11,8	15,6	15,0	9,6	-8,8	-61,3	-138,0	102,08	83,7	90,7	94,1	96,7	96,5	93,6	88,8	79,3

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Calculated:
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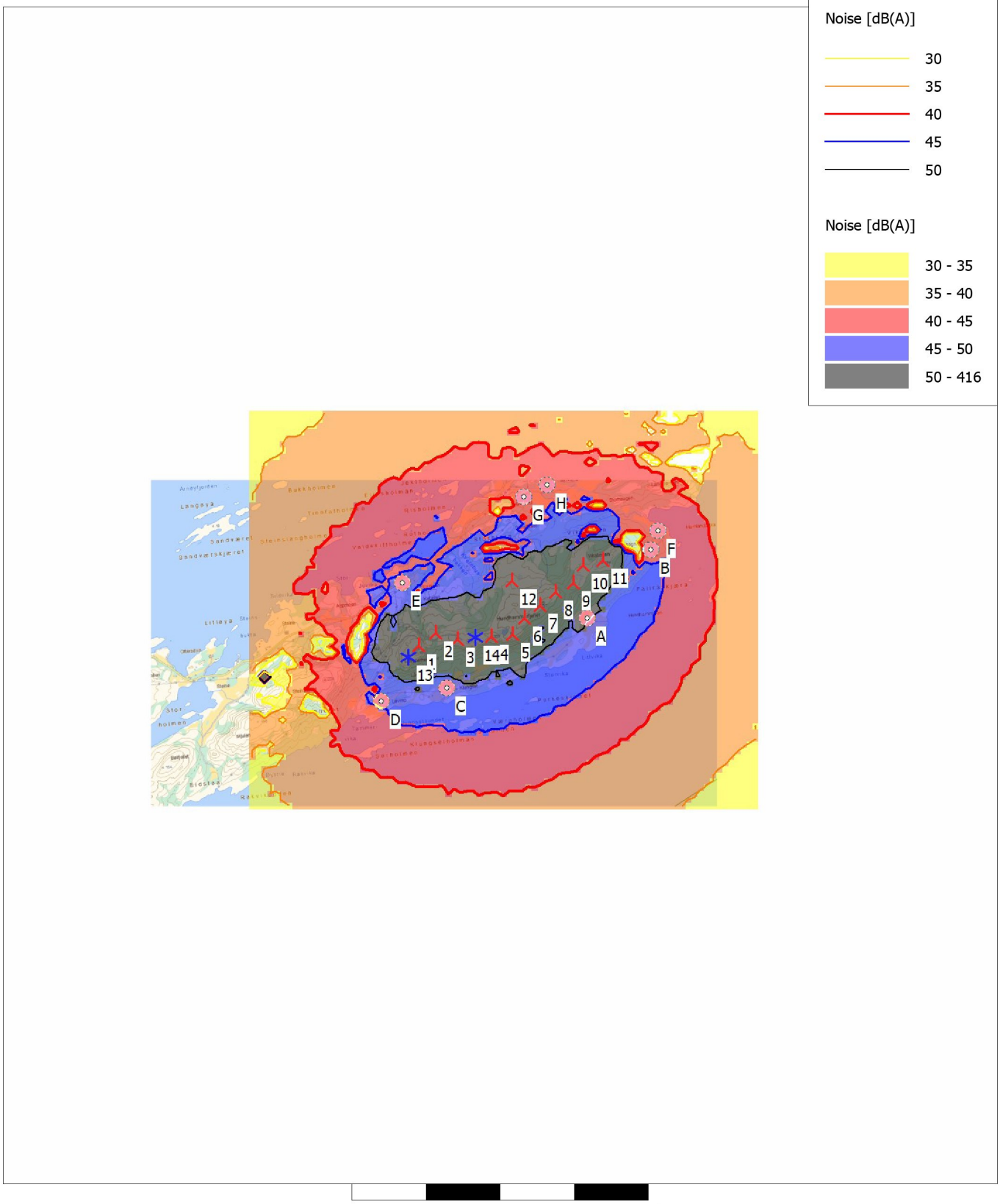
NORD2000 - Highest noise value

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6



Map: HHF , Print scale 1:75 000, Map center ETRS 89 Zone: 32 East: 612 860 North: 7 183 682

New WTG Existing WTG Noise sensitive area

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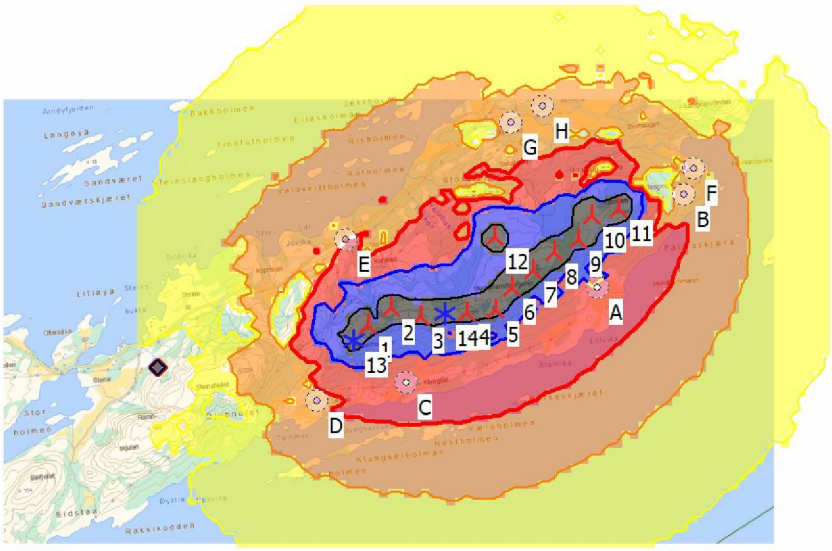
Calculated:
19.12.2018 21.51/3.2.737

NORD2000 - Lday

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6



0 1 2 3 4 km

Map: HHF , Print scale 1:75 000, Map center ETRS 89 Zone: 32 East: 612 860 North: 7 183 682

New WTG Existing WTG Noise sensitive area

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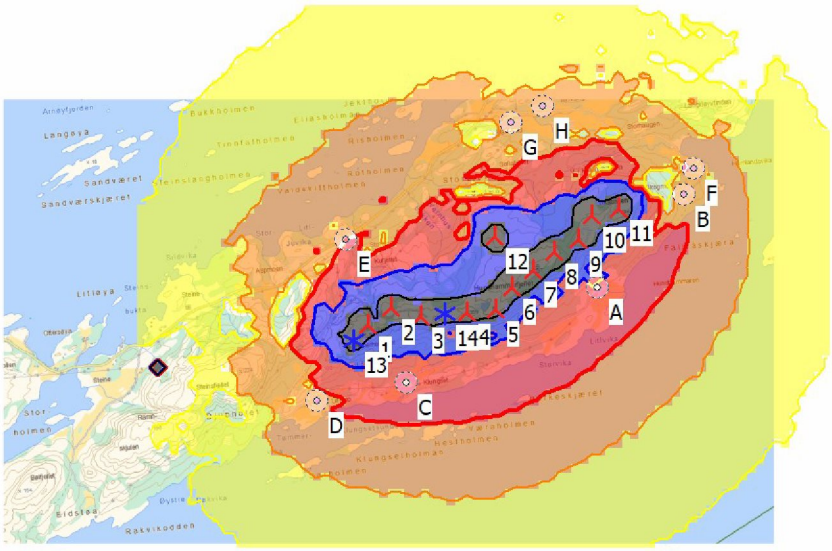
Calculated:
19.12.2018 21.51/3.2.737

NORD2000 - Levening

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6



0 1 2 3 4 km

Map: HHF , Print scale 1:75 000, Map center ETRS 89 Zone: 32 East: 612 860 North: 7 183 682

New WTG Existing WTG Noise sensitive area

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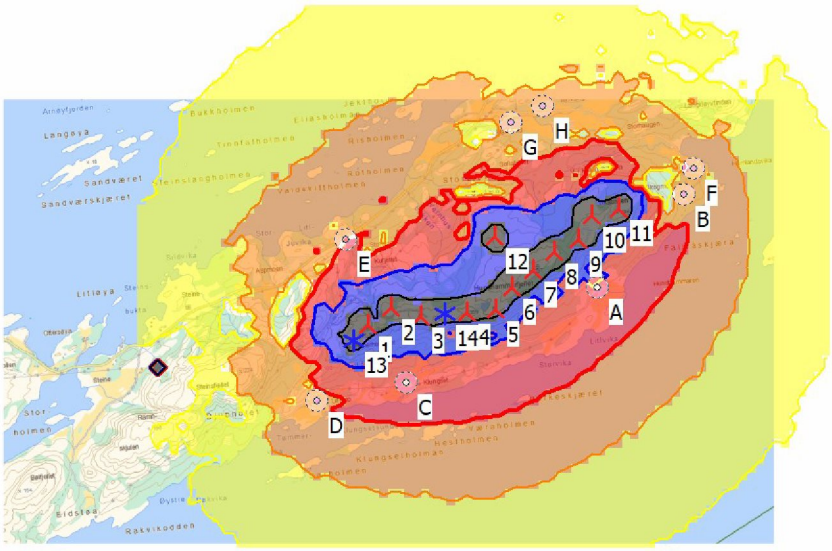
Calculated:
19.12.2018 21.51/3.2.737

NORD2000 - Lnight

Calculation: Worst case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6



0 1 2 3 4 km

Map: HHF , Print scale 1:75 000, Map center ETRS 89 Zone: 32 East: 612 860 North: 7 183 682

New WTG Existing WTG Noise sensitive area

Project:

Hundhammerfjellet Reetablering

NTE Energi AS

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Calculated:
16.12.2018 01.08/3.2.737

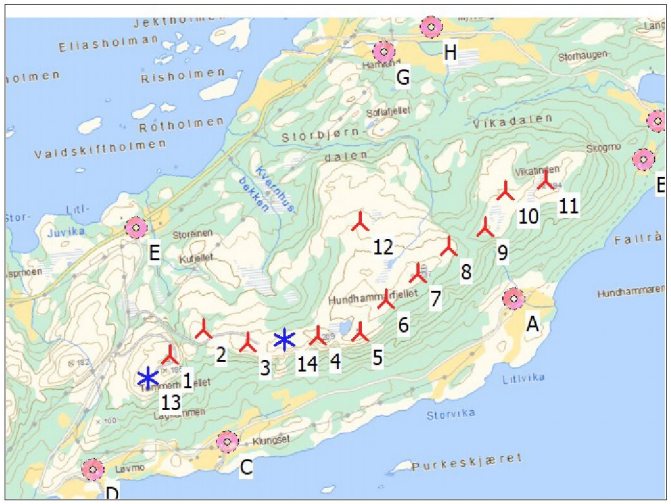
NORD2000 - Main Result

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

Assumptions

Weather stability	
Relative humidity	50,0 %
Air temperature	15,0 °C
Height for air temperature	2,0 m
Stability parameters	Night;Clear sky
Inverse Monin Obukhov lenght	0,0100
Temperature scale T*	0,0500
Terrain	
Elevation based on object	
Height Contours 2013	
Roughness based on area object	
Area object (Roughness): ROUGH_REGIONS_Hundhammerfjellet vindpark_6.w2r (25)	
Terrain type based on area object	
Area object (Nord2000): Terrain hardness	
Month for calculation	July
Wind speed criteria	
Uniform wind speed at 10 m agl.	
Wind speed distribution	Målemast.30,00m -
Probability of exceedance	
Wind direction	0,0 ° - 330,0 ° - 30,0 °
Height above ground level for receiver	4,0 m
Wind speed has been extrapolated to calculation height using	
Fixed shear: 0,1300	
No stability correction	
Version	5.022

All coordinates are in
ETRS 89 Zone: 32



Scale 1:50 000

New WTG | Existing WTG | Noise sensitive area

WTGs

	X(East)	Y(North)	Z [m]	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Noise data Setting	Creator	Name
1	611 497	7 182 974	178,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
2	611 722	7 183 142	145,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
3	612 015	7 183 056	170,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
4	612 478	7 183 097	205,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
5	612 757	7 183 128	199,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
6	612 927	7 183 340	225,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
7	613 136	7 183 515	234,1	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
8	613 342	7 183 694	199,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
9	613 584	7 183 818	198,3	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
10	613 714	7 184 057	184,6	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
11	613 981	7 184 127	174,1	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
12	612 753	7 183 853	175,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	Day	USER	Mode 0/0-0S (HWO)
											Evening	USER	Mode 0/0-0S (HWO)
											Night	USER	Mode 0/0-0S (HWO)
13	611 350	7 182 825	170,0	M1-E-70 E4 2000 71.0	Yes	ENERCON	E-70 E4-2 000	2 000	71,0	65,0	Day	USER	8m/s, 64m Hub, Man. guaranteed 10/2004
											Evening	USER	8m/s, 64m Hub, Man. guaranteed 10/2004
											Night	USER	8m/s, 64m Hub, Man. guaranteed 10/2004
14	612 257	7 183 083	190,0	M5- E-70 E4 2,3 MW 2300	Yes	ENERCON	E-70 E4 2,3 MW-2 300	2 300	71,0	64,0	Day	EMD	Level 0 - guaranteed - OM II- 02/2006
											Evening	EMD	Level 0 - guaranteed - OM II- 02/2006
											Night	EMD	Level 0 - guaranteed - OM II- 02/2006

Calculation Results

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NORD2000 - Main Result

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

Sound level

Noise sensitive area						Demands	Sound level	Demands fulfilled?
No.	Name	X(East)	Y(North)	Z [m]	Imission height [m]	Noise [dB(A)]	L50 [dB(A)]	Noise [dB(A)]
A	Hundhammer	613 769	7 183 346	24,8	4,0	45,0	45,4	No
A	Day						39,0	
A	Evening						39,0	
A	Night						39,0	
B	Skogmo	614 630	7 184 268	28,5	4,0	45,0	36,0	Yes
B	Day						29,6	
B	Evening						29,6	
B	Night						29,6	
C	Klungset	611 877	7 182 400	10,0	4,0	45,0	42,7	Yes
C	Day						36,3	
C	Evening						36,3	
C	Night						36,3	
D	Løvmo	610 992	7 182 219	12,0	4,0	45,0	39,2	Yes
D	Day						32,8	
D	Evening						32,8	
D	Night						32,8	
E	Storeienen	611 279	7 183 819	37,0	4,0	45,0	39,9	Yes
E	Day						33,5	
E	Evening						33,5	
E	Night						33,5	
F	Hamlandsvika	614 727	7 184 523	12,2	4,0	45,0	32,9	Yes
F	Day						26,5	
F	Evening						26,5	
F	Night						26,5	
G	Hamland	612 918	7 184 980	23,2	4,0	45,0	36,4	Yes
G	Day						30,0	
G	Evening						30,0	
G	Night						30,0	
H	Myhrvang	613 225	7 185 144	33,1	4,0	45,0	37,5	Yes
H	Day						31,1	
H	Evening						31,1	
H	Night						31,1	

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NORD2000 - Assumptions for NORD2000 calculation

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

Assumptions

Weather stability	
Relative humidity	50,0 %
Air temperature	15,0 °C
Height for air temperature	2,0 m
Stability parameters	Night;Clear sky
Inverse Monin Obukhov lenght	0,0100
Temperature scale T*	0,0500

Terrain
Elevation based on object
Height Contours 2013
Roughness based on area object
Area object (Roughness): ROUGH_REGIONS_Hundhammerfjellet vindpark_6.w2r (25)
Terrain type based on area object
Area object (Nord2000): Terrain hardness

Month for calculation	July

Wind speed criteria
Uniform wind speed at 10 m agl.

Wind speed distribution	Målemast.30,00m -
Probability of exceedance	
Wind direction	0,0 ° - 330,0 ° - 30,0 °
Height above ground level for receiver	4,0 m

Wind speed has been extrapolated to calculation height using
Fixed shear: 0,1300

No stability correction	
Version	5.022

All coordinates are in
ETRS 89 Zone: 32

Setup for Lden calculation

Variant	Name	From hour	To hour	Hours	Penalty [dB]	Days per year
1	Day	7	19	12	0	365
2	Evening	19	23	4	5	365
3	Night	23	7	8	10	365

WTG: VESTAS V136-4.2 4200 136.0 !O!
Noise: Mode 0/0-0S (HWO)

Source	Source/Date	Creator	Edited
0067-7065 V05	21.12.2017	USER	08.06.2018 09.03

Wind speed [m/s]	LwA,ref [dB(A)]
3,0	90,9
4,0	91,1
5,0	92,9
6,0	96,0
7,0	99,6
8,0	102,8
9,0	103,9
10,0	103,9
11,0	103,9
12,0	103,9
13,0	103,9
14,0	103,9
15,0	103,9
16,0	103,9
17,0	103,9
18,0	103,9
19,0	103,9
20,0	103,9

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NORD2000 - Assumptions for NORD2000 calculation

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6
WTG: ENERCON E-70 E4 2000 71.0 !O!
Noise: 8m/s, 64m Hub, Man. guaranteed 10/2004

Source	Source/Date	Creator	Edited
Enercon	07.10.2004	USER	17.09.2018 14.20

Wind speed [m/s]	LwA,ref [dB(A)]
6,0	91,1
7,0	93,6
8,0	97,4
9,0	99,5
10,0	101,1
11,0	102,2
12,0	102,7
13,0	103,2

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NORD2000 - Assumptions for NORD2000 calculation

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6
WTG: ENERCON E-70 E4 2,3 MW 2300 71.0 !O!
Noise: Level 0 - guaranteed - OM II- 02/2006

Source	Source/Date	Creator	Edited
Enercon	07.10.2004	EMD	12.07.2006 12.26

Noise data corresponding to 95 % production are based on Report WICO 314SEA05/01

Wind speed [m/s]	LwA,ref [dB(A)]
6,0	92,0
7,0	94,6
8,0	98,4
9,0	100,5
10,0	102,1

NSA: Hundhammer-A
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

NSA: Skogmo-B
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): Use standard value from calculation model

Distance demand: 700,0 m

NSA: Klungset-C
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

NSA: Løvmo-D
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

NSA: Storeienen-E
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

NSA: Hamlandsvika-F
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

NSA: Hamland-G
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

NSA: Myhrvang-H
Predefined calculation standard: Yellow zone
Imission height(a.g.l.): 4,0 m

Distance demand: 700,0 m

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NORD2000 - Details

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

Calculation Results

Noise sensitive area: A Hundhammer

WTG No.	Distance [m]	Variant	Sound level [dB(A)]
1	2 302	Day	**-7,99**
1	2 302	Evening	**-7,99**
1	2 302	Night	**-7,99**
2	2 057	Day	**-5,80**
2	2 057	Evening	**-5,80**
2	2 057	Night	**-5,80**
3	1 778	Day	**-4,82**
3	1 778	Evening	**-4,82**
3	1 778	Night	**-4,82**
4	1 315	Day	**22,69**
4	1 315	Evening	**22,69**
4	1 315	Night	**22,69**
5	1 035	Day	**26,51**
5	1 035	Evening	**26,51**
5	1 035	Night	**26,51**
6	842	Day	**27,57**
6	842	Evening	**27,57**
6	842	Night	**27,57**
7	655	Day	**30,06**
7	655	Evening	**30,06**
7	655	Night	**30,06**
8	551	Day	**32,52**
8	551	Evening	**32,52**
8	551	Night	**32,52**
9	507	Day	**33,71**
9	507	Evening	**33,71**
9	507	Night	**33,71**
10	713	Day	**29,29**
10	713	Evening	**29,29**
10	713	Night	**29,29**
11	809	Day	**28,43**
11	809	Evening	**28,43**
11	809	Night	**28,43**
12	1 136	Day	**0,26**
12	1 136	Evening	**0,26**
12	1 136	Night	**0,26**
13	2 475	Day	**-11,81**
13	2 475	Evening	**-11,81**
13	2 475	Night	**-11,81**
14	1 536	Day	**-8,11**
14	1 536	Evening	**-8,11**
14	1 536	Night	**-8,11**

Noise sensitive area: B Skogmo

WTG No.	Distance [m]	Variant	Sound level [dB(A)]
1	3 389	Day	**-15,88**
1	3 389	Evening	**-15,88**
1	3 389	Night	**-15,88**
2	3 118	Day	**-14,36**
2	3 118	Evening	**-14,36**
2	3 118	Night	**-14,36**
3	2 882	Day	**-10,90**
3	2 882	Evening	**-10,90**
3	2 882	Night	**-10,90**
4	2 450	Day	**-7,19**
4	2 450	Evening	**-7,19**
4	2 450	Night	**-7,19**
5	2 192	Day	**-3,27**
5	2 192	Evening	**-3,27**
5	2 192	Night	**-3,27**

To be continued on next page...

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NORD2000 - Details

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

...continued from previous page

WTG No.	Distance [m]	Variant	Sound level [dB(A)]
6	1 939	Day	**-1,46**
6	1 939	Evening	**-1,46**
6	1 939	Night	**-1,46**
7	1 673	Day	**-0,18**
7	1 673	Evening	**-0,18**
7	1 673	Night	**-0,18**
8	1 410	Day	**1,62**
8	1 410	Evening	**1,62**
8	1 410	Night	**1,62**
9	1 138	Day	**9,89**
9	1 138	Evening	**9,89**
9	1 138	Night	**9,89**
10	940	Day	**4,98**
10	940	Evening	**4,98**
10	940	Night	**4,98**
11	664	Day	**29,57**
11	664	Evening	**29,57**
11	664	Night	**29,57**
12	1 922	Day	**-6,99**
12	1 922	Evening	**-6,99**
12	1 922	Night	**-6,99**
13	3 584	Day	**-22,14**
13	3 584	Evening	**-22,14**
13	3 584	Night	**-22,14**
14	2 653	Day	**-13,48**
14	2 653	Evening	**-13,48**
14	2 653	Night	**-13,48**

Noise sensitive area: C Klungset

WTG No.	Distance [m]	Variant	Sound level [dB(A)]
1	688	Day	**30,60**
1	688	Evening	**30,60**
1	688	Night	**30,60**
2	758	Day	**28,88**
2	758	Evening	**28,88**
2	758	Night	**28,88**
3	670	Day	**29,16**
3	670	Evening	**29,16**
3	670	Night	**29,16**
4	920	Day	**26,78**
4	920	Evening	**26,78**
4	920	Night	**26,78**
5	1 142	Day	**24,54**
5	1 142	Evening	**24,54**
5	1 142	Night	**24,54**
6	1 409	Day	**21,38**
6	1 409	Evening	**21,38**
6	1 409	Night	**21,38**
7	1 681	Day	**14,83**
7	1 681	Evening	**14,83**
7	1 681	Night	**14,83**
8	1 954	Day	**-2,88**
8	1 954	Evening	**-2,88**
8	1 954	Night	**-2,88**
9	2 219	Day	**-5,06**
9	2 219	Evening	**-5,06**
9	2 219	Night	**-5,06**
10	2 473	Day	**-10,01**
10	2 473	Evening	**-10,01**
10	2 473	Night	**-10,01**
11	2 721	Day	**-10,66**
11	2 721	Evening	**-10,66**

To be continued on next page...

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NORD2000 - Details

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

...continued from previous page

WTG No.	Distance [m]	Variant	Sound level [dB(A)]
11	2 721	Night	**-10,66**
12	1 696	Day	**-1,82**
12	1 696	Evening	**-1,82**
12	1 696	Night	**-1,82**
13	677	Day	**24,57**
13	677	Evening	**24,57**
13	677	Night	**24,57**
14	780	Day	**25,09**
14	780	Evening	**25,09**
14	780	Night	**25,09**

Noise sensitive area: D Løvmo

WTG No.	Distance [m]	Variant	Sound level [dB(A)]
1	908	Day	**27,32**
1	908	Evening	**27,32**
1	908	Night	**27,32**
2	1 176	Day	**8,79**
2	1 176	Evening	**8,79**
2	1 176	Night	**8,79**
3	1 321	Day	**22,94**
3	1 321	Evening	**22,94**
3	1 321	Night	**22,94**
4	1 726	Day	**20,52**
4	1 726	Evening	**20,52**
4	1 726	Night	**20,52**
5	1 985	Day	**18,71**
5	1 985	Evening	**18,71**
5	1 985	Night	**18,71**
6	2 236	Day	**16,59**
6	2 236	Evening	**16,59**
6	2 236	Night	**16,59**
7	2 505	Day	**12,10**
7	2 505	Evening	**12,10**
7	2 505	Night	**12,10**
8	2 774	Day	**-6,11**
8	2 774	Evening	**-6,11**
8	2 774	Night	**-6,11**
9	3 045	Day	**-13,33**
9	3 045	Evening	**-13,33**
9	3 045	Night	**-13,33**
10	3 284	Day	**-16,23**
10	3 284	Evening	**-16,23**
10	3 284	Night	**-16,23**
11	3 546	Day	**-11,88**
11	3 546	Evening	**-11,88**
11	3 546	Night	**-11,88**
12	2 402	Day	**-9,81**
12	2 402	Evening	**-9,81**
12	2 402	Night	**-9,81**
13	703	Day	**29,34**
13	703	Evening	**29,34**
13	703	Night	**29,34**
14	1 531	Day	**15,90**
14	1 531	Evening	**15,90**
14	1 531	Night	**15,90**

Noise sensitive area: E Storeienen

WTG No.	Distance [m]	Variant	Sound level [dB(A)]
1	873	Day	**27,09**
1	873	Evening	**27,09**

To be continued on next page...

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NORD2000 - Details

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

...continued from previous page

WTG No.	Distance [m]	Variant	Sound level [dB(A)]
1	873	Night	**27,09**
2	809	Day	**28,19**
2	809	Evening	**28,19**
2	809	Night	**28,19**
3	1 060	Day	**24,51**
3	1 060	Evening	**24,51**
3	1 060	Night	**24,51**
4	1 400	Day	**22,31**
4	1 400	Evening	**22,31**
4	1 400	Night	**22,31**
5	1 632	Day	**17,64**
5	1 632	Evening	**17,64**
5	1 632	Night	**17,64**
6	1 716	Day	**18,22**
6	1 716	Evening	**18,22**
6	1 716	Night	**18,22**
7	1 882	Day	**18,03**
7	1 882	Evening	**18,03**
7	1 882	Night	**18,03**
8	2 067	Day	**12,67**
8	2 067	Evening	**12,67**
8	2 067	Night	**12,67**
9	2 305	Day	**7,81**
9	2 305	Evening	**7,81**
9	2 305	Night	**7,81**
10	2 447	Day	**10,14**
10	2 447	Evening	**10,14**
10	2 447	Night	**10,14**
11	2 720	Day	**2,95**
11	2 720	Evening	**2,95**
11	2 720	Night	**2,95**
12	1 475	Day	**21,14**
12	1 475	Evening	**21,14**
12	1 475	Night	**21,14**
13	997	Day	**21,60**
13	997	Evening	**21,60**
13	997	Night	**21,60**
14	1 224	Day	**20,90**
14	1 224	Evening	**20,90**
14	1 224	Night	**20,90**

Noise sensitive area: F Hamlandsvika

WTG No.	Distance [m]	Variant	Sound level [dB(A)]
1	3 582	Day	**-17,19**
1	3 582	Evening	**-17,19**
1	3 582	Night	**-17,19**
2	3 307	Day	**-16,76**
2	3 307	Evening	**-16,76**
2	3 307	Night	**-16,76**
3	3 083	Day	**-14,55**
3	3 083	Evening	**-14,55**
3	3 083	Night	**-14,55**
4	2 663	Day	**-12,15**
4	2 663	Evening	**-12,15**
4	2 663	Night	**-12,15**
5	2 414	Day	**-10,30**
5	2 414	Evening	**-10,30**
5	2 414	Night	**-10,30**
6	2 154	Day	**-8,53**
6	2 154	Evening	**-8,53**
6	2 154	Night	**-8,53**
7	1 884	Day	**-8,18**

To be continued on next page...

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NORD2000 - Details

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

...continued from previous page

WTG No.	Distance [m]	Variant	Sound level [dB(A)]
7	1 884	Evening	**-8,18**
7	1 884	Night	**-8,18**
8	1 614	Day	**-6,52**
8	1 614	Evening	**-6,52**
8	1 614	Night	**-6,52**
9	1 343	Day	**-2,18**
9	1 343	Evening	**-2,18**
9	1 343	Night	**-2,18**
10	1 115	Day	**9,10**
10	1 115	Evening	**9,10**
10	1 115	Night	**9,10**
11	845	Day	**26,38**
11	845	Evening	**26,38**
11	845	Night	**26,38**
12	2 085	Day	**-3,03**
12	2 085	Evening	**-3,03**
12	2 085	Night	**-3,03**
13	3 781	Day	**-21,42**
13	3 781	Evening	**-21,42**
13	3 781	Night	**-21,42**
14	2 860	Day	**-15,36**
14	2 860	Evening	**-15,36**
14	2 860	Night	**-15,36**

Noise sensitive area: G Hamland

WTG No.	Distance [m]	Variant	Sound level [dB(A)]
1	2 458	Day	**-7,85**
1	2 458	Evening	**-7,85**
1	2 458	Night	**-7,85**
2	2 192	Day	**-4,39**
2	2 192	Evening	**-4,39**
2	2 192	Night	**-4,39**
3	2 125	Day	**-4,81**
3	2 125	Evening	**-4,81**
3	2 125	Night	**-4,81**
4	1 933	Day	**7,76**
4	1 933	Evening	**7,76**
4	1 933	Night	**7,76**
5	1 859	Day	**4,39**
5	1 859	Evening	**4,39**
5	1 859	Night	**4,39**
6	1 640	Day	**15,00**
6	1 640	Evening	**15,00**
6	1 640	Night	**15,00**
7	1 481	Day	**20,90**
7	1 481	Evening	**20,90**
7	1 481	Night	**20,90**
8	1 354	Day	**17,91**
8	1 354	Evening	**17,91**
8	1 354	Night	**17,91**
9	1 339	Day	**21,91**
9	1 339	Evening	**21,91**
9	1 339	Night	**21,91**
10	1 219	Day	**23,30**
10	1 219	Evening	**23,30**
10	1 219	Night	**23,30**
11	1 363	Day	**22,61**
11	1 363	Evening	**22,61**
11	1 363	Night	**22,61**
12	1 139	Day	**23,68**
12	1 139	Evening	**23,68**
12	1 139	Night	**23,68**

To be continued on next page...

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NORD2000 - Details

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6

...continued from previous page

WTG No.	Distance [m]	Variant	Sound level [dB(A)]
13	2 665	Day	**-14,96**
13	2 665	Evening	**-14,96**
13	2 665	Night	**-14,96**
14	2 009	Day	**-7,67**
14	2 009	Evening	**-7,67**
14	2 009	Night	**-7,67**

Noise sensitive area: H Myhrvang

WTG No.	Distance [m]	Variant	Sound level [dB(A)]
1	2 774	Day	**12,98**
1	2 774	Evening	**12,98**
1	2 774	Night	**12,98**
2	2 504	Day	**13,56**
2	2 504	Evening	**13,56**
2	2 504	Night	**13,56**
3	2 413	Day	**10,45**
3	2 413	Evening	**10,45**
3	2 413	Night	**10,45**
4	2 179	Day	**12,92**
4	2 179	Evening	**12,92**
4	2 179	Night	**12,92**
5	2 070	Day	**17,08**
5	2 070	Evening	**17,08**
5	2 070	Night	**17,08**
6	1 829	Day	**19,37**
6	1 829	Evening	**19,37**
6	1 829	Night	**19,37**
7	1 632	Day	**20,69**
7	1 632	Evening	**20,69**
7	1 632	Night	**20,69**
8	1 455	Day	**22,09**
8	1 455	Evening	**22,09**
8	1 455	Night	**22,09**
9	1 374	Day	**22,70**
9	1 374	Evening	**22,70**
9	1 374	Night	**22,70**
10	1 192	Day	**23,63**
10	1 192	Evening	**23,63**
10	1 192	Night	**23,63**
11	1 267	Day	**23,66**
11	1 267	Evening	**23,66**
11	1 267	Night	**23,66**
12	1 375	Day	**21,67**
12	1 375	Evening	**21,67**
12	1 375	Night	**21,67**
13	2 983	Day	**1,37**
13	2 983	Evening	**1,37**
13	2 983	Night	**1,37**
14	2 278	Day	**2,88**
14	2 278	Evening	**2,88**
14	2 278	Night	**2,88**

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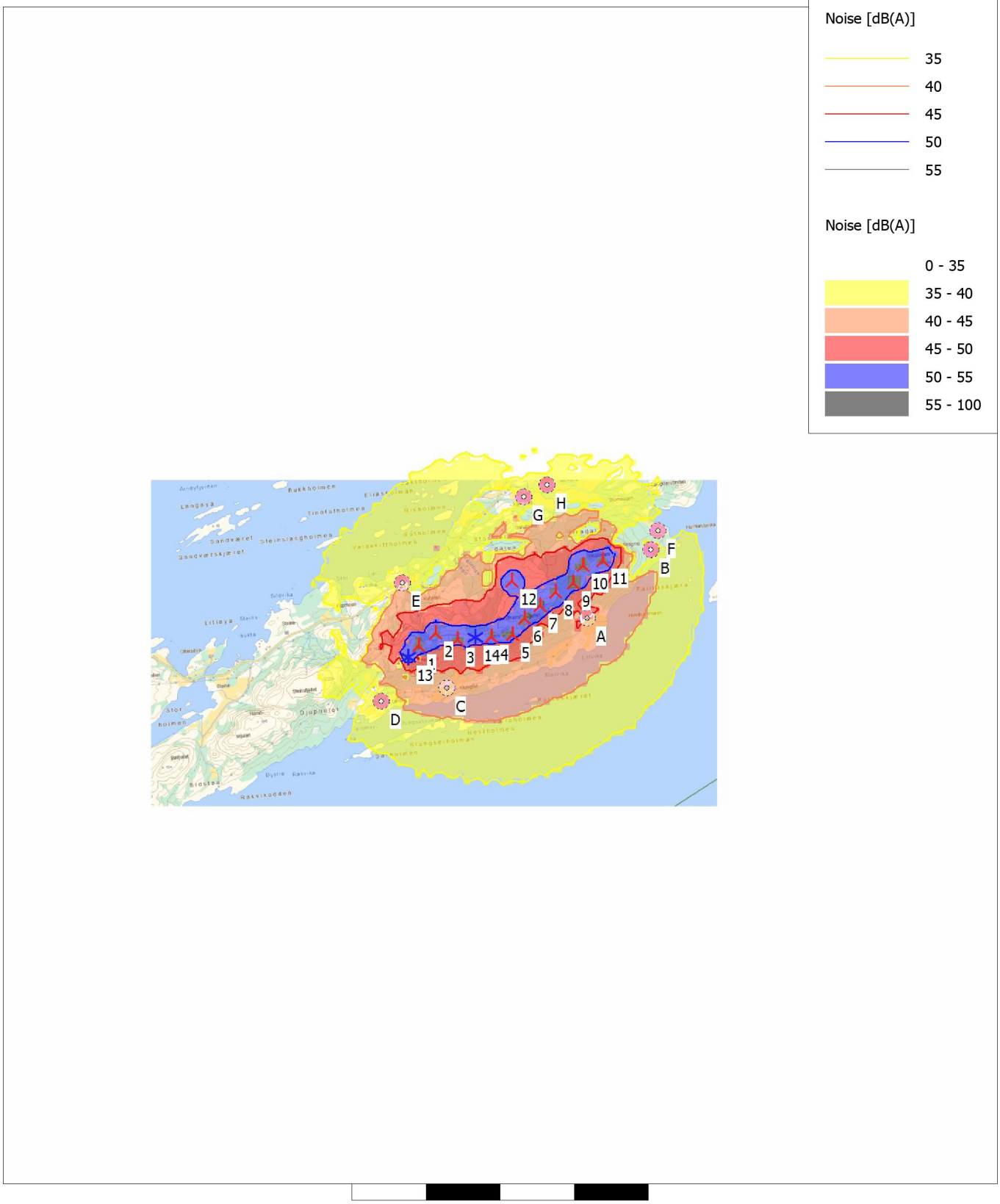
NORD2000 - Aggregated Lden

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6



Map: HHF , Print scale 1:75 000, Map center ETRS 89 Zone: 32 East: 612 860 North: 7 183 682

New WTG Existing WTG Noise sensitive area

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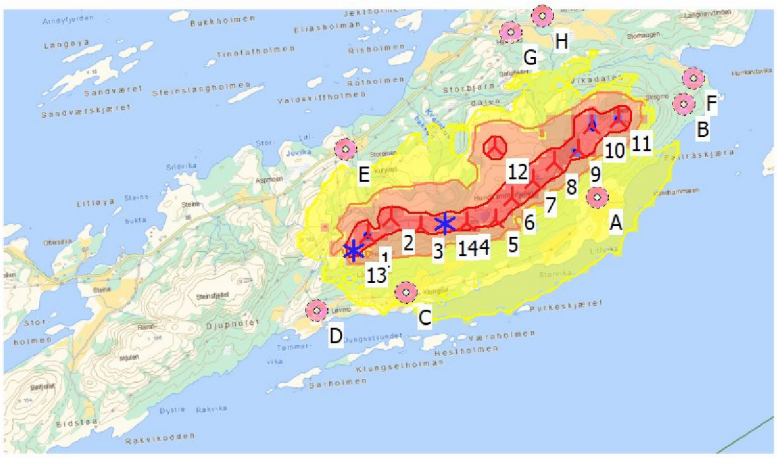
NORD2000 - Lday

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6



0 1 2 3 4 km

Map: HHF , Print scale 1:75 000, Map center ETRS 89 Zone: 32 East: 612 860 North: 7 183 682

New WTG Existing WTG Noise sensitive area

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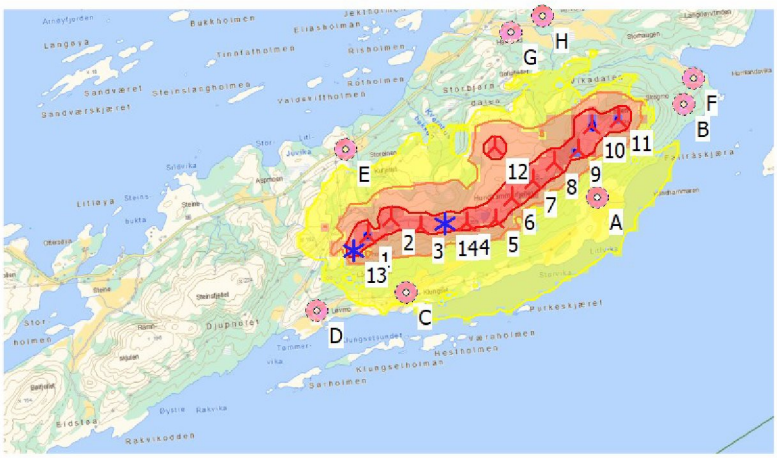
NORD2000 - Levening

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6



0 1 2 3 4 km

Map: HHF , Print scale 1:75 000, Map center ETRS 89 Zone: 32 East: 612 860 North: 7 183 682

New WTG Existing WTG Noise sensitive area

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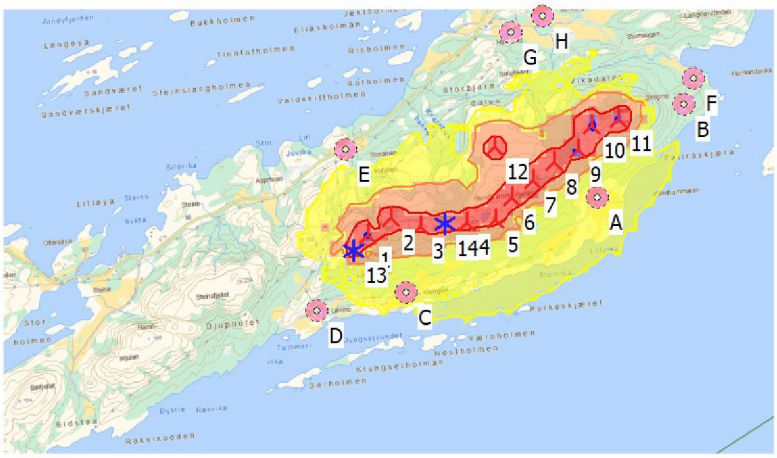
NORD2000 - Lnight

Calculation: Real case, 12 x V136 4,2MW + 2 x E70 (2.0+2.3) layout v6



0 1 2 3 4 km

Map: HHF , Print scale 1:75 000, Map center ETRS 89 Zone: 32 East: 612 860 North: 7 183 682

New WTG Existing WTG Noise sensitive area

Project:
Hundhammerfjellet Reetablering

NTE Energi AS

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SHADOW - Main Result

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6

Assumptions for shadow calculations

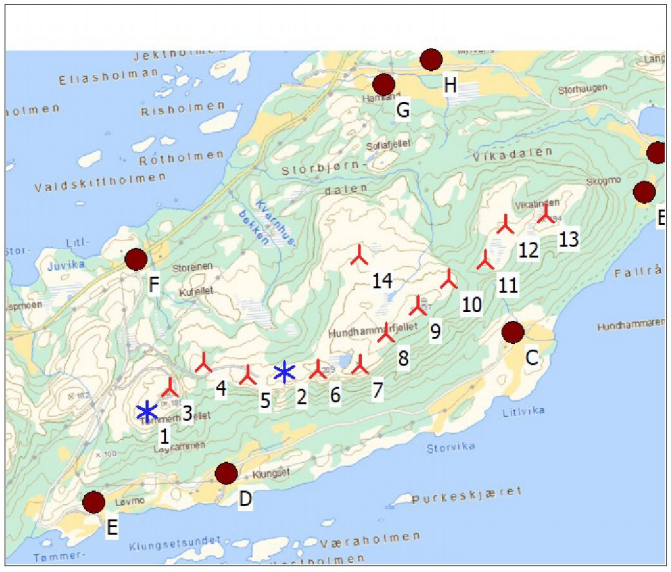
Maximum distance for influence
Calculate only when more than 20 % of sun is covered by the blade
Please look in WTG table

Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	1 minutes

The calculated times are "worst case" given by the following assumptions:
- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Height Contours 2013
Obstacles used in calculation
Eye height for map: 1,5 m
Grid resolution: 10,0 m

All coordinates are in
ETRS 89 Zone: 32



Scale 1:50 000
New WTG | Existing WTG | Shadow receptor

WTGs

	X(East)	Y(North)	Z [m]	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data Calculation distance [m]	RPM [RPM]
1	611 350	7 182 825	170,0	M1-E-70 E4 2000 71.0	Yes	ENERCON	E-70 E4-2 000	2 000	71,0	65,0	1 644	20,0
2	612 257	7 183 083	190,0	M5- E-70 E4 2,3 MW 2300	Yes	ENERCON	E-70 E4 2,3 MW-2 300	2 300	71,0	64,0	1 644	20,0
3	611 497	7 182 974	178,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
4	611 722	7 183 142	145,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
5	612 015	7 183 056	170,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
6	612 478	7 183 097	205,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
7	612 757	7 183 128	199,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
8	612 927	7 183 340	225,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
9	613 136	7 183 515	234,1	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
10	613 342	7 183 694	199,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
11	613 584	7 183 818	198,3	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
12	613 714	7 184 057	184,6	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
13	613 981	7 184 127	174,1	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
14	612 753	7 183 853	175,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4

Shadow receptor-Input

No.	Name	X(East)	Y(North)	Z [m]	Width [m]	Height [m]	Elevation a.g.l. [m]	Slope of window [°]	Direction mode	Eye height (ZVI) a.g.l. [m]
A	Hamlandsvika	614 724	7 184 531	10,9	2,0	2,0	2,0	90,0	"Green house mode"	4,0
B	Skogmo	614 639	7 184 269	27,7	2,0	2,0	2,0	90,0	"Green house mode"	4,0
C	Hundhammer	613 767	7 183 342	24,9	2,0	2,0	2,0	90,0	"Green house mode"	4,0
D	Klungset	611 876	7 182 409	10,1	2,0	2,0	2,0	90,0	"Green house mode"	4,0
E	Løvmo	610 998	7 182 220	11,2	2,0	2,0	2,0	90,0	"Green house mode"	4,0
F	Storeienen	611 279	7 183 824	36,8	2,0	2,0	2,0	90,0	"Green house mode"	4,0
G	Hamland	612 913	7 184 983	22,7	2,0	2,0	2,0	90,0	"Green house mode"	4,0
H	Myhrvang	613 230	7 185 147	33,2	2,0	2,0	2,0	90,0	"Green house mode"	4,0

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Calculated:
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SHADOW - Main Result

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6

Calculation Results

Shadow receptor

No.	Name	Shadow, worst case Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
A	Hamlandsvika	36:54	67	0:49
B	Skogmo	60:28	110	0:46
C	Hundhammer	54:24	118	0:38
D	Klungset	2:23	19	0:10
E	Løvmo	30:46	81	0:32
F	Storeienen	98:04	131	1:46
G	Hamland	72:06	78	1:43
H	Myhrvang	63:22	62	1:51

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]
1	M1-E-70 E4 2000 71.0	5:29
2	M5- E-70 E4 2,3 MW 2300	8:36
3	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (627)	21:57
4	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (628)	25:02
5	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (629)	27:50
6	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (630)	30:02
7	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (631)	21:57
8	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (632)	47:42
9	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (633)	19:10
10	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (634)	20:30
11	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (635)	41:28
12	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (636)	55:37
13	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (637)	81:09
14	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (638)	33:11

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

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Calculated:
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SHADOW - Calendar

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**Shadow receptor:** A - Hamlandsvika

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January	February	March			April			May	June	July	August	September			October			November	December
1	10.18	09.03	07.27			06.35		16.58 (13)	04.46	03.01	02.35	04.12	05.52		17.07 (13)	07.21		16.47 (11)	07.59	09.39
	14.18	15.55	17.29			20.05	47	17.45 (12)	21.41	23.27	00.01	22.28	20.36	13	17.20 (13)	18.47	19	17.06 (11)	15.57	14.28
2	10.17	09.00	07.24			06.31		16.58 (13)	04.42	02.58	02.37	04.15	05.55		17.03 (13)	07.24		16.47 (11)	08.02	09.42
	14.21	15.58	17.32			20.08	45	17.43 (12)	21.44	23.30	23.59	22.25	20.33	19	17.22 (13)	18.43	17	17.04 (11)	15.54	14.25
3	10.16	08.57	07.20			06.28		16.58 (13)	04.39	02.55	02.39	04.19	05.58		17.00 (13)	07.27		16.49 (11)	08.06	09.45
	14.23	16.02	17.35			20.11	43	17.41 (12)	21.47	23.33	23.57	22.21	20.29	24	17.24 (13)	18.39	13	17.02 (11)	15.50	14.23
4	10.14	08.53	07.17			06.24		16.58 (13)	04.35	02.52	02.41	04.22	06.01		16.59 (13)	07.30		16.52 (11)	08.09	09.48
	14.25	16.05	17.38			20.14	39	17.37 (12)	21.51	23.36	23.55	22.18	20.25	26	17.25 (13)	18.36	6	16.58 (11)	15.47	14.21
5	10.13	08.50	07.13			06.20		16.59 (13)	04.31	02.49	02.44	04.25	06.04		16.57 (13)	07.33			08.12	09.51
	14.28	16.09	17.41			20.17	33	17.32 (13)	21.54	23.39	23.52	22.14	20.22	29	17.26 (13)	18.32			15.44	14.19
6	10.11	08.47	07.10			06.17		16.59 (13)	04.28	02.47	02.47	04.29	06.07		16.56 (13)	07.36			08.16	09.53
	14.30	16.12	17.45			20.20	31	17.30 (13)	21.58	23.42	23.50	22.10	20.18	31	17.27 (13)	18.28			15.40	14.17
7	10.09	08.44	07.06			06.13		17.00 (13)	04.24	02.44	02.49	04.32	06.10		16.54 (13)	07.39			08.19	09.56
	14.33	16.16	17.48			20.23	29	17.29 (13)	22.01	23.45	23.48	22.07	20.14	33	17.27 (13)	18.25			15.37	14.16
8	10.08	08.40	07.02			06.10		17.01 (13)	04.21	02.42	02.52	04.35	06.13		16.53 (13)	07.43			08.22	09.58
	14.36	16.19	17.51			20.26	27	17.28 (13)	22.05	23.48	23.45	22.03	20.11	38	17.31 (12)	18.21			15.34	14.14
9	10.06	08.37	06.59			06.06		17.02 (13)	04.17	02.39	02.55	04.39	06.16		16.52 (13)	07.46			08.26	10.01
	14.38	16.22	17.54			20.30	24	17.26 (13)	22.08	23.50	23.42	22.00	20.07	42	17.34 (12)	18.18			15.31	14.12
10	10.04	08.34	06.55		16.13 (11)	06.02		17.05 (13)	04.14	02.37	02.58	04.42	06.19		16.51 (13)	07.49			08.29	10.03
	14.41	16.26	17.57	10	16.23 (11)	20.33	19	17.24 (13)	22.11	23.53	23.39	21.56	20.03	45	17.36 (12)	18.14			15.27	14.11
11	10.01	08.30	06.52		16.10 (11)	05.59		17.08 (13)	04.10	02.35	03.01	04.45	06.22		16.51 (13)	07.52			08.33	10.05
	14.44	16.29	18.00	15	16.25 (11)	20.36	12	17.20 (13)	22.15	23.55	23.37	21.53	20.00	46	17.37 (12)	18.11			15.24	14.10
12	09.59	08.27	06.48		16.08 (11)	05.55			04.07	02.33	03.04	04.49	06.25		16.50 (13)	07.55			08.36	10.08
	14.47	16.33	18.03	18	16.26 (11)	20.39			22.18	23.58	23.34	21.49	19.56	48	17.38 (12)	18.07			15.21	14.09
13	09.57	08.23	06.44		16.07 (11)	05.51			04.03	02.31	03.08	04.52	06.28		16.50 (13)	07.58			08.39	10.10
	14.50	16.36	18.06	20	16.27 (11)	20.42			22.22	00.00	23.31	21.45	19.52	48	17.38 (12)	18.03			15.18	14.08
14	09.55	08.20	06.41		16.06 (11)	05.48			04.00	02.30	03.11	04.55	06.31		16.50 (13)	08.01			08.43	10.11
	14.53	16.39	18.10	22	16.28 (11)	20.45			22.25	00.02	23.28	21.42	19.49	49	17.39 (12)	18.00			15.15	14.07
15	09.52	08.17	06.37		16.05 (11)	05.44			03.56	02.28	03.14	04.58	06.34		16.50 (13)	08.04			08.46	10.13
	14.57	16.43	18.13	22	16.27 (11)	20.48			22.29	00.03	23.25	21.38	19.45	49	17.39 (12)	17.56			15.12	14.06
16	09.50	08.13	06.34		16.04 (11)	05.40			03.53	02.27	03.17	05.02	06.37		16.50 (13)	08.07			08.50	10.15
	15.00	16.46	18.16	23	16.27 (11)	20.52			22.32	00.05	23.22	21.35	19.41	47	17.37 (12)	17.53			15.08	14.05
17	09.47	08.10	06.30		16.04 (11)	05.37			03.49	02.26	03.21	05.05	06.40		16.50 (13)	08.10			08.53	10.16
	15.03	16.50	18.19	24	16.28 (11)	20.55			22.36	00.06	23.19	21.31	19.38	47	17.37 (12)	17.49			15.05	14.05
18	09.44	08.06	06.26		16.04 (11)	05.33			03.46	02.25	03.24	05.08	06.43		16.51 (13)	08.13			08.57	10.17
	15.06	16.53	18.22	23	16.27 (11)	20.58			22.39	00.07	23.15	21.27	19.34	46	17.37 (12)	17.46			15.02	14.05
19	09.42	08.03	06.23		16.04 (11)	05.29			03.42	02.24	03.27	05.11	06.46		16.51 (13)	08.17			09.00	10.19
	15.10	16.56	18.25	34	16.43 (12)	21.01			22.43	00.08	23.12	21.24	19.30	45	17.36 (12)	17.42			14.59	14.04
20	09.39	07.59	06.19		16.05 (11)	05.26			03.39	02.24	03.31	05.15	06.49		16.53 (13)	08.20			09.03	10.20
	15.13	16.59	18.28	37	16.46 (12)	21.04			22.46	00.09	23.09	21.20	19.27	42	17.35 (12)	17.39			14.57	14.05
21	09.36	07.56	06.15		16.06 (11)	05.22			03.36	02.24	03.34	05.18	06.52		16.53 (11)	08.23			09.07	10.20
	15.17	17.03	18.31	40	16.47 (12)	21.08			22.50	00.09	23.06	21.16	19.23	41	17.34 (12)	17.35			14.54	14.05
22	09.33	07.52	06.12		16.07 (11)	05.18			03.32	02.24	03.37	05.21	06.55		16.51 (11)	08.26			09.10	10.21
	15.20	17.06	18.34	41	16.48 (12)	21.11			22.53	00.09	23.02	21.13	19.19	41	17.32 (12)	17.32			14.51	14.05
23	09.31	07.49	06.08		16.07 (13)	05.15			03.29	02.24	03.41	05.24	06.58		16.50 (11)	08.29			09.13	10.21
	15.23	17.09	18.37	42	16.49 (12)	21.14			22.57	00.09	22.59	21.09	19.16	38	17.31 (12)	17.28			14.48	14.06
24	09.28	07.45	06.04		16.05 (13)	05.11			03.26	02.25	03.44	05.27	07.01		16.48 (11)	08.33			09.17	10.22
	15.27	17.13	18.40	44	16.49 (12)	21.17			23.00	00.09	22.56	21.05	19.12	35	17.28 (12)	17.25			14.45	14.06
25	09.25	07.42	06.01		16.03 (13)	05.07			03.23	02.25	03.48	05.30	07.04		16.47 (11)	07.36			09.20	10.22
	15.30	17.16	18.43	46	16.49 (12)	21.21			23.04	00.08	22.52	21.02	19.08	29	17.24 (12)	16.21			14.43	14.07
26	09.22	07.38	05.57		16.02 (13)	05.04			03.19	02.26	03.51	05.33	07.07		16.47 (11)	07.39			09.23	10.22
	15.34	17.19	18.46	47	16.49 (12)	21.24			23.07	00.08	22.49	20.58	19.05	23	17.10 (11)	16.18			14.40	14.08
27	09.19	07.35	05.53		16.01 (13)	05.00			03.16	02.28	03.55	05.37	07.09		16.46 (11)	07.42			09.26	10.22
	15.37	17.22	18.49	48	16.49 (12)	21.27			23.10	00.07	22.45	20.54	19.01	23	17.09 (11)	16.14			14.37	14.10
28	09.16	07.31	05.50		16.00 (13)	04.57			03.13	02.29	03.58	05.40	07.12		16.46 (11)	07.46			09.30	10.21
	15.41	17.26	18.52	48	16.48 (12)	21.31			23.14	00.05	22.42	20.51	18.57	23	17.09 (11)	16.11			14.35	14.11
29	09.13		06.46		17.00 (13)	04.53			03.10	02.31	04.01	05.43	07.15		16.46 (11)	07.49			09.33	10.21
	15.44		19.56	48	17.48 (12)	21.34			23.17	00.04	22.39	20.47	18.54	22	17.08 (11)	16.07			14.32	14.12
30	09.09		06.42		16.59 (13)	04.49			03.07	02.33	04.05	05.46	07.18		16.46 (11)	07.52			09.36	10.20
	15.48		19.59	48	17.47 (12)	21.37			23.20	00.03	22.35	20.44	18.50	21	17.07 (11)	16.04			14.30	14.14
31	09.06		06.39		16.59 (13)				03.04		04.08	05.49				07.56				10.19
	15.51		20.02	47	17.46 (12)				23.24		22.32	20.40				16.00				14.16
Potential sun hours	163	235	363			454			578	641	621	513	394			302			192	125
Total, worst case				747			349							1063			55			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 11.11/3.2.737

SHADOW - Calendar

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**Shadow receptor:** B - Skogmo

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March			April			May			June
1	10.18	09.03	07.27			06.35		17.30 (11)	04.46		17.41 (13)	03.01
	14.19	15.55	17.29			20.05	25	18.16 (12)	21.41	42	18.23 (13)	23.27
2	10.17	09.00	07.24			06.31		17.31 (11)	04.42		17.42 (13)	02.58
	14.21	15.58	17.32			20.08	34	18.21 (12)	21.44	40	18.22 (13)	23.30
3	10.16	08.57	07.20			06.28		17.33 (11)	04.39		17.43 (13)	02.55
	14.23	16.02	17.35			20.11	36	18.24 (12)	21.47	39	18.22 (13)	23.33
4	10.14	08.53	07.17			06.24		17.34 (11)	04.35		17.43 (13)	02.52
	14.25	16.05	17.38			20.14	36	18.25 (12)	21.51	38	18.21 (13)	23.36
5	10.13	08.50	07.13			06.21		17.39 (11)	04.32		17.44 (13)	02.50
	14.28	16.09	17.41			20.17	30	18.27 (12)	21.54	36	18.20 (13)	23.39
6	10.11	08.47	07.10			06.17		17.59 (12)	04.28		17.46 (13)	02.47
	14.30	16.12	17.45			20.20	28	18.27 (12)	21.58	34	18.20 (13)	23.42
7	10.09	08.44	07.06			06.13		17.58 (12)	04.24		17.47 (13)	02.44
	14.33	16.16	17.48			20.23	29	18.27 (12)	22.01	31	18.18 (13)	23.45
8	10.08	08.40	07.02			06.10		17.57 (12)	04.21		17.48 (13)	02.42
	14.36	16.19	17.51			20.26	31	18.28 (12)	22.05	29	18.17 (13)	23.48
9	10.06	08.37	06.59			06.06		17.56 (12)	04.17		17.50 (13)	02.40
	14.38	16.22	17.54			20.30	32	18.28 (12)	22.08	26	18.16 (13)	23.50
10	10.04	08.34	06.55			06.02		17.56 (12)	04.14		17.52 (13)	02.37
	14.41	16.26	17.57			20.33	32	18.28 (12)	22.11	22	18.14 (13)	23.53
11	10.01	08.30	06.52			05.59		17.55 (13)	04.10		17.54 (13)	02.35
	14.44	16.29	18.00			20.36	33	18.28 (12)	22.15	18	18.12 (13)	23.55
12	09.59	08.27	06.48			05.55		17.52 (13)	04.07		17.57 (13)	02.33
	14.47	16.33	18.03			20.39	36	18.28 (12)	22.18	11	18.08 (13)	23.58
13	09.57	08.23	06.44			05.51		17.50 (13)	04.03			02.31
	14.50	16.36	18.06			20.42	37	18.27 (12)	22.22			00.00
14	09.55	08.20	06.41			05.48		17.48 (13)	04.00			02.30
	14.54	16.39	18.10			20.45	39	18.27 (12)	22.25			00.02
15	09.52	08.17	06.37			05.44		17.46 (13)	03.56			02.28
	14.57	16.43	18.13			20.48	40	18.26 (12)	22.29			00.03
16	09.50	08.13	06.34			05.40		17.46 (13)	03.53			02.27
	15.00	16.46	18.16			20.52	40	18.26 (12)	22.32			00.05
17	09.47	08.10	06.30			05.37		17.45 (13)	03.49			02.26
	15.03	16.50	18.19			20.55	40	18.25 (13)	22.36			00.06
18	09.44	08.06	06.26			05.33		17.43 (13)	03.46			02.25
	15.07	16.53	18.22			20.58	42	18.25 (13)	22.39			00.07
19	09.42	08.03	06.23			05.29		17.43 (13)	03.43			02.24
	15.10	16.56	18.25			21.01	42	18.25 (13)	22.43			00.08
20	09.39	07.59	06.19		16.39 (11)	05.26		17.42 (13)	03.39			02.24
	15.13	17.00	18.28	12	16.51 (11)	21.04	43	18.25 (13)	22.46			00.09
21	09.36	07.56	06.15		16.36 (11)	05.22		17.41 (13)	03.36			02.24
	15.17	17.03	18.31	17	16.53 (11)	21.08	45	18.26 (13)	22.50			00.09
22	09.33	07.52	06.12		16.34 (11)	05.18		17.41 (13)	03.32			02.24
	15.20	17.06	18.34	20	16.54 (11)	21.11	45	18.26 (13)	22.53			00.09
23	09.31	07.49	06.08		16.33 (11)	05.15		17.40 (13)	03.29			02.24
	15.23	17.09	18.37	23	16.56 (11)	21.14	45	18.25 (13)	22.57			00.09
24	09.28	07.45	06.04		16.32 (11)	05.11		17.40 (13)	03.26			02.25
	15.27	17.13	18.40	24	16.56 (11)	21.17	46	18.26 (13)	23.00			00.09
25	09.25	07.42	06.01		16.30 (11)	05.08		17.40 (13)	03.23			02.26
	15.30	17.16	18.43	26	16.56 (11)	21.21	46	18.26 (13)	23.04			00.08
26	09.22	07.38	05.57		16.30 (11)	05.04		17.40 (13)	03.19			02.27
	15.34	17.19	18.46	27	16.57 (11)	21.24	45	18.25 (13)	23.07			00.08
27	09.19	07.35	05.53		16.29 (11)	05.00		17.40 (13)	03.16			02.28
	15.37	17.22	18.49	27	16.56 (11)	21.27	45	18.25 (13)	23.10			00.07
28	09.16	07.31	05.50		16.29 (11)	04.57		17.40 (13)	03.13			02.29
	15.41	17.26	18.52	27	16.56 (11)	21.31	45	18.25 (13)	23.14			00.05
29	09.13		06.46		17.29 (11)	04.53		17.41 (13)	03.10			02.31
	15.44		19.56	27	17.56 (11)	21.34	44	18.25 (13)	23.17			00.04
30	09.09		06.42		17.29 (11)	04.49		17.41 (13)	03.07			02.33
	15.48		19.59	26	17.55 (11)	21.37	43	18.24 (13)	23.20			00.02
31	09.06		06.39		17.30 (11)				03.04			
	15.51		20.02	25	17.55 (11)				23.24			
Potential sun hours	163	235	363			454			578			641
Total, worst case				281			1154			366		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 11.11/3.2.737

SHADOW - Calendar

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**Shadow receptor:** B - Skogmo

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July			August			September			October	November	December
1	02.35			04.12		18.06 (13)	05.52		17.55 (13)	07.21	07.59	09.39
	00.01			22.28	15	18.21 (13)	20.36	33	18.28 (12)	18.47	15.57	14.28
2	02.37			04.15		18.03 (13)	05.55		17.54 (12)	07.24	08.02	09.42
	23.59			22.25	19	18.22 (13)	20.33	32	18.26 (12)	18.43	15.54	14.26
3	02.39			04.19		18.01 (13)	05.58		17.54 (12)	07.27	08.06	09.45
	23.57			22.21	24	18.25 (13)	20.29	32	18.26 (12)	18.39	15.50	14.23
4	02.41			04.22		17.59 (13)	06.01		17.54 (12)	07.30	08.09	09.48
	23.55			22.17	27	18.26 (13)	20.25	31	18.25 (12)	18.36	15.47	14.21
5	02.44			04.25		17.58 (13)	06.04		17.55 (12)	07.33	08.12	09.51
	23.52			22.14	30	18.28 (13)	20.22	29	18.24 (12)	18.32	15.44	14.19
6	02.47			04.29		17.56 (13)	06.07		17.55 (12)	07.36	08.16	09.53
	23.50			22.10	33	18.29 (13)	20.18	28	18.23 (12)	18.29	15.40	14.17
7	02.49			04.32		17.54 (13)	06.10		17.35 (11)	07.39	08.19	09.56
	23.47			22.07	35	18.29 (13)	20.14	28	18.22 (12)	18.25	15.37	14.16
8	02.52			04.35		17.53 (13)	06.13		17.29 (11)	07.43	08.22	09.58
	23.45			22.03	37	18.30 (13)	20.11	36	18.20 (12)	18.21	15.34	14.14
9	02.55			04.39		17.52 (13)	06.16		17.26 (11)	07.46	08.26	10.01
	23.42			22.00	39	18.31 (13)	20.07	36	18.17 (12)	18.18	15.31	14.13
10	02.58			04.42		17.51 (13)	06.19		17.24 (11)	07.49	08.29	10.03
	23.39			21.56	40	18.31 (13)	20.03	36	18.15 (12)	18.14	15.27	14.11
11	03.01			04.45		17.51 (13)	06.22		17.23 (11)	07.52	08.33	10.05
	23.37			21.53	41	18.32 (13)	20.00	27	18.10 (12)	18.11	15.24	14.10
12	03.04			04.49		17.50 (13)	06.25		17.22 (11)	07.55	08.36	10.08
	23.34			21.49	42	18.32 (13)	19.56	24	17.46 (11)	18.07	15.21	14.09
13	03.08			04.52		17.48 (13)	06.28		17.21 (11)	07.58	08.39	10.10
	23.31			21.45	44	18.32 (13)	19.52	25	17.46 (11)	18.03	15.18	14.08
14	03.11			04.55		17.48 (13)	06.31		17.20 (11)	08.01	08.43	10.11
	23.28			21.42	44	18.32 (13)	19.49	26	17.46 (11)	18.00	15.15	14.07
15	03.14			04.58		17.48 (13)	06.34		17.19 (11)	08.04	08.46	10.13
	23.25			21.38	44	18.32 (13)	19.45	27	17.46 (11)	17.56	15.12	14.06
16	03.17			05.02		17.47 (13)	06.37		17.18 (11)	08.07	08.50	10.15
	23.22			21.35	45	18.32 (13)	19.41	27	17.45 (11)	17.53	15.08	14.05
17	03.21			05.05		17.47 (13)	06.40		17.18 (11)	08.10	08.53	10.16
	23.18			21.31	45	18.32 (13)	19.38	27	17.45 (11)	17.49	15.05	14.05
18	03.24			05.08		17.47 (13)	06.43		17.18 (11)	08.13	08.56	10.17
	23.15			21.27	45	18.32 (13)	19.34	26	17.44 (11)	17.46	15.02	14.05
19	03.27			05.11		17.47 (13)	06.46		17.18 (11)	08.17	09.00	10.19
	23.12			21.24	45	18.32 (13)	19.30	25	17.43 (11)	17.42	14.59	14.05
20	03.31			05.15		17.46 (13)	06.49		17.19 (11)	08.20	09.03	10.19
	23.09			21.20	45	18.31 (13)	19.27	23	17.42 (11)	17.39	14.57	14.05
21	03.34			05.18		17.46 (13)	06.52		17.20 (11)	08.23	09.07	10.20
	23.06			21.16	45	18.31 (13)	19.23	21	17.41 (11)	17.35	14.54	14.05
22	03.38			05.21		17.46 (13)	06.55		17.21 (11)	08.26	09.10	10.21
	23.02			21.13	44	18.30 (13)	19.19	18	17.39 (11)	17.32	14.51	14.05
23	03.41			05.24		17.46 (13)	06.58		17.22 (11)	08.29	09.13	10.21
	22.59			21.09	44	18.30 (13)	19.16	14	17.36 (11)	17.28	14.48	14.06
24	03.44			05.27		17.47 (13)	07.01		17.26 (11)	08.33	09.17	10.22
	22.56			21.05	42	18.29 (13)	19.12	6	17.32 (11)	17.25	14.45	14.06
25	03.48			05.30		17.47 (13)	07.04			07.36	09.20	10.22
	22.52			21.02	41	18.28 (13)	19.08			16.21	14.43	14.07
26	03.51			05.33		17.47 (13)	07.07			07.39	09.23	10.22
	22.49			20.58	40	18.27 (12)	19.05			16.18	14.40	14.08
27	03.55			05.37		17.47 (13)	07.09			07.42	09.26	10.22
	22.45			20.54	40	18.27 (12)	19.01			16.14	14.37	14.10
28	03.58			05.40		17.48 (13)	07.12			07.46	09.30	10.21
	22.42			20.51	40	18.28 (12)	18.57			16.11	14.35	14.11
29	04.02			05.43		17.49 (13)	07.15			07.49	09.33	10.21
	22.38			20.47	39	18.28 (12)	18.54			16.07	14.32	14.13
30	04.05			05.46		17.51 (13)	07.18			07.52	09.36	10.20
	22.35			20.44	37	18.28 (12)	18.50			16.04	14.30	14.14
31	04.08		18.12 (13)	05.49		17.52 (13)				07.55		10.19
	22.32	3	18.15 (13)	20.40	36	18.28 (12)				16.00		14.16
Potential sun hours	621			513			394			302	192	125
Total, worst case		3			1187			637				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**Shadow receptor:** C - Hundhammer

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March			April			May			June		
1	10.18	09.03	07.28			06.35		18.20 (6)	04.46		18.31 (8)	03.01		18.45 (8)
	14.19	15.55	17.29			20.05	15	18.35 (6)	21.41	28	18.59 (8)	23.27	4	18.49 (8)
2	10.17	09.00	07.24			06.32		18.18 (6)	04.42		18.29 (8)	02.58		
	14.21	15.58	17.32			20.08	18	18.36 (6)	21.44	30	18.59 (8)	23.30		
3	10.16	08.57	07.20			06.28		18.12 (7)	04.39		18.28 (8)	02.55		
	14.23	16.02	17.35			20.11	25	18.37 (6)	21.47	32	19.00 (8)	23.33		
4	10.14	08.53	07.17			06.24		18.09 (7)	04.35		18.28 (8)	02.52		
	14.25	16.05	17.38			20.14	28	18.37 (6)	21.51	33	19.01 (8)	23.36		
5	10.13	08.50	07.13			06.21		18.07 (7)	04.32		18.27 (8)	02.50		
	14.28	16.09	17.42			20.17	31	18.38 (6)	21.54	34	19.01 (8)	23.39		
6	10.11	08.47	07.10			06.17		18.05 (7)	04.28		18.26 (8)	02.47		
	14.30	16.12	17.45			20.20	33	18.38 (6)	21.58	36	19.02 (8)	23.42		
7	10.09	08.44	07.06			06.13		18.04 (7)	04.25		18.26 (8)	02.45		
	14.33	16.16	17.48			20.23	34	18.38 (6)	22.01	36	19.02 (8)	23.45		
8	10.07	08.40	07.02			06.10		18.03 (7)	04.21		18.26 (8)	02.42		
	14.36	16.19	17.51			20.27	34	18.37 (6)	22.05	36	19.02 (8)	23.48		
9	10.06	08.37	06.59			06.06		18.02 (7)	04.17		18.26 (8)	02.40		
	14.39	16.23	17.54			20.30	35	18.37 (6)	22.08	36	19.02 (8)	23.50		
10	10.03	08.34	06.55			06.02		18.01 (7)	04.14		18.25 (8)	02.38		
	14.42	16.26	17.57			20.33	35	18.36 (6)	22.11	38	19.03 (8)	23.53		
11	10.01	08.30	06.52			05.59		18.00 (7)	04.10		18.25 (8)	02.36		
	14.44	16.29	18.00			20.36	34	18.34 (6)	22.15	37	19.02 (8)	23.55		
12	09.59	08.27	06.48			05.55		18.00 (7)	04.07		18.25 (8)	02.34		
	14.47	16.33	18.03			20.39	33	18.33 (6)	22.18	37	19.02 (8)	23.57		
13	09.57	08.23	06.44			05.51		18.01 (7)	04.03		18.26 (8)	02.32		
	14.51	16.36	18.07			20.42	31	18.32 (6)	22.22	37	19.03 (8)	23.59		
14	09.55	08.20	06.41			05.48		18.00 (7)	04.00		18.26 (8)	02.30		
	14.54	16.40	18.10			20.45	30	18.30 (7)	22.25	37	19.03 (8)	00.01		
15	09.52	08.17	06.37			05.44		18.01 (7)	03.56		18.26 (8)	02.29		
	14.57	16.43	18.13			20.49	28	18.29 (7)	22.29	36	19.02 (8)	00.03		
16	09.50	08.13	06.34			05.40		18.01 (7)	03.53		18.26 (8)	02.27		
	15.00	16.46	18.16			20.52	27	18.28 (7)	22.32	36	19.02 (8)	00.05		
17	09.47	08.10	06.30			05.37		18.01 (7)	03.50		18.27 (8)	02.26		
	15.03	16.50	18.19			20.55	27	18.28 (7)	22.36	35	19.02 (8)	00.06		
18	09.44	08.06	06.26			05.33		18.02 (7)	03.46		18.27 (8)	02.25		
	15.07	16.53	18.22			20.58	24	18.26 (7)	22.39	34	19.01 (8)	00.07		
19	09.42	08.03	06.23			05.29		18.03 (7)	03.43		18.27 (8)	02.25		
	15.10	16.56	18.25			21.01	22	18.25 (7)	22.43	34	19.01 (8)	00.08		
20	09.39	07.59	06.19			05.26		18.05 (7)	03.39		18.29 (8)	02.24		
	15.13	17.00	18.28			21.05	19	18.24 (7)	22.46	32	19.01 (8)	00.09		
21	09.36	07.56	06.15			05.22		18.06 (7)	03.36		18.29 (8)	02.24		
	15.17	17.03	18.31			21.08	15	18.21 (7)	22.50	31	19.00 (8)	00.09		
22	09.33	07.52	06.12			05.19		18.10 (7)	03.33		18.30 (8)	02.24		
	15.20	17.06	18.34			21.11	7	18.17 (7)	22.53	30	19.00 (8)	00.09		
23	09.31	07.49	06.08			05.15			03.29		18.31 (8)	02.25		
	15.24	17.09	18.37			21.14			22.57	29	19.00 (8)	00.09		
24	09.28	07.45	06.04			05.11			03.26		18.31 (8)	02.25		
	15.27	17.13	18.40			21.18			23.00	27	18.58 (8)	00.09		
25	09.25	07.42	06.01			05.08			03.23		18.33 (8)	02.26		
	15.30	17.16	18.43			21.21			23.03	25	18.58 (8)	00.08		
26	09.22	07.38	05.57			05.04			03.20		18.34 (8)	02.27		
	15.34	17.19	18.46			21.24			23.07	24	18.58 (8)	00.07		
27	09.19	07.35	05.54			05.00		18.38 (8)	03.16		18.35 (8)	02.28		
	15.37	17.22	18.49			21.27	13	18.51 (8)	23.10	22	18.57 (8)	00.06		
28	09.16	07.31	05.50			04.57		18.35 (8)	03.13		18.37 (8)	02.29		
	15.41	17.26	18.53			21.31	19	18.54 (8)	23.14	19	18.56 (8)	00.05		
29	09.13		06.46			04.53		18.33 (8)	03.10		18.38 (8)	02.31		
	15.44		19.56			21.34	23	18.56 (8)	23.17	17	18.55 (8)	00.04		
30	09.09		06.43			04.50		18.32 (8)	03.07		18.40 (8)	02.33		
	15.48		19.59			21.37	26	18.58 (8)	23.20	14	18.54 (8)	00.02		
31	09.06		06.39		18.23 (6)				03.04		18.42 (8)			
	15.51		20.02	10	18.33 (6)				23.24	10	18.52 (8)			
Potential sun hours	163	235	363			454			578			641		
Total, worst case				10			666			942			4	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 11.11/3.2.737

SHADOW - Calendar

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**Shadow receptor:** C - Hundhammer

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July		August		September		October	November	December
1	02.35		04.12		18.36 (8)	05.52	18.00 (7)	07.21	07.59	09.39
	00.01		22.28	37	19.13 (8)	20.36	34	18.34 (6)	18.47	15.57	14.28
2	02.37		04.15		18.36 (8)	05.55	17.59 (7)	07.24	08.02	09.42
	23.59		22.25	37	19.13 (8)	20.33	35	18.34 (6)	18.43	15.54	14.26
3	02.39		04.19		18.35 (8)	05.58	17.59 (7)	07.27	08.06	09.45
	23.57		22.21	37	19.12 (8)	20.29	35	18.34 (6)	18.39	15.50	14.24
4	02.42		04.22		18.36 (8)	06.01	18.00 (7)	07.30	08.09	09.48
	23.55		22.17	36	19.12 (8)	20.25	34	18.34 (6)	18.36	15.47	14.22
5	02.44		04.25		18.36 (8)	06.04	18.00 (7)	07.34	08.12	09.51
	23.52		22.14	36	19.12 (8)	20.22	34	18.34 (6)	18.32	15.44	14.20
6	02.47		04.29		18.36 (8)	06.07	18.01 (7)	07.37	08.16	09.53
	23.50		22.10	36	19.12 (8)	20.18	33	18.34 (6)	18.29	15.40	14.18
7	02.50		04.32		18.37 (8)	06.10	18.02 (7)	07.40	08.19	09.56
	23.47		22.07	35	19.12 (8)	20.14	31	18.33 (6)	18.25	15.37	14.16
8	02.53		04.36		18.36 (8)	06.13	18.04 (7)	07.43	08.22	09.58
	23.45		22.03	34	19.10 (8)	20.11	29	18.33 (6)	18.21	15.34	14.14
9	02.55		04.39		18.37 (8)	06.16	18.05 (7)	07.46	08.26	10.01
	23.42		22.00	33	19.10 (8)	20.07	26	18.31 (6)	18.18	15.31	14.13
10	02.58		04.42		18.37 (8)	06.19	18.11 (6)	07.49	08.29	10.03
	23.39		21.56	32	19.09 (8)	20.03	19	18.30 (6)	18.14	15.27	14.11
11	03.02		04.45		18.38 (8)	06.22	18.12 (6)	07.52	08.33	10.05
	23.37		21.53	30	19.08 (8)	20.00	16	18.28 (6)	18.11	15.24	14.10
12	03.05		18.51 (8)	04.49		18.39 (8)	06.25	18.14 (6)	07.55	08.36	10.08
	23.34	8	18.59 (8)	21.49	28	19.07 (8)	19.56	11	18.25 (6)	18.07	15.21	14.09
13	03.08		18.49 (8)	04.52		18.41 (8)	06.28		07.58	08.39	10.09
	23.31	12	19.01 (8)	21.45	25	19.06 (8)	19.52		18.03	15.18	14.08
14	03.11		18.47 (8)	04.55		18.41 (8)	06.31		08.01	08.43	10.11
	23.28	15	19.02 (8)	21.42	22	19.03 (8)	19.49		18.00	15.15	14.07
15	03.14		18.45 (8)	04.59		18.43 (8)	06.34		08.04	08.46	10.13
	23.25	19	19.04 (8)	21.38	18	19.01 (8)	19.45		17.56	15.12	14.06
16	03.18		18.45 (8)	05.02		18.46 (8)	06.37		08.07	08.50	10.15
	23.22	21	19.06 (8)	21.35	12	18.58 (8)	19.41		17.53	15.09	14.06
17	03.21		18.44 (8)	05.05			06.40		08.10	08.53	10.16
	23.18	22	19.06 (8)	21.31			19.38		17.49	15.06	14.05
18	03.24		18.42 (8)	05.08			06.43		08.13	08.56	10.17
	23.15	25	19.07 (8)	21.27			19.34		17.46	15.03	14.05
19	03.28		18.42 (8)	05.11			06.46		08.17	09.00	10.18
	23.12	26	19.08 (8)	21.24			19.30		17.42	15.00	14.05
20	03.31		18.41 (8)	05.15			06.49		08.20	09.03	10.19
	23.09	28	19.09 (8)	21.20			19.27		17.39	14.57	14.05
21	03.34		18.41 (8)	05.18		18.14 (7)	06.52		08.23	09.07	10.20
	23.06	29	19.10 (8)	21.16	9	18.23 (7)	19.23		17.35	14.54	14.05
22	03.38		18.39 (8)	05.21		18.10 (7)	06.55		08.26	09.10	10.21
	23.02	31	19.10 (8)	21.13	16	18.26 (7)	19.19		17.32	14.51	14.05
23	03.41		18.39 (8)	05.24		18.08 (7)	06.58		08.29	09.13	10.21
	22.59	32	19.11 (8)	21.09	19	18.27 (7)	19.16		17.28	14.48	14.06
24	03.45		18.38 (8)	05.27		18.07 (7)	07.01		08.33	09.17	10.22
	22.56	33	19.11 (8)	21.05	22	18.29 (7)	19.12		17.25	14.45	14.07
25	03.48		18.38 (8)	05.30		18.05 (7)	07.04		07.36	09.20	10.22
	22.52	34	19.12 (8)	21.02	25	18.30 (7)	19.08		16.21	14.43	14.08
26	03.51		18.38 (8)	05.34		18.04 (7)	07.07		07.39	09.23	10.22
	22.49	34	19.12 (8)	20.58	26	18.30 (7)	19.05		16.18	14.40	14.09
27	03.55		18.37 (8)	05.37		18.02 (7)	07.10		07.42	09.26	10.22
	22.45	35	19.12 (8)	20.55	28	18.30 (7)	19.01		16.14	14.38	14.10
28	03.58		18.37 (8)	05.40		18.01 (7)	07.13		07.46	09.30	10.21
	22.42	36	19.13 (8)	20.51	29	18.30 (7)	18.58		16.11	14.35	14.11
29	04.02		18.37 (8)	05.43		18.01 (7)	07.16		07.49	09.33	10.21
	22.38	36	19.13 (8)	20.47	29	18.30 (6)	18.54		16.07	14.33	14.13
30	04.05		18.36 (8)	05.46		18.01 (7)	07.19		07.52	09.36	10.20
	22.35	37	19.13 (8)	20.44	31	18.32 (6)	18.50		16.04	14.30	14.14
31	04.09		18.36 (8)	05.49		18.00 (7)			07.56		10.19
	22.32	37	19.13 (8)	20.40	33	18.33 (6)			16.01		14.16
Potential sun hours	620			513			394		302	192	125
Total, worst case		550			755			337			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 11.11/3.2.737

SHADOW - Calendar

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6 **Shadow receptor:** D - Klungset

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May	June			July	August	September	October	November	December
1	10.18	09.03	07.28	06.35	04.46	03.01			02.35	04.12	05.52	07.22	07.59	09.39
	14.19	15.55	17.29	20.05	21.41	23.27			00.01	22.28	20.36	18.47	15.57	14.28
2	10.17	09.00	07.24	06.32	04.43	02.58			02.37	04.16	05.55	07.25	08.02	09.42
	14.21	15.59	17.32	20.08	21.44	23.30			23.59	22.25	20.33	18.43	15.54	14.26
3	10.16	08.57	07.21	06.28	04.39	02.56			02.40	04.19	05.58	07.28	08.06	09.45
	14.23	16.02	17.35	20.11	21.48	23.33			23.57	22.21	20.29	18.40	15.51	14.24
4	10.14	08.54	07.17	06.24	04.35	02.53			02.42	04.22	06.01	07.31	08.09	09.48
	14.26	16.06	17.39	20.14	21.51	23.36			23.54	22.18	20.25	18.36	15.47	14.22
5	10.13	08.50	07.13	06.21	04.32	02.50			02.45	04.26	06.04	07.34	08.12	09.51
	14.28	16.09	17.42	20.17	21.54	23.39			23.52	22.14	20.22	18.32	15.44	14.20
6	10.11	08.47	07.10	06.17	04.28	02.48			02.47	04.29	06.07	07.37	08.16	09.53
	14.31	16.12	17.45	20.20	21.58	23.42			23.50	22.10	20.18	18.29	15.41	14.18
7	10.09	08.44	07.06	06.13	04.25	02.45			02.50	04.32	06.10	07.40	08.19	09.56
	14.33	16.16	17.48	20.24	22.01	23.45			23.47	22.07	20.14	18.25	15.37	14.16
8	10.08	08.40	07.03	06.10	04.21	02.43			02.53	04.36	06.13	07.43	08.23	09.58
	14.36	16.19	17.51	20.27	22.05	23.48			23.45	22.03	20.11	18.22	15.34	14.15
9	10.06	08.37	06.59	06.06	04.18	02.40			02.56	04.39	06.16	07.46	08.26	10.01
	14.39	16.23	17.54	20.30	22.08	23.50			23.42	22.00	20.07	18.18	15.31	14.13
10	10.04	08.34	06.55	06.03	04.14	02.38			02.59	04.42	06.19	07.49	08.29	10.03
	14.42	16.26	17.57	20.33	22.12	23.53			23.39	21.56	20.03	18.14	15.28	14.12
11	10.01	08.30	06.52	05.59	04.11	02.36			03.02	04.46	06.22	07.52	08.33	10.05
	14.45	16.30	18.01	20.36	22.15	23.55			23.37	21.53	20.00	18.11	15.24	14.10
12	09.59	08.27	06.48	05.55	04.07	02.34		05.04 (9)	03.05	04.49	06.25	07.55	08.36	10.08
	14.48	16.33	18.04	20.39	22.18	23.57	1	05.05 (9)	23.34	21.49	19.56	18.07	15.21	14.09
13	09.57	08.24	06.45	05.52	04.04	02.32		05.02 (9)	03.08	04.52	06.28	07.58	08.40	10.10
	14.51	16.36	18.07	20.42	22.22	23.59	4	05.06 (9)	23.31	21.45	19.52	18.04	15.18	14.08
14	09.55	08.20	06.41	05.48	04.00	02.31		05.02 (9)	03.11	04.56	06.31	08.01	08.43	10.11
	14.54	16.40	18.10	20.45	22.25	00.01	6	05.08 (9)	23.28	21.42	19.49	18.00	15.15	14.07
15	09.52	08.17	06.37	05.44	03.57	02.29		05.01 (9)	03.15	04.59	06.34	08.04	08.46	10.13
	14.57	16.43	18.13	20.49	22.29	00.03	7	05.08 (9)	23.25	21.38	19.45	17.57	15.12	14.06
16	09.50	08.13	06.34	05.41	03.53	02.28		05.01 (9)	03.18	05.02	06.37	08.07	08.50	10.15
	15.00	16.47	18.16	20.52	22.32	00.05	8	05.09 (9)	23.22	21.35	19.41	17.53	15.09	14.06
17	09.47	08.10	06.30	05.37	03.50	02.27		05.00 (9)	03.21	05.05	06.40	08.10	08.53	10.16
	15.04	16.50	18.19	20.55	22.36	00.06	9	05.09 (9)	23.18	21.31	19.38	17.49	15.06	14.05
18	09.44	08.06	06.26	05.33	03.46	02.26		05.00 (9)	03.25	05.08	06.43	08.14	08.57	10.17
	15.07	16.53	18.22	20.58	22.39	00.07	10	05.10 (9)	23.15	21.27	19.34	17.46	15.03	14.05
19	09.42	08.03	06.23	05.30	03.43	02.25		05.01 (9)	03.28	05.12	06.46	08.17	09.00	10.18
	15.10	16.57	18.25	21.01	22.43	00.08	9	05.10 (9)	23.12	21.24	19.31	17.42	15.00	14.05
20	09.39	07.59	06.19	05.26	03.40	02.25		05.01 (9)	03.31	05.15	06.49	08.20	09.03	10.19
	15.14	17.00	18.28	21.05	22.46	00.08	9	05.10 (9)	23.09	21.20	19.27	17.39	14.57	14.05
21	09.36	07.56	06.16	05.22	03.36	02.25		05.01 (9)	03.35	05.18	06.52	08.23	09.07	10.20
	15.17	17.03	18.31	21.08	22.50	00.09	10	05.11 (9)	23.06	21.17	19.23	17.35	14.54	14.05
22	09.33	07.52	06.12	05.19	03.33	02.25		05.02 (9)	03.38	05.21	06.55	08.26	09.10	10.21
	15.20	17.06	18.34	21.11	22.53	00.09	10	05.12 (9)	23.02	21.13	19.20	17.32	14.51	14.06
23	09.31	07.49	06.08	05.15	03.30	02.25		05.02 (9)	03.41	05.24	06.58	08.30	09.13	10.21
	15.24	17.10	18.37	21.14	22.57	00.09	9	05.11 (9)	22.59	21.09	19.16	17.28	14.48	14.06
24	09.28	07.45	06.05	05.11	03.26	02.26		05.01 (9)	03.45	05.28	07.01	08.33	09.17	10.22
	15.27	17.13	18.40	21.18	23.00	00.09	10	05.11 (9)	22.56	21.06	19.12	17.25	14.46	14.07
25	09.25	07.42	06.01	05.08	03.23	02.26		05.02 (9)	03.48	05.31	07.04	07.36	09.20	10.22
	15.31	17.16	18.44	21.21	23.04	00.08	9	05.11 (9)	22.52	21.02	19.09	16.21	14.43	14.08
26	09.22	07.38	05.57	05.04	03.20	02.27		05.03 (9)	03.52	05.34	07.07	07.39	09.23	10.22
	15.34	17.19	18.47	21.24	23.07	00.07	9	05.12 (9)	22.49	20.58	19.05	16.18	14.40	14.09
27	09.19	07.35	05.54	05.01	03.17	02.28		05.03 (9)	03.55	05.37	07.10	07.42	09.26	10.22
	15.38	17.23	18.50	21.28	23.10	00.06	8	05.11 (9)	22.45	20.55	19.01	16.14	14.38	14.10
28	09.16	07.31	05.50	04.57	03.14	02.30		05.04 (9)	03.59	05.40	07.13	07.46	09.30	10.21
	15.41	17.26	18.53	21.31	23.14	00.05	7	05.11 (9)	22.42	20.51	18.58	16.11	14.35	14.12
29	09.13		06.46	04.53	03.10	02.32		05.05 (9)	04.02	05.43	07.16	07.49	09.33	10.21
	15.45		19.56	21.34	23.17	00.04	5	05.10 (9)	22.39	20.47	18.54	16.08	14.33	14.13
30	09.10		06.43	04.50	03.07	02.33		05.06 (9)	04.05	05.46	07.19	07.52	09.36	10.20
	15.48		19.59	21.37	23.20	00.02	3	05.09 (9)	22.35	20.44	18.50	16.04	14.31	14.15
31	09.06		06.39		03.04				04.09	05.49		07.56		10.19
	15.52		20.02		23.24				22.32	20.40		16.01		14.17
Potential sun hours	163	235	363	454	578	641			620	513	394	302	192	125
Total, worst case							143							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

SHADOW - Calendar

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6 **Shadow receptor:** E - Løvmo

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May		June		July		August	September	October	November	December
1	10.18	09.03	07.28	06.35	04.46		03.01		05.06 (5)	02.35	05.05 (5)	04.12	05.52	07.22	07.59	09.39
	14.19	15.55	17.29	20.05	21.41		23.27	31	05.48 (6)	00.01 21	05.26 (5)	22.28	20.36	18.47	15.57	14.28
2	10.17	09.00	07.24	06.32	04.43		02.59		05.05 (5)	02.38	05.06 (5)	04.16	05.55	07.25	08.02	09.42
	14.21	15.59	17.32	20.08	21.44		23.30	32	05.48 (6)	23.59 20	05.26 (5)	22.25	20.33	18.43	15.54	14.26
3	10.16	08.57	07.21	06.28	04.39		02.56		05.04 (5)	02.40	05.06 (5)	04.19	05.58	07.28	08.06	09.45
	14.23	16.02	17.35	20.11	21.48		23.33	31	05.46 (6)	23.57 20	05.26 (5)	22.21	20.29	18.40	15.51	14.24
4	10.14	08.54	07.17	06.25	04.36		02.53		05.02 (5)	02.42	05.07 (5)	04.22	06.01	07.31	08.09	09.48
	14.26	16.06	17.39	20.14	21.51		23.36	29	05.45 (6)	23.55 19	05.26 (5)	22.18	20.25	18.36	15.47	14.22
5	10.13	08.50	07.13	06.21	04.32		02.50		05.02 (5)	02.45	05.07 (5)	04.26	06.04	07.34	08.12	09.51
	14.28	16.09	17.42	20.17	21.54		23.39	23	05.31 (2)	23.52 20	05.34 (2)	22.14	20.22	18.32	15.44	14.20
6	10.11	08.47	07.10	06.17	04.28		02.48		05.01 (5)	02.47	05.08 (5)	04.29	06.07	07.37	08.16	09.53
	14.31	16.13	17.45	20.20	21.58		23.42	24	05.30 (2)	23.50 22	05.36 (2)	22.11	20.18	18.29	15.41	14.18
7	10.09	08.44	07.06	06.14	04.25		02.45		05.01 (5)	02.50	05.09 (5)	04.33	06.10	07.40	08.19	09.56
	14.33	16.16	17.48	20.24	22.01		23.45	21	05.29 (2)	23.47 22	05.37 (2)	22.07	20.14	18.25	15.37	14.16
8	10.08	08.40	07.03	06.10	04.21		02.43		05.01 (5)	02.53	05.09 (5)	04.36	06.13	07.43	08.23	09.58
	14.36	16.19	17.51	20.27	22.05		23.48	19	05.20 (5)	23.45 27	05.51 (6)	22.03	20.11	18.22	15.34	14.15
9	10.06	08.37	06.59	06.06	04.18		02.40		05.01 (5)	02.56	05.10 (5)	04.39	06.16	07.46	08.26	10.01
	14.39	16.23	17.54	20.30	22.08		23.50	20	05.21 (5)	23.42 31	05.53 (6)	22.00	20.07	18.18	15.31	14.13
10	10.04	08.34	06.56	06.03	04.14		02.38		05.01 (5)	02.59	05.11 (5)	04.43	06.19	07.49	08.29	10.03
	14.42	16.26	17.57	20.33	22.12		23.53	20	05.21 (5)	23.39 32	05.54 (6)	21.56	20.04	18.14	15.28	14.12
11	10.01	08.30	06.52	05.59	04.11		02.36		05.01 (5)	03.02	05.13 (5)	04.46	06.22	07.52	08.33	10.05
	14.45	16.30	18.01	20.36	22.15		23.55	21	05.22 (5)	23.37 30	05.55 (6)	21.53	20.00	18.11	15.25	14.10
12	09.59	08.27	06.48	05.55	04.07	05.38 (6)	02.34		05.01 (5)	03.05	05.15 (5)	04.49	06.25	07.55	08.36	10.08
	14.48	16.33	18.04	20.39	22.19 6	05.44 (6)	23.57	21	05.22 (5)	23.34 29	05.56 (6)	21.49	19.56	18.07	15.21	14.09
13	09.57	08.24	06.45	05.52	04.04	05.36 (6)	02.32		05.01 (5)	03.08	05.29 (2)	04.52	06.28	07.58	08.40	10.10
	14.51	16.37	18.07	20.42	22.22 10	05.46 (6)	23.59	21	05.22 (5)	23.31 26	05.57 (6)	21.46	19.53	18.04	15.18	14.08
14	09.55	08.20	06.41	05.48	04.00	05.34 (6)	02.31		05.01 (5)	03.11	05.30 (2)	04.56	06.31	08.01	08.43	10.11
	14.54	16.40	18.10	20.46	22.25 13	05.47 (6)	00.01	22	05.23 (5)	23.28 26	05.58 (6)	21.42	19.49	18.00	15.15	14.07
15	09.52	08.17	06.37	05.44	03.57	05.33 (6)	02.29		05.01 (5)	03.15	05.29 (2)	04.59	06.34	08.04	08.46	10.13
	14.57	16.43	18.13	20.49	22.29 15	05.48 (6)	00.03	22	05.23 (5)	23.25 29	05.59 (6)	21.38	19.45	17.57	15.12	14.07
16	09.50	08.13	06.34	05.41	03.53	05.33 (6)	02.28		05.01 (5)	03.18	05.29 (2)	05.02	06.37	08.07	08.50	10.15
	15.00	16.47	18.16	20.52	22.32 16	05.49 (6)	00.05	23	05.24 (5)	23.22 29	05.59 (6)	21.35	19.42	17.53	15.09	14.06
17	09.47	08.10	06.30	05.37	03.50	05.32 (6)	02.27		05.01 (5)	03.21	05.29 (2)	05.05	06.40	08.11	08.53	10.16
	15.04	16.50	18.19	20.55	22.36 17	05.49 (6)	00.06	22	05.23 (5)	23.18 30	05.59 (6)	21.31	19.38	17.50	15.06	14.06
18	09.45	08.06	06.27	05.33	03.46	05.31 (6)	02.26		05.01 (5)	03.25	05.30 (2)	05.09	06.43	08.14	08.57	10.17
	15.07	16.53	18.22	20.58	22.39 18	05.49 (6)	00.07	23	05.24 (5)	23.15 29	06.00 (6)	21.27	19.34	17.46	15.03	14.05
19	09.42	08.03	06.23	05.30	03.43	05.31 (6)	02.25		05.01 (5)	03.28	05.30 (2)	05.12	06.46	08.17	09.00	10.19
	15.10	16.57	18.25	21.01	22.43 19	05.50 (6)	00.08	23	05.24 (5)	23.12 29	06.00 (6)	21.24	19.31	17.42	15.00	14.05
20	09.39	07.59	06.19	05.26	03.40	05.31 (6)	02.25		05.02 (5)	03.31	05.31 (2)	05.15	06.49	08.20	09.03	10.19
	15.14	17.00	18.28	21.05	22.46 19	05.50 (6)	00.08	22	05.24 (5)	23.09 29	06.01 (6)	21.20	19.27	17.39	14.57	14.05
21	09.36	07.56	06.16	05.22	03.36	05.24 (2)	02.25		05.02 (5)	03.35	05.31 (2)	05.18	06.52	08.23	09.07	10.20
	15.17	17.03	18.31	21.08	22.50 24	05.51 (6)	00.09	22	05.24 (5)	23.06 28	06.00 (6)	21.17	19.23	17.35	14.54	14.05
22	09.34	07.52	06.12	05.19	03.33	05.22 (2)	02.25		05.03 (5)	03.38	05.33 (2)	05.21	06.55	08.26	09.10	10.21
	15.21	17.06	18.34	21.11	22.53 26	05.50 (6)	00.09	22	05.25 (5)	23.02 25	06.01 (6)	21.13	19.20	17.32	14.51	14.06
23	09.31	07.49	06.08	05.15	03.30	05.21 (2)	02.25		05.02 (5)	03.42	05.41 (6)	05.24	06.58	08.30	09.13	10.21
	15.24	17.10	18.37	21.14	22.57 29	05.51 (6)	00.09	23	05.25 (5)	22.59 19	06.00 (6)	21.09	19.16	17.28	14.49	14.06
24	09.28	07.45	06.05	05.12	03.26	05.21 (2)	02.26		05.02 (5)	03.45	05.42 (6)	05.28	07.01	08.33	09.17	10.22
	15.27	17.13	18.41	21.18	23.00 29	05.51 (6)	00.09	23	05.25 (5)	22.56 19	06.01 (6)	21.06	19.12	17.25	14.46	14.07
25	09.25	07.42	06.01	05.08	03.23	05.20 (2)	02.26		05.03 (5)	03.48	05.41 (6)	05.31	07.04	07.36	09.20	10.22
	15.31	17.16	18.44	21.21	23.04 30	05.50 (6)	00.08	23	05.26 (5)	22.52 19	06.00 (6)	21.02	19.09	16.21	14.43	14.08
26	09.22	07.38	05.57	05.04	03.20	05.20 (2)	02.27		05.04 (5)	03.52	05.42 (6)	05.34	07.07	07.39	09.23	10.22
	15.34	17.19	18.47	21.24	23.07 29	05.50 (6)	00.07	22	05.26 (5)	22.49 18	06.00 (6)	20.58	19.05	16.18	14.41	14.09
27	09.19	07.35	05.54	05.01	03.17	05.20 (2)	02.29		05.04 (5)	03.55	05.43 (6)	05.37	07.10	07.43	09.27	10.22
	15.38	17.23	18.50	21.28	23.10 30	05.50 (6)	00.06	22	05.26 (5)	22.45 17	06.00 (6)	20.55	19.01	16.15	14.38	14.10
28	09.16	07.31	05.50	04.57	03.14	05.20 (2)	02.30		05.04 (5)	03.59	05.43 (6)	05.40	07.13	07.46	09.30	10.21
	15.41	17.26	18.53	21.31	23.14 29	05.50 (6)	00.05	22	05.26 (5)	22.42 16	05.59 (6)	20.51	18.58	16.11	14.35	14.12
29	09.13		06.46	04.53	03.10	05.20 (2)	02.32		05.04 (5)	04.02	05.44 (6)	05.43	07.16	07.49	09.33	10.21
	15.45		19.56	21.34	23.17 27	05.49 (6)	00.04	22	05.26 (5)	22.39 14	05.58 (6)	20.47	18.54	16.08	14.33	14.13
30	09.10		06.43	04.50	03.07	05.21 (2)	02.33		05.04 (5)	04.05	05.45 (6)	05.46	07.19	07.52	09.36	10.20
	15.48		19.59	21.38	23.20 26	05.49 (6)	00.02	22	05.26 (5)	22.35 12	05.57 (6)	20.44	18.51	16.04	14.31	14.15
31	09.06		06.39		03.04	05.09 (5)				04.09	05.46 (6)	05.49		07.56		10.19
	15.52		20.02		23.24 25	05.48 (6)				22.32 9	05.55 (6)	20.40		16.01		14.17
Potential sun hours	163	235	363	454	578		641		620		513	394	302	192	126	
Total, worst case						437		693		716						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**Shadow receptor:** F - Storeienen

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February		March		April		May	June
1	10.18	09.03		07.28		09.02 (2)	06.35	04.46	03.01
	14.19	15.55		17.29	106	11.53 (3)	20.05	21.41	23.27
2	10.17	09.00		07.24		09.00 (2)	06.32	07.34 (14)	04.43	02.58
	14.21	15.58		17.32	104	11.51 (3)	20.08	6	07.40 (14)	21.44	23.30
3	10.16	08.57		07.21		08.59 (2)	06.28	07.30 (14)	04.39	02.55
	14.23	16.02		17.35	100	11.49 (3)	20.11	13	07.43 (14)	21.48	23.33
4	10.14	08.54		07.17		08.40 (6)	06.24	07.28 (14)	04.35	02.53
	14.26	16.05		17.39	104	11.47 (3)	20.14	16	07.44 (14)	21.51	23.37
5	10.13	08.50	12.15 (1)	07.13		08.37 (6)	06.21	07.27 (14)	04.32	02.50
	14.28	16.09	9	12.24 (1)	17.42	98	11.42 (3)	20.17	18	07.45 (14)	21.55	23.40
6	10.11	08.47	12.14 (1)	07.10		08.35 (6)	06.17	07.25 (14)	04.28	02.47
	14.31	16.12	12	12.26 (1)	17.45	88	10.40 (4)	20.21	20	07.45 (14)	21.58	23.42
7	10.10	08.44	12.13 (1)	07.06		08.14 (7)	06.13	07.25 (14)	04.25	02.45
	14.33	16.16	14	12.27 (1)	17.48	91	10.38 (4)	20.24	21	07.46 (14)	22.01	23.45
8	10.08	08.41	12.12 (1)	07.03		08.12 (7)	06.10	07.24 (14)	04.21	02.42
	14.36	16.19	16	12.28 (1)	17.51	88	10.37 (4)	20.27	21	07.45 (14)	22.05	23.48
9	10.06	08.37	12.12 (1)	06.59		08.11 (7)	06.06	07.24 (14)	04.18	02.40
	14.39	16.23	16	12.28 (1)	17.54	76	10.34 (4)	20.30	21	07.45 (14)	22.08	23.51
10	10.04	08.34	11.37 (3)	06.56		08.10 (7)	06.03	07.23 (14)	04.14	02.38
	14.42	16.26	22	12.28 (1)	17.57	65	10.30 (4)	20.33	22	07.45 (14)	22.12	23.53
11	10.02	08.30	11.32 (3)	06.52		08.09 (7)	05.59	07.24 (14)	04.11	02.36
	14.45	16.30	31	12.28 (1)	18.01	41	08.54 (6)	20.36	20	07.44 (14)	22.15	23.56
12	09.59	08.27	11.31 (3)	06.48		08.09 (7)	05.55	07.24 (14)	04.07	02.34
	14.48	16.33	35	12.29 (1)	18.04	41	08.54 (6)	20.39	19	07.43 (14)	22.19	23.58
13	09.57	08.24	11.29 (3)	06.45		08.08 (7)	05.52	07.25 (14)	04.04	02.32
	14.51	16.36	39	12.29 (1)	18.07	40	08.53 (6)	20.42	17	07.42 (14)	22.22	00.00
14	09.55	08.20	11.27 (3)	06.41		08.08 (7)	05.48	07.26 (14)	04.00	02.30
	14.54	16.40	41	12.28 (1)	18.10	38	08.51 (6)	20.46	14	07.40 (14)	22.26	00.02
15	09.52	08.17	10.20 (4)	06.37		08.08 (7)	05.44	07.28 (14)	03.57	02.29
	14.57	16.43	55	12.26 (1)	18.13	34	08.50 (6)	20.49	10	07.38 (14)	22.29	00.03
16	09.50	08.13	10.17 (4)	06.34		08.10 (7)	05.41	03.53	02.27
	15.00	16.47	57	12.24 (1)	18.16	28	08.48 (6)	20.52	22.33	00.05
17	09.47	08.10	10.15 (4)	06.30		07.40 (8)	05.37	03.50	02.26
	15.04	16.50	56	11.56 (3)	18.19	29	08.45 (6)	20.55	22.36	00.06
18	09.45	08.06	10.13 (4)	06.27		07.38 (8)	05.33	03.46	02.26
	15.07	16.53	62	11.57 (3)	18.22	17	08.18 (7)	20.58	22.40	00.07
19	09.42	08.03	10.12 (4)	06.23		07.37 (8)	05.30	03.43	02.25
	15.10	16.57	64	11.57 (3)	18.25	16	07.53 (8)	21.02	22.43	00.08
20	09.39	08.00	09.41 (5)	06.19		07.36 (8)	05.26	03.39	02.24
	15.14	17.00	73	11.57 (3)	18.28	17	07.53 (8)	21.05	22.46	00.09
21	09.36	07.56	09.37 (5)	06.16		07.35 (8)	05.22	03.36	02.24
	15.17	17.03	84	11.58 (3)	18.31	18	07.53 (8)	21.08	22.50	00.09
22	09.34	07.53	09.35 (5)	06.12		07.35 (8)	05.19	03.33	02.24
	15.20	17.06	90	11.58 (3)	18.34	18	07.53 (8)	21.11	22.53	00.10
23	09.31	07.49	09.33 (5)	06.08		07.35 (8)	05.15	03.29	02.25
	15.24	17.10	93	11.57 (3)	18.37	17	07.52 (8)	21.14	22.57	00.09
24	09.28	07.45	09.31 (5)	06.05		07.34 (8)	05.11	03.26	02.25
	15.27	17.13	97	11.57 (3)	18.41	17	07.51 (8)	21.18	23.00	00.09
25	09.25	07.42	09.30 (5)	06.01		07.36 (8)	05.08	03.23	02.26
	15.31	17.16	98	11.56 (3)	18.44	15	07.51 (8)	21.21	23.04	00.09
26	09.22	07.38	09.29 (5)	05.57		07.36 (8)	05.04	03.20	02.27
	15.34	17.19	100	11.56 (3)	18.47	13	07.49 (8)	21.24	23.07	00.08
27	09.19	07.35	09.29 (5)	05.54		07.38 (8)	05.01	03.16	02.28
	15.38	17.23	101	11.56 (3)	18.50	8	07.46 (8)	21.28	23.11	00.07
28	09.16	07.31	09.06 (2)	05.50			04.57	03.13	02.30
	15.41	17.26	100	11.54 (3)	18.53		21.31	23.14	00.06
29	09.13			06.46			04.53	03.10	02.31
	15.45			19.56			21.34	23.17	00.04
30	09.10			06.43			04.50	03.07	02.33
	15.48			19.59			21.38	23.21	00.03
31	09.07			06.39				03.04	
	15.52			20.02				23.24	
Potential sun hours	163	235		363		454		578	641
Total, worst case			1365		1327		238		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 11.11/3.2.737

SHADOW - Calendar

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**Shadow receptor:** F - Storeienen

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July	August			September			October			November			December
1	02.35	04.12			05.52		07.23 (14)	07.22		08.47 (7)	07.59		11.42 (1)	09.39
	00.01	22.28			20.36	20	07.43 (14)	18.47	41	09.32 (6)	15.57	17	11.59 (1)	14.28
2	02.37	04.15			05.55		07.22 (14)	07.25		08.47 (7)	08.02		11.42 (1)	09.42
	23.59	22.25			20.33	21	07.43 (14)	18.43	41	09.32 (6)	15.54	17	11.59 (1)	14.26
3	02.39	04.19			05.58		07.22 (14)	07.28		08.48 (7)	08.06		11.43 (1)	09.45
	23.57	22.21			20.29	22	07.44 (14)	18.40	58	11.07 (4)	15.51	15	11.58 (1)	14.24
4	02.42	04.22			06.01		07.21 (14)	07.31		08.48 (7)	08.09		11.43 (1)	09.48
	23.55	22.18			20.25	21	07.42 (14)	18.36	72	11.10 (4)	15.47	14	11.57 (1)	14.22
5	02.44	04.26			06.04		07.21 (14)	07.34		08.49 (7)	08.13		11.44 (1)	09.51
	23.53	22.14			20.22	21	07.42 (14)	18.32	81	11.13 (4)	15.44	12	11.56 (1)	14.20
6	02.47	04.29			06.07		07.21 (14)	07.37		08.50 (7)	08.16		11.46 (1)	09.54
	23.50	22.11			20.18	20	07.41 (14)	18.29	90	11.14 (4)	15.41	8	11.54 (1)	14.18
7	02.50	04.32			06.10		07.22 (14)	07.40		08.52 (7)	08.19			09.56
	23.48	22.07			20.15	18	07.40 (14)	18.25	92	11.15 (4)	15.37			14.16
8	02.53	04.36			06.13		07.23 (14)	07.43		09.11 (6)	08.23			09.59
	23.45	22.04			20.11	16	07.39 (14)	18.22	87	11.16 (4)	15.34			14.14
9	02.56	04.39			06.16		07.24 (14)	07.46		09.14 (6)	08.26			10.01
	23.42	22.00			20.07	13	07.37 (14)	18.18	100	12.20 (3)	15.31			14.13
10	02.59	04.42			06.19		07.26 (14)	07.49		09.17 (6)	08.29			10.03
	23.40	21.56			20.04	7	07.33 (14)	18.14	101	12.22 (3)	15.28			14.11
11	03.02	04.46			06.22			07.52		09.34 (2)	08.33			10.06
	23.37	21.53			20.00			18.11	102	12.24 (3)	15.24			14.10
12	03.05	04.49			06.25			07.55		09.34 (2)	08.36			10.08
	23.34	21.49			19.56			18.07	105	12.25 (3)	15.21			14.09
13	03.08	04.52			06.28			07.58		09.37 (2)	08.40			10.10
	23.31	21.46			19.53			18.04	104	12.27 (3)	15.18			14.08
14	03.11	04.56			06.31			08.01		10.01 (5)	08.43			10.12
	23.28	21.42			19.49			18.00	98	12.27 (3)	15.15			14.07
15	03.14	04.59			06.34			08.04		10.01 (5)	08.47			10.13
	23.25	21.38			19.45			17.57	98	12.27 (3)	15.12			14.06
16	03.18	05.02			06.37		08.28 (8)	08.07		10.02 (5)	08.50			10.15
	23.22	21.35			19.42	6	08.34 (8)	17.53	99	12.28 (3)	15.09			14.06
17	03.21	05.05			06.40		08.25 (8)	08.11		10.02 (5)	08.53			10.16
	23.19	21.31			19.38	12	08.37 (8)	17.49	99	12.28 (3)	15.06			14.05
18	03.24	05.08			06.43		08.24 (8)	08.14		10.04 (5)	08.57			10.18
	23.16	21.28			19.34	14	08.38 (8)	17.46	95	12.29 (3)	15.03			14.05
19	03.28	05.12			06.46		08.21 (8)	08.17		10.04 (5)	09.00			10.19
	23.12	21.24			19.31	17	08.38 (8)	17.42	92	12.28 (3)	15.00			14.05
20	03.31	05.15			06.49		08.21 (8)	08.20		10.06 (5)	09.04			10.20
	23.09	21.20			19.27	17	08.38 (8)	17.39	88	12.28 (3)	14.57			14.05
21	03.34	05.18			06.52		08.20 (8)	08.23		10.08 (5)	09.07			10.21
	23.06	21.17			19.23	18	08.38 (8)	17.35	82	12.28 (3)	14.54			14.05
22	03.38	05.21			06.55		08.20 (8)	08.26		10.42 (4)	09.10			10.21
	23.02	21.13			19.20	18	08.38 (8)	17.32	66	12.28 (3)	14.51			14.06
23	03.41	05.24			06.58		08.20 (8)	08.30		10.43 (4)	09.14			10.22
	22.59	21.09			19.16	17	08.37 (8)	17.28	63	12.28 (3)	14.48			14.06
24	03.45	05.27			07.01		08.20 (8)	08.33		10.44 (4)	09.17			10.22
	22.56	21.06			19.12	16	08.36 (8)	17.25	59	12.26 (3)	14.46			14.07
25	03.48	05.31			07.04		08.21 (8)	07.36		09.46 (4)	09.20			10.22
	22.52	21.02			19.09	14	08.35 (8)	16.21	55	11.26 (3)	14.43			14.08
26	03.52	05.34			07.07		08.22 (8)	07.39		09.48 (4)	09.23			10.22
	22.49	20.58			19.05	22	09.24 (6)	16.18	57	11.55 (1)	14.40			14.09
27	03.55	05.37			07.10		08.24 (8)	07.43		09.50 (4)	09.27			10.22
	22.46	20.55			19.01	31	09.29 (6)	16.14	53	11.56 (1)	14.38			14.10
28	03.58	05.40		07.28 (14)	07.13		08.50 (7)	07.46		10.57 (3)	09.30			10.21
	22.42	20.51	11	07.39 (14)	18.58	31	09.30 (6)	16.11	39	11.57 (1)	14.35			14.11
29	04.02	05.43		07.26 (14)	07.16		08.49 (7)	07.49		10.58 (3)	09.33			10.21
	22.39	20.47	15	07.41 (14)	18.54	36	09.31 (6)	16.08	39	11.58 (1)	14.33			14.13
30	04.05	05.46		07.25 (14)	07.19		08.48 (7)	07.52		11.00 (3)	09.36			10.20
	22.35	20.44	17	07.42 (14)	18.51	39	09.32 (6)	16.04	35	11.58 (1)	14.30			14.15
31	04.09	05.49		07.24 (14)				07.56		11.03 (3)				10.19
	22.32	20.40	19	07.43 (14)				16.01	31	11.59 (1)				14.16
Potential sun hours	621	513			394			302			192			125
Total, worst case			62			487			2322			83		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 11.11/3.2.737

SHADOW - Calendar

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**Shadow receptor:** G - Hamland

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January			February			March			April		May		June	
1	10.18			09.03			12.28 (8)	07.28		09.01 (13)	06.35		04.46		03.01
	14.19			15.55	12		12.40 (8)	17.29	47	10.06 (12)	20.05		21.41		23.27
2	10.17			09.00			12.27 (8)	07.24		09.01 (13)	06.32		04.42		02.58
	14.21			15.58	15		12.42 (8)	17.32	46	10.05 (12)	20.08		21.44		23.30
3	10.16			08.57			12.26 (8)	07.21		09.00 (13)	06.28		04.39		02.55
	14.23			16.02	17		12.43 (8)	17.35	45	10.04 (12)	20.11		21.48		23.34
4	10.15			08.54			11.58 (9)	07.17		09.01 (13)	06.24		04.35		02.52
	14.25			16.05	31		13.12 (14)	17.38	43	10.03 (12)	20.14		21.51		23.37
5	10.13			08.50			11.18 (10)	07.13		09.01 (13)	06.21		04.32		02.50
	14.28			16.09	52		13.15 (14)	17.42	39	10.01 (12)	20.17		21.54		23.40
6	10.11			08.47			11.15 (10)	07.10		09.01 (13)	06.17		04.28		02.47
	14.30			16.12	65		13.17 (14)	17.45	34	09.59 (12)	20.20		21.58		23.43
7	10.10			08.44			11.14 (10)	07.06		09.01 (13)	06.13		04.24		02.44
	14.33			16.16	74		13.19 (14)	17.48	19	09.20 (13)	20.24		22.01		23.45
8	10.08			08.40			11.13 (10)	07.03		09.03 (13)	06.10		04.21		02.42
	14.36			16.19	79		13.20 (14)	17.51	16	09.19 (13)	20.27		22.05		23.48
9	10.06			08.37			11.12 (10)	06.59		09.04 (13)	06.06		04.17		02.40
	14.38			16.23	84		13.21 (14)	17.54	13	09.17 (13)	20.30		22.08		23.51
10	10.04			08.34			11.11 (10)	06.55		09.08 (13)	06.02		04.14		02.37
	14.41			16.26	88		13.22 (14)	17.57	4	09.12 (13)	20.33		22.12		23.53
11	10.02			08.30			10.32 (11)	06.52			05.59		04.10		02.35
	14.44			16.29	96		13.22 (14)	18.00			20.36		22.15		23.56
12	09.59			08.27			10.31 (11)	06.48			05.55		04.07		02.33
	14.47			16.33	100		13.23 (14)	18.03			20.39		22.19		23.58
13	09.57			08.24			10.29 (11)	06.45			05.51		04.03		02.31
	14.50			16.36	101		13.24 (14)	18.07			20.42		22.22		00.00
14	09.55			08.20			10.28 (11)	06.41			05.48		04.00		02.30
	14.54			16.40	98		13.24 (14)	18.10			20.45		22.26		00.02
15	09.52			08.17			10.27 (11)	06.37			05.44		03.56		02.28
	14.57			16.43	91		13.23 (14)	18.13			20.49		22.29		00.04
16	09.50			08.13			10.26 (11)	06.34			05.40		03.53		02.27
	15.00			16.46	89		13.23 (14)	18.16			20.52		22.33		00.05
17	09.47			08.10			10.25 (11)	06.30			05.37		03.49		02.26
	15.03			16.50	87		13.23 (14)	18.19			20.55		22.36		00.06
18	09.45			08.06			10.25 (11)	06.26			05.33		03.46		02.25
	15.07			16.53	81		13.22 (14)	18.22			20.58		22.40		00.08
19	09.42			08.03			09.50 (12)	06.23			05.29		03.43		02.24
	15.10			16.56	80		13.21 (14)	18.25			21.01		22.43		00.08
20	09.39			07.59			09.47 (12)	06.19			05.26		03.39		02.24
	15.13			17.00	73		13.20 (14)	18.28			21.05		22.46		00.09
21	09.36			07.56			09.46 (12)	06.15			05.22		03.36		02.24
	15.17			17.03	65		13.19 (14)	18.31			21.08		22.50		00.10
22	09.34			07.52			09.45 (12)	06.12			05.19		03.32		02.24
	15.20			17.06	58		13.17 (14)	18.34			21.11		22.53		00.10
23	09.31			07.49			09.43 (12)	06.08			05.15		03.29		02.24
	15.23			17.09	51		13.13 (14)	18.37			21.14		22.57		00.10
24	09.28			07.45			09.09 (13)	06.05			05.11		03.26		02.25
	15.27			17.13	52		10.45 (11)	18.40			21.18		23.00		00.09
25	09.25			07.42			09.06 (13)	06.01			05.08		03.23		02.25
	15.30			17.16	53		10.43 (11)	18.43			21.21		23.04		00.09
26	09.22			07.38			09.04 (13)	05.57			05.04		03.19		02.26
	15.34			17.19	52		10.40 (11)	18.47			21.24		23.07		00.08
27	09.19			07.35			09.03 (13)	05.54			05.00		03.16		02.28
	15.37			17.22	45		10.07 (12)	18.50			21.28		23.11		00.07
28	09.16			07.31			09.02 (13)	05.50			04.57		03.13		02.29
	15.41			17.26	47		10.07 (12)	18.53			21.31		23.14		00.06
29	09.13							06.46			04.53		03.10		02.31
	15.44							19.56			21.34		23.17		00.04
30	09.10							06.43			04.50		03.07		02.33
	15.48							19.59			21.38		23.21		00.03
31	09.06		12.30 (8)					06.39					03.04		
	15.51	8	12.38 (8)					20.02					23.24		
Potential sun hours	162			235				363			454		578		641
Total, worst case		8			1836				306						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
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SHADOW - Calendar

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6 **Shadow receptor:** G - Hamland

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July	August	September	October		November		December
1	02.35	04.12	05.52	07.22		07.59	10.42 (10)	09.39
	00.01	22.28	20.36	18.47		15.57	86 12.52 (14)	14.28
2	02.37	04.15	05.55	07.25		08.02	10.42 (10)	09.42
	23.59	22.25	20.33	18.43		15.54	84 12.51 (14)	14.26
3	02.39	04.19	05.58	07.28		08.06	10.43 (10)	09.45
	23.57	22.21	20.29	18.39		15.50	79 12.50 (14)	14.23
4	02.41	04.22	06.01	07.31	09.43 (13)	08.09	10.44 (10)	09.48
	23.55	22.18	20.25	18.36	10 09.53 (13)	15.47	73 12.49 (14)	14.21
5	02.44	04.25	06.04	07.34	09.40 (13)	08.12	10.46 (10)	09.51
	23.53	22.14	20.22	18.32	15 09.55 (13)	15.44	63 12.47 (14)	14.19
6	02.47	04.29	06.07	07.37	09.38 (13)	08.16	10.48 (10)	09.54
	23.50	22.11	20.18	18.29	18 09.56 (13)	15.40	51 12.45 (14)	14.18
7	02.49	04.32	06.10	07.40	09.37 (13)	08.19	11.30 (9)	09.56
	23.48	22.07	20.14	18.25	29 10.33 (12)	15.37	28 12.42 (14)	14.16
8	02.52	04.35	06.13	07.43	09.36 (13)	08.23	11.56 (8)	09.59
	23.45	22.03	20.11	18.21	36 10.35 (12)	15.34	16 12.12 (8)	14.14
9	02.55	04.39	06.16	07.46	09.35 (13)	08.26	11.58 (8)	10.01
	23.43	22.00	20.07	18.18	41 10.37 (12)	15.31	14 12.12 (8)	14.13
10	02.58	04.42	06.19	07.49	09.35 (13)	08.29	11.59 (8)	10.03
	23.40	21.56	20.03	18.14	44 10.38 (12)	15.27	12 12.11 (8)	14.11
11	03.01	04.45	06.22	07.52	09.34 (13)	08.33	12.01 (8)	10.06
	23.37	21.53	20.00	18.11	46 10.39 (12)	15.24	7 12.08 (8)	14.10
12	03.04	04.49	06.25	07.55	09.34 (13)	08.36		10.08
	23.34	21.49	19.56	18.07	47 10.39 (12)	15.21		14.09
13	03.08	04.52	06.28	07.58	09.35 (13)	08.40		10.10
	23.31	21.46	19.52	18.04	47 10.40 (12)	15.18		14.08
14	03.11	04.55	06.31	08.01	09.35 (13)	08.43		10.12
	23.28	21.42	19.49	18.00	46 10.39 (12)	15.15		14.07
15	03.14	04.59	06.34	08.04	09.35 (13)	08.46		10.13
	23.25	21.38	19.45	17.56	45 10.39 (12)	15.12		14.06
16	03.17	05.02	06.37	08.07	09.37 (13)	08.50		10.15
	23.22	21.35	19.41	17.53	53 11.14 (11)	15.09		14.05
17	03.21	05.05	06.40	08.10	09.38 (13)	08.53		10.16
	23.19	21.31	19.38	17.49	53 11.15 (11)	15.06		14.05
18	03.24	05.08	06.43	08.14	09.42 (13)	08.57		10.18
	23.16	21.27	19.34	17.46	48 11.17 (11)	15.03		14.05
19	03.27	05.11	06.46	08.17	10.14 (12)	09.00		10.19
	23.12	21.24	19.30	17.42	55 13.45 (14)	15.00		14.05
20	03.31	05.15	06.49	08.20	10.16 (12)	09.03		10.20
	23.09	21.20	19.27	17.39	58 13.48 (14)	14.57		14.05
21	03.34	05.18	06.52	08.23	10.16 (12)	09.07		10.21
	23.06	21.17	19.23	17.35	70 13.49 (14)	14.54		14.05
22	03.38	05.21	06.55	08.26	10.19 (12)	09.10		10.21
	23.02	21.13	19.19	17.32	74 13.51 (14)	14.51		14.05
23	03.41	05.24	06.58	08.30	10.21 (12)	09.14		10.22
	22.59	21.09	19.16	17.28	81 13.51 (14)	14.48		14.06
24	03.44	05.27	07.01	08.33	10.55 (11)	09.17		10.22
	22.56	21.06	19.12	17.25	83 13.52 (14)	14.45		14.06
25	03.48	05.30	07.04	07.36	09.55 (11)	09.20		10.22
	22.52	21.02	19.09	16.21	87 12.53 (14)	14.43		14.07
26	03.51	05.34	07.07	07.39	09.55 (11)	09.23		10.22
	22.49	20.58	19.05	16.18	89 12.52 (14)	14.40		14.08
27	03.55	05.37	07.10	07.42	09.56 (11)	09.27		10.22
	22.46	20.55	19.01	16.14	91 12.52 (14)	14.37		14.10
28	03.58	05.40	07.13	07.46	09.57 (11)	09.30		10.22
	22.42	20.51	18.58	16.11	100 12.53 (14)	14.35		14.11
29	04.02	05.43	07.16	07.49	09.58 (11)	09.33		10.21
	22.39	20.47	18.54	16.07	103 12.53 (14)	14.32		14.13
30	04.05	05.46	07.19	07.52	10.00 (11)	09.36		10.20
	22.35	20.44	18.50	16.04	100 12.53 (14)	14.30		14.14
31	04.08	05.49		07.56	10.03 (11)			10.20
	22.32	20.40		16.01	94 12.52 (14)			14.16
Potential sun hours	621	513	394	302		192		125
Total, worst case					1663		513	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Helge Dalbu / helge.dalbu@multiconsult.no
Calculated:
20.12.2018 11.11/3.2.737

SHADOW - Calendar

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**Shadow receptor:** H - Myhrvang

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
- The sun is shining all the day, from sunrise to sunset
- The rotor plane is always perpendicular to the line from the WTG to the sun
- The WTG is always operating

	January		February		March	April	May	June	July	August	September	October		November		December
1	10.18		09.03	12.10 (10)	07.28	06.35	04.46	03.01	02.34	04.12	05.52	07.22		07.59	10.21 (12)	09.39
	14.18		15.55 28	12.55 (9)	17.29	20.05	21.41	23.27	00.01	22.28	20.36	18.47		15.57 105	13.41 (14)	14.28
2	10.17		09.00	11.31 (11)	07.24	06.32	04.42	02.58	02.37	04.15	05.55	07.25		08.02	10.22 (12)	09.42
	14.21		15.58 42	12.57 (9)	17.32	20.08	21.44	23.30	23.59	22.25	20.33	18.43		15.54 104	13.40 (14)	14.26
3	10.16		08.57	11.29 (11)	07.21	06.28	04.39	02.55	02.39	04.19	05.58	07.28		08.06	10.25 (12)	09.45
	14.23		16.02 60	14.04 (14)	17.35	20.11	21.48	23.34	23.57	22.21	20.29	18.39		15.50 98	13.40 (14)	14.23
4	10.15		08.54	11.27 (11)	07.17	06.24	04.35	02.52	02.41	04.22	06.01	07.31		08.09	10.29 (12)	09.48
	14.25		16.05 69	14.05 (14)	17.38	20.14	21.51	23.37	23.55	22.18	20.25	18.36		15.47 88	13.39 (14)	14.21
5	10.13		08.50	11.26 (11)	07.13	06.21	04.32	02.49	02.44	04.25	06.04	07.34		08.12	10.56 (11)	09.51
	14.28		16.09 77	14.07 (14)	17.42	20.17	21.54	23.40	23.53	22.14	20.22	18.32		15.44 80	13.38 (14)	14.19
6	10.11		08.47	11.25 (11)	07.10	06.17	04.28	02.47	02.47	04.29	06.07	07.37		08.16	10.57 (11)	09.54
	14.30		16.12 81	14.08 (14)	17.45	20.20	21.58	23.43	23.50	22.11	20.18	18.29		15.40 73	13.37 (14)	14.17
7	10.10		08.44	10.57 (12)	07.06	06.13	04.24	02.44	02.49	04.32	06.10	07.40		08.19	10.58 (11)	09.56
	14.33		16.16 91	14.09 (14)	17.48	20.23	22.01	23.45	23.48	22.07	20.14	18.25		15.37 68	13.35 (14)	14.16
8	10.08		08.40	10.54 (12)	07.03	06.10	04.21	02.42	02.52	04.35	06.13	07.43		08.23	10.59 (11)	09.59
	14.36		16.19 99	14.10 (14)	17.51	20.27	22.05	23.48	23.45	22.03	20.11	18.21		15.34 58	13.33 (14)	14.14
9	10.06		08.37	10.52 (12)	06.59	06.06	04.17	02.39	02.55	04.39	06.16	07.46		08.26	11.02 (11)	10.01
	14.38		16.23 104	14.10 (14)	17.54	20.30	22.08	23.51	23.43	22.00	20.07	18.18		15.31 40	12.27 (9)	14.12
10	10.04		08.34	10.50 (12)	06.55	06.02	04.14	02.37	02.58	04.42	06.19	07.49		08.29	11.40 (10)	10.03
	14.41		16.26 106	14.10 (14)	17.57	20.33	22.12	23.53	23.40	21.56	20.03	18.14		15.27 28	12.26 (9)	14.11
11	10.02		08.30	10.49 (12)	06.52	05.59	04.10	02.35	03.01	04.45	06.22	07.52		08.33	11.41 (10)	10.06
	14.44		16.29 106	14.10 (14)	18.00	20.36	22.15	23.56	23.37	21.53	20.00	18.11		15.24 21	12.23 (9)	14.10
12	09.59		08.27	10.07 (13)	06.48	05.55	04.07	02.33	03.04	04.49	06.25	07.55		08.36	11.44 (10)	10.08
	14.47		16.33 110	14.10 (14)	18.03	20.39	22.19	23.58	23.34	21.49	19.56	18.07		15.21 11	11.55 (10)	14.09
13	09.57		08.24	10.05 (13)	06.45	05.51	04.03	02.31	03.08	04.52	06.28	07.58		08.40	11.46 (10)	10.10
	14.50		16.36 111	14.11 (14)	18.07	20.42	22.22	00.00	23.31	21.46	19.52	18.03		15.18 5	11.51 (10)	14.08
14	09.55		08.20	10.03 (13)	06.41	05.48	04.00	02.30	03.11	04.55	06.31	08.01	10.36 (13)	08.43		10.12
	14.54		16.40 104	14.11 (14)	18.10	20.45	22.26	00.02	23.28	21.42	19.49	18.00 13	10.49 (13)	15.15		14.07
15	09.52		08.17	10.02 (13)	06.37	05.44	03.56	02.28	03.14	04.59	06.34	08.04	10.34 (13)	08.46		10.13
	14.57		16.43 85	14.10 (14)	18.13	20.49	22.29	00.04	23.25	21.38	19.45	17.56 16	10.50 (13)	15.12		14.06
16	09.50		08.13	10.00 (13)	06.34	05.40	03.53	02.27	03.17	05.02	06.37	08.07	10.33 (13)	08.50		10.15
	15.00		16.46 84	14.09 (14)	18.16	20.52	22.33	00.05	23.22	21.35	19.41	17.53 19	10.52 (13)	15.09		14.05
17	09.47		08.10	10.00 (13)	06.30	05.37	03.49	02.26	03.21	05.05	06.40	08.10	10.31 (13)	08.53		10.16
	15.03		16.50 81	14.08 (14)	18.19	20.55	22.36	00.07	23.19	21.31	19.38	17.49 32	11.36 (12)	15.05		14.05
18	09.45		08.06	09.59 (13)	06.26	05.33	03.46	02.25	03.24	05.08	06.43	08.14	10.31 (13)	08.57		10.18
	15.07		16.53 71	14.06 (14)	18.22	20.58	22.40	00.08	23.16	21.27	19.34	17.46 39	11.40 (12)	15.02		14.05
19	09.42		08.03	09.58 (13)	06.23	05.29	03.43	02.24	03.27	05.11	06.46	08.17	10.30 (13)	09.00		10.19
	15.10		16.56 57	14.03 (14)	18.25	21.01	22.43	00.09	23.12	21.24	19.30	17.42 43	11.41 (12)	15.00		14.04
20	09.39		07.59	09.58 (13)	06.19	05.26	03.39	02.24	03.31	05.15	06.49	08.20	10.29 (13)	09.03		10.20
	15.13		17.00 49	11.12 (12)	18.28	21.05	22.46	00.09	23.09	21.20	19.27	17.39 46	11.42 (12)	14.57		14.05
21	09.36		07.56	09.58 (13)	06.15	05.22	03.36	02.24	03.34	05.18	06.52	08.23	10.29 (13)	09.07		10.21
	15.17		17.03 48	11.11 (12)	18.31	21.08	22.50	00.10	23.06	21.17	19.23	17.35 49	11.43 (12)	14.54		14.05
22	09.34		07.52	09.59 (13)	06.12	05.18	03.32	02.24	03.38	05.21	06.55	08.26	10.29 (13)	09.10		10.21
	15.20		17.06 45	11.11 (12)	18.34	21.11	22.53	00.10	23.02	21.13	19.19	17.32 50	11.44 (12)	14.51		14.05
23	09.31		07.49	09.59 (13)	06.08	05.15	03.29	02.24	03.41	05.24	06.58	08.29	10.28 (13)	09.14		10.22
	15.23		17.09 42	11.09 (12)	18.37	21.14	22.57	00.10	22.59	21.09	19.16	17.28 61	14.34 (14)	14.48		14.06
24	09.28		07.45	09.59 (13)	06.04	05.11	03.26	02.25	03.44	05.27	07.01	08.33	10.29 (13)	09.17		10.22
	15.27		17.13 37	11.07 (12)	18.40	21.18	23.00	00.09	22.56	21.06	19.12	17.25 75	14.36 (14)	14.45		14.06
25	09.25		07.42	10.00 (13)	06.01	05.08	03.23	02.25	03.48	05.30	07.04	07.36	09.30 (13)	09.20		10.22
	15.30		17.16 28	11.03 (12)	18.43	21.21	23.04	00.09	22.52	21.02	19.09	16.21 81	13.38 (14)	14.43		14.07
26	09.22		07.38	10.01 (13)	05.57	05.04	03.19	02.26	03.51	05.34	07.07	07.39	09.30 (13)	09.23		10.22
	15.34		17.19 18	10.19 (13)	18.46	21.24	23.07	00.08	22.49	20.58	19.05	16.18 83	13.38 (14)	14.40		14.08
27	09.19		07.35	10.03 (13)	05.54	05.00	03.16	02.28	03.55	05.37	07.10	07.42	09.31 (13)	09.27		10.22
	15.37		17.22 15	10.18 (13)	18.50	21.28	23.11	00.07	22.46	20.55	19.01	16.14 88	13.39 (14)	14.37		14.10
28	09.16		07.31	10.05 (13)	05.50	04.57	03.13	02.29	03.58	05.40	07.13	07.46	09.32 (13)	09.30		10.22
	15.41		17.26 10	10.15 (13)	18.53	21.31	23.14	00.06	22.42	20.51	18.58	16.11 108	13.40 (14)	14.35		14.11
29	09.13	12.14 (10)			06.46	04.53	03.10	02.31	04.02	05.43	07.16	07.49	09.35 (13)	09.33		10.21
	15.44 6	12.20 (10)			19.56	21.34	23.17	00.04	22.39	20.47	18.54	16.07 111	13.40 (14)	14.32		14.12
30	09.10	12.12 (10)			06.43	04.49	03.07	02.32	04.05	05.46	07.19	07.52	09.39 (13)	09.36		10.20
	15.48 11	12.23 (10)			19.59	21.38	23.21	00.03	22.35	20.44	18.50	16.04 107	13.41 (14)	14.30		14.14
31	09.06	12.10 (10)			06.39		03.04		04.08	05.49		07.56	10.20 (12)			10.20
	15.51 21	12.52 (9)			20.02		23.24		22.32	20.40		16.01 106	13.41 (14)			14.16
Potential sun hours	162		235		363	454	578	641	621	513	394	302		192		125
Total, worst case	38		1858									1127		779		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

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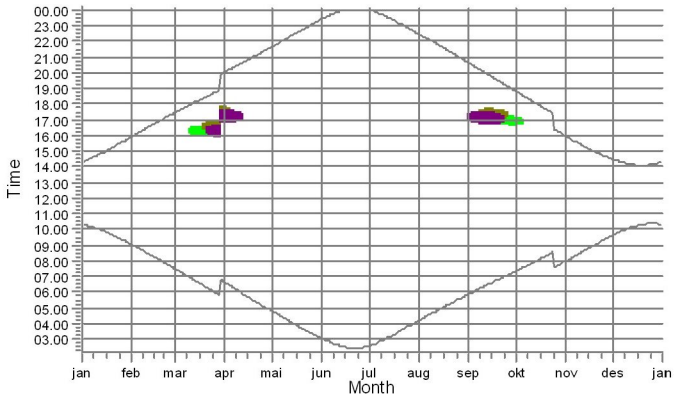
Helge Dalbu / helge.dalbu@multiconsult.no
Calculated:
20.12.2018 11.11/3.2.737

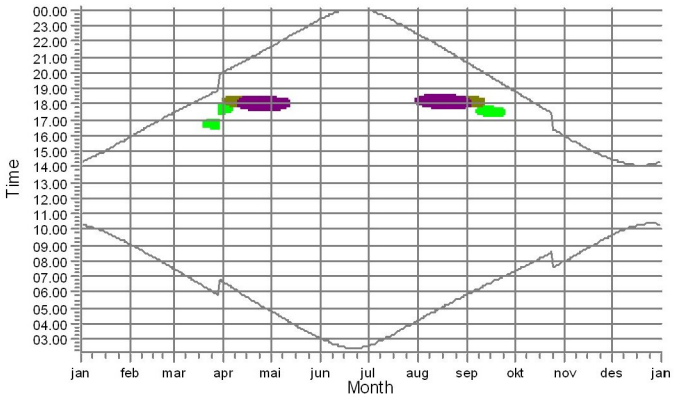
SHADOW - Calendar, graphical

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6

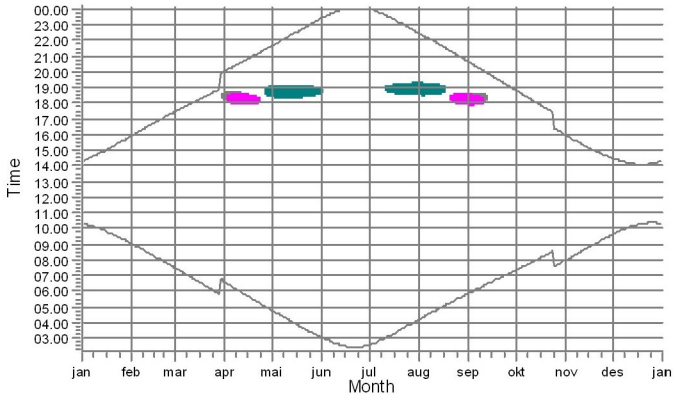
A: Hamlandsvika



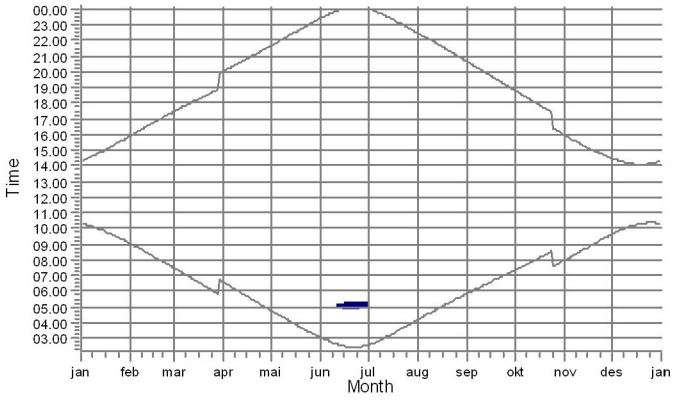
B: Skogmo



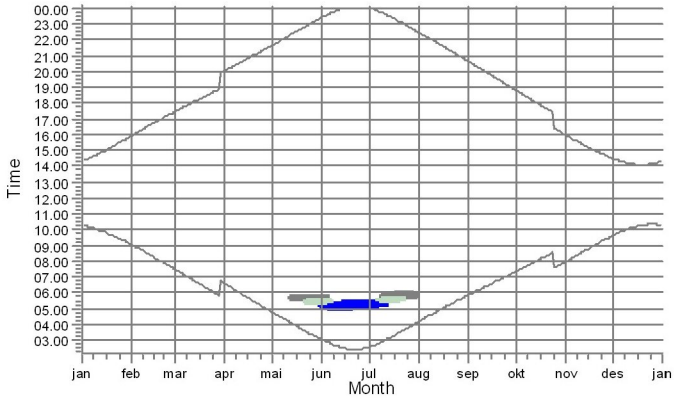
C: Hundhammer



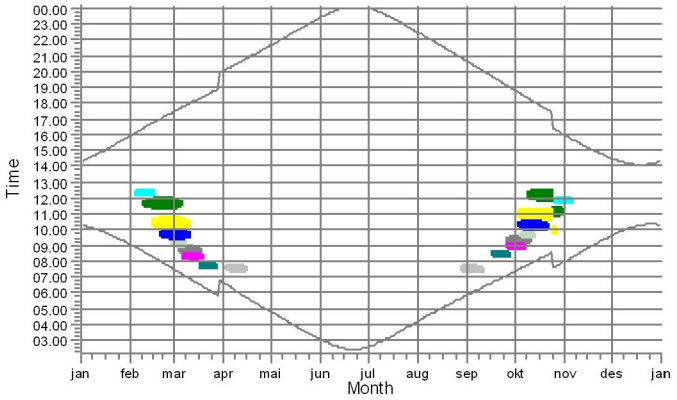
D: Klungset



E: Løvmo



F: Storeienen



WTGs

- 3: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (627)
- 4: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (628)
- 5: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (629)
- 6: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (630)
- 7: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (631)
- 8: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (632)
- 9: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (633)
- 11: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (635)
- 12: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (636)
- 13: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (637)
- 14: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (638)
- 1: M1-E-70 E4 2000 71.0
- 2: M5- E-70 E4 2,3 MW 2300

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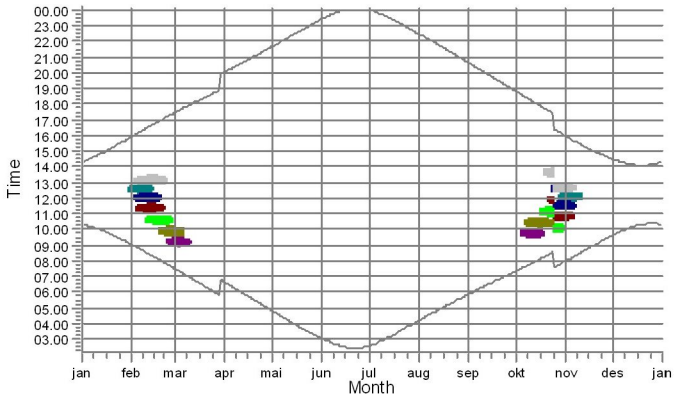
Calculated:
20.12.2018 11.11/3.2.737

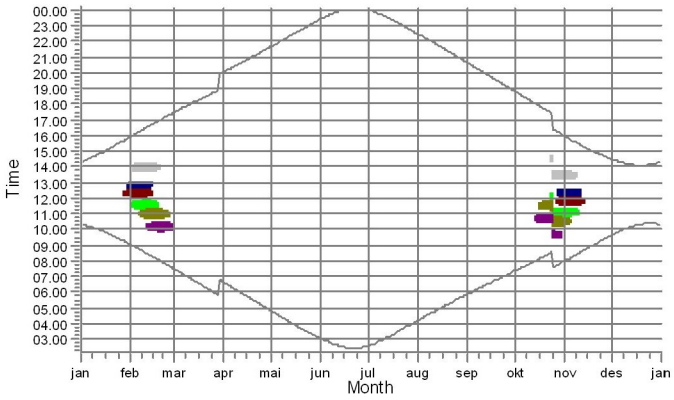
SHADOW - Calendar, graphical

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6

G: Hamland



H: Myhrvang



WTGs

- 8: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (632)
- 9: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (633)
- 10: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (634)
- 11: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (635)
- 12: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (636)
- 13: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (637)
- 14: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (638)

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Calculated:
20.12.2018 11.11/3.2.737

SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**WTG:** 3 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (627)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February		March		April	May	June	July	August	September	October		November	December
1	10.18	09.03		07.28	11.24-11.53/29	06.35	04.46	03.01	02.35	04.12	05.52	07.22		07.59	09.39
	14.19	15.55		17.29		20.05	21.41	23.27	00.01	22.28	20.36	18.47		15.57	14.28
2	10.17	09.00		07.24	11.25-11.51/26	06.32	04.43	02.58	02.37	04.16	05.55	07.25		08.02	09.42
	14.21	15.59		17.32		20.08	21.44	23.30	23.59	22.25	20.33	18.43		15.54	14.26
3	10.16	08.57		07.21	11.27-11.49/22	06.28	04.39	02.56	02.40	04.19	05.58	07.28		08.06	09.45
	14.23	16.02		17.35		20.11	21.48	23.33	23.57	22.21	20.29	18.40		15.51	14.24
4	10.14	08.54		07.17	11.30-11.47/17	06.24	04.35	02.53	02.42	04.22	06.01	07.31		08.09	09.48
	14.26	16.06		17.39		20.14	21.51	23.36	23.55	22.18	20.25	18.36		15.47	14.22
5	10.13	08.50		07.13	11.34-11.42/8	06.21	04.32	02.50	02.45	04.26	06.04	07.34		08.12	09.51
	14.28	16.09		17.42		20.17	21.54	23.39	23.52	22.14	20.22	18.32		15.44	14.20
6	10.11	08.47		07.10		06.17	04.28	02.47	02.47	04.29	06.07	07.37		08.16	09.53
	14.31	16.12		17.45		20.20	21.58	23.42	23.50	22.11	20.18	18.29		15.41	14.18
7	10.09	08.44		07.06		06.13	04.25	02.45	02.50	04.32	06.10	07.40		08.19	09.56
	14.33	16.16		17.48		20.24	22.01	23.45	23.47	22.07	20.14	18.25		15.37	14.16
8	10.08	08.40		07.03		06.10	04.21	02.42	02.53	04.36	06.13	07.43		08.23	09.59
	14.36	16.19		17.51		20.27	22.05	23.48	23.45	22.03	20.11	18.22		15.34	14.14
9	10.06	08.37		06.59		06.06	04.18	02.40	02.56	04.39	06.16	07.46	12.07-12.20/13	08.26	10.01
	14.39	16.23		17.54		20.30	22.08	23.50	23.42	22.00	20.07	18.18		15.31	14.13
10	10.04	08.34	11.37-11.43/6	06.55		06.03	04.14	02.38	02.59	04.42	06.19	07.49	12.03-12.22/19	08.29	10.03
	14.42	16.26		17.57		20.33	22.12	23.53	23.39	21.56	20.03	18.14		15.28	14.12
11	10.02	08.30	11.32-11.47/15	06.52		05.59	04.11	02.36	03.02	04.46	06.22	07.52	12.00-12.24/24	08.33	10.06
	14.45	16.30		18.01		20.36	22.15	23.55	23.37	21.53	20.00	18.11		15.24	14.10
12	09.59	08.27	11.31-11.50/19	06.48		05.55	04.07	02.34	03.05	04.49	06.25	07.55	11.58-12.25/27	08.36	10.08
	14.48	16.33		18.04		20.39	22.19	23.58	23.34	21.49	19.56	18.07		15.21	14.09
13	09.57	08.24	11.29-11.52/23	06.45		05.52	04.04	02.32	03.08	04.52	06.28	07.58	11.57-12.27/30	08.40	10.10
	14.51	16.36		18.07		20.42	22.22	00.00	23.31	21.46	19.52	18.04		15.18	14.08
14	09.55	08.20	11.27-11.54/27	06.41		05.48	04.00	02.30	03.11	04.56	06.31	08.01	11.56-12.27/31	08.43	10.11
	14.54	16.40		18.10		20.46	22.25	00.01	23.28	21.42	19.49	18.00		15.15	14.07
15	09.52	08.17	11.26-11.55/29	06.37		05.44	03.57	02.29	03.15	04.59	06.34	08.04	11.55-12.27/32	08.46	10.13
	14.57	16.43		18.13		20.49	22.29	00.03	23.25	21.38	19.45	17.57		15.12	14.06
16	09.50	08.13	11.25-11.55/30	06.34		05.41	03.53	02.28	03.18	05.02	06.37	08.07	11.54-12.28/34	08.50	10.15
	15.00	16.47		18.16		20.52	22.32	00.05	23.22	21.35	19.42	17.53		15.09	14.06
17	09.47	08.10	11.24-11.56/32	06.30		05.37	03.50	02.27	03.21	05.05	06.40	08.11	11.53-12.28/35	08.53	10.16
	15.04	16.50		18.19		20.55	22.36	00.06	23.19	21.31	19.38	17.49		15.06	14.05
18	09.45	08.06	11.23-11.57/34	06.27		05.33	03.46	02.26	03.24	05.08	06.43	08.14	11.54-12.29/35	08.57	10.17
	15.07	16.53		18.22		20.58	22.39	00.07	23.15	21.27	19.34	17.46		15.03	14.05
19	09.42	08.03	11.23-11.57/34	06.23		05.30	03.43	02.25	03.28	05.12	06.46	08.17	11.53-12.28/35	09.00	10.19
	15.10	16.57		18.25		21.01	22.43	00.08	23.12	21.24	19.31	17.42		15.00	14.05
20	09.39	07.59	11.22-11.57/35	06.19		05.26	03.40	02.25	03.31	05.15	06.49	08.20	11.53-12.28/35	09.03	10.20
	15.14	17.00		18.28		21.05	22.46	00.09	23.09	21.20	19.27	17.39		14.57	14.05
21	09.36	07.56	11.23-11.58/35	06.16		05.22	03.36	02.24	03.35	05.18	06.52	08.23	11.52-12.28/36	09.07	10.20
	15.17	17.03		18.31		21.08	22.50	00.09	23.06	21.17	19.23	17.35		14.54	14.05
22	09.34	07.52	11.22-11.58/36	06.12		05.19	03.33	02.25	03.38	05.21	06.55	08.26	11.53-12.28/35	09.10	10.21
	15.20	17.06		18.34		21.11	22.53	00.09	23.02	21.13	19.20	17.32		14.51	14.06
23	09.31	07.49	11.22-11.57/35	06.08		05.15	03.30	02.25	03.41	05.24	06.58	08.30	11.54-12.28/34	09.13	10.21
	15.24	17.10		18.37		21.14	22.57	00.09	22.59	21.09	19.16	17.28		14.48	14.06
24	09.28	07.45	11.22-11.57/35	06.05		05.11	03.26	02.25	03.45	05.28	07.01	08.33	11.53-12.26/33	09.17	10.22
	15.27	17.13		18.41		21.18	23.00	00.09	22.56	21.06	19.12	17.25		14.46	14.07
25	09.25	07.42	11.22-11.56/34	06.01		05.08	03.23	02.26	03.48	05.31	07.04	07.36	10.54-11.26/32	09.20	10.22
	15.31	17.16		18.44		21.21	23.04	00.08	22.52	21.02	19.09	16.21		14.43	14.08
26	09.22	07.38	11.22-11.56/34	05.57		05.04	03.20	02.27	03.52	05.34	07.07	07.39	10.55-11.25/30	09.23	10.22
	15.34	17.19		18.47		21.24	23.07	00.08	22.49	20.58	19.05	16.18		14.40	14.09
27	09.19	07.35	11.23-11.56/33	05.54		05.01	03.17	02.28	03.55	05.37	07.10	07.43	10.55-11.23/28	09.27	10.22
	15.38	17.23		18.50		21.28	23.10	00.07	22.45	20.55	19.01	16.14		14.38	14.10
28	09.16	07.31	11.24-11.54/30	05.50		04.57	03.13	02.30	03.58	05.40	07.13	07.46	10.57-11.22/25	09.30	10.21
	15.41	17.26		18.53		21.31	23.14	00.05	22.42	20.51	18.58	16.11		14.35	14.11
29	09.13			06.46		04.53	03.10	02.31	04.02	05.43	07.16	07.49	10.58-11.21/23	09.33	10.21
	15.45			19.56		21.34	23.17	00.04	22.39	20.47	18.54	16.08		14.33	14.13
30	09.10			06.43		04.50	03.07	02.33	04.05	05.46	07.19	07.52	11.00-11.19/19	09.36	10.20
	15.48			19.59		21.38	23.20	00.02	22.35	20.44	18.50	16.04		14.30	14.15
31	09.06			06.39			03.04		04.09	05.49		07.56	11.03-11.17/14		10.19
	15.52			20.02			23.24		22.32	20.40		16.01			14.16
Potential sun hours	163	235		363		454	578	641	620	513	394	302		192	125
Sum of minutes with flicker	0	556		102		0	0	0	0	0	0	659		0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**WTG:** 4 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (628)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February		March		April	May	June	July	August	September	October		November	December
1	10.18	09.03		07.28	10.07-10.45/38	06.35	04.46	03.01	02.35	04.12	05.52	07.22		07.59	09.39
	14.19	15.55		17.29		20.05	21.41	23.27	00.01	22.28	20.36	18.47		15.57	14.28
2	10.17	09.00		07.24	10.07-10.44/37	06.32	04.43	02.58	02.37	04.16	05.55	07.25		08.02	09.42
	14.21	15.59		17.32		20.08	21.44	23.30	23.59	22.25	20.33	18.43		15.54	14.26
3	10.16	08.57		07.21	10.07-10.43/36	06.28	04.39	02.55	02.40	04.19	05.58	07.28	10.57-11.07/10	08.06	09.45
	14.23	16.02		17.35		20.11	21.48	23.33	23.57	22.21	20.29	18.40		15.51	14.24
4	10.14	08.54		07.17	10.08-10.43/35	06.24	04.35	02.53	02.42	04.22	06.01	07.31	10.52-11.10/18	08.09	09.48
	14.26	16.05		17.39		20.14	21.51	23.36	23.55	22.18	20.25	18.36		15.47	14.22
5	10.13	08.50		07.13	10.08-10.42/34	06.21	04.32	02.50	02.45	04.26	06.04	07.34	10.49-11.13/24	08.12	09.51
	14.28	16.09		17.42		20.17	21.54	23.39	23.52	22.14	20.22	18.32		15.44	14.20
6	10.11	08.47		07.10	10.09-10.40/31	06.17	04.28	02.47	02.47	04.29	06.07	07.37	10.47-11.14/27	08.16	09.53
	14.31	16.12		17.45		20.20	21.58	23.42	23.50	22.11	20.18	18.29		15.41	14.18
7	10.09	08.44		07.06	10.10-10.38/28	06.13	04.25	02.45	02.50	04.32	06.10	07.40	10.45-11.15/30	08.19	09.56
	14.33	16.16		17.48		20.24	22.01	23.45	23.48	22.07	20.14	18.25		15.37	14.16
8	10.08	08.40		07.03	10.12-10.37/25	06.10	04.21	02.42	02.53	04.36	06.13	07.43	10.44-11.16/32	08.23	09.59
	14.36	16.19		17.51		20.27	22.05	23.48	23.45	22.03	20.11	18.22		15.34	14.14
9	10.06	08.37		06.59	10.13-10.34/21	06.06	04.18	02.40	02.56	04.39	06.16	07.46	10.43-11.17/34	08.26	10.01
	14.39	16.23		17.54		20.30	22.08	23.50	23.42	22.00	20.07	18.18		15.31	14.13
10	10.04	08.34		06.55	10.16-10.30/14	06.02	04.14	02.38	02.59	04.42	06.19	07.49	10.42-11.18/36	08.29	10.03
	14.42	16.26		17.57		20.33	22.12	23.53	23.39	21.56	20.03	18.14		15.28	14.11
11	10.02	08.30		06.52		05.59	04.11	02.36	03.02	04.46	06.22	07.52	10.41-11.18/37	08.33	10.06
	14.45	16.30		18.01		20.36	22.15	23.55	23.37	21.53	20.00	18.11		15.24	14.10
12	09.59	08.27		06.48		05.55	04.07	02.34	03.05	04.49	06.25	07.55	10.40-11.17/37	08.36	10.08
	14.48	16.33		18.04		20.39	22.19	23.58	23.34	21.49	19.56	18.07		15.21	14.09
13	09.57	08.24		06.45		05.52	04.04	02.32	03.08	04.52	06.28	07.58	10.40-11.18/38	08.40	10.10
	14.51	16.36		18.07		20.42	22.22	00.00	23.31	21.46	19.52	18.04		15.18	14.08
14	09.55	08.20		06.41		05.48	04.00	02.30	03.11	04.56	06.31	08.01	10.40-11.18/38	08.43	10.11
	14.54	16.40		18.10		20.46	22.25	00.02	23.28	21.42	19.49	18.00		15.15	14.07
15	09.52	08.17	10.20-10.35/15	06.37		05.44	03.57	02.29	03.14	04.59	06.34	08.04	10.39-11.17/38	08.46	10.13
	14.57	16.43		18.13		20.49	22.29	00.03	23.25	21.38	19.45	17.57		15.12	14.06
16	09.50	08.13	10.17-10.37/20	06.34		05.41	03.53	02.28	03.18	05.02	06.37	08.07	10.39-11.17/38	08.50	10.15
	15.00	16.47		18.16		20.52	22.32	00.05	23.22	21.35	19.42	17.53		15.09	14.06
17	09.47	08.10	10.15-10.39/24	06.30		05.37	03.50	02.27	03.21	05.05	06.40	08.11	10.39-11.17/38	08.53	10.16
	15.04	16.50		18.19		20.55	22.36	00.06	23.19	21.31	19.38	17.49		15.06	14.05
18	09.45	08.06	10.13-10.41/28	06.26		05.33	03.46	02.26	03.24	05.08	06.43	08.14	10.40-11.17/37	08.57	10.17
	15.07	16.53		18.22		20.58	22.39	00.07	23.15	21.27	19.34	17.46		15.03	14.05
19	09.42	08.03	10.12-10.42/30	06.23		05.30	03.43	02.25	03.28	05.12	06.46	08.17	10.39-11.15/36	09.00	10.19
	15.10	16.56		18.25		21.01	22.43	00.08	23.12	21.24	19.31	17.42		15.00	14.05
20	09.39	07.59	10.11-10.43/32	06.19		05.26	03.40	02.25	03.31	05.15	06.49	08.20	10.40-11.15/35	09.03	10.20
	15.14	17.00		18.28		21.05	22.46	00.09	23.09	21.20	19.27	17.39		14.57	14.05
21	09.36	07.56	10.10-10.44/34	06.16		05.22	03.36	02.24	03.35	05.18	06.52	08.23	10.40-11.14/34	09.07	10.20
	15.17	17.03		18.31		21.08	22.50	00.09	23.06	21.17	19.23	17.35		14.54	14.05
22	09.34	07.52	10.09-10.45/36	06.12		05.19	03.33	02.24	03.38	05.21	06.55	08.26	10.42-11.13/31	09.10	10.21
	15.20	17.06		18.34		21.11	22.53	00.09	23.02	21.13	19.20	17.32		14.51	14.06
23	09.31	07.49	10.09-10.45/36	06.08		05.15	03.30	02.25	03.41	05.24	06.58	08.30	10.43-11.12/29	09.13	10.21
	15.24	17.10		18.37		21.14	22.57	00.09	22.59	21.09	19.16	17.28		14.48	14.06
24	09.28	07.45	10.08-10.45/37	06.05		05.11	03.26	02.25	03.45	05.27	07.01	08.33	10.44-11.10/26	09.17	10.22
	15.27	17.13		18.40		21.18	23.00	00.09	22.56	21.06	19.12	17.25		14.46	14.07
25	09.25	07.42	10.07-10.45/38	06.01		05.08	03.23	02.26	03.48	05.31	07.04	07.36	09.46-10.09/23	09.20	10.22
	15.31	17.16		18.44		21.21	23.04	00.08	22.52	21.02	19.09	16.21		14.43	14.08
26	09.22	07.38	10.07-10.45/38	05.57		05.04	03.20	02.27	03.52	05.34	07.07	07.39	09.48-10.07/19	09.23	10.22
	15.34	17.19		18.47		21.24	23.07	00.08	22.49	20.58	19.05	16.18		14.40	14.09
27	09.19	07.35	10.07-10.46/39	05.54		05.01	03.17	02.28	03.55	05.37	07.10	07.43	09.50-10.03/13	09.27	10.22
	15.38	17.23		18.50		21.28	23.10	00.07	22.45	20.55	19.01	16.14		14.38	14.10
28	09.16	07.31	10.07-10.45/38	05.50		04.57	03.13	02.30	03.58	05.40	07.13	07.46		09.30	10.21
	15.41	17.26		18.53		21.31	23.14	00.05	22.42	20.51	18.58	16.11		14.35	14.11
29	09.13			06.46		04.53	03.10	02.31	04.02	05.43	07.16	07.49		09.33	10.21
	15.45			19.56		21.34	23.17	00.04	22.39	20.47	18.54	16.08		14.33	14.13
30	09.10			06.43		04.50	03.07	02.33	04.05	05.46	07.19	07.52		09.36	10.20
	15.48			19.59		21.38	23.20	00.02	22.35	20.44	18.50	16.04		14.30	14.15
31	09.06			06.39			03.04		04.09	05.49		07.56			10.19
	15.52			20.02			23.24		22.32	20.40		16.01			14.16
Potential sun hours	163	235		363		454	578	641	620	513	394	302		192	125
Sum of minutes with flicker	0	445		299		0	0	0	0	0	0	758		0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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20.12.2018 11.11/3.2.737

SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**WTG:** 5 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (629)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February		March		April	May		June	
1	10.18	09.03		07.28	09.28-09.58/30	06.35	04.46		03.01	05.06-05.13/7
	14.19	15.55		17.29		20.05	21.41		23.27	
2	10.17	09.00		07.24	09.28-09.57/29	06.32	04.43		02.58	05.05-05.16/11
	14.21	15.58		17.32		20.08	21.44		23.30	
3	10.16	08.57		07.21	09.28-09.57/29	06.28	04.39		02.55	05.04-05.17/13
	14.23	16.02		17.35		20.11	21.48		23.33	
4	10.14	08.54		07.17	09.28-09.57/29	06.24	04.35		02.53	05.02-05.17/15
	14.26	16.05		17.39		20.14	21.51		23.36	
5	10.13	08.50		07.13	09.29-09.56/27	06.21	04.32		02.50	05.02-05.18/16
	14.28	16.09		17.42		20.17	21.54		23.39	
6	10.11	08.47		07.10	09.29-09.55/26	06.17	04.28		02.47	05.01-05.19/18
	14.31	16.12		17.45		20.20	21.58		23.42	
7	10.09	08.44		07.06	09.29-09.53/24	06.13	04.25		02.45	05.01-05.19/18
	14.33	16.16		17.48		20.24	22.01		23.45	
8	10.08	08.40		07.03	09.31-09.52/21	06.10	04.21		02.42	05.01-05.20/19
	14.36	16.19		17.51		20.27	22.05		23.48	
9	10.06	08.37		06.59	09.32-09.50/18	06.06	04.18		02.40	05.01-05.21/20
	14.39	16.23		17.54		20.30	22.08		23.50	
10	10.04	08.34		06.55	09.35-09.46/11	06.02	04.14		02.38	05.01-05.21/20
	14.42	16.26		17.57		20.33	22.12		23.53	
11	10.01	08.30		06.52		05.59	04.11		02.36	05.01-05.22/21
	14.45	16.30		18.00		20.36	22.15		23.55	
12	09.59	08.27		06.48		05.55	04.07		02.34	05.01-05.22/21
	14.48	16.33		18.04		20.39	22.19		23.57	
13	09.57	08.24		06.45		05.52	04.04		02.32	05.01-05.22/21
	14.51	16.36		18.07		20.42	22.22		00.00	
14	09.55	08.20		06.41		05.48	04.00		02.30	05.01-05.23/22
	14.54	16.40		18.10		20.45	22.25		00.01	
15	09.52	08.17		06.37		05.44	03.57		02.29	05.01-05.23/22
	14.57	16.43		18.13		20.49	22.29		00.03	
16	09.50	08.13		06.34		05.41	03.53		02.28	05.01-05.24/23
	15.00	16.46		18.16		20.52	22.32		00.05	
17	09.47	08.10		06.30		05.37	03.50		02.27	05.01-05.23/22
	15.04	16.50		18.19		20.55	22.36		00.06	
18	09.45	08.06		06.26		05.33	03.46		02.26	05.01-05.24/23
	15.07	16.53		18.22		20.58	22.39		00.07	
19	09.42	08.03		06.23		05.30	03.43		02.25	05.01-05.24/23
	15.10	16.56		18.25		21.01	22.43		00.08	
20	09.39	07.59	09.41-09.47/6	06.19		05.26	03.40		02.25	05.02-05.24/22
	15.14	17.00		18.28		21.05	22.46		00.09	
21	09.36	07.56	09.37-09.52/15	06.16		05.22	03.36		02.24	05.02-05.24/22
	15.17	17.03		18.31		21.08	22.50		00.09	
22	09.34	07.52	09.35-09.53/18	06.12		05.19	03.33		02.24	05.03-05.25/22
	15.20	17.06		18.34		21.11	22.53		00.09	
23	09.31	07.49	09.33-09.55/22	06.08		05.15	03.29		02.25	05.02-05.25/23
	15.24	17.10		18.37		21.14	22.57		00.09	
24	09.28	07.45	09.31-09.56/25	06.05		05.11	03.26		02.25	05.02-05.25/23
	15.27	17.13		18.40		21.18	23.00		00.09	
25	09.25	07.42	09.30-09.56/26	06.01		05.08	03.23		02.26	05.03-05.26/23
	15.31	17.16		18.44		21.21	23.04		00.08	
26	09.22	07.38	09.29-09.57/28	05.57		05.04	03.20		02.27	05.04-05.26/22
	15.34	17.19		18.47		21.24	23.07		00.07	
27	09.19	07.35	09.29-09.58/29	05.54		05.01	03.17		02.28	05.04-05.26/22
	15.38	17.23		18.50		21.28	23.10		00.07	
28	09.16	07.31	09.29-09.58/29	05.50		04.57	03.13		02.30	05.04-05.26/22
	15.41	17.26		18.53		21.31	23.14		00.05	
29	09.13			06.46		04.53	03.10		02.31	05.04-05.26/22
	15.45			19.56		21.34	23.17		00.04	
30	09.10			06.43		04.50	03.07		02.33	05.04-05.26/22
	15.48			19.59		21.38	23.20		00.02	
31	09.06			06.39			03.04	05.09-05.10/1		
	15.52			20.02			23.24			
Potential sun hours	163	235		363		454	578		641	
Sum of minutes with flicker	0	198		244		0	1		600	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**WTG:** 5 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (629)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July		August	September	October		November	December
1	02.35	05.05-05.26/21	04.12	05.52	07.22		07.59	09.39
	00.01		22.28	20.36	18.47		15.57	14.28
2	02.37	05.06-05.26/20	04.15	05.55	07.25		08.02	09.42
	23.59		22.25	20.33	18.43		15.54	14.26
3	02.40	05.06-05.26/20	04.19	05.58	07.28	10.15-10.22/7	08.06	09.45
	23.57		22.21	20.29	18.40		15.51	14.24
4	02.42	05.07-05.26/19	04.22	06.01	07.31	10.11-10.26/15	08.09	09.48
	23.55		22.18	20.25	18.36		15.47	14.22
5	02.45	05.07-05.25/18	04.26	06.04	07.34	10.09-10.28/19	08.12	09.51
	23.52		22.14	20.22	18.32		15.44	14.20
6	02.47	05.08-05.25/17	04.29	06.07	07.37	10.07-10.29/22	08.16	09.53
	23.50		22.11	20.18	18.29		15.41	14.18
7	02.50	05.09-05.25/16	04.32	06.10	07.40	10.05-10.30/25	08.19	09.56
	23.47		22.07	20.14	18.25		15.37	14.16
8	02.53	05.09-05.24/15	04.36	06.13	07.43	10.04-10.30/26	08.23	09.59
	23.45		22.03	20.11	18.22		15.34	14.14
9	02.56	05.10-05.24/14	04.39	06.16	07.46	10.04-10.31/27	08.26	10.01
	23.42		22.00	20.07	18.18		15.31	14.13
10	02.59	05.11-05.23/12	04.42	06.19	07.49	10.03-10.31/28	08.29	10.03
	23.39		21.56	20.03	18.14		15.28	14.11
11	03.02	05.13-05.22/9	04.46	06.22	07.52	10.02-10.31/29	08.33	10.06
	23.37		21.53	20.00	18.11		15.24	14.10
12	03.05	05.15-05.20/5	04.49	06.25	07.55	10.01-10.31/30	08.36	10.08
	23.34		21.49	19.56	18.07		15.21	14.09
13	03.08		04.52	06.28	07.58	10.02-10.31/29	08.40	10.10
	23.31		21.45	19.52	18.04		15.18	14.08
14	03.11		04.55	06.31	08.01	10.01-10.30/29	08.43	10.11
	23.28		21.42	19.49	18.00		15.15	14.07
15	03.14		04.59	06.34	08.04	10.01-10.29/28	08.46	10.13
	23.25		21.38	19.45	17.57		15.12	14.06
16	03.18		05.02	06.37	08.07	10.02-10.29/27	08.50	10.15
	23.22		21.35	19.41	17.53		15.09	14.06
17	03.21		05.05	06.40	08.10	10.02-10.28/26	08.53	10.16
	23.19		21.31	19.38	17.49		15.06	14.05
18	03.24		05.08	06.43	08.14	10.04-10.27/23	08.57	10.17
	23.15		21.27	19.34	17.46		15.03	14.05
19	03.28		05.12	06.46	08.17	10.04-10.25/21	09.00	10.19
	23.12		21.24	19.31	17.42		15.00	14.05
20	03.31		05.15	06.49	08.20	10.06-10.24/18	09.03	10.20
	23.09		21.20	19.27	17.39		14.57	14.05
21	03.35		05.18	06.52	08.23	10.08-10.20/12	09.07	10.20
	23.06		21.17	19.23	17.35		14.54	14.05
22	03.38		05.21	06.55	08.26		09.10	10.21
	23.02		21.13	19.20	17.32		14.51	14.06
23	03.41		05.24	06.58	08.30		09.13	10.21
	22.59		21.09	19.16	17.28		14.48	14.06
24	03.45		05.27	07.01	08.33		09.17	10.22
	22.56		21.06	19.12	17.25		14.46	14.07
25	03.48		05.31	07.04	07.36		09.20	10.22
	22.52		21.02	19.09	16.21		14.43	14.08
26	03.52		05.34	07.07	07.39		09.23	10.22
	22.49		20.58	19.05	16.18		14.40	14.09
27	03.55		05.37	07.10	07.42		09.27	10.22
	22.45		20.55	19.01	16.14		14.38	14.10
28	03.58		05.40	07.13	07.46		09.30	10.21
	22.42		20.51	18.58	16.11		14.35	14.11
29	04.02		05.43	07.16	07.49		09.33	10.21
	22.39		20.47	18.54	16.08		14.33	14.13
30	04.05		05.46	07.19	07.52		09.36	10.20
	22.35		20.44	18.50	16.04		14.30	14.15
31	04.09		05.49		07.56			10.19
	22.32		20.40		16.01			14.16
Potential sun hours	620		513	394	302		192	125
Sum of minutes with flicker		186	0	0		441	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**WTG:** 6 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (630)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March		April		May		June	
1	10.18	09.03	07.28		06.35	18.20-18.35/15	04.46		03.01	05.35-05.48/13
	14.19	15.55	17.29		20.05		21.41		23.27	
2	10.17	09.00	07.24		06.32	18.18-18.36/18	04.43		02.58	05.37-05.48/11
	14.21	15.58	17.32		20.08		21.44		23.30	
3	10.16	08.57	07.21		06.28	18.17-18.37/20	04.39		02.55	05.38-05.46/8
	14.23	16.02	17.35		20.11		21.48		23.33	
4	10.14	08.54	07.17	08.40-08.50/10	06.24	18.15-18.37/22	04.35		02.53	05.39-05.45/6
	14.26	16.05	17.39		20.14		21.51		23.36	
5	10.13	08.50	07.13	08.37-08.52/15	06.21	18.15-18.38/23	04.32		02.50	
	14.28	16.09	17.42		20.17		21.54		23.39	
6	10.11	08.47	07.10	08.35-08.53/18	06.17	18.14-18.38/24	04.28		02.47	
	14.31	16.12	17.45		20.20		21.58		23.42	
7	10.09	08.44	07.06	08.34-08.53/19	06.13	18.14-18.38/24	04.25		02.45	
	14.33	16.16	17.48		20.23		22.01		23.45	
8	10.08	08.40	07.03	08.34-08.54/20	06.10	18.14-18.37/23	04.21		02.42	
	14.36	16.19	17.51		20.27		22.05		23.48	
9	10.06	08.37	06.59	08.33-08.54/21	06.06	18.14-18.37/23	04.18		02.40	
	14.39	16.23	17.54		20.30		22.08		23.50	
10	10.04	08.34	06.55	08.32-08.54/22	06.02	18.14-18.36/22	04.14		02.38	
	14.42	16.26	17.57		20.33		22.12		23.53	
11	10.01	08.30	06.52	08.31-08.54/23	05.59	18.14-18.34/20	04.11		02.36	
	14.45	16.30	18.00		20.36		22.15		23.55	
12	09.59	08.27	06.48	08.32-08.54/22	05.55	18.16-18.33/17	04.07	05.38-05.44/6	02.34	
	14.48	16.33	18.04		20.39		22.18		23.57	
13	09.57	08.24	06.45	08.32-08.53/21	05.51	18.17-18.32/15	04.04	05.36-05.46/10	02.32	
	14.51	16.36	18.07		20.42		22.22		00.00	
14	09.55	08.20	06.41	08.32-08.51/19	05.48	18.19-18.29/10	04.00	05.34-05.47/13	02.30	
	14.54	16.40	18.10		20.45		22.25		00.01	
15	09.52	08.17	06.37	08.33-08.50/17	05.44		03.57	05.33-05.48/15	02.29	
	14.57	16.43	18.13		20.49		22.29		00.03	
16	09.50	08.13	06.34	08.35-08.48/13	05.41		03.53	05.33-05.49/16	02.28	
	15.00	16.46	18.16		20.52		22.32		00.05	
17	09.47	08.10	06.30	08.37-08.45/8	05.37		03.50	05.32-05.49/17	02.27	
	15.04	16.50	18.19		20.55		22.36		00.06	
18	09.44	08.06	06.26		05.33		03.46	05.31-05.49/18	02.26	
	15.07	16.53	18.22		20.58		22.39		00.07	
19	09.42	08.03	06.23		05.30		03.43	05.31-05.50/19	02.25	
	15.10	16.56	18.25		21.01		22.43		00.08	
20	09.39	07.59	06.19		05.26		03.39	05.31-05.50/19	02.25	
	15.14	17.00	18.28		21.05		22.46		00.09	
21	09.36	07.56	06.16		05.22		03.36	05.31-05.51/20	02.24	
	15.17	17.03	18.31		21.08		22.50		00.09	
22	09.33	07.52	06.12		05.19		03.33	05.31-05.50/19	02.24	
	15.20	17.06	18.34		21.11		22.53		00.09	
23	09.31	07.49	06.08		05.15		03.29	05.31-05.51/20	02.25	
	15.24	17.10	18.37		21.14		22.57		00.09	
24	09.28	07.45	06.05		05.11		03.26	05.32-05.51/19	02.25	
	15.27	17.13	18.40		21.18		23.00		00.09	
25	09.25	07.42	06.01		05.08		03.23	05.31-05.50/19	02.26	
	15.31	17.16	18.43		21.21		23.04		00.08	
26	09.22	07.38	05.57		05.04		03.20	05.32-05.50/18	02.27	
	15.34	17.19	18.47		21.24		23.07		00.07	
27	09.19	07.35	05.54		05.01		03.16	05.32-05.50/18	02.28	
	15.38	17.23	18.50		21.27		23.10		00.06	
28	09.16	07.31	05.50		04.57		03.13	05.33-05.50/17	02.30	
	15.41	17.26	18.53		21.31		23.14		00.05	
29	09.13		06.46		04.53		03.10	05.34-05.49/15	02.31	
	15.45		19.56		21.34		23.17		00.04	
30	09.10		06.43		04.50		03.07	05.34-05.49/15	02.33	
	15.48		19.59		21.37		23.20		00.02	
31	09.06		06.39	18.23-18.33/10			03.04	05.35-05.48/13		
	15.51		20.02				23.24			
Potential sun hours	163	235	363		454		578		641	
Sum of minutes with flicker	0	0	258		276		326		38	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**WTG:** 6 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (630)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July		August		September		October		November	December
1	02.35		04.12		05.52	18.14-18.34/20	07.22	09.11-09.32/21	07.59	09.39
	00.01		22.28		20.36		18.47		15.57	14.28
2	02.37		04.15		05.55	18.12-18.34/22	07.25	09.10-09.32/22	08.02	09.42
	23.59		22.25		20.33		18.43		15.54	14.26
3	02.39		04.19		05.58	18.11-18.34/23	07.28	09.10-09.33/23	08.06	09.45
	23.57		22.21		20.29		18.40		15.51	14.24
4	02.42		04.22		06.01	18.11-18.34/23	07.31	09.10-09.32/22	08.09	09.48
	23.55		22.18		20.25		18.36		15.47	14.22
5	02.44		04.26		06.04	18.10-18.34/24	07.34	09.10-09.31/21	08.12	09.51
	23.52		22.14		20.22		18.32		15.44	14.20
6	02.47		04.29		06.07	18.10-18.34/24	07.37	09.10-09.30/20	08.16	09.53
	23.50		22.10		20.18		18.29		15.41	14.18
7	02.50		04.32		06.10	18.10-18.33/23	07.40	09.11-09.29/18	08.19	09.56
	23.47		22.07		20.14		18.25		15.37	14.16
8	02.53	05.46-05.51/5	04.36		06.13	18.11-18.33/22	07.43	09.11-09.27/16	08.23	09.58
	23.45		22.03		20.11		18.22		15.34	14.14
9	02.56	05.45-05.53/8	04.39		06.16	18.10-18.31/21	07.46	09.14-09.26/12	08.26	10.01
	23.42		22.00		20.07		18.18		15.31	14.13
10	02.59	05.44-05.54/10	04.42		06.19	18.11-18.30/19	07.49	09.17-09.22/5	08.29	10.03
	23.39		21.56		20.03		18.14		15.28	14.11
11	03.02	05.44-05.55/11	04.46		06.22	18.12-18.28/16	07.52		08.33	10.05
	23.37		21.53		20.00		18.11		15.24	14.10
12	03.05	05.43-05.56/13	04.49		06.25	18.14-18.25/11	07.55		08.36	10.08
	23.34		21.49		19.56		18.07		15.21	14.09
13	03.08	05.42-05.57/15	04.52		06.28		07.58		08.40	10.10
	23.31		21.45		19.52		18.04		15.18	14.08
14	03.11	05.43-05.58/15	04.55		06.31		08.01		08.43	10.11
	23.28		21.42		19.49		18.00		15.15	14.07
15	03.14	05.42-05.59/17	04.59		06.34		08.04		08.46	10.13
	23.25		21.38		19.45		17.56		15.12	14.06
16	03.18	05.42-05.59/17	05.02		06.37		08.07		08.50	10.15
	23.22		21.35		19.41		17.53		15.09	14.06
17	03.21	05.41-05.59/18	05.05		06.40		08.10		08.53	10.16
	23.18		21.31		19.38		17.49		15.06	14.05
18	03.24	05.42-06.00/18	05.08		06.43		08.14		08.57	10.17
	23.15		21.27		19.34		17.46		15.03	14.05
19	03.28	05.41-06.00/19	05.12		06.46		08.17		09.00	10.19
	23.12		21.24		19.30		17.42		15.00	14.05
20	03.31	05.42-06.01/19	05.15		06.49		08.20		09.03	10.19
	23.09		21.20		19.27		17.39		14.57	14.05
21	03.34	05.41-06.00/19	05.18		06.52		08.23		09.07	10.20
	23.06		21.16		19.23		17.35		14.54	14.05
22	03.38	05.42-06.01/19	05.21		06.55		08.26		09.10	10.21
	23.02		21.13		19.20		17.32		14.51	14.06
23	03.41	05.41-06.00/19	05.24		06.58		08.29		09.13	10.21
	22.59		21.09		19.16		17.28		14.48	14.06
24	03.45	05.42-06.01/19	05.27		07.01		08.33		09.17	10.22
	22.56		21.06		19.12		17.25		14.46	14.07
25	03.48	05.41-06.00/19	05.31		07.04		07.36		09.20	10.22
	22.52		21.02		19.09		16.21		14.43	14.08
26	03.52	05.42-06.00/18	05.34		07.07	09.22-09.24/2	07.39		09.23	10.22
	22.49		20.58		19.05		16.18		14.40	14.09
27	03.55	05.43-06.00/17	05.37		07.10	09.17-09.29/12	07.42		09.27	10.22
	22.45		20.55		19.01		16.14		14.38	14.10
28	03.58	05.43-05.59/16	05.40		07.13	09.15-09.30/15	07.46		09.30	10.21
	22.42		20.51		18.58		16.11		14.35	14.11
29	04.02	05.44-05.58/14	05.43	18.20-18.30/10	07.16	09.13-09.31/18	07.49		09.33	10.21
	22.39		20.47		18.54		16.08		14.33	14.13
30	04.05	05.45-05.57/12	05.46	18.17-18.32/15	07.19	09.12-09.32/20	07.52		09.36	10.20
	22.35		20.44		18.50		16.04		14.30	14.15
31	04.09	05.46-05.55/9	05.49	18.15-18.33/18			07.56			10.19
	22.32		20.40				16.01			14.16
Potential sun hours	620		513		394		302		192	125
Sum of minutes with flicker		366		43		315		180	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**WTG:** 7 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (631)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	10.18	09.03	07.28	06.35	04.46	03.01	02.35	04.12	05.52 18.00-18.30/30	07.22 08.47-09.07/20	07.59	09.39
	14.19	15.55	17.29	20.05	21.41	23.27	00.01	22.28	20.36	18.47	15.57	14.28
2	10.17	09.00	07.24	06.32	04.42	02.58	02.37	04.15	05.55 17.59-18.29/30	07.25 08.47-09.06/19	08.02	09.42
	14.21	15.58	17.32	20.08	21.44	23.30	23.59	22.25	20.33	18.43	15.54	14.26
3	10.16	08.57	07.21	06.28 18.12-18.24/12	04.39	02.55	02.39	04.19	05.58 17.59-18.28/29	07.28 08.48-09.06/18	08.06	09.45
	14.23	16.02	17.35	20.11	21.48	23.33	23.57	22.21	20.29	18.40	15.51	14.24
4	10.14	08.54	07.17	06.24 18.09-18.26/17	04.35	02.53	02.42	04.22	06.01 18.00-18.27/27	07.31 08.48-09.05/17	08.09	09.48
	14.26	16.05	17.38	20.14	21.51	23.36	23.55	22.18	20.25	18.36	15.47	14.22
5	10.13	08.50	07.13	06.21 18.07-18.28/21	04.32	02.50	02.44	04.26	06.04 18.00-18.26/26	07.34 08.49-09.04/15	08.12	09.51
	14.28	16.09	17.42	20.17	21.54	23.39	23.52	22.14	20.22	18.32	15.44	14.20
6	10.11	08.47	07.10	06.17 18.05-18.29/24	04.28	02.47	02.47	04.29	06.07 18.01-18.25/24	07.37 08.50-09.02/12	08.16	09.53
	14.31	16.12	17.45	20.20	21.58	23.42	23.50	22.10	20.18	18.29	15.41	14.18
7	10.09	08.44	07.06 08.14-08.24/10	06.13 18.04-18.30/26	04.25	02.45	02.50	04.32	06.10 18.02-18.23/21	07.40 08.52-08.59/7	08.19	09.56
	14.33	16.16	17.48	20.23	22.01	23.45	23.47	22.07	20.14	18.25	15.37	14.16
8	10.08	08.40	07.03 08.12-08.27/15	06.10 18.03-18.30/27	04.21	02.42	02.53	04.36	06.13 18.04-18.21/17	07.43	08.22	09.58
	14.36	16.19	17.51	20.27	22.05	23.48	23.45	22.03	20.11	18.21	15.34	14.14
9	10.06	08.37	06.59 08.11-08.27/16	06.06 18.02-18.31/29	04.18	02.40	02.56	04.39	06.16 18.05-18.17/12	07.46	08.26	10.01
	14.39	16.23	17.54	20.30	22.08	23.50	23.42	22.00	20.07	18.18	15.31	14.13
10	10.04	08.34	06.55 08.10-08.28/18	06.02 18.01-18.31/30	04.14	02.38	02.59	04.42	06.19	07.49	08.29	10.03
	14.42	16.26	17.57	20.33	22.12	23.53	23.39	21.56	20.03	18.14	15.28	14.11
11	10.01	08.30	06.52 08.09-08.27/18	05.59 18.00-18.30/30	04.10	02.36	03.02	04.46	06.22	07.52	08.33	10.05
	14.45	16.30	18.00	20.36	22.15	23.55	23.37	21.53	20.00	18.11	15.24	14.10
12	09.59	08.27	06.48 08.09-08.28/19	05.55 18.00-18.30/30	04.07	02.34	03.05	04.49	06.25	07.55	08.36	10.08
	14.48	16.33	18.04	20.39	22.18	23.57	23.34	21.49	19.56	18.07	15.21	14.09
13	09.57	08.24	06.45 08.08-08.27/19	05.51 18.01-18.31/30	04.03	02.32	03.08	04.52	06.28	07.58	08.40	10.10
	14.51	16.36	18.07	20.42	22.22	00.00	23.31	21.45	19.52	18.04	15.18	14.08
14	09.55	08.20	06.41 08.08-08.27/19	05.48 18.00-18.30/30	04.00	02.30	03.11	04.55	06.31	08.01	08.43	10.11
	14.54	16.40	18.10	20.45	22.25	00.01	23.28	21.42	19.49	18.00	15.15	14.07
15	09.52	08.17	06.37 08.08-08.25/17	05.44 18.01-18.29/28	03.57	02.29	03.14	04.59	06.34	08.04	08.46	10.13
	14.57	16.43	18.13	20.49	22.29	00.03	23.25	21.38	19.45	17.56	15.12	14.06
16	09.50	08.13	06.34 08.10-08.25/15	05.40 18.01-18.28/27	03.53	02.28	03.18	05.02	06.37	08.07	08.50	10.15
	15.00	16.46	18.16	20.52	22.32	00.05	23.22	21.35	19.41	17.53	15.09	14.06
17	09.47	08.10	06.30 08.11-08.22/11	05.37 18.01-18.28/27	03.50	02.26	03.21	05.05	06.40	08.10	08.53	10.16
	15.03	16.50	18.19	20.55	22.36	00.06	23.18	21.31	19.38	17.49	15.06	14.05
18	09.44	08.06	06.26 08.14-08.18/4	05.33 18.02-18.26/24	03.46	02.26	03.24	05.08	06.43	08.14	08.57	10.17
	15.07	16.53	18.22	20.58	22.39	00.07	23.15	21.27	19.34	17.46	15.03	14.05
19	09.42	08.03	06.23	05.30 18.03-18.25/22	03.43	02.25	03.28	05.12	06.46	08.17	09.00	10.19
	15.10	16.56	18.25	21.01	22.43	00.08	23.12	21.24	19.30	17.42	15.00	14.05
20	09.39	07.59	06.19	05.26 18.05-18.24/19	03.39	02.25	03.31	05.15	06.49	08.20	09.03	10.19
	15.13	17.00	18.28	21.05	22.46	00.09	23.09	21.20	19.27	17.39	14.57	14.05
21	09.36	07.56	06.15	05.22 18.06-18.21/15	03.36	02.24	03.34	05.18 18.14-18.23/9	06.52	08.23	09.07	10.20
	15.17	17.03	18.31	21.08	22.50	00.09	23.06	21.16	19.23	17.35	14.54	14.05
22	09.33	07.52	06.12	05.19 18.10-18.17/7	03.33	02.24	03.38	05.21 18.10-18.26/16	06.55	08.26	09.10	10.21
	15.20	17.06	18.34	21.11	22.53	00.09	23.02	21.13	19.19	17.32	14.51	14.06
23	09.31	07.49	06.08	05.15	03.29	02.25	03.41	05.24 18.08-18.27/19	06.58	08.29	09.13	10.21
	15.24	17.10	18.37	21.14	22.57	00.09	22.59	21.09	19.16	17.28	14.48	14.06
24	09.28	07.45	06.05	05.11	03.26	02.25	03.45	05.27 18.07-18.29/22	07.01	08.33	09.17	10.22
	15.27	17.13	18.40	21.18	23.00	00.09	22.56	21.06	19.12	17.25	14.46	14.07
25	09.25	07.42	06.01	05.08	03.23	02.26	03.48	05.31 18.05-18.30/25	07.04	07.36	09.20	10.22
	15.31	17.16	18.43	21.21	23.04	00.08	22.52	21.02	19.09	16.21	14.43	14.08
26	09.22	07.38	05.57	05.04	03.20	02.27	03.52	05.34 18.04-18.30/26	07.07 08.54-09.03/9	07.39	09.23	10.22
	15.34	17.19	18.47	21.24	23.07	00.07	22.49	20.58	19.05	16.18	14.40	14.09
27	09.19	07.35	05.54	05.01	03.16	02.28	03.55	05.37 18.02-18.30/28	07.10 08.52-09.05/13	07.42	09.26	10.22
	15.38	17.23	18.50	21.27	23.10	00.06	22.45	20.55	19.01	16.14	14.38	14.10
28	09.16	07.31	05.50	04.57	03.13	02.30	03.58	05.40 18.01-18.30/29	07.13 08.50-09.06/16	07.46	09.30	10.21
	15.41	17.26	18.53	21.31	23.14	00.05	22.42	20.51	18.58	16.11	14.35	14.11
29	09.13		06.46	04.53	03.10	02.31	04.02	05.43 18.01-18.30/29	07.16 08.49-09.07/18	07.49	09.33	10.21
	15.44		19.56	21.34	23.17	00.04	22.39	20.47	18.54	16.07	14.33	14.13
30	09.09		06.43	04.50	03.07	02.33	04.05	05.46 18.01-18.30/29	07.19 08.48-09.07/19	07.52	09.36	10.20
	15.48		19.59	21.37	23.20	00.02	22.35	20.44	18.50	16.04	14.30	14.15
31	09.06		06.39		03.04		04.09	05.49 18.00-18.30/30		07.56		10.19
	15.51		20.02		23.24		22.32	20.40		16.01		14.16
Potential sun hours	163	235	363	454	578	641	620	513	394	302	192	125
Sum of minutes with flicker	0	0	181	475	0	0	0	262	291	108	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**WTG:** 8 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (632)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January		February		March		April		May		June	
1	10.18		09.03	12.28-12.40/12	07.28		06.35		04.46	18.31-18.59/28	03.01	18.45-18.49/4
	14.19		15.55		17.29		20.05		21.41		23.27	
2	10.17		09.00	12.27-12.42/15	07.24		06.32		04.42	18.29-18.59/30	02.58	
	14.21		15.58		17.32		20.08		21.44		23.30	
3	10.16		08.57	12.26-12.43/17	07.20		06.28		04.39	18.28-19.00/32	02.55	
	14.23		16.02		17.35		20.11		21.48		23.33	
4	10.14		08.54	12.25-12.43/18	07.17		06.24		04.35	18.28-19.01/33	02.53	
	14.25		16.05		17.38		20.14		21.51		23.36	
5	10.13		08.50	12.25-12.43/18	07.13		06.21		04.32	18.27-19.01/34	02.50	
	14.28		16.09		17.42		20.17		21.54		23.39	
6	10.11		08.47	12.24-12.44/20	07.10		06.17		04.28	18.26-19.02/36	02.47	
	14.30		16.12		17.45		20.20		21.58		23.42	
7	10.09		08.44	12.24-12.44/20	07.06		06.13		04.25	18.26-19.02/36	02.45	
	14.33		16.16		17.48		20.23		22.01		23.45	
8	10.08		08.40	12.25-12.44/19	07.03		06.10		04.21	18.26-19.02/36	02.42	
	14.36		16.19		17.51		20.27		22.05		23.48	
9	10.06		08.37	12.25-12.44/19	06.59		06.06		04.18	18.26-19.02/36	02.40	
	14.39		16.23		17.54		20.30		22.08		23.50	
10	10.04		08.34	12.25-12.44/19	06.55		06.02		04.14	18.25-19.03/38	02.38	
	14.42		16.26		17.57		20.33		22.12		23.53	
11	10.01		08.30	12.26-12.43/17	06.52		05.59		04.10	18.25-19.02/37	02.36	
	14.45		16.29		18.00		20.36		22.15		23.55	
12	09.59		08.27	12.28-12.43/15	06.48		05.55		04.07	18.25-19.02/37	02.34	
	14.48		16.33		18.04		20.39		22.18		23.57	
13	09.57		08.24	12.30-12.41/11	06.45		05.51		04.03	18.26-19.03/37	02.32	
	14.51		16.36		18.07		20.42		22.22		00.00	
14	09.55		08.20	12.32-12.38/6	06.41		05.48		04.00	18.26-19.03/37	02.30	
	14.54		16.40		18.10		20.45		22.25		00.01	
15	09.52		08.17		06.37		05.44		03.56	18.26-19.02/36	02.29	
	14.57		16.43		18.13		20.49		22.29		00.03	
16	09.50		08.13		06.34		05.40		03.53	18.26-19.02/36	02.27	
	15.00		16.46		18.16		20.52		22.32		00.05	
17	09.47		08.10		06.30	07.40-07.50/10	05.37		03.50	18.27-19.02/35	02.26	
	15.03		16.50		18.19		20.55		22.36		00.06	
18	09.44		08.06		06.26	07.38-07.51/13	05.33		03.46	18.27-19.01/34	02.26	
	15.07		16.53		18.22		20.58		22.39		00.07	
19	09.42		08.03		06.23	07.37-07.53/16	05.30		03.43	18.27-19.01/34	02.25	
	15.10		16.56		18.25		21.01		22.43		00.08	
20	09.39		07.59		06.19	07.36-07.53/17	05.26		03.39	18.29-19.01/32	02.24	
	15.13		17.00		18.28		21.05		22.46		00.09	
21	09.36		07.56		06.15	07.35-07.53/18	05.22		03.36	18.29-19.00/31	02.24	
	15.17		17.03		18.31		21.08		22.50		00.09	
22	09.33		07.52		06.12	07.35-07.53/18	05.19		03.33	18.30-19.00/30	02.24	
	15.20		17.06		18.34		21.11		22.53		00.09	
23	09.31		07.49		06.08	07.35-07.52/17	05.15		03.29	18.31-19.00/29	02.25	
	15.24		17.10		18.37		21.14		22.57		00.09	
24	09.28		07.45		06.05	07.34-07.51/17	05.11		03.26	18.31-18.58/27	02.25	
	15.27		17.13		18.40		21.18		23.00		00.09	
25	09.25		07.42		06.01	07.36-07.51/15	05.08		03.23	18.33-18.58/25	02.26	
	15.31		17.16		18.43		21.21		23.04		00.08	
26	09.22		07.38		05.57	07.36-07.49/13	05.04		03.20	18.34-18.58/24	02.27	
	15.34		17.19		18.47		21.24		23.07		00.07	
27	09.19		07.35		05.54	07.38-07.46/8	05.00	18.38-18.51/13	03.16	18.35-18.57/22	02.28	
	15.37		17.23		18.50		21.27		23.10		00.07	
28	09.16		07.31		05.50		04.57	18.35-18.54/19	03.13	18.37-18.56/19	02.30	
	15.41		17.26		18.53		21.31		23.14		00.05	
29	09.13				06.46		04.53	18.33-18.56/23	03.10	18.38-18.55/17	02.31	
	15.44				19.56		21.34		23.17		00.04	
30	09.09				06.43		04.50	18.32-18.58/26	03.07	18.40-18.54/14	02.33	
	15.48				19.59		21.37		23.20		00.02	
31	09.06	12.30-12.38/8			06.39				03.04	18.42-18.52/10		
	15.51				20.02				23.24			
Potential sun hours	163		235		363		454		578		641	
Sum of minutes with flicker	8		226		162		81		942		4	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**WTG:** 8 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (632)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July		August		September		October		November		December
1	02.35		04.12	18.36-19.13/37	05.52		07.22		07.59	11.56-12.14/18	09.39
	00.01		22.28		20.36		18.47		15.57		14.28
2	02.37		04.15	18.36-19.13/37	05.55		07.25		08.02	11.55-12.14/19	09.42
	23.59		22.25		20.33		18.43		15.54		14.26
3	02.39		04.19	18.35-19.12/37	05.58		07.28		08.06	11.55-12.15/20	09.45
	23.57		22.21		20.29		18.40		15.51		14.24
4	02.42		04.22	18.36-19.12/36	06.01		07.31		08.09	11.55-12.15/20	09.48
	23.55		22.18		20.25		18.36		15.47		14.22
5	02.44		04.26	18.36-19.12/36	06.04		07.34		08.12	11.55-12.14/19	09.51
	23.52		22.14		20.22		18.32		15.44		14.20
6	02.47		04.29	18.36-19.12/36	06.07		07.37		08.16	11.55-12.14/19	09.53
	23.50		22.10		20.18		18.29		15.41		14.18
7	02.50		04.32	18.37-19.12/35	06.10		07.40		08.19	11.55-12.13/18	09.56
	23.47		22.07		20.14		18.25		15.37		14.16
8	02.53		04.36	18.36-19.10/34	06.13		07.43		08.22	11.56-12.12/16	09.58
	23.45		22.03		20.11		18.21		15.34		14.14
9	02.56		04.39	18.37-19.10/33	06.16		07.46		08.26	11.58-12.12/14	10.01
	23.42		22.00		20.07		18.18		15.31		14.13
10	02.59		04.42	18.37-19.09/32	06.19		07.49		08.29	11.59-12.11/12	10.03
	23.39		21.56		20.03		18.14		15.28		14.11
11	03.02		04.46	18.38-19.08/30	06.22		07.52		08.33	12.01-12.08/7	10.05
	23.37		21.53		20.00		18.11		15.24		14.10
12	03.05	18.51-18.59/8	04.49	18.39-19.07/28	06.25		07.55		08.36		10.08
	23.34		21.49		19.56		18.07		15.21		14.09
13	03.08	18.49-19.01/12	04.52	18.41-19.06/25	06.28		07.58		08.40		10.10
	23.31		21.45		19.52		18.04		15.18		14.08
14	03.11	18.47-19.02/15	04.55	18.41-19.03/22	06.31		08.01		08.43		10.11
	23.28		21.42		19.49		18.00		15.15		14.07
15	03.14	18.45-19.04/19	04.59	18.43-19.01/18	06.34		08.04		08.46		10.13
	23.25		21.38		19.45		17.56		15.12		14.06
16	03.18	18.45-19.06/21	05.02	18.46-18.58/12	06.37	08.28-08.34/6	08.07		08.50		10.15
	23.22		21.35		19.41		17.53		15.09		14.06
17	03.21	18.44-19.06/22	05.05		06.40	08.25-08.37/12	08.10		08.53		10.16
	23.18		21.31		19.38		17.49		15.06		14.05
18	03.24	18.42-19.07/25	05.08		06.43	08.24-08.38/14	08.14		08.57		10.17
	23.15		21.27		19.34		17.46		15.03		14.05
19	03.28	18.42-19.08/26	05.12		06.46	08.21-08.38/17	08.17		09.00		10.19
	23.12		21.24		19.30		17.42		15.00		14.05
20	03.31	18.41-19.09/28	05.15		06.49	08.21-08.38/17	08.20		09.03		10.19
	23.09		21.20		19.27		17.39		14.57		14.05
21	03.34	18.41-19.10/29	05.18		06.52	08.20-08.38/18	08.23		09.07		10.20
	23.06		21.16		19.23		17.35		14.54		14.05
22	03.38	18.39-19.10/31	05.21		06.55	08.20-08.38/18	08.26		09.10		10.21
	23.02		21.13		19.19		17.32		14.51		14.06
23	03.41	18.39-19.11/32	05.24		06.58	08.20-08.37/17	08.29		09.13		10.21
	22.59		21.09		19.16		17.28		14.48		14.06
24	03.45	18.38-19.11/33	05.27		07.01	08.20-08.36/16	08.33		09.17		10.22
	22.56		21.06		19.12		17.25		14.46		14.07
25	03.48	18.38-19.12/34	05.31		07.04	08.21-08.35/14	07.36		09.20		10.22
	22.52		21.02		19.09		16.21		14.43		14.08
26	03.51	18.38-19.12/34	05.34		07.07	08.22-08.33/11	07.39		09.23		10.22
	22.49		20.58		19.05		16.18		14.40		14.09
27	03.55	18.37-19.12/35	05.37		07.10	08.24-08.30/6	07.42		09.26		10.22
	22.45		20.55		19.01		16.14		14.38		14.10
28	03.58	18.37-19.13/36	05.40		07.13		07.46	12.00-12.08/8	09.30		10.21
	22.42		20.51		18.58		16.11		14.35		14.11
29	04.02	18.37-19.13/36	05.43		07.16		07.49	11.58-12.11/13	09.33		10.21
	22.39		20.47		18.54		16.07		14.33		14.13
30	04.05	18.36-19.13/37	05.46		07.19		07.52	11.57-12.12/15	09.36		10.20
	22.35		20.44		18.50		16.04		14.30		14.14
31	04.09	18.36-19.13/37	05.49				07.56	11.56-12.13/17			10.19
	22.32		20.40				16.01				14.16
Potential sun hours	620		513		394		302		192		125
Sum of minutes with flicker		550		488		166		53		182	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**WTG:** 9 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (633)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	10.18	09.03 12.44-12.55/11	07.28	06.35	04.46	03.01	02.35	04.12	05.52	07.22	07.59 12.11-12.30/19	09.39
	14.19	15.55	17.29	20.05	21.41	23.27	00.01	22.28	20.36	18.47	15.57 11.21-11.42/21	14.28
2	10.17	09.00 12.43-12.57/14	07.24	06.32	04.42	02.58	02.37	04.15	05.55	07.25	08.02 12.10-12.30/20	09.42
	14.21	15.58	17.32	20.08	21.44	23.30	23.59	22.25	20.33	18.43	15.54 11.22-11.42/20	14.26
3	10.16	08.57 12.42-12.58/16	07.20	06.28	04.39	02.55	02.39	04.19	05.58	07.28	08.06 12.10-12.30/20	09.45
	14.23	16.02	17.35	20.11	21.48	23.33	23.57	22.21	20.29	18.39	15.50 11.23-11.41/18	14.24
4	10.14	08.54 12.41-12.58/17	07.17	06.24	04.35	02.53	02.42	04.22	06.01	07.31	08.09 12.10-12.30/20	09.48
	14.25	16.05 11.58-12.03/5	17.38	20.14	21.51	23.36	23.55	22.18	20.25	18.36	15.47 11.23-11.40/17	14.22
5	10.13	08.50 12.40-12.59/19	07.13	06.21	04.32	02.50	02.44	04.26	06.04	07.34	08.12 12.10-12.30/20	09.51
	14.28	16.09 11.55-12.07/12	17.42	20.17	21.54	23.39	23.52	22.14	20.22	18.32	15.44 11.25-11.39/14	14.20
6	10.11	08.47 12.40-12.59/19	07.10	06.17	04.28	02.47	02.47	04.29	06.07	07.37	08.16 12.11-12.29/18	09.53
	14.30	16.12 11.54-12.09/15	17.45	20.20	21.58	23.42	23.50	22.10	20.18	18.29	15.41 11.26-11.37/11	14.18
7	10.09	08.44 12.40-13.00/20	07.06	06.13	04.25	02.45	02.50	04.32	06.10	07.40	08.19 12.11-12.29/18	09.56
	14.33	16.16 11.53-12.10/17	17.48	20.23	22.01	23.45	23.47	22.07	20.14	18.25	15.37 11.30-11.33/3	14.16
8	10.08	08.40 12.40-13.00/20	07.03	06.10	04.21	02.42	02.53	04.36	06.13	07.43	08.22 12.12-12.28/16	09.58
	14.36	16.19 11.52-12.11/19	17.51	20.27	22.05	23.48	23.45	22.03	20.11	18.21	15.34	14.14
9	10.06	08.37 12.40-13.00/20	06.59	06.06	04.17	02.40	02.55	04.39	06.16	07.46	08.26 12.14-12.27/13	10.01
	14.39	16.23 11.51-12.12/21	17.54	20.30	22.08	23.50	23.42	22.00	20.07	18.18	15.31	14.13
10	10.04	08.34 12.41-12.59/18	06.55	06.02	04.14	02.38	02.58	04.42	06.19	07.49	08.29 12.15-12.26/11	10.03
	14.42	16.26 11.51-12.12/21	17.57	20.33	22.12	23.53	23.39	21.56	20.03	18.14	15.27	14.11
11	10.01	08.30 12.41-12.59/18	06.52	05.59	04.10	02.36	03.02	04.46	06.22	07.52	08.33 12.17-12.23/6	10.05
	14.44	16.29 11.51-12.12/21	18.00	20.36	22.15	23.55	23.37	21.53	20.00	18.11	15.24	14.10
12	09.59	08.27 12.42-12.58/16	06.48	05.55	04.07	02.34 05.04-05.05/1	03.05	04.49	06.25	07.55	08.36	10.08
	14.48	16.33 11.52-12.13/21	18.03	20.39	22.18	23.58	23.34	21.49	19.56	18.07	15.21	14.09
13	09.57	08.23 12.44-12.57/13	06.45	05.51	04.03	02.32 05.02-05.06/4	03.08	04.52	06.28	07.58	08.40	10.10
	14.51	16.36 11.52-12.13/21	18.07	20.42	22.22	00.00	23.31	21.45	19.52	18.04	15.18	14.08
14	09.55	08.20 12.47-12.55/8	06.41	05.48	04.00	02.30 05.02-05.08/6	03.11	04.55	06.31	08.01	08.43	10.11
	14.54	16.40 11.52-12.13/21	18.10	20.45	22.25	00.01	23.28	21.42	19.49	18.00	15.15	14.07
15	09.52	08.17 11.52-12.12/20	06.37	05.44	03.56	02.29 05.01-05.08/7	03.14	04.59	06.34	08.04	08.46	10.13
	14.57	16.43	18.13	20.49	22.29	00.03	23.25	21.38	19.45	17.56	15.12	14.06
16	09.50	08.13 11.53-12.11/18	06.34	05.40	03.53	02.27 05.01-05.09/8	03.18	05.02	06.37	08.07	08.50	10.15
	15.00	16.46	18.16	20.52	22.32	00.05	23.22	21.35	19.41	17.53	15.09	14.06
17	09.47	08.10 11.54-12.10/16	06.30	05.37	03.50	02.26 05.00-05.09/9	03.21	05.05	06.40	08.10	08.53	10.16
	15.03	16.50	18.19	20.55	22.36	00.06	23.18	21.31	19.38	17.49	15.06	14.05
18	09.44	08.06 11.55-12.08/13	06.26	05.33	03.46	02.25 05.00-05.10/10	03.24	05.08	06.43	08.14	08.57	10.17
	15.07	16.53	18.22	20.58	22.39	00.07	23.15	21.27	19.34	17.46	15.03	14.05
19	09.42	08.03 11.58-12.05/7	06.23	05.29	03.43	02.25 05.01-05.10/9	03.28	05.12	06.46	08.17	09.00	10.19
	15.10	16.56	18.25	21.01	22.43	00.08	23.12	21.24	19.30	17.42	15.00	14.05
20	09.39	07.59	06.19	05.26	03.39	02.24 05.01-05.10/9	03.31	05.15	06.49	08.20	09.03	10.19
	15.13	17.00	18.28	21.05	22.46	00.09	23.09	21.20	19.27	17.39	14.57	14.05
21	09.36	07.56	06.15	05.22	03.36	02.24 05.01-05.11/10	03.34	05.18	06.52	08.23	09.07	10.20
	15.17	17.03	18.31	21.08	22.50	00.09	23.06	21.16	19.23	17.35	14.54	14.05
22	09.33	07.52	06.12	05.19	03.33	02.24 05.02-05.12/10	03.38	05.21	06.55	08.26	09.10	10.21
	15.20	17.06	18.34	21.11	22.53	00.09	23.02	21.13	19.19	17.32	14.51	14.05
23	09.31	07.49	06.08	05.15	03.29	02.25 05.02-05.11/9	03.41	05.24	06.58	08.29 12.27-12.36/9	09.13	10.21
	15.24	17.10	18.37	21.14	22.57	00.09	22.59	21.09	19.16	17.28	14.48	14.06
24	09.28	07.45	06.05	05.11	03.26	02.25 05.01-05.11/10	03.45	05.27	07.01	08.33 12.25-12.39/14	09.17	10.22
	15.27	17.13	18.40	21.18	23.00	00.09	22.56	21.06	19.12	17.25	14.46	14.07
25	09.25	07.42	06.01	05.08	03.23	02.26 05.02-05.11/9	03.48	05.30	07.04	07.36 11.24-11.40/16	09.20	10.22
	15.31	17.16	18.43	21.21	23.04	00.08	22.52	21.02	19.09	16.21	14.43	14.08
26	09.22	07.38	05.57	05.04	03.20	02.27 05.03-05.12/9	03.51	05.34	07.07	07.39 11.22-11.40/18	09.23	10.22
	15.34	17.19	18.46	21.24	23.07	00.08	22.49	20.58	19.05	16.18	14.40	14.09
27	09.19	07.35	05.54	05.00	03.16	02.28 05.03-05.11/8	03.55	05.37	07.10	07.42 11.21-11.41/20	09.26	10.22
	15.37	17.22	18.50	21.27	23.10	00.07	22.45	20.55	19.01	16.14	14.38	14.10
28	09.16	07.31	05.50	04.57	03.13	02.29 05.04-05.11/7	03.58	05.40	07.13	07.46 12.15-12.25/10	09.30	10.21
	15.41	17.26	18.53	21.31	23.14	00.05	22.42	20.51	18.58	16.11 11.21-11.42/21	14.35	14.11
29	09.13		06.46	04.53	03.10	02.31 05.05-05.10/5	04.02	05.43	07.16	07.49 12.13-12.27/14	09.33	10.21
	15.44		19.56	21.34	23.17	00.04	22.39	20.47	18.54	16.07 11.21-11.42/21	14.33	14.13
30	09.09		06.43	04.50	03.07	02.33 05.06-05.09/3	04.05	05.46	07.19	07.52 12.12-12.28/16	09.36	10.20
	15.48		19.59	21.37	23.20	00.02	22.35	20.44	18.50	16.04 11.21-11.42/21	14.30	14.14
31	09.06 12.46-12.52/6		06.39		03.04		04.09	05.49		07.56 12.11-12.29/18		10.19
	15.51		20.02		23.24		22.32	20.40		16.01 11.21-11.42/21		14.16
Potential sun hours	163	235	363	454	578	641	620	513	394	302	192	125
Sum of minutes with flicker	6	497	0	0	0	143	0	0	0	219	285	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6 **WTG:** 10 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (634)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	10.18	09.03 12.10-12.27/17	07.28	06.35	04.46	03.01	02.35	04.12	05.52	07.22	07.59 11.38-11.59/21	09.39
	14.19	15.55	17.29	20.05	21.41	23.27	00.01	22.28	20.36	18.47	15.57 10.42-11.03/21	14.28
2	10.17	09.00 12.09-12.28/19	07.24	06.32	04.42	02.58	02.37	04.15	05.55	07.25	08.02 11.38-12.00/22	09.42
	14.21	15.58	17.32	20.08	21.44	23.30	23.59	22.25	20.33	18.43	15.54 10.42-11.03/21	14.26
3	10.16	08.57 12.09-12.29/20	07.20	06.28	04.39	02.55	02.39	04.19	05.58	07.28	08.06 11.38-12.00/22	09.45
	14.23	16.02	17.35	20.11	21.48	23.33	23.57	22.21	20.29	18.39	15.50 10.43-11.02/19	14.24
4	10.14	08.54 12.07-12.28/21	07.17	06.24	04.35	02.52	02.42	04.22	06.01	07.31	08.09 11.38-12.00/22	09.48
	14.25	16.05	17.38	20.14	21.51	23.36	23.55	22.18	20.25	18.36	15.47 10.44-11.00/16	14.22
5	10.13	08.50 12.07-12.29/22	07.13	06.21	04.32	02.50	02.44	04.25	06.04	07.34	08.12 11.38-12.00/22	09.51
	14.28	16.09 11.18-11.26/8	17.42	20.17	21.54	23.39	23.52	22.14	20.22	18.32	15.44 10.46-10.59/13	14.20
6	10.11	08.47 12.07-12.29/22	07.10	06.17	04.28	02.47	02.47	04.29	06.07	07.37	08.16 11.38-11.59/21	09.53
	14.30	16.12 11.15-11.28/13	17.45	20.20	21.58	23.42	23.50	22.10	20.18	18.29	15.40 10.48-10.56/8	14.18
7	10.09	08.44 12.07-12.29/22	07.06	06.13	04.25	02.45	02.50	04.32	06.10	07.40	08.19 11.38-11.59/21	09.56
	14.33	16.16 11.14-11.30/16	17.48	20.23	22.01	23.45	23.47	22.07	20.14	18.25	15.37	14.16
8	10.08	08.40 12.07-12.29/22	07.03	06.10	04.21	02.42	02.53	04.36	06.13	07.43	08.22 11.38-11.58/20	09.58
	14.36	16.19 11.13-11.31/18	17.51	20.27	22.05	23.48	23.45	22.03	20.11	18.21	15.34	14.14
9	10.06	08.37 12.08-12.29/21	06.59	06.06	04.17	02.40	02.55	04.39	06.16	07.46	08.26 11.40-11.58/18	10.01
	14.39	16.23 11.12-11.32/20	17.54	20.30	22.08	23.50	23.42	22.00	20.07	18.18	15.31	14.13
10	10.04	08.34 12.08-12.29/21	06.55	06.02	04.14	02.38	02.58	04.42	06.19	07.49	08.29 11.40-11.57/17	10.03
	14.41	16.26 11.11-11.33/22	17.57	20.33	22.12	23.53	23.39	21.56	20.03	18.14	15.27	14.11
11	10.01	08.30 12.09-12.28/19	06.52	05.59	04.10	02.35	03.02	04.46	06.22	07.52	08.33 11.41-11.56/15	10.05
	14.44	16.29 11.11-11.33/22	18.00	20.36	22.15	23.55	23.37	21.53	20.00	18.11	15.24	14.10
12	09.59	08.27 12.10-12.27/17	06.48	05.55	04.07	02.34	03.05	04.49	06.25	07.55	08.36 11.44-11.55/11	10.08
	14.47	16.33 11.11-11.35/24	18.03	20.39	22.18	23.58	23.34	21.49	19.56	18.07	15.21	14.09
13	09.57	08.23 12.12-12.27/15	06.44	05.51	04.03	02.32	03.08	04.52	06.28	07.58	08.40 11.46-11.51/5	10.10
	14.51	16.36 11.11-11.35/24	18.07	20.42	22.22	00.00	23.31	21.45	19.52	18.04	15.18	14.08
14	09.55	08.20 12.14-12.24/10	06.41	05.48	04.00	02.30	03.11	04.55	06.31	08.01	08.43	10.11
	14.54	16.40 11.11-11.35/24	18.10	20.45	22.25	00.02	23.28	21.42	19.49	18.00	15.15	14.07
15	09.52	08.17 11.11-11.34/23	06.37	05.44	03.56	02.29	03.14	04.59	06.34	08.04	08.46	10.13
	14.57	16.43	18.13	20.49	22.29	00.03	23.25	21.38	19.45	17.56	15.12	14.06
16	09.50	08.13 11.12-11.34/22	06.34	05.40	03.53	02.27	03.18	05.02	06.37	08.07	08.50	10.15
	15.00	16.46	18.16	20.52	22.32	00.05	23.22	21.35	19.41	17.53	15.09	14.06
17	09.47	08.10 11.12-11.33/21	06.30	05.37	03.50	02.26	03.21	05.05	06.40	08.10	08.53	10.16
	15.03	16.50	18.19	20.55	22.36	00.06	23.19	21.31	19.38	17.49	15.06	14.05
18	09.44	08.06 11.13-11.32/19	06.26	05.33	03.46	02.25	03.24	05.08	06.43	08.14	08.57	10.17
	15.07	16.53	18.22	20.58	22.39	00.07	23.15	21.27	19.34	17.46	15.03	14.05
19	09.42	08.03 11.14-11.30/16	06.23	05.29	03.43	02.25	03.28	05.11	06.46	08.17	09.00	10.19
	15.10	16.56	18.25	21.01	22.43	00.08	23.12	21.24	19.30	17.42	15.00	14.05
20	09.39	07.59 11.15-11.28/13	06.19	05.26	03.39	02.24	03.31	05.15	06.49	08.20	09.03	10.20
	15.13	17.00	18.28	21.05	22.46	00.09	23.09	21.20	19.27	17.39	14.57	14.05
21	09.36	07.56 11.20-11.25/5	06.15	05.22	03.36	02.24	03.34	05.18	06.52	08.23 11.48-11.57/9	09.07	10.20
	15.17	17.03	18.31	21.08	22.50	00.09	23.06	21.16	19.23	17.35	14.54	14.05
22	09.33	07.52	06.12	05.19	03.33	02.24	03.38	05.21	06.55	08.26 11.46-12.00/14	09.10	10.21
	15.20	17.06	18.34	21.11	22.53	00.09	23.02	21.13	19.19	17.32	14.51	14.05
23	09.31	07.49	06.08	05.15	03.29	02.24	03.41	05.24	06.58	08.29 11.43-12.01/18	09.13	10.21
	15.24	17.09	18.37	21.14	22.57	00.09	22.59	21.09	19.16	17.28	14.48	14.06
24	09.28	07.45	06.04	05.11	03.26	02.25	03.45	05.27	07.01	08.33 11.42-12.02/20	09.17	10.22
	15.27	17.13	18.40	21.18	23.00	00.09	22.56	21.06	19.12	17.25	14.45	14.07
25	09.25	07.42	06.01	05.08	03.23	02.26	03.48	05.30	07.04	07.36 10.42-11.03/21	09.20	10.22
	15.30	17.16	18.43	21.21	23.04	00.08	22.52	21.02	19.09	16.21	14.43	14.08
26	09.22	07.38	05.57	05.04	03.20	02.27	03.51	05.34	07.07	07.39 10.41-11.03/22	09.23	10.22
	15.34	17.19	18.46	21.24	23.07	00.08	22.49	20.58	19.05	16.18	14.40	14.09
27	09.19	07.35	05.54	05.00	03.16	02.28	03.55	05.37	07.10	07.42 11.47-11.49/2	09.26	10.22
	15.37	17.22	18.50	21.27	23.10	00.07	22.45	20.55	19.01	16.14 10.40-11.03/23	14.38	14.10
28	09.16	07.31	05.50	04.57	03.13	02.29	03.58	05.40	07.13	07.46 11.43-11.54/11	09.30	10.21
	15.41	17.26	18.53	21.31	23.14	00.05	22.42	20.51	18.58	16.11 10.40-11.04/24	14.35	14.11
29	09.13 12.14-12.20/6		06.46	04.53	03.10	02.31	04.02	05.43	07.16	07.49 11.41-11.56/15	09.33	10.21
	15.44		19.56	21.34	23.17	00.04	22.39	20.47	18.54	16.07 10.40-11.04/24	14.33	14.13
30	09.09 12.12-12.23/11		06.43	04.50	03.07	02.33	04.05	05.46	07.19	07.52 11.40-11.57/17	09.36	10.20
	15.48		19.59	21.37	23.20	00.02	22.35	20.44	18.50	16.04 10.41-11.04/23	14.30	14.14
31	09.06 12.10-12.25/15		06.39		03.04		04.09	05.49		07.56 11.39-11.58/19		10.19
	15.51		20.02		23.24		22.32	20.40		16.01 10.41-11.04/23		14.16
Potential sun hours	163	235	363	454	578	641	620	513	394	302	192	125
Sum of minutes with flicker	32	578	0	0	0	0	0	0	0	285	335	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
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SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6 **WTG:** 11 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (635)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February		March		April		May	June
1	10.18	09.03		07.28		06.35	17.30-17.53/23	04.46	03.01
	14.19	15.55		17.29		20.05		21.41	23.27
2	10.17	09.00	11.31-11.40/9	07.24		06.32	17.31-17.51/20	04.42	02.58
	14.21	15.58		17.32		20.08		21.44	23.30
3	10.16	08.57	11.29-11.43/14	07.20		06.28	17.33-17.50/17	04.39	02.55
	14.23	16.02		17.35		20.11		21.48	23.33
4	10.14	08.53	11.27-11.44/17	07.17		06.24	17.34-17.47/13	04.35	02.52
	14.25	16.05		17.38		20.14		21.51	23.36
5	10.13	08.50	11.26-11.45/19	07.13		06.21	17.39-17.43/4	04.32	02.50
	14.28	16.09		17.42		20.17		21.54	23.39
6	10.11	08.47	11.25-11.46/21	07.10		06.17		04.28	02.47
	14.30	16.12		17.45		20.20		21.58	23.42
7	10.09	08.44	11.25-11.47/22	07.06		06.13		04.24	02.45
	14.33	16.16		17.48		20.23		22.01	23.45
8	10.08	08.40	11.25-11.47/22	07.03		06.10		04.21	02.42
	14.36	16.19		17.51		20.27		22.05	23.48
9	10.06	08.37	11.24-11.47/23	06.59		06.06		04.17	02.40
	14.39	16.23		17.54		20.30		22.08	23.50
10	10.04	08.34	11.24-11.48/24	06.55	16.13-16.23/10	06.02		04.14	02.38
	14.41	16.26		17.57		20.33		22.12	23.53
11	10.01	08.30	11.24-11.48/24	06.52	16.10-16.25/15	05.59		04.10	02.35
	14.44	16.29	10.32-10.41/9	18.00		20.36		22.15	23.55
12	09.59	08.27	11.24-11.47/23	06.48	16.08-16.26/18	05.55		04.07	02.33
	14.47	16.33	10.31-10.44/13	18.03		20.39		22.18	23.58
13	09.57	08.23	11.26-11.48/22	06.44	16.07-16.27/20	05.51		04.03	02.32
	14.51	16.36	10.29-10.46/17	18.07		20.42		22.22	00.00
14	09.55	08.20	11.26-11.47/21	06.41	16.06-16.28/22	05.48		04.00	02.30
	14.54	16.40	10.28-10.47/19	18.10		20.45		22.25	00.02
15	09.52	08.17	11.27-11.46/19	06.37	16.05-16.27/22	05.44		03.56	02.29
	14.57	16.43	10.27-10.48/21	18.13		20.49		22.29	00.03
16	09.50	08.13	11.28-11.45/17	06.34	16.04-16.27/23	05.40		03.53	02.27
	15.00	16.46	10.26-10.48/22	18.16		20.52		22.32	00.05
17	09.47	08.10	11.29-11.43/14	06.30	16.04-16.28/24	05.37		03.49	02.26
	15.03	16.50	10.25-10.48/23	18.19		20.55		22.36	00.06
18	09.44	08.06	11.32-11.40/8	06.26	16.04-16.27/23	05.33		03.46	02.25
	15.07	16.53	10.25-10.48/23	18.22		20.58		22.39	00.07
19	09.42	08.03	10.25-10.48/23	06.23	16.04-16.26/22	05.29		03.43	02.25
	15.10	16.56		18.25		21.01		22.43	00.08
20	09.39	07.59	10.25-10.48/23	06.19	16.39-16.51/12	05.26		03.39	02.24
	15.13	17.00		18.28	16.05-16.25/20	21.05		22.46	00.09
21	09.36	07.56	10.26-10.48/22	06.15	16.36-16.53/17	05.22		03.36	02.24
	15.17	17.03		18.31	16.06-16.24/18	21.08		22.50	00.09
22	09.33	07.52	10.26-10.48/22	06.12	16.34-16.54/20	05.19		03.33	02.24
	15.20	17.06		18.34	16.07-16.21/14	21.11		22.53	00.09
23	09.31	07.49	10.27-10.47/20	06.08	16.33-16.56/23	05.15		03.29	02.24
	15.24	17.09		18.37	16.10-16.19/9	21.14		22.57	00.09
24	09.28	07.45	10.27-10.45/18	06.04	16.32-16.56/24	05.11		03.26	02.25
	15.27	17.13		18.40		21.18		23.00	00.09
25	09.25	07.42	10.29-10.43/14	06.01	16.30-16.56/26	05.08		03.23	02.26
	15.30	17.16		18.43		21.21		23.04	00.08
26	09.22	07.38	10.31-10.40/9	05.57	16.30-16.57/27	05.04		03.19	02.27
	15.34	17.19		18.46		21.24		23.07	00.08
27	09.19	07.35		05.54	16.29-16.56/27	05.00		03.16	02.28
	15.37	17.22		18.50		21.27		23.10	00.07
28	09.16	07.31		05.50	16.29-16.56/27	04.57		03.13	02.29
	15.41	17.26		18.53		21.31		23.14	00.05
29	09.13			06.46	17.29-17.56/27	04.53		03.10	02.31
	15.44			19.56		21.34		23.17	00.04
30	09.09			06.43	17.29-17.55/26	04.50		03.07	02.33
	15.48			19.59		21.37		23.20	00.02
31	09.06			06.39	17.30-17.55/25			03.04	
	15.51			20.02				23.24	
Potential sun hours	163	235		363		454		578	641
Sum of minutes with flicker	0	617		541		77		0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
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SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6 **WTG:** 11 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (635)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July	August	September	October	November	December
1	02.35	04.12	05.52	07.22 16.47-17.06/19	07.59 10.55-11.18/23	09.39
	00.01	22.28	20.36	18.47	15.57	14.28
2	02.37	04.15	05.55	07.25 16.47-17.04/17	08.02 10.55-11.18/23	09.42
	23.59	22.25	20.33	18.43	15.54	14.26
3	02.39	04.19	05.58	07.28 16.49-17.02/13	08.06 10.55-11.17/22	09.45
	23.57	22.21	20.29	18.39	15.50	14.24
4	02.42	04.22	06.01	07.31 16.52-16.58/6	08.09 10.55-11.17/22	09.48
	23.55	22.18	20.25	18.36	15.47	14.21
5	02.44	04.25	06.04	07.34	08.12 10.56-11.16/20	09.51
	23.52	22.14	20.22	18.32	15.44	14.19
6	02.47	04.29	06.07	07.37	08.16 10.57-11.15/18	09.53
	23.50	22.10	20.18	18.29	15.40	14.18
7	02.50	04.32	06.10 17.35-17.37/2	07.40	08.19 10.58-11.14/16	09.56
	23.47	22.07	20.14	18.25	15.37	14.16
8	02.52	04.36	06.13 17.29-17.41/12	07.43	08.22 10.59-11.12/13	09.58
	23.45	22.03	20.11	18.21	15.34	14.14
9	02.55	04.39	06.16 17.26-17.43/17	07.46	08.26 11.02-11.11/9	10.01
	23.42	22.00	20.07	18.18	15.31	14.13
10	02.58	04.42	06.19 17.24-17.45/21	07.49	08.29	10.03
	23.39	21.56	20.03	18.14	15.27	14.11
11	03.01	04.45	06.22 17.23-17.45/22	07.52	08.33	10.05
	23.37	21.53	20.00	18.11	15.24	14.10
12	03.05	04.49	06.25 17.22-17.46/24	07.55	08.36	10.08
	23.34	21.49	19.56	18.07	15.21	14.09
13	03.08	04.52	06.28 17.21-17.46/25	07.58	08.39	10.10
	23.31	21.45	19.52	18.03	15.18	14.08
14	03.11	04.55	06.31 17.20-17.46/26	08.01	08.43	10.11
	23.28	21.42	19.49	18.00	15.15	14.07
15	03.14	04.59	06.34 17.19-17.46/27	08.04	08.46	10.13
	23.25	21.38	19.45	17.56	15.12	14.06
16	03.18	05.02	06.37 17.18-17.45/27	08.07 11.02-11.14/12	08.50	10.15
	23.22	21.35	19.41	17.53	15.09	14.06
17	03.21	05.05	06.40 17.18-17.45/27	08.10 11.00-11.15/15	08.53	10.16
	23.19	21.31	19.38	17.49	15.06	14.05
18	03.24	05.08	06.43 17.18-17.44/26	08.14 10.59-11.17/18	08.57	10.17
	23.15	21.27	19.34	17.46	15.03	14.05
19	03.28	05.11	06.46 17.18-17.43/25	08.17 10.57-11.18/21	09.00	10.19
	23.12	21.24	19.30	17.42	15.00	14.05
20	03.31	05.15	06.49 17.19-17.42/23	08.20 10.57-11.19/22	09.03	10.20
	23.09	21.20	19.27 16.57-17.04/7	17.39	14.57	14.05
21	03.34	05.18	06.52 17.20-17.41/21	08.23 10.55-11.18/23	09.07	10.20
	23.06	21.16	19.23 16.53-17.07/14	17.35	14.54	14.05
22	03.38	05.21	06.55 17.21-17.39/18	08.26 10.55-11.19/24	09.10	10.21
	23.02	21.13	19.19 16.51-17.08/17	17.32	14.51	14.05
23	03.41	05.24	06.58 17.22-17.36/14	08.29 10.55-11.18/23	09.13	10.21
	22.59	21.09	19.16 16.50-17.09/19	17.28	14.48	14.06
24	03.45	05.27	07.01 17.26-17.32/6	08.33 12.01-12.11/10	09.17	10.22
	22.56	21.06	19.12 16.48-17.09/21	17.25 10.55-11.18/23	14.45	14.07
25	03.48	05.30	07.04 16.47-17.10/23	07.36 10.59-11.14/15	09.20	10.22
	22.52	21.02	19.08	16.21 09.55-10.18/23	14.43	14.08
26	03.51	05.34	07.07 16.47-17.10/23	07.39 10.57-11.14/17	09.23	10.22
	22.49	20.58	19.05	16.18 09.55-10.17/22	14.40	14.09
27	03.55	05.37	07.10 16.46-17.09/23	07.42 10.56-11.16/20	09.26	10.22
	22.45	20.55	19.01	16.14 09.56-10.17/21	14.38	14.10
28	03.58	05.40	07.13 16.46-17.09/23	07.46 10.55-11.17/22	09.30	10.21
	22.42	20.51	18.58	16.11 09.57-10.16/19	14.35	14.11
29	04.02	05.43	07.16 16.46-17.08/22	07.49 10.55-11.17/22	09.33	10.21
	22.39	20.47	18.54	16.07 09.58-10.15/17	14.33	14.13
30	04.05	05.46	07.19 16.46-17.07/21	07.52 10.55-11.18/23	09.36	10.20
	22.35	20.44	18.50	16.04 10.00-10.13/13	14.30	14.14
31	04.08	05.49		07.56 10.54-11.18/24		10.19
	22.32	20.40		16.01 10.03-10.10/7		14.16
Potential sun hours	620	513	394	302	192	125
Sum of minutes with flicker	0	0	576	511	166	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
20.12.2018 11.11/3.2.737

SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6 **WTG:** 12 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (636)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February		March		April		May	June
1	10.18	09.03		07.28	09.41-10.06/25	06.35	18.14-18.16/2	04.46	03.01
	14.19	15.55		17.29		20.05	17.23-17.45/22	21.41	23.27
2	10.17	09.00		07.24	09.41-10.05/24	06.32	18.07-18.21/14	04.42	02.58
	14.21	15.58		17.32		20.08	17.24-17.43/19	21.44	23.30
3	10.16	08.57		07.20	09.42-10.04/22	06.28	18.05-18.24/19	04.39	02.55
	14.23	16.02		17.35		20.11	17.26-17.41/15	21.48	23.33
4	10.14	08.53		07.17	09.43-10.03/20	06.24	18.02-18.25/23	04.35	02.52
	14.25	16.05		17.38		20.14	17.29-17.37/8	21.51	23.36
5	10.13	08.50		07.13	09.44-10.01/17	06.21	18.01-18.27/26	04.32	02.50
	14.28	16.09		17.42		20.17		21.54	23.39
6	10.11	08.47		07.10	09.46-09.59/13	06.17	17.59-18.27/28	04.28	02.47
	14.30	16.12		17.45		20.20		21.58	23.42
7	10.09	08.44	10.57-11.03/6	07.06		06.13	17.58-18.27/29	04.24	02.44
	14.33	16.16		17.48		20.23		22.01	23.45
8	10.08	08.40	10.54-11.07/13	07.03		06.10	17.57-18.28/31	04.21	02.42
	14.36	16.19		17.51		20.27		22.05	23.48
9	10.06	08.37	10.52-11.09/17	06.59		06.06	17.56-18.28/32	04.17	02.40
	14.39	16.23		17.54		20.30		22.08	23.50
10	10.04	08.34	10.50-11.10/20	06.55		06.02	17.56-18.28/32	04.14	02.37
	14.41	16.26		17.57		20.33		22.12	23.53
11	10.01	08.30	10.49-11.11/22	06.52		05.59	17.55-18.28/33	04.10	02.35
	14.44	16.29		18.00		20.36		22.15	23.55
12	09.59	08.27	10.48-11.12/24	06.48		05.55	17.55-18.28/33	04.07	02.33
	14.47	16.33		18.03		20.39		22.18	23.58
13	09.57	08.23	10.49-11.14/25	06.44		05.51	17.55-18.27/32	04.03	02.32
	14.50	16.36		18.07		20.42		22.22	00.00
14	09.55	08.20	10.48-11.14/26	06.41		05.48	17.55-18.27/32	04.00	02.30
	14.54	16.40		18.10		20.45		22.25	00.02
15	09.52	08.17	10.48-11.14/26	06.37		05.44	17.55-18.26/31	03.56	02.28
	14.57	16.43		18.13		20.49		22.29	00.03
16	09.50	08.13	10.48-11.14/26	06.34		05.40	17.56-18.26/30	03.53	02.27
	15.00	16.46		18.16		20.52		22.32	00.05
17	09.47	08.10	10.47-11.14/27	06.30		05.37	17.57-18.25/28	03.49	02.26
	15.03	16.50		18.19		20.55		22.36	00.06
18	09.44	08.06	10.48-11.14/26	06.26		05.33	17.57-18.23/26	03.46	02.25
	15.07	16.53		18.22		20.58		22.39	00.07
19	09.42	08.03	10.48-11.13/25	06.23	16.31-16.43/12	05.29	17.58-18.22/24	03.43	02.25
	15.10	16.56	09.50-10.00/10	18.25		21.01		22.43	00.08
20	09.39	07.59	10.48-11.12/24	06.19	16.29-16.46/17	05.26	17.59-18.20/21	03.39	02.24
	15.13	17.00	09.47-10.02/15	18.28		21.05		22.46	00.09
21	09.36	07.56	10.48-11.11/23	06.15	16.27-16.47/20	05.22	18.01-18.18/17	03.36	02.24
	15.17	17.03	09.46-10.05/19	18.31		21.08		22.50	00.09
22	09.33	07.52	10.50-11.11/21	06.12	16.25-16.48/23	05.19	18.05-18.16/11	03.33	02.24
	15.20	17.06	09.45-10.06/21	18.34		21.11		22.53	00.09
23	09.31	07.49	10.51-11.09/18	06.08	16.24-16.49/25	05.15		03.29	02.24
	15.24	17.09	09.43-10.06/23	18.37		21.14		22.57	00.09
24	09.28	07.45	10.53-11.07/14	06.04	16.23-16.49/26	05.11		03.26	02.25
	15.27	17.13	09.42-10.07/25	18.40		21.18		23.00	00.09
25	09.25	07.42	10.56-11.03/7	06.01	16.22-16.49/27	05.08		03.23	02.26
	15.30	17.16	09.42-10.07/25	18.43		21.21		23.04	00.08
26	09.22	07.38	09.41-10.07/26	05.57	16.22-16.49/27	05.04		03.19	02.27
	15.34	17.19		18.46		21.24		23.07	00.08
27	09.19	07.35	09.42-10.07/25	05.54	16.21-16.49/28	05.00		03.16	02.28
	15.37	17.22		18.50		21.27		23.10	00.07
28	09.16	07.31	09.41-10.07/26	05.50	16.21-16.48/27	04.57		03.13	02.29
	15.41	17.26		18.53		21.31		23.14	00.05
29	09.13			06.46	17.21-17.48/27	04.53		03.10	02.31
	15.44			19.56		21.34		23.17	00.04
30	09.09			06.43	17.21-17.47/26	04.50		03.07	02.33
	15.48			19.59		21.37		23.20	00.03
31	09.06			06.39	17.22-17.46/24			03.04	
	15.51			20.02				23.24	
Potential sun hours	163	235		363		454		578	641
Sum of minutes with flicker	0	605		430		618		0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
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SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6 **WTG:** 12 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (636)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July	August	September	October	November	December
1	02.35	04.12	05.52 17.55-18.28/33	07.21	07.59 10.21-10.40/19	09.39
	00.01	22.28	20.36	18.47	15.57	14.28
2	02.37	04.15	05.55 17.54-18.26/32	07.24	08.02 10.22-10.39/17	09.42
	23.59	22.25	20.33	18.43	15.54	14.26
3	02.39	04.19	05.58 17.54-18.26/32	07.27	08.06 10.25-10.37/12	09.45
	23.57	22.21	20.29	18.39	15.50	14.23
4	02.42	04.22	06.01 17.54-18.25/31	07.30	08.09 10.29-10.33/4	09.48
	23.55	22.18	20.25	18.36	15.47	14.21
5	02.44	04.25	06.04 17.55-18.24/29	07.34	08.12	09.51
	23.52	22.14	20.22	18.32	15.44	14.19
6	02.47	04.29	06.07 17.55-18.23/28	07.37	08.16	09.53
	23.50	22.10	20.18	18.29	15.40	14.18
7	02.50	04.32	06.10 17.56-18.22/26	07.40 10.24-10.33/9	08.19	09.56
	23.48	22.07	20.14	18.25	15.37	14.16
8	02.52	04.35	06.13 17.56-18.20/24	07.43 10.20-10.35/15	08.22	09.59
	23.45	22.03	20.11 17.23-17.31/8	18.21	15.34	14.14
9	02.55	04.39	06.16 17.58-18.17/19	07.46 10.18-10.37/19	08.26	10.01
	23.42	22.00	20.07 17.19-17.34/15	18.18	15.31	14.13
10	02.58	04.42	06.19 18.00-18.15/15	07.49 10.17-10.38/21	08.29	10.03
	23.39	21.56	20.03 17.17-17.36/19	18.14	15.27	14.11
11	03.01	04.45	06.22 18.05-18.10/5	07.52 10.16-10.39/23	08.33	10.06
	23.37	21.53	20.00 17.15-17.37/22	18.11	15.24	14.10
12	03.05	04.49	06.25 17.14-17.38/24	07.55 10.15-10.39/24	08.36	10.08
	23.34	21.49	19.56	18.07	15.21	14.09
13	03.08	04.52	06.28 17.13-17.38/25	07.58 10.15-10.40/25	08.40	10.10
	23.31	21.45	19.52	18.03	15.18	14.08
14	03.11	04.55	06.31 17.12-17.39/27	08.01 10.14-10.39/25	08.43	10.11
	23.28	21.42	19.49	18.00	15.15	14.07
15	03.14	04.59	06.34 17.11-17.39/28	08.04 10.13-10.39/26	08.46	10.13
	23.25	21.38	19.45	17.56	15.12	14.06
16	03.17	05.02	06.37 17.10-17.37/27	08.07 10.14-10.39/25	08.50	10.15
	23.22	21.35	19.41	17.53	15.09	14.05
17	03.21	05.05	06.40 17.10-17.37/27	08.10 11.26-11.36/10	08.53	10.16
	23.19	21.31	19.38	17.49 10.13-10.38/25	15.06	14.05
18	03.24	05.08	06.43 17.09-17.37/28	08.14 11.24-11.40/16	08.57	10.17
	23.15	21.27	19.34	17.46 10.14-10.38/24	15.03	14.05
19	03.27	05.11	06.46 17.10-17.36/26	08.17 11.22-11.41/19	09.00	10.19
	23.12	21.24	19.30	17.42 10.14-10.37/23	15.00	14.05
20	03.31	05.15	06.49 17.10-17.35/25	08.20 11.21-11.42/21	09.03	10.20
	23.09	21.20	19.27	17.39 10.16-10.36/20	14.57	14.05
21	03.34	05.18 18.09-18.21/12	06.52 17.10-17.34/24	08.23 11.19-11.43/24	09.07	10.20
	23.06	21.16	19.23	17.35 10.16-10.34/18	14.54	14.05
22	03.38	05.21 18.06-18.23/17	06.55 17.11-17.32/21	08.26 11.19-11.44/25	09.10	10.21
	23.02	21.13	19.19	17.32 10.19-10.32/13	14.51	14.05
23	03.41	05.24 18.03-18.25/22	06.58 17.12-17.31/19	08.29 11.17-11.43/26	09.13	10.21
	22.59	21.09	19.16	17.28 10.21-10.28/7	14.48	14.06
24	03.44	05.27 18.02-18.26/24	07.01 17.14-17.28/14	08.33 11.17-11.44/27	09.17	10.22
	22.56	21.06	19.12	17.25	14.45	14.07
25	03.48	05.30 18.00-18.27/27	07.04 17.18-17.24/6	07.36 10.17-10.44/27	09.20	10.22
	22.52	21.02	19.08	16.21	14.43	14.07
26	03.51	05.34 17.58-18.27/29	07.07	07.39 10.17-10.43/26	09.23	10.22
	22.49	20.58	19.05	16.18	14.40	14.09
27	03.55	05.37 17.57-18.27/30	07.10	07.42 10.17-10.43/26	09.27	10.22
	22.45	20.55	19.01	16.14	14.38	14.10
28	03.58	05.40 17.57-18.28/31	07.13	07.46 10.17-10.43/26	09.30	10.21
	22.42	20.51	18.58	16.11	14.35	14.11
29	04.02	05.43 17.56-18.28/32	07.16	07.49 10.18-10.43/25	09.33	10.21
	22.39	20.47	18.54	16.07	14.33	14.13
30	04.05	05.46 17.56-18.28/32	07.19	07.52 10.19-10.42/23	09.36	10.20
	22.35	20.44	18.50	16.04	14.30	14.14
31	04.08	05.49 17.55-18.28/33		07.56 10.20-10.41/21		10.19
	22.32	20.40		16.01		14.16
Potential sun hours	621	513	394	302	192	125
Sum of minutes with flicker	0	289	659	684	52	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6 **WTG:** 13 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (637)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February		March		April		May		June
1	10.18	09.03		07.28	09.01-09.23/22	06.35	16.58-17.34/36	04.46	17.41-18.23/42	03.01
	14.19	15.55		17.29		20.05		21.41		23.27
2	10.17	09.00		07.24	09.01-09.23/22	06.32	16.58-17.33/35	04.42	17.42-18.22/40	02.58
	14.21	15.58		17.32		20.08		21.44		23.30
3	10.16	08.57		07.20	09.00-09.23/23	06.28	16.58-17.33/35	04.39	17.43-18.22/39	02.55
	14.23	16.02		17.35		20.11		21.48		23.33
4	10.14	08.53		07.17	09.01-09.24/23	06.24	16.58-17.32/34	04.35	17.43-18.21/38	02.52
	14.25	16.05		17.38		20.14		21.51		23.36
5	10.13	08.50		07.13	09.01-09.23/22	06.21	16.59-17.32/33	04.32	17.44-18.20/36	02.50
	14.28	16.09		17.42		20.17		21.54		23.39
6	10.11	08.47		07.10	09.01-09.22/21	06.17	16.59-17.30/31	04.28	17.46-18.20/34	02.47
	14.30	16.12		17.45		20.20		21.58		23.42
7	10.09	08.44		07.06	09.01-09.20/19	06.13	17.00-17.29/29	04.24	17.47-18.18/31	02.44
	14.33	16.16		17.48		20.23		22.01		23.45
8	10.08	08.40		07.02	09.03-09.19/16	06.10	17.01-17.28/27	04.21	17.48-18.17/29	02.42
	14.36	16.19		17.51		20.27		22.05		23.48
9	10.06	08.37		06.59	09.04-09.17/13	06.06	17.02-17.26/24	04.17	17.50-18.16/26	02.40
	14.38	16.23		17.54		20.30		22.08		23.50
10	10.04	08.34		06.55	09.08-09.12/4	06.02	17.59-18.13/14	04.14	17.52-18.14/22	02.37
	14.41	16.26		17.57		20.33	17.05-17.24/19	22.12		23.53
11	10.01	08.30		06.52		05.59	17.55-18.16/21	04.10	17.54-18.12/18	02.35
	14.44	16.29		18.00		20.36	17.08-17.20/12	22.15		23.55
12	09.59	08.27	10.07-10.14/7	06.48		05.55	17.52-18.19/27	04.07	17.57-18.08/11	02.33
	14.47	16.33		18.03		20.39		22.18		23.58
13	09.57	08.23	10.05-10.18/13	06.44		05.51	17.50-18.20/30	04.03		02.32
	14.50	16.36		18.07		20.42		22.22		00.00
14	09.55	08.20	10.03-10.20/17	06.41		05.48	17.48-18.22/34	04.00		02.30
	14.54	16.40		18.10		20.45		22.25		00.02
15	09.52	08.17	10.02-10.21/19	06.37		05.44	17.46-18.22/36	03.56		02.28
	14.57	16.43		18.13		20.49		22.29		00.03
16	09.50	08.13	10.00-10.22/22	06.34		05.40	17.46-18.24/38	03.53		02.27
	15.00	16.46		18.16		20.52		22.32		00.05
17	09.47	08.10	10.00-10.23/23	06.30		05.37	17.45-18.25/40	03.49		02.26
	15.03	16.50		18.19		20.55		22.36		00.06
18	09.44	08.06	09.59-10.23/24	06.26		05.33	17.43-18.25/42	03.46		02.25
	15.07	16.53		18.22		20.58		22.39		00.07
19	09.42	08.03	09.58-10.23/25	06.23		05.29	17.43-18.25/42	03.43		02.25
	15.10	16.56		18.25		21.01		22.43		00.08
20	09.39	07.59	09.58-10.23/25	06.19		05.26	17.42-18.25/43	03.39		02.24
	15.13	17.00		18.28		21.05		22.46		00.09
21	09.36	07.56	09.58-10.23/25	06.15	16.12-16.26/14	05.22	17.41-18.26/45	03.36		02.24
	15.17	17.03		18.31		21.08		22.50		00.09
22	09.33	07.52	09.59-10.23/24	06.12	16.09-16.29/20	05.18	17.41-18.26/45	03.33		02.24
	15.20	17.06		18.34		21.11		22.53		00.09
23	09.31	07.49	09.59-10.23/24	06.08	16.07-16.31/24	05.15	17.40-18.25/45	03.29		02.24
	15.23	17.09		18.37		21.14		22.57		00.09
24	09.28	07.45	09.59-10.22/23	06.04	16.05-16.32/27	05.11	17.40-18.26/46	03.26		02.25
	15.27	17.13	09.09-09.18/9	18.40		21.18		23.00		00.09
25	09.25	07.42	10.00-10.21/21	06.01	16.03-16.33/30	05.08	17.40-18.26/46	03.23		02.26
	15.30	17.16	09.06-09.20/14	18.43		21.21		23.04		00.08
26	09.22	07.38	10.01-10.19/18	05.57	16.02-16.34/32	05.04	17.40-18.25/45	03.19		02.27
	15.34	17.19	09.04-09.21/17	18.46		21.24		23.07		00.08
27	09.19	07.35	10.03-10.18/15	05.53	16.01-16.34/33	05.00	17.40-18.25/45	03.16		02.28
	15.37	17.22	09.03-09.23/20	18.49		21.27		23.10		00.07
28	09.16	07.31	10.05-10.15/10	05.50	16.00-16.34/34	04.57	17.40-18.25/45	03.13		02.29
	15.41	17.26	09.02-09.23/21	18.53		21.31		23.14		00.05
29	09.13			06.46	17.00-17.35/35	04.53	17.41-18.25/44	03.10		02.31
	15.44			19.56		21.34		23.17		00.04
30	09.09			06.43	16.59-17.34/35	04.50	17.41-18.24/43	03.07		02.33
	15.48			19.59		21.37		23.20		00.03
31	09.06			06.39	16.59-17.35/36			03.04		
	15.51			20.02				23.24		
Potential sun hours	163	235		363		454		578		641
Sum of minutes with flicker	0	416		505		1131		366		0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
20.12.2018 11.11/3.2.737

SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6 **WTG:** 13 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (637)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July	August	September	October	November	December
1	02.35	04.12 18.06-18.21/15	05.52 17.55-18.16/21	07.21	07.59	09.39
	00.01	22.28	20.36 17.07-17.20/13	18.47	15.57	14.28
2	02.37	04.15 18.03-18.22/19	05.55 17.57-18.11/14	07.24	08.02	09.42
	23.59	22.25	20.33 17.03-17.22/19	18.43	15.54	14.26
3	02.39	04.19 18.01-18.25/24	05.58 17.00-17.24/24	07.27	08.06	09.45
	23.57	22.21	20.29	18.39	15.50	14.23
4	02.42	04.22 17.59-18.26/27	06.01 16.59-17.25/26	07.30 09.43-09.53/10	08.09	09.48
	23.55	22.18	20.25	18.36	15.47	14.21
5	02.44	04.25 17.58-18.28/30	06.04 16.57-17.26/29	07.33 09.40-09.55/15	08.12	09.51
	23.52	22.14	20.22	18.32	15.44	14.19
6	02.47	04.29 17.56-18.29/33	06.07 16.56-17.27/31	07.37 09.38-09.56/18	08.16	09.53
	23.50	22.10	20.18	18.29	15.40	14.18
7	02.50	04.32 17.54-18.29/35	06.10 16.54-17.27/33	07.40 09.37-09.57/20	08.19	09.56
	23.48	22.07	20.14	18.25	15.37	14.16
8	02.52	04.35 17.53-18.30/37	06.13 16.53-17.26/33	07.43 09.36-09.57/21	08.22	09.58
	23.45	22.03	20.11	18.21	15.34	14.14
9	02.55	04.39 17.52-18.31/39	06.16 16.52-17.27/35	07.46 09.35-09.57/22	08.26	10.01
	23.42	22.00	20.07	18.18	15.31	14.13
10	02.58	04.42 17.51-18.31/40	06.19 16.51-17.27/36	07.49 09.35-09.58/23	08.29	10.03
	23.39	21.56	20.03	18.14	15.27	14.11
11	03.01	04.45 17.51-18.32/41	06.22 16.51-17.27/36	07.52 09.34-09.57/23	08.33	10.05
	23.37	21.53	20.00	18.11	15.24	14.10
12	03.04	04.49 17.50-18.32/42	06.25 16.50-17.26/36	07.55 09.34-09.57/23	08.36	10.08
	23.34	21.49	19.56	18.07	15.21	14.09
13	03.08	04.52 17.48-18.32/44	06.28 16.50-17.26/36	07.58 09.35-09.57/22	08.39	10.10
	23.31	21.45	19.52	18.03	15.18	14.08
14	03.11	04.55 17.48-18.32/44	06.31 16.50-17.25/35	08.01 10.36-10.49/13	08.43	10.11
	23.28	21.42	19.49	18.00 09.35-09.56/21	15.15	14.07
15	03.14	04.59 17.48-18.32/44	06.34 16.50-17.25/35	08.04 10.34-10.50/16	08.46	10.13
	23.25	21.38	19.45	17.56 09.35-09.54/19	15.12	14.06
16	03.17	05.02 17.47-18.32/45	06.37 16.50-17.23/33	08.07 10.33-10.52/19	08.50	10.15
	23.22	21.35	19.41	17.53 09.37-09.53/16	15.09	14.05
17	03.21	05.05 17.47-18.32/45	06.40 16.50-17.22/32	08.10 10.31-10.53/22	08.53	10.16
	23.19	21.31	19.38	17.49 09.38-09.51/13	15.06	14.05
18	03.24	05.08 17.47-18.32/45	06.43 16.51-17.21/30	08.13 10.31-10.54/23	08.57	10.17
	23.15	21.27	19.34	17.46 09.42-09.48/6	15.03	14.05
19	03.27	05.11 17.47-18.32/45	06.46 16.51-17.19/28	08.17 10.30-10.54/24	09.00	10.19
	23.12	21.24	19.30	17.42	15.00	14.05
20	03.31	05.15 17.46-18.31/45	06.49 16.53-17.17/24	08.20 10.29-10.54/25	09.03	10.20
	23.09	21.20	19.27	17.39	14.57	14.05
21	03.34	05.18 17.46-18.31/45	06.52 16.54-17.15/21	08.23 10.29-10.54/25	09.07	10.20
	23.06	21.16	19.23	17.35	14.54	14.05
22	03.38	05.21 17.46-18.30/44	06.55 16.56-17.12/16	08.26 10.29-10.54/25	09.10	10.21
	23.02	21.13	19.19	17.32	14.51	14.05
23	03.41	05.24 17.46-18.30/44	06.58 17.01-17.07/6	08.29 10.28-10.53/25	09.13	10.21
	22.59	21.09	19.16	17.28	14.48	14.06
24	03.44	05.27 17.47-18.29/42	07.01	08.33 10.29-10.53/24	09.17	10.22
	22.56	21.05	19.12	17.25	14.45	14.07
25	03.48	05.30 17.47-18.28/41	07.04	07.36 09.30-09.52/22	09.20	10.22
	22.52	21.02	19.08	16.21	14.43	14.07
26	03.51	05.33 17.47-18.26/39	07.07	07.39 09.30-09.51/21	09.23	10.22
	22.49	20.58	19.05	16.18	14.40	14.09
27	03.55	05.37 17.47-18.25/38	07.10	07.42 09.31-09.50/19	09.26	10.22
	22.45	20.55	19.01	16.14	14.37	14.10
28	03.58	05.40 17.48-18.24/36	07.13	07.46 09.32-09.49/17	09.30	10.21
	22.42	20.51	18.58	16.11	14.35	14.11
29	04.02	05.43 17.49-18.22/33	07.16	07.49 09.35-09.47/12	09.33	10.21
	22.39	20.47	18.54	16.07	14.33	14.13
30	04.05	05.46 17.51-18.21/30	07.18	07.52 09.39-09.43/4	09.36	10.20
	22.35	20.44	18.50	16.04	14.30	14.14
31	04.08 18.12-18.15/3	05.49 17.52-18.19/27		07.56		10.19
	22.32	20.40		16.01		14.16
Potential sun hours	621	513	394	302	192	125
Sum of minutes with flicker	3	1158	682	608	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
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SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6 **WTG:** 14 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (638)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February		March	April		May	June
1	10.18	09.03		07.28	06.35		04.46	03.01
	14.19	15.55		17.29	20.05		21.41	23.27
2	10.17	09.00		07.24	06.32	07.34-07.40/6	04.42	02.58
	14.21	15.58		17.32	20.08		21.44	23.30
3	10.16	08.57	13.54-14.04/10	07.21	06.28	07.30-07.43/13	04.39	02.55
	14.23	16.02		17.35	20.11		21.48	23.33
4	10.14	08.54	13.51-14.05/14	07.17	06.24	07.28-07.44/16	04.35	02.52
	14.25	16.05	13.04-13.12/8	17.38	20.14		21.51	23.36
5	10.13	08.50	13.50-14.07/17	07.13	06.21	07.27-07.45/18	04.32	02.50
	14.28	16.09	13.01-13.15/14	17.42	20.17		21.54	23.39
6	10.11	08.47	13.49-14.08/19	07.10	06.17	07.25-07.45/20	04.28	02.47
	14.30	16.12	13.00-13.17/17	17.45	20.20		21.58	23.42
7	10.09	08.44	13.48-14.09/21	07.06	06.13	07.25-07.46/21	04.25	02.45
	14.33	16.16	12.58-13.19/21	17.48	20.23		22.01	23.45
8	10.08	08.40	13.48-14.10/22	07.03	06.10	07.24-07.45/21	04.21	02.42
	14.36	16.19	12.57-13.20/23	17.51	20.27		22.05	23.48
9	10.06	08.37	13.47-14.10/23	06.59	06.06	07.24-07.45/21	04.17	02.40
	14.39	16.23	12.57-13.21/24	17.54	20.30		22.08	23.51
10	10.04	08.34	13.47-14.10/23	06.55	06.02	07.23-07.45/22	04.14	02.38
	14.42	16.26	12.56-13.22/26	17.57	20.33		22.12	23.53
11	10.02	08.30	13.47-14.10/23	06.52	05.59	07.24-07.44/20	04.10	02.35
	14.44	16.29	12.55-13.22/27	18.00	20.36		22.15	23.55
12	09.59	08.27	13.47-14.10/23	06.48	05.55	07.24-07.43/19	04.07	02.34
	14.48	16.33	12.56-13.23/27	18.04	20.39		22.19	23.58
13	09.57	08.24	13.48-14.11/23	06.45	05.51	07.25-07.42/17	04.03	02.32
	14.51	16.36	12.56-13.24/28	18.07	20.42		22.22	00.00
14	09.55	08.20	13.49-14.11/22	06.41	05.48	07.26-07.40/14	04.00	02.30
	14.54	16.40	12.56-13.24/28	18.10	20.45		22.25	00.02
15	09.52	08.17	13.49-14.10/21	06.37	05.44	07.28-07.38/10	03.56	02.29
	14.57	16.43	12.56-13.23/27	18.13	20.49		22.29	00.03
16	09.50	08.13	13.50-14.09/19	06.34	05.40		03.53	02.27
	15.00	16.46	12.56-13.23/27	18.16	20.52		22.32	00.05
17	09.47	08.10	13.51-14.08/17	06.30	05.37		03.50	02.26
	15.03	16.50	12.56-13.23/27	18.19	20.55		22.36	00.06
18	09.45	08.06	13.53-14.06/13	06.26	05.33		03.46	02.25
	15.07	16.53	12.56-13.22/26	18.22	20.58		22.39	00.07
19	09.42	08.03	13.56-14.03/7	06.23	05.30		03.43	02.25
	15.10	16.56	12.57-13.21/24	18.25	21.01		22.43	00.08
20	09.39	07.59	12.58-13.20/22	06.19	05.26		03.39	02.24
	15.13	17.00		18.28	21.05		22.46	00.09
21	09.36	07.56	13.00-13.19/19	06.15	05.22		03.36	02.24
	15.17	17.03		18.31	21.08		22.50	00.09
22	09.34	07.52	13.02-13.17/15	06.12	05.19		03.33	02.24
	15.20	17.06		18.34	21.11		22.53	00.09
23	09.31	07.49	13.05-13.13/8	06.08	05.15		03.29	02.24
	15.24	17.10		18.37	21.14		22.57	00.09
24	09.28	07.45		06.05	05.11		03.26	02.25
	15.27	17.13		18.40	21.18		23.00	00.09
25	09.25	07.42		06.01	05.08		03.23	02.26
	15.31	17.16		18.43	21.21		23.04	00.08
26	09.22	07.38		05.57	05.04		03.20	02.27
	15.34	17.19		18.47	21.24		23.07	00.08
27	09.19	07.35		05.54	05.00		03.16	02.28
	15.37	17.22		18.50	21.28		23.10	00.07
28	09.16	07.31		05.50	04.57		03.13	02.29
	15.41	17.26		18.53	21.31		23.14	00.05
29	09.13			06.46	04.53		03.10	02.31
	15.44			19.56	21.34		23.17	00.04
30	09.10			06.43	04.50		03.07	02.33
	15.48			19.59	21.38		23.20	00.03
31	09.06			06.39			03.04	
	15.51			20.02			23.24	
Potential sun hours	163	235		363	454		578	641
Sum of minutes with flicker	0	755		0	238		0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
20.12.2018 11.11/3.2.737

SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6 **WTG:** 14 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (638)

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July	August		September		October		November		December
1	02.35	04.12		05.52	07.23-07.43/20	07.22		07.59	13.18-13.41/23	09.39
	00.01	22.28		20.36		18.47		15.57	12.26-12.52/26	14.28
2	02.37	04.15		05.55	07.22-07.43/21	07.25		08.02	13.18-13.40/22	09.42
	23.59	22.25		20.33		18.43		15.54	12.27-12.51/24	14.26
3	02.39	04.19		05.58	07.22-07.44/22	07.28		08.06	13.18-13.40/22	09.45
	23.57	22.21		20.29		18.40		15.51	12.28-12.50/22	14.24
4	02.42	04.22		06.01	07.21-07.42/21	07.31		08.09	13.19-13.39/20	09.48
	23.55	22.18		20.25		18.36		15.47	12.29-12.49/20	14.22
5	02.44	04.26		06.04	07.21-07.42/21	07.34		08.12	13.20-13.38/18	09.51
	23.52	22.14		20.22		18.32		15.44	12.30-12.47/17	14.20
6	02.47	04.29		06.07	07.21-07.41/20	07.37		08.16	13.21-13.37/16	09.53
	23.50	22.11		20.18		18.29		15.41	12.32-12.45/13	14.18
7	02.50	04.32		06.10	07.22-07.40/18	07.40		08.19	13.22-13.35/13	09.56
	23.48	22.07		20.14		18.25		15.37	12.35-12.42/7	14.16
8	02.53	04.36		06.13	07.23-07.39/16	07.43		08.23	13.24-13.33/9	09.59
	23.45	22.03		20.11		18.21		15.34		14.14
9	02.55	04.39		06.16	07.24-07.37/13	07.46		08.26		10.01
	23.42	22.00		20.07		18.18		15.31		14.13
10	02.58	04.42		06.19	07.26-07.33/7	07.49		08.29		10.03
	23.40	21.56		20.03		18.14		15.27		14.11
11	03.02	04.46		06.22		07.52		08.33		10.06
	23.37	21.53		20.00		18.11		15.24		14.10
12	03.05	04.49		06.25		07.55		08.36		10.08
	23.34	21.49		19.56		18.07		15.21		14.09
13	03.08	04.52		06.28		07.58		08.40		10.10
	23.31	21.45		19.52		18.04		15.18		14.08
14	03.11	04.55		06.31		08.01		08.43		10.12
	23.28	21.42		19.49		18.00		15.15		14.07
15	03.14	04.59		06.34		08.04		08.46		10.13
	23.25	21.38		19.45		17.56		15.12		14.06
16	03.18	05.02		06.37		08.07		08.50		10.15
	23.22	21.35		19.41		17.53		15.09		14.06
17	03.21	05.05		06.40		08.10		08.53		10.16
	23.19	21.31		19.38		17.49		15.06		14.05
18	03.24	05.08		06.43		08.14		08.57		10.18
	23.15	21.27		19.34		17.46		15.03		14.05
19	03.28	05.12		06.46		08.17	13.34-13.45/11	09.00		10.19
	23.12	21.24		19.30		17.42		15.00		14.05
20	03.31	05.15		06.49		08.20	13.32-13.48/16	09.03		10.20
	23.09	21.20		19.27		17.39		14.57		14.05
21	03.34	05.18		06.52		08.23	13.29-13.49/20	09.07		10.20
	23.06	21.17		19.23		17.35		14.54		14.05
22	03.38	05.21		06.55		08.26	13.28-13.51/23	09.10		10.21
	23.02	21.13		19.19		17.32		14.51		14.05
23	03.41	05.24		06.58		08.29	14.24-14.34/10	09.13		10.21
	22.59	21.09		19.16		17.28	13.27-13.51/24	14.48		14.06
24	03.45	05.27		07.01		08.33	14.22-14.36/14	09.17		10.22
	22.56	21.06		19.12		17.25	13.26-13.52/26	14.46		14.07
25	03.48	05.30		07.04		07.36	13.21-13.38/17	09.20		10.22
	22.52	21.02		19.09		16.21	12.26-12.53/27	14.43		14.08
26	03.51	05.34		07.07		07.39	13.19-13.38/19	09.23		10.22
	22.49	20.58		19.05		16.18	12.25-12.52/27	14.40		14.09
27	03.55	05.37		07.10		07.42	13.18-13.39/21	09.27		10.22
	22.45	20.55		19.01		16.14	12.25-12.52/27	14.38		14.10
28	03.58	05.40	07.28-07.39/11	07.13		07.46	13.18-13.40/22	09.30		10.21
	22.42	20.51		18.58		16.11	12.25-12.53/28	14.35		14.11
29	04.02	05.43	07.26-07.41/15	07.16		07.49	13.17-13.40/23	09.33		10.21
	22.39	20.47		18.54		16.07	12.25-12.53/28	14.33		14.13
30	04.05	05.46	07.25-07.42/17	07.19		07.52	13.17-13.41/24	09.36		10.20
	22.35	20.44		18.50		16.04	12.25-12.53/28	14.30		14.14
31	04.09	05.49	07.24-07.43/19			07.56	13.17-13.41/24			10.19
	22.32	20.40				16.01	12.26-12.52/26			14.16
Potential sun hours	620	513		394		302		192		125
Sum of minutes with flicker	0	62		179		485		272		0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
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SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**WTG:** 1 - M1-E-70 E4 2000 71.0

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February	March	April	May	June	July	August	September	October	November	December
1	10.18	09.03	07.28	06.35	04.46	03.01	02.35	04.12	05.52	07.22	07.59 11.42-11.59/17	09.39
	14.19	15.55	17.29	20.05	21.41	23.27	00.01	22.28	20.36	18.47	15.57	14.28
2	10.17	09.00	07.24	06.32	04.43	02.58	02.37	04.16	05.55	07.25	08.02 11.42-11.59/17	09.42
	14.21	15.59	17.32	20.08	21.44	23.30	23.59	22.25	20.33	18.43	15.54	14.26
3	10.16	08.57	07.21	06.28	04.39	02.56	02.40	04.19	05.58	07.28	08.06 11.43-11.58/15	09.45
	14.23	16.02	17.35	20.11	21.48	23.33	23.57	22.21	20.29	18.40	15.51	14.24
4	10.14	08.54	07.17	06.24	04.35	02.53	02.42	04.22	06.01	07.31	08.09 11.43-11.57/14	09.48
	14.26	16.06	17.39	20.14	21.51	23.36	23.55	22.18	20.25	18.36	15.47	14.22
5	10.13	08.50 12.15-12.24/9	07.13	06.21	04.32	02.50	02.45	04.26	06.04	07.34	08.12 11.44-11.56/12	09.51
	14.28	16.09	17.42	20.17	21.54	23.39	23.52	22.14	20.22	18.32	15.44	14.20
6	10.11	08.47 12.14-12.26/12	07.10	06.17	04.28	02.47	02.47	04.29	06.07	07.37	08.16 11.46-11.54/8	09.53
	14.31	16.12	17.45	20.20	21.58	23.42	23.50	22.11	20.18	18.29	15.41	14.18
7	10.09	08.44 12.13-12.27/14	07.06	06.14	04.25	02.45	02.50	04.32	06.10	07.40	08.19	09.56
	14.33	16.16	17.48	20.24	22.01	23.45	23.47	22.07	20.14	18.25	15.37	14.16
8	10.08	08.40 12.12-12.28/16	07.03	06.10	04.21	02.42	02.53	04.36	06.13	07.43	08.23	09.59
	14.36	16.19	17.51	20.27	22.05	23.48	23.45	22.03	20.11	18.22	15.34	14.15
9	10.06	08.37 12.12-12.28/16	06.59	06.06	04.18	02.40	02.56	04.39	06.16	07.46	08.26	10.01
	14.39	16.23	17.54	20.30	22.08	23.50	23.42	22.00	20.07	18.18	15.31	14.13
10	10.04	08.34 12.12-12.28/16	06.55	06.03	04.14	02.38	02.59	04.42	06.19	07.49	08.29	10.03
	14.42	16.26	17.57	20.33	22.12	23.53	23.39	21.56	20.03	18.14	15.28	14.12
11	10.02	08.30 12.12-12.28/16	06.52	05.59	04.11	02.36	03.02	04.46	06.22	07.52	08.33	10.06
	14.45	16.30	18.01	20.36	22.15	23.55	23.37	21.53	20.00	18.11	15.24	14.10
12	09.59	08.27 12.13-12.29/16	06.48	05.55	04.07	02.34	03.05	04.49	06.25	07.55	08.36	10.08
	14.48	16.33	18.04	20.39	22.19	23.57	23.34	21.49	19.56	18.07	15.21	14.09
13	09.57	08.24 12.13-12.29/16	06.45	05.52	04.04	02.32	03.08	04.52	06.28	07.58	08.40	10.10
	14.51	16.36	18.07	20.42	22.22	00.00	23.31	21.46	19.53	18.04	15.18	14.08
14	09.55	08.20 12.14-12.28/14	06.41	05.48	04.00	02.30	03.11	04.56	06.31	08.01	08.43	10.11
	14.54	16.40	18.10	20.46	22.25	00.01	23.28	21.42	19.49	18.00	15.15	14.07
15	09.52	08.17 12.15-12.26/11	06.37	05.44	03.57	02.29	03.15	04.59	06.34	08.04	08.46	10.13
	14.57	16.43	18.13	20.49	22.29	00.03	23.25	21.38	19.45	17.57	15.12	14.06
16	09.50	08.13 12.17-12.24/7	06.34	05.41	03.53	02.28	03.18	05.02	06.37	08.07	08.50	10.15
	15.00	16.47	18.16	20.52	22.32	00.05	23.22	21.35	19.42	17.53	15.09	14.06
17	09.47	08.10	06.30	05.37	03.50	02.27	03.21	05.05	06.40	08.11	08.53	10.16
	15.04	16.50	18.19	20.55	22.36	00.06	23.19	21.31	19.38	17.49	15.06	14.05
18	09.45	08.06	06.27	05.33	03.46	02.26	03.24	05.09	06.43	08.14	08.57	10.17
	15.07	16.53	18.22	20.58	22.39	00.07	23.15	21.27	19.34	17.46	15.03	14.05
19	09.42	08.03	06.23	05.30	03.43	02.25	03.28	05.12	06.46	08.17	09.00	10.19
	15.10	16.57	18.25	21.01	22.43	00.08	23.12	21.24	19.31	17.42	15.00	14.05
20	09.39	07.59	06.19	05.26	03.40	02.25	03.31	05.15	06.49	08.20	09.03	10.20
	15.14	17.00	18.28	21.05	22.46	00.09	23.09	21.20	19.27	17.39	14.57	14.05
21	09.36	07.56	06.16	05.22	03.36	02.25	03.35	05.18	06.52	08.23	09.07	10.20
	15.17	17.03	18.31	21.08	22.50	00.09	23.06	21.17	19.23	17.35	14.54	14.05
22	09.34	07.52	06.12	05.19	03.33	02.25	03.38	05.21	06.55	08.26	09.10	10.21
	15.20	17.06	18.34	21.11	22.53	00.09	23.02	21.13	19.20	17.32	14.51	14.06
23	09.31	07.49	06.08	05.15	03.30	02.25	03.41	05.24	06.58	08.30	09.13	10.21
	15.24	17.10	18.37	21.14	22.57	00.09	22.59	21.09	19.16	17.28	14.48	14.06
24	09.28	07.45	06.05	05.12	03.26	02.25	03.45	05.28	07.01	08.33	09.17	10.22
	15.27	17.13	18.41	21.18	23.00	00.09	22.56	21.06	19.12	17.25	14.46	14.07
25	09.25	07.42	06.01	05.08	03.23	02.26	03.48	05.31	07.04	07.36	09.20	10.22
	15.31	17.16	18.44	21.21	23.04	00.08	22.52	21.02	19.09	16.21	14.43	14.08
26	09.22	07.38	05.57	05.04	03.20	02.27	03.52	05.34	07.07	07.39 11.47-11.55/8	09.23	10.22
	15.34	17.19	18.47	21.24	23.07	00.07	22.49	20.58	19.05	16.18	14.40	14.09
27	09.19	07.35	05.54	05.01	03.17	02.28	03.55	05.37	07.10	07.43 11.44-11.56/12	09.27	10.22
	15.38	17.23	18.50	21.28	23.10	00.07	22.45	20.55	19.01	16.14	14.38	14.10
28	09.16	07.31	05.50	04.57	03.13	02.30	03.59	05.40	07.13	07.46 11.43-11.57/14	09.30	10.21
	15.41	17.26	18.53	21.31	23.14	00.05	22.42	20.51	18.58	16.11	14.35	14.12
29	09.13		06.46	04.53	03.10	02.31	04.02	05.43	07.16	07.49 11.42-11.58/16	09.33	10.21
	15.45		19.56	21.34	23.17	00.04	22.39	20.47	18.54	16.08	14.33	14.13
30	09.10		06.43	04.50	03.07	02.33	04.05	05.46	07.19	07.52 11.42-11.58/16	09.36	10.20
	15.48		19.59	21.38	23.20	00.02	22.35	20.44	18.51	16.04	14.31	14.15
31	09.06		06.39		03.04		04.09	05.49		07.56 11.42-11.59/17		10.19
	15.52		20.02		23.24		22.32	20.40		16.01		14.17
Potential sun hours	163	235	363	454	578	641	620	513	394	302	192	125
Sum of minutes with flicker	0	163	0	0	0	0	0	0	0	83	83	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
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SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**WTG:** 2 - M5- E-70 E4 2,3 MW 2300

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	January	February		March		April	May		June	
1	10.18	09.03		07.28	09.02-09.11/9	06.35	04.46		03.01	05.21-05.32/11
	14.19	15.55		17.29		20.05	21.41		23.27	
2	10.17	09.00		07.24	09.00-09.12/12	06.32	04.43		02.58	05.22-05.32/10
	14.21	15.58		17.32		20.08	21.44		23.30	
3	10.16	08.57		07.21	08.59-09.12/13	06.28	04.39		02.55	05.22-05.32/10
	14.23	16.02		17.35		20.11	21.48		23.33	
4	10.14	08.54		07.17	09.00-09.13/13	06.24	04.35		02.53	05.23-05.31/8
	14.26	16.05		17.39		20.14	21.51		23.36	
5	10.13	08.50		07.13	08.59-09.13/14	06.21	04.32		02.50	05.24-05.31/7
	14.28	16.09		17.42		20.17	21.54		23.39	
6	10.11	08.47		07.10	08.59-09.12/13	06.17	04.28		02.47	05.24-05.30/6
	14.31	16.12		17.45		20.20	21.58		23.42	
7	10.09	08.44		07.06	09.00-09.10/10	06.13	04.25		02.45	05.26-05.29/3
	14.33	16.16		17.48		20.24	22.01		23.45	
8	10.08	08.40		07.03	09.02-09.09/7	06.10	04.21		02.42	
	14.36	16.19		17.51		20.27	22.05		23.48	
9	10.06	08.37		06.59		06.06	04.18		02.40	
	14.39	16.23		17.54		20.30	22.08		23.50	
10	10.04	08.34		06.55		06.02	04.14		02.38	
	14.42	16.26		17.57		20.33	22.12		23.53	
11	10.01	08.30		06.52		05.59	04.11		02.36	
	14.45	16.30		18.00		20.36	22.15		23.55	
12	09.59	08.27		06.48		05.55	04.07		02.34	
	14.48	16.33		18.04		20.39	22.18		23.57	
13	09.57	08.24		06.45		05.51	04.04		02.32	
	14.51	16.36		18.07		20.42	22.22		00.00	
14	09.55	08.20		06.41		05.48	04.00		02.30	
	14.54	16.40		18.10		20.45	22.25		00.01	
15	09.52	08.17		06.37		05.44	03.57		02.29	
	14.57	16.43		18.13		20.49	22.29		00.03	
16	09.50	08.13		06.34		05.41	03.53		02.28	
	15.00	16.46		18.16		20.52	22.32		00.05	
17	09.47	08.10		06.30		05.37	03.50		02.27	
	15.04	16.50		18.19		20.55	22.36		00.06	
18	09.45	08.06		06.26		05.33	03.46		02.26	
	15.07	16.53		18.22		20.58	22.39		00.07	
19	09.42	08.03		06.23		05.30	03.43		02.25	
	15.10	16.56		18.25		21.01	22.43		00.08	
20	09.39	07.59		06.19		05.26	03.39		02.25	
	15.14	17.00		18.28		21.05	22.46		00.09	
21	09.36	07.56		06.16		05.22	03.36	05.24-05.28/4	02.24	
	15.17	17.03		18.31		21.08	22.50		00.09	
22	09.34	07.52		06.12		05.19	03.33	05.22-05.29/7	02.24	
	15.20	17.06		18.34		21.11	22.53		00.09	
23	09.31	07.49		06.08		05.15	03.29	05.21-05.30/9	02.25	
	15.24	17.10		18.37		21.14	22.57		00.09	
24	09.28	07.45		06.05		05.11	03.26	05.21-05.31/10	02.25	
	15.27	17.13		18.40		21.18	23.00		00.09	
25	09.25	07.42		06.01		05.08	03.23	05.20-05.31/11	02.26	
	15.31	17.16		18.44		21.21	23.04		00.08	
26	09.22	07.38		05.57		05.04	03.20	05.20-05.31/11	02.27	
	15.34	17.19		18.47		21.24	23.07		00.07	
27	09.19	07.35		05.54		05.01	03.17	05.20-05.32/12	02.28	
	15.38	17.23		18.50		21.28	23.10		00.07	
28	09.16	07.31	09.06-09.09/3	05.50		04.57	03.13	05.20-05.32/12	02.30	
	15.41	17.26		18.53		21.31	23.14		00.05	
29	09.13			06.46		04.53	03.10	05.20-05.32/12	02.31	
	15.45			19.56		21.34	23.17		00.04	
30	09.10			06.43		04.50	03.07	05.21-05.32/11	02.33	
	15.48			19.59		21.38	23.20		00.02	
31	09.06			06.39			03.04	05.21-05.32/11		
	15.52			20.02			23.24			
Potential sun hours	163	235		363		454	578		641	
Sum of minutes with flicker	0	3		91		0	110		55	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
20.12.2018 11.11/3.2.737

SHADOW - Calendar per WTG

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6**WTG:** 2 - M5- E-70 E4 2,3 MW 2300

Assumptions for shadow calculations

The calculated times are "worst case" given by the following assumptions:
The sun is shining all the day, from sunrise to sunset
The rotor plane is always perpendicular to the line from the WTG to the sun
The WTG is always operating

	July		August		September		October		November		December	
1	02.35		04.12		05.52		07.22		07.59		09.39	
	00.01		22.28		20.36		18.47		15.57		14.28	
2	02.37		04.15		05.55		07.25		08.02		09.42	
	23.59		22.25		20.33		18.43		15.54		14.26	
3	02.40		04.19		05.58		07.28		08.06		09.45	
	23.57		22.21		20.29		18.40		15.51		14.24	
4	02.42		04.22		06.01		07.31		08.09		09.48	
	23.55		22.18		20.25		18.36		15.47		14.22	
5	02.44	05.32-05.34/2	04.26		06.04		07.34	09.41-09.43/2	08.12		09.51	
	23.52		22.14		20.22		18.32		15.44		14.20	
6	02.47	05.31-05.36/5	04.29		06.07		07.37	09.37-09.46/9	08.16		09.53	
	23.50		22.11		20.18		18.29		15.41		14.18	
7	02.50	05.31-05.37/6	04.32		06.10		07.40	09.35-09.47/12	08.19		09.56	
	23.47		22.07		20.14		18.25		15.37		14.16	
8	02.53	05.30-05.37/7	04.36		06.13		07.43	09.34-09.47/13	08.23		09.58	
	23.45		22.03		20.11		18.22		15.34		14.14	
9	02.56	05.29-05.38/9	04.39		06.16		07.46	09.34-09.48/14	08.26		10.01	
	23.42		22.00		20.07		18.18		15.31		14.13	
10	02.59	05.29-05.39/10	04.42		06.19		07.49	09.34-09.47/13	08.29		10.03	
	23.39		21.56		20.03		18.14		15.28		14.11	
11	03.02	05.29-05.39/10	04.46		06.22		07.52	09.34-09.46/12	08.33		10.05	
	23.37		21.53		20.00		18.11		15.24		14.10	
12	03.05	05.29-05.40/11	04.49		06.25		07.55	09.34-09.45/11	08.36		10.08	
	23.34		21.49		19.56		18.07		15.21		14.09	
13	03.08	05.29-05.40/11	04.52		06.28		07.58	09.37-09.44/7	08.40		10.10	
	23.31		21.45		19.52		18.04		15.18		14.08	
14	03.11	05.30-05.41/11	04.55		06.31		08.01		08.43		10.11	
	23.28		21.42		19.49		18.00		15.15		14.07	
15	03.14	05.29-05.41/12	04.59		06.34		08.04		08.46		10.13	
	23.25		21.38		19.45		17.56		15.12		14.06	
16	03.18	05.29-05.41/12	05.02		06.37		08.07		08.50		10.15	
	23.22		21.35		19.41		17.53		15.09		14.06	
17	03.21	05.29-05.41/12	05.05		06.40		08.10		08.53		10.16	
	23.19		21.31		19.38		17.49		15.06		14.05	
18	03.24	05.30-05.41/11	05.08		06.43		08.14		08.57		10.17	
	23.15		21.27		19.34		17.46		15.03		14.05	
19	03.28	05.30-05.40/10	05.12		06.46		08.17		09.00		10.19	
	23.12		21.24		19.30		17.42		15.00		14.05	
20	03.31	05.31-05.41/10	05.15		06.49		08.20		09.03		10.19	
	23.09		21.20		19.27		17.39		14.57		14.05	
21	03.34	05.31-05.40/9	05.18		06.52		08.23		09.07		10.20	
	23.06		21.17		19.23		17.35		14.54		14.05	
22	03.38	05.33-05.39/6	05.21		06.55		08.26		09.10		10.21	
	23.02		21.13		19.20		17.32		14.51		14.06	
23	03.41		05.24		06.58		08.30		09.13		10.21	
	22.59		21.09		19.16		17.28		14.48		14.06	
24	03.45		05.27		07.01		08.33		09.17		10.22	
	22.56		21.06		19.12		17.25		14.46		14.07	
25	03.48		05.31		07.04		07.36		09.20		10.22	
	22.52		21.02		19.09		16.21		14.43		14.08	
26	03.52		05.34		07.07		07.39		09.23		10.22	
	22.49		20.58		19.05		16.18		14.40		14.09	
27	03.55		05.37		07.10		07.42		09.27		10.22	
	22.45		20.55		19.01		16.14		14.38		14.10	
28	03.58		05.40		07.13		07.46		09.30		10.21	
	22.42		20.51		18.58		16.11		14.35		14.11	
29	04.02		05.43		07.16		07.49		09.33		10.21	
	22.39		20.47		18.54		16.08		14.33		14.13	
30	04.05		05.46		07.19		07.52		09.36		10.20	
	22.35		20.44		18.50		16.04		14.30		14.15	
31	04.09		05.49				07.56				10.19	
	22.32		20.40				16.01				14.16	
Potential sun hours	620		513		394		302		192		125	
Sum of minutes with flicker		164		0		0		93		0		0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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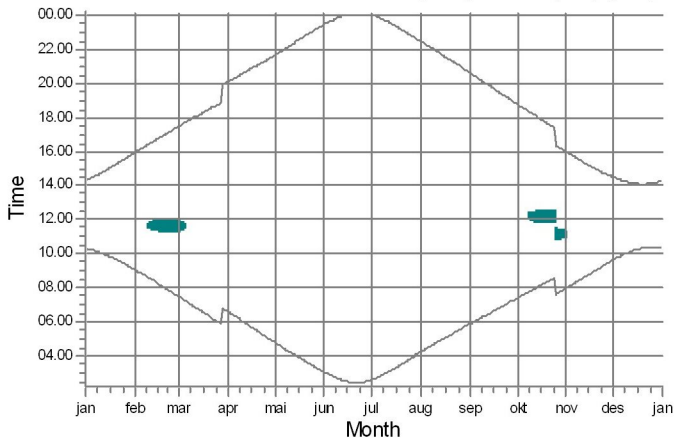
20.12.2018 11.11/3.2.737

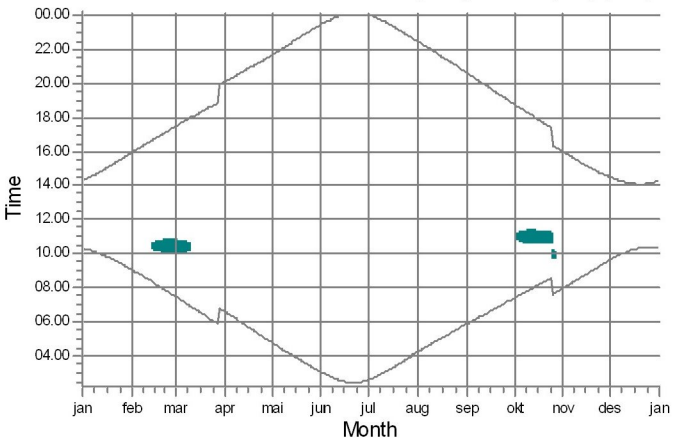
SHADOW - Calendar per WTG, graphical

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6

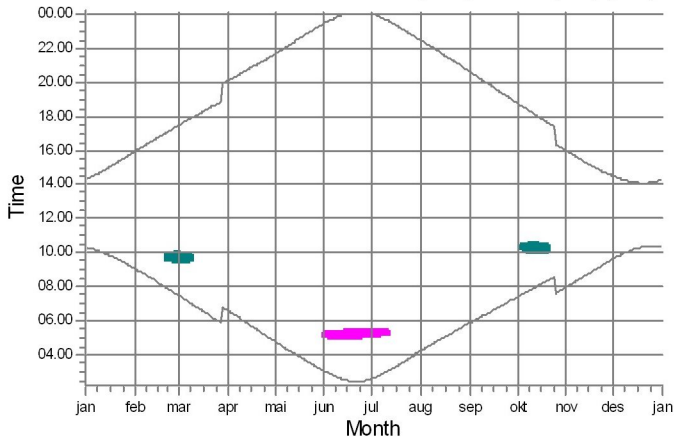
3: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (627)



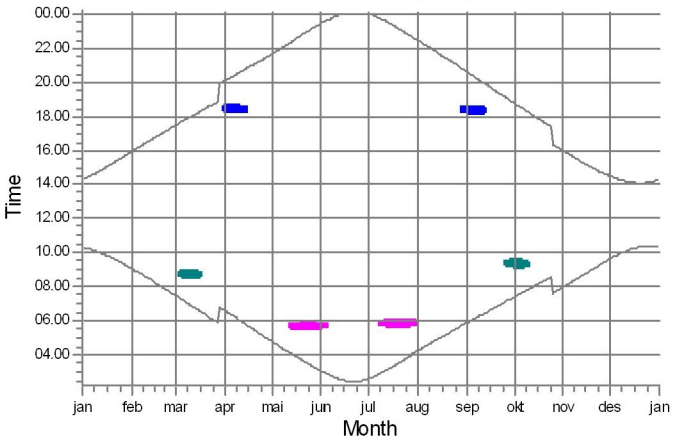
4: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (628)



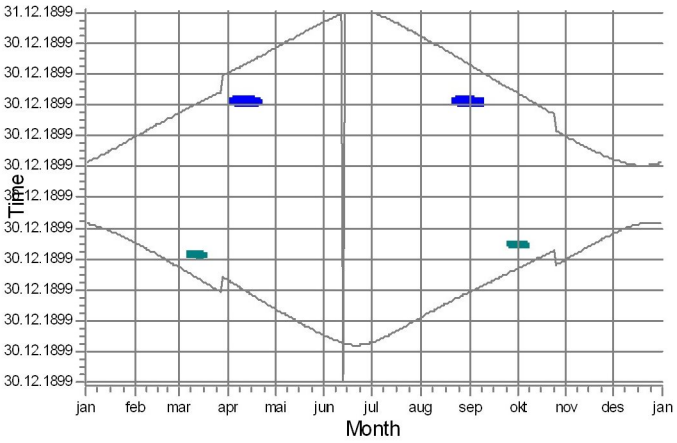
5: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (629)



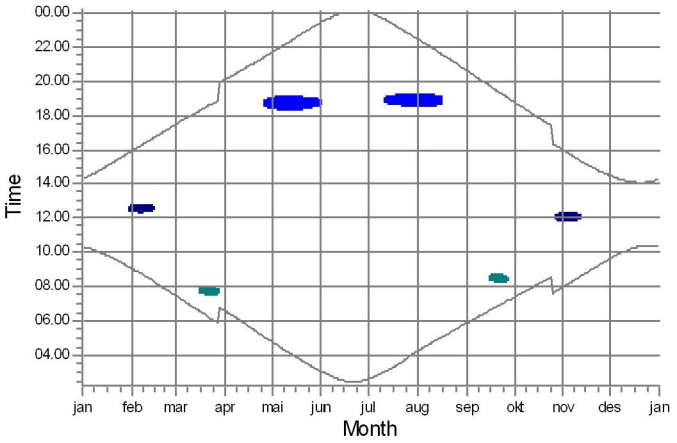
6: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (630)



7: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (631)



8: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (632)



Shadow receptors

C: Hundhammer E: Løvmo F: Storeienen G: Hamland

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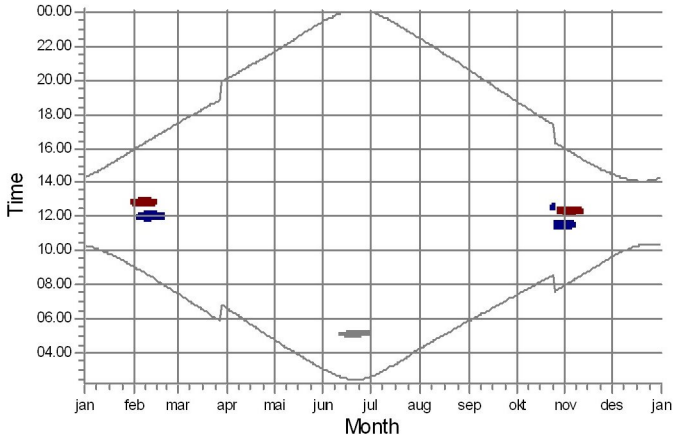
20.12.2018 11.11/3.2.737

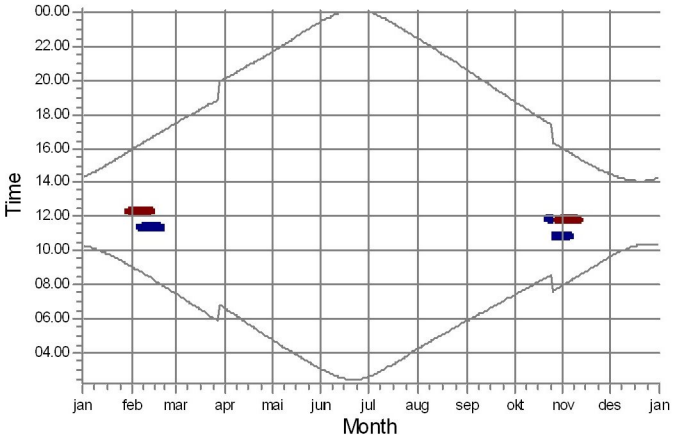
SHADOW - Calendar per WTG, graphical

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6

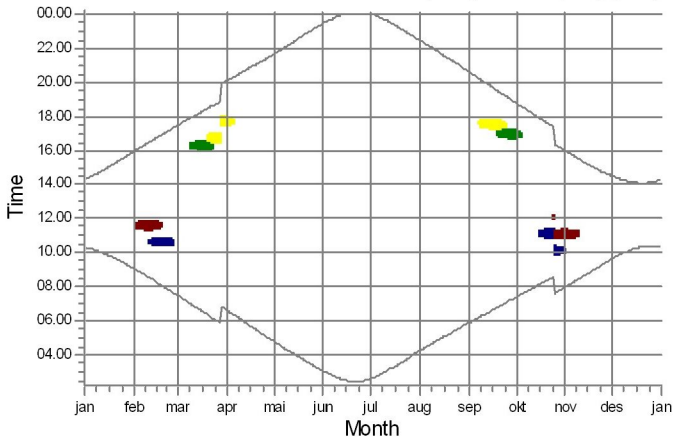
9: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (633)



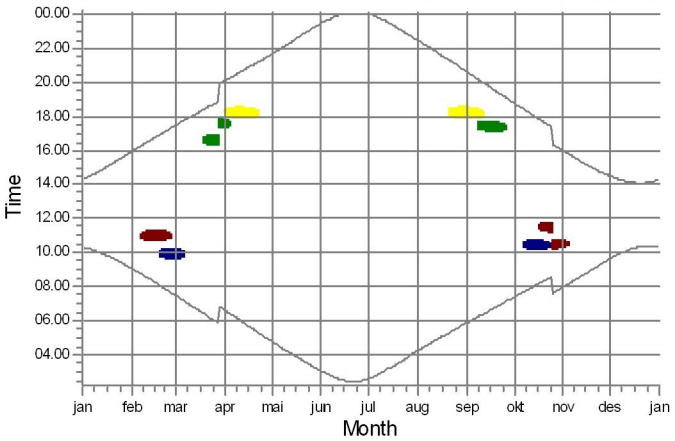
10: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (634)



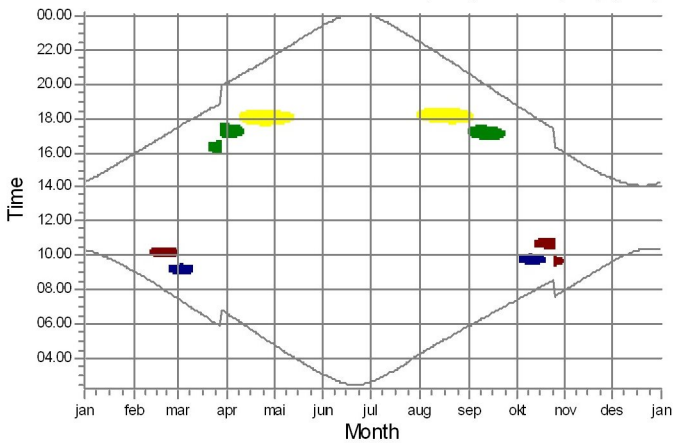
11: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (635)



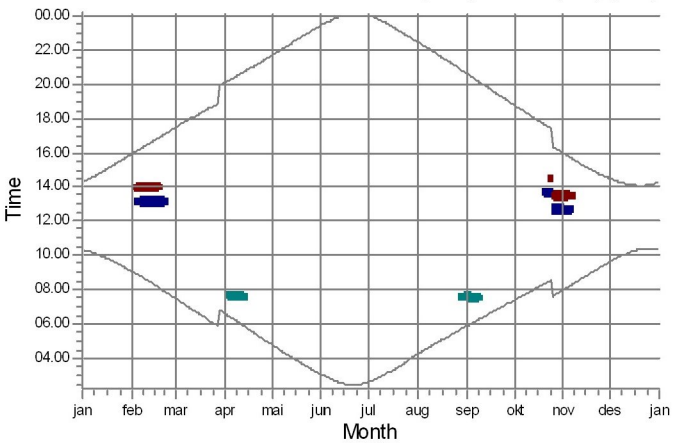
12: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (636)



13: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (637)



14: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (638)



Shadow receptors

	A: Hamlandsvika		D: Klungset		G: Hamland
	B: Skogmo		F: Storeienen		H: Myhrvang

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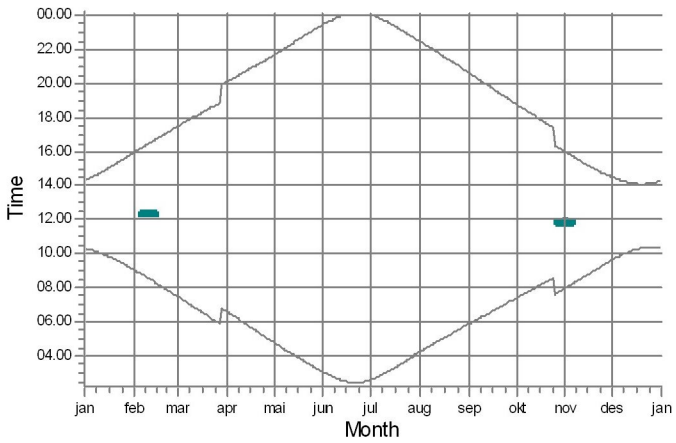
Calculated:
20.12.2018 11.11/3.2.737

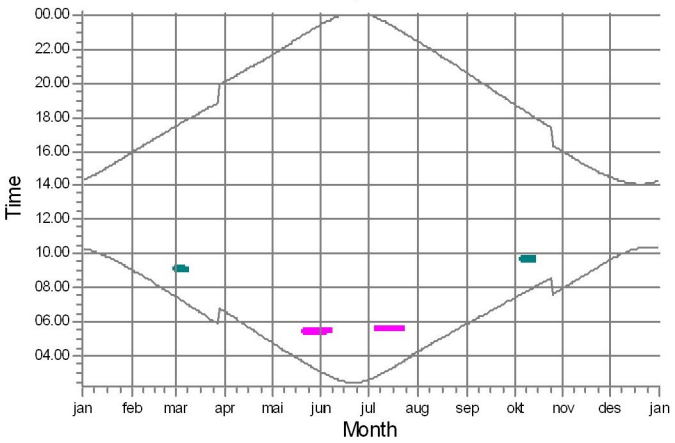
SHADOW - Calendar per WTG, graphical

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6

1: M1-E-70 E4 2000 71.0



2: M5- E-70 E4 2,3 MW 2300



Shadow receptors

E: Løvmo

F: Storeienen

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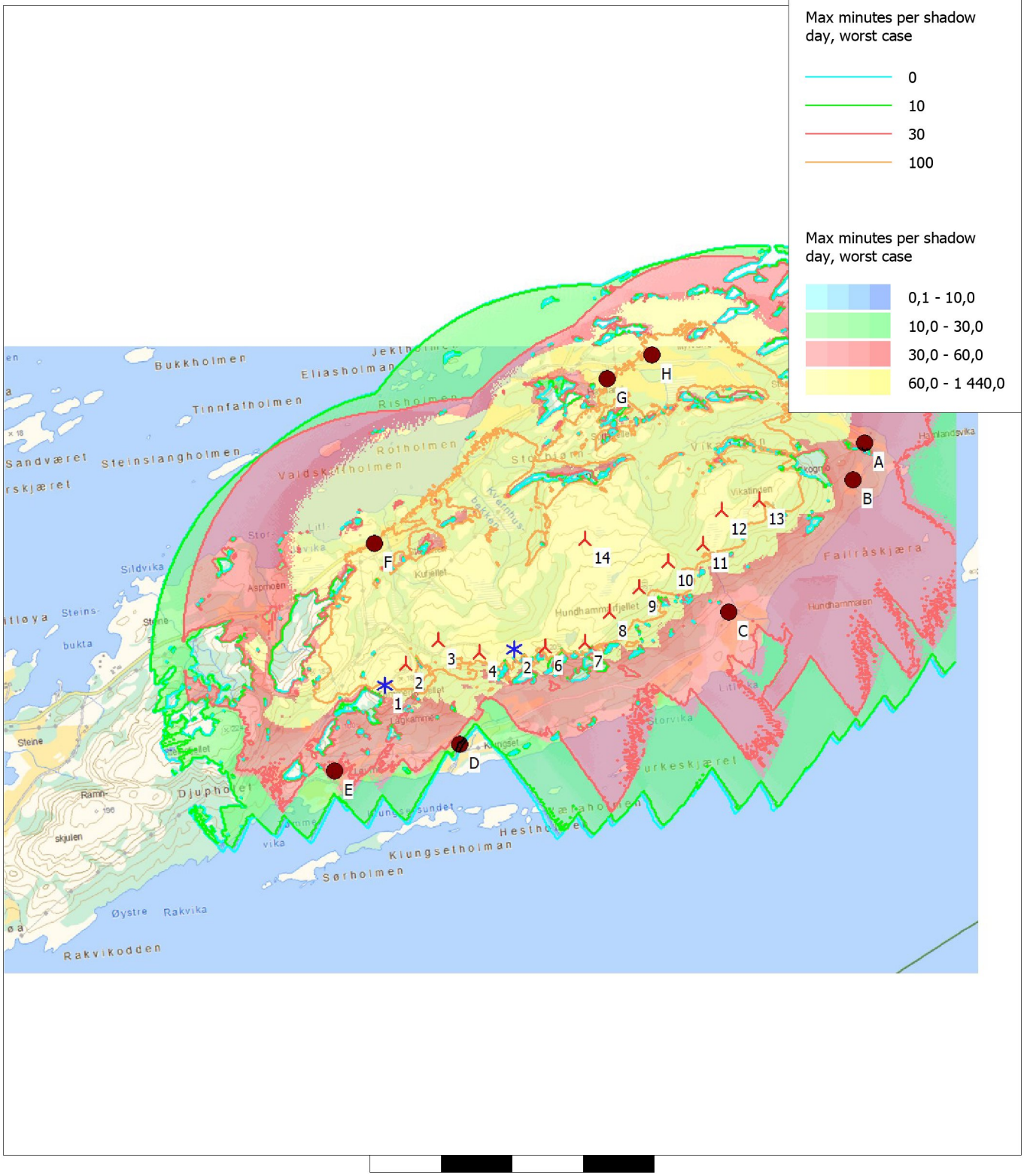
Calculated:
20.12.2018 11.11/3.2.737

SHADOW - Map

Calculation: Teoretisk (worst case) 12 x V136 + 2 x E70 minutter/dag layout v6



Map: HHF , Print scale 1:40 000, Map center ETRS 89 Zone: 32 East: 612 510 North: 7 183 590

New WTG Existing WTG Shadow receptor

Flicker map level: Height Contours 2013

Project:
Hundhammerfjellet Reetablering

NTE Energi AS

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SHADOW - Main Result

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6

Assumptions for shadow calculations

Maximum distance for influence
Calculate only when more than 20 % of sun is covered by the blade
Please look in WTG table

Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	1 minutes

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

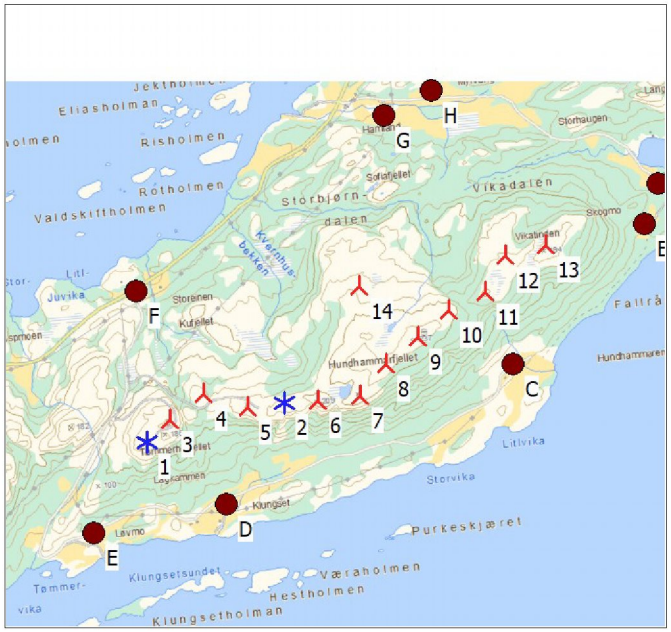
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Height Contours 2013
Obstacles used in calculation
Eye height for map: 1,5 m
Grid resolution: 10,0 m

All coordinates are in
ETRS 89 Zone: 32



WTGs

	X(East)	Y(North)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	611 350	7 182 825	170,0	M1-E-70 E4 2000 71.0	Yes	ENERCON	E-70 E4-2 000	2 000	71,0	65,0	1 644	20,0
2	612 257	7 183 083	190,0	M5- E-70 E4 2,3 MW 2300	Yes	ENERCON	E-70 E4 2,3 MW-2 300	2 300	71,0	64,0	1 644	20,0
3	611 497	7 182 974	178,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
4	611 722	7 183 142	145,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
5	612 015	7 183 056	170,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
6	612 478	7 183 097	205,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
7	612 757	7 183 128	199,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
8	612 927	7 183 340	225,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
9	613 136	7 183 515	234,1	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
10	613 342	7 183 694	199,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
11	613 584	7 183 818	198,3	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
12	613 714	7 184 057	184,6	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
13	613 981	7 184 127	174,1	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4
14	612 753	7 183 853	175,0	VESTAS V136-4.2 4200 13...	Yes	VESTAS	V136-4.2-4 200	4 200	136,0	90,0	1 803	10,4

Shadow receptor-Input

No.	Name	X(East)	Y(North)	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
A	Hamlandsvika	614 724	7 184 531	10,9	2,0	2,0	2,0	90,0	"Green house mode"	4,0
B	Skogmo	614 639	7 184 269	27,7	2,0	2,0	2,0	90,0	"Green house mode"	4,0
C	Hundhammer	613 767	7 183 342	24,9	2,0	2,0	2,0	90,0	"Green house mode"	4,0
D	Klungset	611 876	7 182 409	10,1	2,0	2,0	2,0	90,0	"Green house mode"	4,0
E	Løvmo	610 998	7 182 220	11,2	2,0	2,0	2,0	90,0	"Green house mode"	4,0
F	Storeienen	611 279	7 183 824	36,8	2,0	2,0	2,0	90,0	"Green house mode"	4,0
G	Hamland	612 913	7 184 983	22,7	2,0	2,0	2,0	90,0	"Green house mode"	4,0
H	Myhrvang	613 230	7 185 147	33,2	2,0	2,0	2,0	90,0	"Green house mode"	4,0

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SHADOW - Main Result

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6

Calculation Results

Shadow receptor

No.	Name	Shadow, expected values Shadow hours per year [h/year]
A	Hamlandsvika	9:38
B	Skogmo	16:28
C	Hundhammer	15:19
D	Klungset	0:34
E	Løvmo	7:43
F	Storeienen	25:31
G	Hamland	17:38
H	Myhrvang	15:05

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	M1-E-70 E4 2000 71.0	5:29	1:16
2	M5- E-70 E4 2,3 MW 2300	8:36	2:14
3	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (627)	21:57	5:06
4	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (628)	25:02	6:30
5	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (629)	27:50	7:05
6	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (630)	30:02	8:07
7	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (631)	21:57	6:05
8	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (632)	47:42	13:10
9	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (633)	19:10	4:26
10	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (634)	20:30	4:50
11	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (635)	41:28	10:30
12	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (636)	55:37	14:40
13	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (637)	81:09	21:51
14	VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (638)	33:11	7:49

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

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SHADOW - Calendar

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6 **Shadow receptor:** A - Hamlandsvika

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February	March		April			May	June	July	August	September		October			November	December
1	10.18	09.03	07.27		06.35		16.58 (13)	04.46	03.01	02.35	04.12	05.52		17.07 (13)	07.21		16.47 (11)	07.59	09.39
	14.18	15.55	17.29		20.05	47	17.45 (12)	21.41	23.27	00.01	22.28	20.36	13	17.20 (13)	18.47	19	17.06 (11)	15.57	14.28
2	10.17	09.00	07.24		06.31		16.58 (13)	04.42	02.58	02.37	04.15	05.55		17.03 (13)	07.24		16.47 (11)	08.02	09.42
	14.21	15.58	17.32		20.08	45	17.43 (12)	21.44	23.30	23.59	22.25	20.33	19	17.22 (13)	18.43	17	17.04 (11)	15.54	14.25
3	10.16	08.57	07.20		06.28		16.58 (13)	04.39	02.55	02.39	04.19	05.58		17.00 (13)	07.27		16.49 (11)	08.06	09.45
	14.23	16.02	17.35		20.11	43	17.41 (12)	21.47	23.33	23.57	22.21	20.29	24	17.24 (13)	18.39	13	17.02 (11)	15.50	14.23
4	10.14	08.53	07.17		06.24		16.58 (13)	04.35	02.52	02.41	04.22	06.01		16.59 (13)	07.30		16.52 (11)	08.09	09.48
	14.25	16.05	17.38		20.14	39	17.37 (12)	21.51	23.36	23.55	22.18	20.25	26	17.25 (13)	18.36	6	16.58 (11)	15.47	14.21
5	10.13	08.50	07.13		06.20		16.59 (13)	04.31	02.49	02.44	04.25	06.04		16.57 (13)	07.33			08.12	09.51
	14.28	16.09	17.41		20.17	33	17.32 (13)	21.54	23.39	23.52	22.14	20.22	29	17.26 (13)	18.32			15.44	14.19
6	10.11	08.47	07.10		06.17		16.59 (13)	04.28	02.47	02.47	04.29	06.07		16.56 (13)	07.36			08.16	09.53
	14.30	16.12	17.45		20.20	31	17.30 (13)	21.58	23.42	23.50	22.10	20.18	31	17.27 (13)	18.28			15.40	14.17
7	10.09	08.44	07.06		06.13		17.00 (13)	04.24	02.44	02.49	04.32	06.10		16.54 (13)	07.39			08.19	09.56
	14.33	16.16	17.48		20.23	29	17.29 (13)	22.01	23.45	23.48	22.07	20.14	33	17.27 (13)	18.25			15.37	14.16
8	10.08	08.40	07.02		06.10		17.01 (13)	04.21	02.42	02.52	04.35	06.13		16.53 (13)	07.43			08.22	09.58
	14.36	16.19	17.51		20.26	27	17.28 (13)	22.05	23.48	23.45	22.03	20.11	38	17.31 (12)	18.21			15.34	14.14
9	10.06	08.37	06.59		06.06		17.02 (13)	04.17	02.39	02.55	04.39	06.16		16.52 (13)	07.46			08.26	10.01
	14.38	16.22	17.54		20.30	24	17.26 (13)	22.08	23.50	23.42	22.00	20.07	42	17.34 (12)	18.18			15.31	14.12
10	10.04	08.34	06.55	16.13 (11)	06.02		17.05 (13)	04.14	02.37	02.58	04.42	06.19		16.51 (13)	07.49			08.29	10.03
	14.41	16.26	17.57	10 16.23 (11)	20.33	19	17.24 (13)	22.11	23.53	23.39	21.56	20.03	45	17.36 (12)	18.14			15.27	14.11
11	10.01	08.30	06.52	16.10 (11)	05.59		17.08 (13)	04.10	02.35	03.01	04.45	06.22		16.51 (13)	07.52			08.33	10.05
	14.44	16.29	18.00	15 16.25 (11)	20.36	12	17.20 (13)	22.15	23.55	23.37	21.53	20.00	46	17.37 (12)	18.11			15.24	14.10
12	09.59	08.27	06.48	16.08 (11)	05.55			04.07	02.33	03.04	04.49	06.25		16.50 (13)	07.55			08.36	10.08
	14.47	16.33	18.03	18 16.26 (11)	20.39			22.18	23.58	23.34	21.49	19.56	48	17.38 (12)	18.07			15.21	14.09
13	09.57	08.23	06.44	16.07 (11)	05.51			04.03	02.31	03.08	04.52	06.28		16.50 (13)	07.58			08.39	10.10
	14.50	16.36	18.06	20 16.27 (11)	20.42			22.22	00.00	23.31	21.45	19.52	48	17.38 (12)	18.03			15.18	14.08
14	09.55	08.20	06.41	16.06 (11)	05.48			04.00	02.30	03.11	04.55	06.31		16.50 (13)	08.01			08.43	10.11
	14.53	16.39	18.10	22 16.28 (11)	20.45			22.25	00.02	23.28	21.42	19.49	49	17.39 (12)	18.00			15.15	14.07
15	09.52	08.17	06.37	16.05 (11)	05.44			03.56	02.28	03.14	04.58	06.34		16.50 (13)	08.04			08.46	10.13
	14.57	16.43	18.13	22 16.27 (11)	20.48			22.29	00.03	23.25	21.38	19.45	49	17.39 (12)	17.56			15.12	14.06
16	09.50	08.13	06.34	16.04 (11)	05.40			03.53	02.27	03.17	05.02	06.37		16.50 (13)	08.07			08.50	10.15
	15.00	16.46	18.16	23 16.27 (11)	20.52			22.32	00.05	23.22	21.35	19.41	47	17.37 (12)	17.53			15.08	14.05
17	09.47	08.10	06.30	16.04 (11)	05.37			03.49	02.26	03.21	05.05	06.40		16.50 (13)	08.10			08.53	10.16
	15.03	16.50	18.19	24 16.28 (11)	20.55			22.36	00.06	23.19	21.31	19.38	47	17.37 (12)	17.49			15.05	14.05
18	09.44	08.06	06.26	16.04 (11)	05.33			03.46	02.25	03.24	05.08	06.43		16.51 (13)	08.13			08.57	10.17
	15.06	16.53	18.22	23 16.27 (11)	20.58			22.39	00.07	23.15	21.27	19.34	46	17.37 (12)	17.46			15.02	14.05
19	09.42	08.03	06.23	16.04 (11)	05.29			03.42	02.24	03.27	05.11	06.46		16.51 (13)	08.17			09.00	10.19
	15.10	16.56	18.25	34 16.43 (12)	21.01			22.43	00.08	23.12	21.24	19.30	45	17.36 (12)	17.42			14.59	14.04
20	09.39	07.59	06.19	16.05 (11)	05.26			03.39	02.24	03.31	05.15	06.49		16.53 (13)	08.20			09.03	10.20
	15.13	16.59	18.28	37 16.46 (12)	21.04			22.46	00.09	23.09	21.20	19.27	42	17.35 (12)	17.39			14.57	14.05
21	09.36	07.56	06.15	16.06 (11)	05.22			03.36	02.24	03.34	05.18	06.52		16.53 (11)	08.23			09.07	10.20
	15.17	17.03	18.31	40 16.47 (12)	21.08			22.50	00.09	23.06	21.16	19.23	41	17.34 (12)	17.35			14.54	14.05
22	09.33	07.52	06.12	16.07 (11)	05.18			03.32	02.24	03.37	05.21	06.55		16.51 (11)	08.26			09.10	10.21
	15.20	17.06	18.34	41 16.48 (12)	21.11			22.53	00.09	23.02	21.13	19.19	41	17.32 (12)	17.32			14.51	14.05
23	09.31	07.49	06.08	16.07 (13)	05.15			03.29	02.24	03.41	05.24	06.58		16.50 (11)	08.29			09.13	10.21
	15.23	17.09	18.37	42 16.49 (12)	21.14			22.57	00.09	22.59	21.09	19.16	38	17.31 (12)	17.28			14.48	14.06
24	09.28	07.45	06.04	16.05 (13)	05.11			03.26	02.25	03.44	05.27	07.01		16.48 (11)	08.33			09.17	10.22
	15.27	17.13	18.40	44 16.49 (12)	21.17			23.00	00.09	22.56	21.05	19.12	35	17.28 (12)	17.25			14.45	14.06
25	09.25	07.42	06.01	16.03 (13)	05.07			03.23	02.25	03.48	05.30	07.04		16.47 (11)	07.36			09.20	10.22
	15.30	17.16	18.43	46 16.49 (12)	21.21			23.04	00.08	22.52	21.02	19.08	29	17.24 (12)	16.21			14.43	14.07
26	09.22	07.38	05.57	16.02 (13)	05.04			03.19	02.26	03.51	05.33	07.07		16.47 (11)	07.39			09.23	10.22
	15.34	17.19	18.46	47 16.49 (12)	21.24			23.07	00.08	22.49	20.58	19.05	23	17.10 (11)	16.18			14.40	14.08
27	09.19	07.35	05.53	16.01 (13)	05.00			03.16	02.28	03.55	05.37	07.09		16.46 (11)	07.42			09.26	10.22
	15.37	17.22	18.49	48 16.49 (12)	21.27			23.10	00.07	22.45	20.54	19.01	23	17.09 (11)	16.14			14.37	14.10
28	09.16	07.31	05.50	16.00 (13)	04.57			03.13	02.29	03.58	05.40	07.12		16.46 (11)	07.46			09.30	10.21
	15.41	17.26	18.52	48 16.48 (12)	21.31			23.14	00.05	22.42	20.51	18.57	23	17.09 (11)	16.11			14.35	14.11
29	09.13		06.46	17.00 (13)	04.53			03.10	02.31	04.01	05.43	07.15		16.46 (11)	07.49			09.33	10.21
	15.44		19.56	48 17.48 (12)	21.34			23.17	00.04	22.39	20.47	18.54	22	17.08 (11)	16.07			14.32	14.12
30	09.09		06.42	16.59 (13)	04.49			03.07	02.33	04.05	05.46	07.18		16.46 (11)	07.52			09.36	10.20
	15.48		19.59	48 17.47 (12)	21.37			23.20	00.03	22.35	20.44	18.50	21	17.07 (11)	16.04			14.30	14.14
31	09.06		06.39	16.59 (13)				03.04		04.08	05.49				07.56				10.19
	15.51		20.02	47 17.46 (12)				23.24		22.32	20.40				16.00				14.16
Potential sun hours	163	235	363		454			578	641	621	513	394			302			192	125
Total, worst case				747		349							1063			55			
Sun reduction				0,50		0,50							0,50			0,50			
Oper. time red.				0,80		0,80							0,80			0,80			
Wind dir. red.				0,65		0,66							0,65			0,64			
Total reduction				0,26		0,26							0,26			0,26			
Total, real				195		91							278			14			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**Shadow receptor:** B - Skogmo

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February	March		April		May		June
1	10.18	09.03	07.27		06.35		17.30 (11)	04.46	17.41 (13) 03.01
	14.19	15.55	17.29		20.05	25	18.16 (12)	21.41	42 18.23 (13) 23.27
2	10.17	09.00	07.24		06.31		17.31 (11)	04.42	17.42 (13) 02.58
	14.21	15.58	17.32		20.08	34	18.21 (12)	21.44	40 18.22 (13) 23.30
3	10.16	08.57	07.20		06.28		17.33 (11)	04.39	17.43 (13) 02.55
	14.23	16.02	17.35		20.11	36	18.24 (12)	21.47	39 18.22 (13) 23.33
4	10.14	08.53	07.17		06.24		17.34 (11)	04.35	17.43 (13) 02.52
	14.25	16.05	17.38		20.14	36	18.25 (12)	21.51	38 18.21 (13) 23.36
5	10.13	08.50	07.13		06.21		17.39 (11)	04.32	17.44 (13) 02.50
	14.28	16.09	17.41		20.17	30	18.27 (12)	21.54	36 18.20 (13) 23.39
6	10.11	08.47	07.10		06.17		17.59 (12)	04.28	17.46 (13) 02.47
	14.30	16.12	17.45		20.20	28	18.27 (12)	21.58	34 18.20 (13) 23.42
7	10.09	08.44	07.06		06.13		17.58 (12)	04.24	17.47 (13) 02.44
	14.33	16.16	17.48		20.23	29	18.27 (12)	22.01	31 18.18 (13) 23.45
8	10.08	08.40	07.02		06.10		17.57 (12)	04.21	17.48 (13) 02.42
	14.36	16.19	17.51		20.26	31	18.28 (12)	22.05	29 18.17 (13) 23.48
9	10.06	08.37	06.59		06.06		17.56 (12)	04.17	17.50 (13) 02.40
	14.38	16.22	17.54		20.30	32	18.28 (12)	22.08	26 18.16 (13) 23.50
10	10.04	08.34	06.55		06.02		17.56 (12)	04.14	17.52 (13) 02.37
	14.41	16.26	17.57		20.33	32	18.28 (12)	22.11	22 18.14 (13) 23.53
11	10.01	08.30	06.52		05.59		17.55 (13)	04.10	17.54 (13) 02.35
	14.44	16.29	18.00		20.36	33	18.28 (12)	22.15	18 18.12 (13) 23.55
12	09.59	08.27	06.48		05.55		17.52 (13)	04.07	17.57 (13) 02.33
	14.47	16.33	18.03		20.39	36	18.28 (12)	22.18	11 18.08 (13) 23.58
13	09.57	08.23	06.44		05.51		17.50 (13)	04.03	02.31
	14.50	16.36	18.06		20.42	37	18.27 (12)	22.22	00.00
14	09.55	08.20	06.41		05.48		17.48 (13)	04.00	02.30
	14.54	16.39	18.10		20.45	39	18.27 (12)	22.25	00.02
15	09.52	08.17	06.37		05.44		17.46 (13)	03.56	02.28
	14.57	16.43	18.13		20.48	40	18.26 (12)	22.29	00.03
16	09.50	08.13	06.34		05.40		17.46 (13)	03.53	02.27
	15.00	16.46	18.16		20.52	40	18.26 (12)	22.32	00.05
17	09.47	08.10	06.30		05.37		17.45 (13)	03.49	02.26
	15.03	16.50	18.19		20.55	40	18.25 (13)	22.36	00.06
18	09.44	08.06	06.26		05.33		17.43 (13)	03.46	02.25
	15.07	16.53	18.22		20.58	42	18.25 (13)	22.39	00.07
19	09.42	08.03	06.23		05.29		17.43 (13)	03.43	02.24
	15.10	16.56	18.25		21.01	42	18.25 (13)	22.43	00.08
20	09.39	07.59	06.19	16.39 (11)	05.26		17.42 (13)	03.39	02.24
	15.13	17.00	18.28	12 16.51 (11)	21.04	43	18.25 (13)	22.46	00.09
21	09.36	07.56	06.15	16.36 (11)	05.22		17.41 (13)	03.36	02.24
	15.17	17.03	18.31	17 16.53 (11)	21.08	45	18.26 (13)	22.50	00.09
22	09.33	07.52	06.12	16.34 (11)	05.18		17.41 (13)	03.32	02.24
	15.20	17.06	18.34	20 16.54 (11)	21.11	45	18.26 (13)	22.53	00.09
23	09.31	07.49	06.08	16.33 (11)	05.15		17.40 (13)	03.29	02.24
	15.23	17.09	18.37	23 16.56 (11)	21.14	45	18.25 (13)	22.57	00.09
24	09.28	07.45	06.04	16.32 (11)	05.11		17.40 (13)	03.26	02.25
	15.27	17.13	18.40	24 16.56 (11)	21.17	46	18.26 (13)	23.00	00.09
25	09.25	07.42	06.01	16.30 (11)	05.08		17.40 (13)	03.23	02.26
	15.30	17.16	18.43	26 16.56 (11)	21.21	46	18.26 (13)	23.04	00.08
26	09.22	07.38	05.57	16.30 (11)	05.04		17.40 (13)	03.19	02.27
	15.34	17.19	18.46	27 16.57 (11)	21.24	45	18.25 (13)	23.07	00.08
27	09.19	07.35	05.53	16.29 (11)	05.00		17.40 (13)	03.16	02.28
	15.37	17.22	18.49	27 16.56 (11)	21.27	45	18.25 (13)	23.10	00.07
28	09.16	07.31	05.50	16.29 (11)	04.57		17.40 (13)	03.13	02.29
	15.41	17.26	18.52	27 16.56 (11)	21.31	45	18.25 (13)	23.14	00.05
29	09.13		06.46	17.29 (11)	04.53		17.41 (13)	03.10	02.31
	15.44		19.56	27 17.56 (11)	21.34	44	18.25 (13)	23.17	00.04
30	09.09		06.42	17.29 (11)	04.49		17.41 (13)	03.07	02.33
	15.48		19.59	26 17.55 (11)	21.37	43	18.24 (13)	23.20	00.02
31	09.06		06.39	17.30 (11)				03.04	
	15.51		20.02	25 17.55 (11)				23.24	
Potential sun hours	163	235	363		454			578	641
Total, worst case				281		1154		366	
Sun reduction				0,50		0,50		0,50	
Oper. time red.				0,80		0,80		0,80	
Wind dir. red.				0,67		0,68		0,69	
Total reduction				0,27		0,27		0,27	
Total, real				75		316		100	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**Shadow receptor:** B - Skogmo

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	July		August		September		October	November	December
1	02.35		04.12		18.06 (13)	05.52	17.55 (13)	07.21	07.59	09.39
	00.01		22.28	15	18.21 (13)	20.36 33	18.28 (12)	18.47	15.57	14.28
2	02.37		04.15		18.03 (13)	05.55	17.54 (12)	07.24	08.02	09.42
	23.59		22.25	19	18.22 (13)	20.33 32	18.26 (12)	18.43	15.54	14.26
3	02.39		04.19		18.01 (13)	05.58	17.54 (12)	07.27	08.06	09.45
	23.57		22.21	24	18.25 (13)	20.29 32	18.26 (12)	18.39	15.50	14.23
4	02.41		04.22		17.59 (13)	06.01	17.54 (12)	07.30	08.09	09.48
	23.55		22.17	27	18.26 (13)	20.25 31	18.25 (12)	18.36	15.47	14.21
5	02.44		04.25		17.58 (13)	06.04	17.55 (12)	07.33	08.12	09.51
	23.52		22.14	30	18.28 (13)	20.22 29	18.24 (12)	18.32	15.44	14.19
6	02.47		04.29		17.56 (13)	06.07	17.55 (12)	07.36	08.16	09.53
	23.50		22.10	33	18.29 (13)	20.18 28	18.23 (12)	18.29	15.40	14.17
7	02.49		04.32		17.54 (13)	06.10	17.35 (11)	07.39	08.19	09.56
	23.47		22.07	35	18.29 (13)	20.14 28	18.22 (12)	18.25	15.37	14.16
8	02.52		04.35		17.53 (13)	06.13	17.29 (11)	07.43	08.22	09.58
	23.45		22.03	37	18.30 (13)	20.11 36	18.20 (12)	18.21	15.34	14.14
9	02.55		04.39		17.52 (13)	06.16	17.26 (11)	07.46	08.26	10.01
	23.42		22.00	39	18.31 (13)	20.07 36	18.17 (12)	18.18	15.31	14.13
10	02.58		04.42		17.51 (13)	06.19	17.24 (11)	07.49	08.29	10.03
	23.39		21.56	40	18.31 (13)	20.03 36	18.15 (12)	18.14	15.27	14.11
11	03.01		04.45		17.51 (13)	06.22	17.23 (11)	07.52	08.33	10.05
	23.37		21.53	41	18.32 (13)	20.00 27	18.10 (12)	18.11	15.24	14.10
12	03.04		04.49		17.50 (13)	06.25	17.22 (11)	07.55	08.36	10.08
	23.34		21.49	42	18.32 (13)	19.56 24	17.46 (11)	18.07	15.21	14.09
13	03.08		04.52		17.48 (13)	06.28	17.21 (11)	07.58	08.39	10.10
	23.31		21.45	44	18.32 (13)	19.52 25	17.46 (11)	18.03	15.18	14.08
14	03.11		04.55		17.48 (13)	06.31	17.20 (11)	08.01	08.43	10.11
	23.28		21.42	44	18.32 (13)	19.49 26	17.46 (11)	18.00	15.15	14.07
15	03.14		04.58		17.48 (13)	06.34	17.19 (11)	08.04	08.46	10.13
	23.25		21.38	44	18.32 (13)	19.45 27	17.46 (11)	17.56	15.12	14.06
16	03.17		05.02		17.47 (13)	06.37	17.18 (11)	08.07	08.50	10.15
	23.22		21.35	45	18.32 (13)	19.41 27	17.45 (11)	17.53	15.08	14.05
17	03.21		05.05		17.47 (13)	06.40	17.18 (11)	08.10	08.53	10.16
	23.18		21.31	45	18.32 (13)	19.38 27	17.45 (11)	17.49	15.05	14.05
18	03.24		05.08		17.47 (13)	06.43	17.18 (11)	08.13	08.56	10.17
	23.15		21.27	45	18.32 (13)	19.34 26	17.44 (11)	17.46	15.02	14.05
19	03.27		05.11		17.47 (13)	06.46	17.18 (11)	08.17	09.00	10.19
	23.12		21.24	45	18.32 (13)	19.30 25	17.43 (11)	17.42	14.59	14.05
20	03.31		05.15		17.46 (13)	06.49	17.19 (11)	08.20	09.03	10.19
	23.09		21.20	45	18.31 (13)	19.27 23	17.42 (11)	17.39	14.57	14.05
21	03.34		05.18		17.46 (13)	06.52	17.20 (11)	08.23	09.07	10.20
	23.06		21.16	45	18.31 (13)	19.23 21	17.41 (11)	17.35	14.54	14.05
22	03.38		05.21		17.46 (13)	06.55	17.21 (11)	08.26	09.10	10.21
	23.02		21.13	44	18.30 (13)	19.19 18	17.39 (11)	17.32	14.51	14.05
23	03.41		05.24		17.46 (13)	06.58	17.22 (11)	08.29	09.13	10.21
	22.59		21.09	44	18.30 (13)	19.16 14	17.36 (11)	17.28	14.48	14.06
24	03.44		05.27		17.47 (13)	07.01	17.26 (11)	08.33	09.17	10.22
	22.56		21.05	42	18.29 (13)	19.12 6	17.32 (11)	17.25	14.45	14.06
25	03.48		05.30		17.47 (13)	07.04		07.36	09.20	10.22
	22.52		21.02	41	18.28 (13)	19.08		16.21	14.43	14.07
26	03.51		05.33		17.47 (13)	07.07		07.39	09.23	10.22
	22.49		20.58	40	18.27 (12)	19.05		16.18	14.40	14.08
27	03.55		05.37		17.47 (13)	07.09		07.42	09.26	10.22
	22.45		20.54	40	18.27 (12)	19.01		16.14	14.37	14.10
28	03.58		05.40		17.48 (13)	07.12		07.46	09.30	10.21
	22.42		20.51	40	18.28 (12)	18.57		16.11	14.35	14.11
29	04.02		05.43		17.49 (13)	07.15		07.49	09.33	10.21
	22.38		20.47	39	18.28 (12)	18.54		16.07	14.32	14.13
30	04.05		05.46		17.51 (13)	07.18		07.52	09.36	10.20
	22.35		20.44	37	18.28 (12)	18.50		16.04	14.30	14.14
31	04.08	18.12 (13)	05.49		17.52 (13)			07.55		10.19
	22.32	3 18.15 (13)	20.40	36	18.28 (12)			16.00		14.16
Potential sun hours	621		513		394			302	192	125
Total, worst case		3		1187		637				
Sun reduction		0,50		0,50		0,50				
Oper. time red.		0,80		0,80		0,80				
Wind dir. red.		0,69		0,69		0,67				
Total reduction		0,27		0,27		0,27				
Total, real		1		326		172				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6 **Shadow receptor:** C - Hundhammer

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February	March		April		May		June		
1	10.18	09.03	07.28		06.35		18.20 (6)	04.46	18.31 (8)	03.01	18.45 (8)
	14.19	15.55	17.29		20.05	15	18.35 (6)	21.41	28 18.59 (8)	23.27	4 18.49 (8)
2	10.17	09.00	07.24		06.32		18.18 (6)	04.42	18.29 (8)	02.58	
	14.21	15.58	17.32		20.08	18	18.36 (6)	21.44	30 18.59 (8)	23.30	
3	10.16	08.57	07.20		06.28		18.12 (7)	04.39	18.28 (8)	02.55	
	14.23	16.02	17.35		20.11	25	18.37 (6)	21.47	32 19.00 (8)	23.33	
4	10.14	08.53	07.17		06.24		18.09 (7)	04.35	18.28 (8)	02.52	
	14.25	16.05	17.38		20.14	28	18.37 (6)	21.51	33 19.01 (8)	23.36	
5	10.13	08.50	07.13		06.21		18.07 (7)	04.32	18.27 (8)	02.50	
	14.28	16.09	17.42		20.17	31	18.38 (6)	21.54	34 19.01 (8)	23.39	
6	10.11	08.47	07.10		06.17		18.05 (7)	04.28	18.26 (8)	02.47	
	14.30	16.12	17.45		20.20	33	18.38 (6)	21.58	36 19.02 (8)	23.42	
7	10.09	08.44	07.06		06.13		18.04 (7)	04.25	18.26 (8)	02.45	
	14.33	16.16	17.48		20.23	34	18.38 (6)	22.01	36 19.02 (8)	23.45	
8	10.07	08.40	07.02		06.10		18.03 (7)	04.21	18.26 (8)	02.42	
	14.36	16.19	17.51		20.27	34	18.37 (6)	22.05	36 19.02 (8)	23.48	
9	10.06	08.37	06.59		06.06		18.02 (7)	04.17	18.26 (8)	02.40	
	14.39	16.23	17.54		20.30	35	18.37 (6)	22.08	36 19.02 (8)	23.50	
10	10.03	08.34	06.55		06.02		18.01 (7)	04.14	18.25 (8)	02.38	
	14.42	16.26	17.57		20.33	35	18.36 (6)	22.11	38 19.03 (8)	23.53	
11	10.01	08.30	06.52		05.59		18.00 (7)	04.10	18.25 (8)	02.36	
	14.44	16.29	18.00		20.36	34	18.34 (6)	22.15	37 19.02 (8)	23.55	
12	09.59	08.27	06.48		05.55		18.00 (7)	04.07	18.25 (8)	02.34	
	14.47	16.33	18.03		20.39	33	18.33 (6)	22.18	37 19.02 (8)	23.57	
13	09.57	08.23	06.44		05.51		18.01 (7)	04.03	18.26 (8)	02.32	
	14.51	16.36	18.07		20.42	31	18.32 (6)	22.22	37 19.03 (8)	23.59	
14	09.55	08.20	06.41		05.48		18.00 (7)	04.00	18.26 (8)	02.30	
	14.54	16.40	18.10		20.45	30	18.30 (7)	22.25	37 19.03 (8)	00.01	
15	09.52	08.17	06.37		05.44		18.01 (7)	03.56	18.26 (8)	02.29	
	14.57	16.43	18.13		20.49	28	18.29 (7)	22.29	36 19.02 (8)	00.03	
16	09.50	08.13	06.34		05.40		18.01 (7)	03.53	18.26 (8)	02.27	
	15.00	16.46	18.16		20.52	27	18.28 (7)	22.32	36 19.02 (8)	00.05	
17	09.47	08.10	06.30		05.37		18.01 (7)	03.50	18.27 (8)	02.26	
	15.03	16.50	18.19		20.55	27	18.28 (7)	22.36	35 19.02 (8)	00.06	
18	09.44	08.06	06.26		05.33		18.02 (7)	03.46	18.27 (8)	02.25	
	15.07	16.53	18.22		20.58	24	18.26 (7)	22.39	34 19.01 (8)	00.07	
19	09.42	08.03	06.23		05.29		18.03 (7)	03.43	18.27 (8)	02.25	
	15.10	16.56	18.25		21.01	22	18.25 (7)	22.43	34 19.01 (8)	00.08	
20	09.39	07.59	06.19		05.26		18.05 (7)	03.39	18.29 (8)	02.24	
	15.13	17.00	18.28		21.05	19	18.24 (7)	22.46	32 19.01 (8)	00.09	
21	09.36	07.56	06.15		05.22		18.06 (7)	03.36	18.29 (8)	02.24	
	15.17	17.03	18.31		21.08	15	18.21 (7)	22.50	31 19.00 (8)	00.09	
22	09.33	07.52	06.12		05.19		18.10 (7)	03.33	18.30 (8)	02.24	
	15.20	17.06	18.34		21.11	7	18.17 (7)	22.53	30 19.00 (8)	00.09	
23	09.31	07.49	06.08		05.15			03.29	18.31 (8)	02.25	
	15.24	17.09	18.37		21.14			22.57	29 19.00 (8)	00.09	
24	09.28	07.45	06.04		05.11			03.26	18.31 (8)	02.25	
	15.27	17.13	18.40		21.18			23.00	27 18.58 (8)	00.09	
25	09.25	07.42	06.01		05.08			03.23	18.33 (8)	02.26	
	15.30	17.16	18.43		21.21			23.03	25 18.58 (8)	00.08	
26	09.22	07.38	05.57		05.04			03.20	18.34 (8)	02.27	
	15.34	17.19	18.46		21.24			23.07	24 18.58 (8)	00.07	
27	09.19	07.35	05.54		05.00		18.38 (8)	03.16	18.35 (8)	02.28	
	15.37	17.22	18.49		21.27	13	18.51 (8)	23.10	22 18.57 (8)	00.06	
28	09.16	07.31	05.50		04.57		18.35 (8)	03.13	18.37 (8)	02.29	
	15.41	17.26	18.53		21.31	19	18.54 (8)	23.14	19 18.56 (8)	00.05	
29	09.13		06.46		04.53		18.33 (8)	03.10	18.38 (8)	02.31	
	15.44		19.56		21.34	23	18.56 (8)	23.17	17 18.55 (8)	00.04	
30	09.09		06.43		04.50		18.32 (8)	03.07	18.40 (8)	02.33	
	15.48		19.59		21.37	26	18.58 (8)	23.20	14 18.54 (8)	00.02	
31	09.06		06.39	18.23 (6)				03.04	18.42 (8)		
	15.51		20.02	10 18.33 (6)				23.24	10 18.52 (8)		
Potential sun hours	163	235	363		454			578		641	
Total, worst case				10		666		942			4
Sun reduction				0,50		0,50		0,50			0,50
Oper. time red.				0,80		0,80		0,80			0,80
Wind dir. red.				0,69		0,69		0,71			0,71
Total reduction				0,28		0,28		0,29			0,29
Total, real				3		184		269			1

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6 **Shadow receptor:** C - Hundhammer

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	July		August		September		October	November	December
1	02.35		04.12		18.36 (8)	05.52	18.00 (7)	07.21	07.59	09.39
	00.01		22.28	37	19.13 (8)	20.36	34	18.34 (6)	18.47	15.57	14.28
2	02.37		04.15		18.36 (8)	05.55	17.59 (7)	07.24	08.02	09.42
	23.59		22.25	37	19.13 (8)	20.33	35	18.34 (6)	18.43	15.54	14.26
3	02.39		04.19		18.35 (8)	05.58	17.59 (7)	07.27	08.06	09.45
	23.57		22.21	37	19.12 (8)	20.29	35	18.34 (6)	18.39	15.50	14.24
4	02.42		04.22		18.36 (8)	06.01	18.00 (7)	07.30	08.09	09.48
	23.55		22.17	36	19.12 (8)	20.25	34	18.34 (6)	18.36	15.47	14.22
5	02.44		04.25		18.36 (8)	06.04	18.00 (7)	07.34	08.12	09.51
	23.52		22.14	36	19.12 (8)	20.22	34	18.34 (6)	18.32	15.44	14.20
6	02.47		04.29		18.36 (8)	06.07	18.01 (7)	07.37	08.16	09.53
	23.50		22.10	36	19.12 (8)	20.18	33	18.34 (6)	18.29	15.40	14.18
7	02.50		04.32		18.37 (8)	06.10	18.02 (7)	07.40	08.19	09.56
	23.47		22.07	35	19.12 (8)	20.14	31	18.33 (6)	18.25	15.37	14.16
8	02.53		04.36		18.36 (8)	06.13	18.04 (7)	07.43	08.22	09.58
	23.45		22.03	34	19.10 (8)	20.11	29	18.33 (6)	18.21	15.34	14.14
9	02.55		04.39		18.37 (8)	06.16	18.05 (7)	07.46	08.26	10.01
	23.42		22.00	33	19.10 (8)	20.07	26	18.31 (6)	18.18	15.31	14.13
10	02.58		04.42		18.37 (8)	06.19	18.11 (6)	07.49	08.29	10.03
	23.39		21.56	32	19.09 (8)	20.03	19	18.30 (6)	18.14	15.27	14.11
11	03.02		04.45		18.38 (8)	06.22	18.12 (6)	07.52	08.33	10.05
	23.37		21.53	30	19.08 (8)	20.00	16	18.28 (6)	18.11	15.24	14.10
12	03.05	18.51 (8)	04.49		18.39 (8)	06.25	18.14 (6)	07.55	08.36	10.08
	23.34	8	18.59 (8)	21.49	28	19.07 (8)	19.56	11	18.25 (6)	18.07	15.21	14.09
13	03.08	18.49 (8)	04.52		18.41 (8)	06.28		07.58	08.39	10.09
	23.31	12	19.01 (8)	21.45	25	19.06 (8)	19.52			18.03	15.18	14.08
14	03.11	18.47 (8)	04.55		18.41 (8)	06.31		08.01	08.43	10.11
	23.28	15	19.02 (8)	21.42	22	19.03 (8)	19.49			18.00	15.15	14.07
15	03.14	18.45 (8)	04.59		18.43 (8)	06.34		08.04	08.46	10.13
	23.25	19	19.04 (8)	21.38	18	19.01 (8)	19.45			17.56	15.12	14.06
16	03.18	18.45 (8)	05.02		18.46 (8)	06.37		08.07	08.50	10.15
	23.22	21	19.06 (8)	21.35	12	18.58 (8)	19.41			17.53	15.09	14.06
17	03.21	18.44 (8)	05.05			06.40		08.10	08.53	10.16
	23.18	22	19.06 (8)	21.31			19.38			17.49	15.06	14.05
18	03.24	18.42 (8)	05.08			06.43		08.13	08.56	10.17
	23.15	25	19.07 (8)	21.27			19.34			17.46	15.03	14.05
19	03.28	18.42 (8)	05.11			06.46		08.17	09.00	10.18
	23.12	26	19.08 (8)	21.24			19.30			17.42	15.00	14.05
20	03.31	18.41 (8)	05.15			06.49		08.20	09.03	10.19
	23.09	28	19.09 (8)	21.20			19.27			17.39	14.57	14.05
21	03.34	18.41 (8)	05.18		18.14 (7)	06.52		08.23	09.07	10.20
	23.06	29	19.10 (8)	21.16	9	18.23 (7)	19.23			17.35	14.54	14.05
22	03.38	18.39 (8)	05.21		18.10 (7)	06.55		08.26	09.10	10.21
	23.02	31	19.10 (8)	21.13	16	18.26 (7)	19.19			17.32	14.51	14.05
23	03.41	18.39 (8)	05.24		18.08 (7)	06.58		08.29	09.13	10.21
	22.59	32	19.11 (8)	21.09	19	18.27 (7)	19.16			17.28	14.48	14.06
24	03.45	18.38 (8)	05.27		18.07 (7)	07.01		08.33	09.17	10.22
	22.56	33	19.11 (8)	21.05	22	18.29 (7)	19.12			17.25	14.45	14.07
25	03.48	18.38 (8)	05.30		18.05 (7)	07.04		07.36	09.20	10.22
	22.52	34	19.12 (8)	21.02	25	18.30 (7)	19.08			16.21	14.43	14.08
26	03.51	18.38 (8)	05.34		18.04 (7)	07.07		07.39	09.23	10.22
	22.49	34	19.12 (8)	20.58	26	18.30 (7)	19.05			16.18	14.40	14.09
27	03.55	18.37 (8)	05.37		18.02 (7)	07.10		07.42	09.26	10.22
	22.45	35	19.12 (8)	20.55	28	18.30 (7)	19.01			16.14	14.38	14.10
28	03.58	18.37 (8)	05.40		18.01 (7)	07.13		07.46	09.30	10.21
	22.42	36	19.13 (8)	20.51	29	18.30 (7)	18.58			16.11	14.35	14.11
29	04.02	18.37 (8)	05.43		18.01 (7)	07.16		07.49	09.33	10.21
	22.38	36	19.13 (8)	20.47	29	18.30 (6)	18.54			16.07	14.33	14.13
30	04.05	18.36 (8)	05.46		18.01 (7)	07.19		07.52	09.36	10.20
	22.35	37	19.13 (8)	20.44	31	18.32 (6)	18.50			16.04	14.30	14.14
31	04.09	18.36 (8)	05.49		18.00 (7)			07.56		10.19
	22.32	37	19.13 (8)	20.40	33	18.33 (6)				16.01		14.16
Potential sun hours	620		513		394			302	192	125
Total, worst case		550		755		337				
Sun reduction		0,50		0,50		0,50				
Oper. time red.		0,80		0,80		0,80				
Wind dir. red.		0,71		0,71		0,69				
Total reduction		0,29		0,28		0,28				
Total, real		157		213		93				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Project:
Hundhammerfjellet Reetablering

NTE Energi AS

Licensed user:
Multiconsult v/Silje Aunehaugen
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+47 21 58 60 15
Helge Dalbu / helge.dalbu@multiconsult.no
Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**Shadow receptor:** D - Klungset

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February	March	April	May	June			July	August	September	October	November	December
1	10.18	09.03	07.28	06.35	04.46	03.01			02.35	04.12	05.52	07.22	07.59	09.39
	14.19	15.55	17.29	20.05	21.41	23.27			00.01	22.28	20.36	18.47	15.57	14.28
2	10.17	09.00	07.24	06.32	04.43	02.58			02.37	04.16	05.55	07.25	08.02	09.42
	14.21	15.59	17.32	20.08	21.44	23.30			23.59	22.25	20.33	18.43	15.54	14.26
3	10.16	08.57	07.21	06.28	04.39	02.56			02.40	04.19	05.58	07.28	08.06	09.45
	14.23	16.02	17.35	20.11	21.48	23.33			23.57	22.21	20.29	18.40	15.51	14.24
4	10.14	08.54	07.17	06.24	04.35	02.53			02.42	04.22	06.01	07.31	08.09	09.48
	14.26	16.06	17.39	20.14	21.51	23.36			23.54	22.18	20.25	18.36	15.47	14.22
5	10.13	08.50	07.13	06.21	04.32	02.50			02.45	04.26	06.04	07.34	08.12	09.51
	14.28	16.09	17.42	20.17	21.54	23.39			23.52	22.14	20.22	18.32	15.44	14.20
6	10.11	08.47	07.10	06.17	04.28	02.48			02.47	04.29	06.07	07.37	08.16	09.53
	14.31	16.12	17.45	20.20	21.58	23.42			23.50	22.10	20.18	18.29	15.41	14.18
7	10.09	08.44	07.06	06.13	04.25	02.45			02.50	04.32	06.10	07.40	08.19	09.56
	14.33	16.16	17.48	20.24	22.01	23.45			23.47	22.07	20.14	18.25	15.37	14.16
8	10.08	08.40	07.03	06.10	04.21	02.43			02.53	04.36	06.13	07.43	08.23	09.58
	14.36	16.19	17.51	20.27	22.05	23.48			23.45	22.03	20.11	18.22	15.34	14.15
9	10.06	08.37	06.59	06.06	04.18	02.40			02.56	04.39	06.16	07.46	08.26	10.01
	14.39	16.23	17.54	20.30	22.08	23.50			23.42	22.00	20.07	18.18	15.31	14.13
10	10.04	08.34	06.55	06.03	04.14	02.38			02.59	04.42	06.19	07.49	08.29	10.03
	14.42	16.26	17.57	20.33	22.12	23.53			23.39	21.56	20.03	18.14	15.28	14.12
11	10.01	08.30	06.52	05.59	04.11	02.36			03.02	04.46	06.22	07.52	08.33	10.05
	14.45	16.30	18.01	20.36	22.15	23.55			23.37	21.53	20.00	18.11	15.24	14.10
12	09.59	08.27	06.48	05.55	04.07	02.34		05.04 (9)	03.05	04.49	06.25	07.55	08.36	10.08
	14.48	16.33	18.04	20.39	22.18	23.57	1	05.05 (9)	23.34	21.49	19.56	18.07	15.21	14.09
13	09.57	08.24	06.45	05.52	04.04	02.32		05.02 (9)	03.08	04.52	06.28	07.58	08.40	10.10
	14.51	16.36	18.07	20.42	22.22	23.59	4	05.06 (9)	23.31	21.45	19.52	18.04	15.18	14.08
14	09.55	08.20	06.41	05.48	04.00	02.31		05.02 (9)	03.11	04.56	06.31	08.01	08.43	10.11
	14.54	16.40	18.10	20.45	22.25	00.01	6	05.08 (9)	23.28	21.42	19.49	18.00	15.15	14.07
15	09.52	08.17	06.37	05.44	03.57	02.29		05.01 (9)	03.15	04.59	06.34	08.04	08.46	10.13
	14.57	16.43	18.13	20.49	22.29	00.03	7	05.08 (9)	23.25	21.38	19.45	17.57	15.12	14.06
16	09.50	08.13	06.34	05.41	03.53	02.28		05.01 (9)	03.18	05.02	06.37	08.07	08.50	10.15
	15.00	16.47	18.16	20.52	22.32	00.05	8	05.09 (9)	23.22	21.35	19.41	17.53	15.09	14.06
17	09.47	08.10	06.30	05.37	03.50	02.27		05.00 (9)	03.21	05.05	06.40	08.10	08.53	10.16
	15.04	16.50	18.19	20.55	22.36	00.06	9	05.09 (9)	23.18	21.31	19.38	17.49	15.06	14.05
18	09.44	08.06	06.26	05.33	03.46	02.26		05.00 (9)	03.25	05.08	06.43	08.14	08.57	10.17
	15.07	16.53	18.22	20.58	22.39	00.07	10	05.10 (9)	23.15	21.27	19.34	17.46	15.03	14.05
19	09.42	08.03	06.23	05.30	03.43	02.25		05.01 (9)	03.28	05.12	06.46	08.17	09.00	10.18
	15.10	16.57	18.25	21.01	22.43	00.08	9	05.10 (9)	23.12	21.24	19.31	17.42	15.00	14.05
20	09.39	07.59	06.19	05.26	03.40	02.25		05.01 (9)	03.31	05.15	06.49	08.20	09.03	10.19
	15.14	17.00	18.28	21.05	22.46	00.08	9	05.10 (9)	23.09	21.20	19.27	17.39	14.57	14.05
21	09.36	07.56	06.16	05.22	03.36	02.25		05.01 (9)	03.35	05.18	06.52	08.23	09.07	10.20
	15.17	17.03	18.31	21.08	22.50	00.09	10	05.11 (9)	23.06	21.17	19.23	17.35	14.54	14.05
22	09.33	07.52	06.12	05.19	03.33	02.25		05.02 (9)	03.38	05.21	06.55	08.26	09.10	10.21
	15.20	17.06	18.34	21.11	22.53	00.09	10	05.12 (9)	23.02	21.13	19.20	17.32	14.51	14.06
23	09.31	07.49	06.08	05.15	03.30	02.25		05.02 (9)	03.41	05.24	06.58	08.30	09.13	10.21
	15.24	17.10	18.37	21.14	22.57	00.09	9	05.11 (9)	22.59	21.09	19.16	17.28	14.48	14.06
24	09.28	07.45	06.05	05.11	03.26	02.26		05.01 (9)	03.45	05.28	07.01	08.33	09.17	10.22
	15.27	17.13	18.40	21.18	23.00	00.09	10	05.11 (9)	22.56	21.06	19.12	17.25	14.46	14.07
25	09.25	07.42	06.01	05.08	03.23	02.26		05.02 (9)	03.48	05.31	07.04	07.36	09.20	10.22
	15.31	17.16	18.44	21.21	23.04	00.08	9	05.11 (9)	22.52	21.02	19.09	16.21	14.43	14.08
26	09.22	07.38	05.57	05.04	03.20	02.27		05.03 (9)	03.52	05.34	07.07	07.39	09.23	10.22
	15.34	17.19	18.47	21.24	23.07	00.07	9	05.12 (9)	22.49	20.58	19.05	16.18	14.40	14.09
27	09.19	07.35	05.54	05.01	03.17	02.28		05.03 (9)	03.55	05.37	07.10	07.42	09.26	10.22
	15.38	17.23	18.50	21.28	23.10	00.06	8	05.11 (9)	22.45	20.55	19.01	16.14	14.38	14.10
28	09.16	07.31	05.50	04.57	03.14	02.30		05.04 (9)	03.59	05.40	07.13	07.46	09.30	10.21
	15.41	17.26	18.53	21.31	23.14	00.05	7	05.11 (9)	22.42	20.51	18.58	16.11	14.35	14.12
29	09.13		06.46	04.53	03.10	02.32		05.05 (9)	04.02	05.43	07.16	07.49	09.33	10.21
	15.45		19.56	21.34	23.17	00.04	5	05.10 (9)	22.39	20.47	18.54	16.08	14.33	14.13
30	09.10		06.43	04.50	03.07	02.33		05.06 (9)	04.05	05.46	07.19	07.52	09.36	10.20
	15.48		19.59	21.37	23.20	00.02	3	05.09 (9)	22.35	20.44	18.50	16.04	14.31	14.15
31	09.06		06.39		03.04				04.09	05.49		07.56		10.19
	15.52		20.02		23.24				22.32	20.40		16.01		14.17
Potential sun hours	163	235	363	454	578	641			620	513	394	302	192	125
Total, worst case							143							
Sun reduction							0,50							
Oper. time red.							0,80							
Wind dir. red.							0,60							
Total reduction							0,24							
Total, real							34							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Helge Dalbu / helge.dalbu@multiconsult.no
Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6 **Shadow receptor:** E - Løvmo

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February	March	April	May	June	July	August	September	October	November	December
1	10.18	09.03	07.28	06.35	04.46	03.01	05.06 (5)	02.35	05.05 (5)	04.12	05.52	07.22	07.59	09.39
	14.19	15.55	17.29	20.05	21.41	23.27 31	05.48 (6)	00.01 21	05.26 (5)	22.28	20.36	18.47	15.57	14.28
2	10.17	09.00	07.24	06.32	04.43	02.59	05.05 (5)	02.38	05.06 (5)	04.16	05.55	07.25	08.02	09.42
	14.21	15.59	17.32	20.08	21.44	23.30 32	05.48 (6)	23.59 20	05.26 (5)	22.25	20.33	18.43	15.54	14.26
3	10.16	08.57	07.21	06.28	04.39	02.56	05.04 (5)	02.40	05.06 (5)	04.19	05.58	07.28	08.06	09.45
	14.23	16.02	17.35	20.11	21.48	23.33 31	05.46 (6)	23.57 20	05.26 (5)	22.21	20.29	18.40	15.51	14.24
4	10.14	08.54	07.17	06.25	04.36	02.53	05.02 (5)	02.42	05.07 (5)	04.22	06.01	07.31	08.09	09.48
	14.26	16.06	17.39	20.14	21.51	23.36 29	05.45 (6)	23.55 19	05.26 (5)	22.18	20.25	18.36	15.47	14.22
5	10.13	08.50	07.13	06.21	04.32	02.50	05.02 (5)	02.45	05.07 (5)	04.26	06.04	07.34	08.12	09.51
	14.28	16.09	17.42	20.17	21.54	23.39 23	05.31 (2)	23.52 20	05.34 (2)	22.14	20.22	18.32	15.44	14.20
6	10.11	08.47	07.10	06.17	04.28	02.48	05.01 (5)	02.47	05.08 (5)	04.29	06.07	07.37	08.16	09.53
	14.31	16.13	17.45	20.20	21.58	23.42 24	05.30 (2)	23.50 22	05.36 (2)	22.11	20.18	18.29	15.41	14.18
7	10.09	08.44	07.06	06.14	04.25	02.45	05.01 (5)	02.50	05.09 (5)	04.33	06.10	07.40	08.19	09.56
	14.33	16.16	17.48	20.24	22.01	23.45 21	05.29 (2)	23.47 22	05.37 (2)	22.07	20.14	18.25	15.37	14.16
8	10.08	08.40	07.03	06.10	04.21	02.43	05.01 (5)	02.53	05.09 (5)	04.36	06.13	07.43	08.23	09.58
	14.36	16.19	17.51	20.27	22.05	23.48 19	05.20 (5)	23.45 27	05.51 (6)	22.03	20.11	18.22	15.34	14.15
9	10.06	08.37	06.59	06.06	04.18	02.40	05.01 (5)	02.56	05.10 (5)	04.39	06.16	07.46	08.26	10.01
	14.39	16.23	17.54	20.30	22.08	23.50 20	05.21 (5)	23.42 31	05.53 (6)	22.00	20.07	18.18	15.31	14.13
10	10.04	08.34	06.56	06.03	04.14	02.38	05.01 (5)	02.59	05.11 (5)	04.43	06.19	07.49	08.29	10.03
	14.42	16.26	17.57	20.33	22.12	23.53 20	05.21 (5)	23.39 32	05.54 (6)	21.56	20.04	18.14	15.28	14.12
11	10.01	08.30	06.52	05.59	04.11	02.36	05.01 (5)	03.02	05.13 (5)	04.46	06.22	07.52	08.33	10.05
	14.45	16.30	18.01	20.36	22.15	23.55 21	05.22 (5)	23.37 30	05.55 (6)	21.53	20.00	18.11	15.25	14.10
12	09.59	08.27	06.48	05.55	04.07 05.38 (6)	02.34	05.01 (5)	03.05	05.15 (5)	04.49	06.25	07.55	08.36	10.08
	14.48	16.33	18.04	20.39	22.19 6	05.44 (6)	23.57 21	05.22 (5)	23.34 29	05.56 (6)	21.49	19.56	18.07	15.21	14.09
13	09.57	08.24	06.45	05.52	04.04	05.36 (6)	02.32	05.01 (5)	03.08	05.29 (2)	04.52	06.28	07.58	08.40	10.10
	14.51	16.37	18.07	20.42	22.22 10	05.46 (6)	23.59 21	05.22 (5)	23.31 26	05.57 (6)	21.46	19.53	18.04	15.18	14.08
14	09.55	08.20	06.41	05.48	04.00	05.34 (6)	02.31	05.01 (5)	03.11	05.30 (2)	04.56	06.31	08.01	08.43	10.11
	14.54	16.40	18.10	20.46	22.25 13	05.47 (6)	00.01 22	05.23 (5)	23.28 26	05.58 (6)	21.42	19.49	18.00	15.15	14.07
15	09.52	08.17	06.37	05.44	03.57	05.33 (6)	02.29	05.01 (5)	03.15	05.29 (2)	04.59	06.34	08.04	08.46	10.13
	14.57	16.43	18.13	20.49	22.29 15	05.48 (6)	00.03 22	05.23 (5)	23.25 29	05.59 (6)	21.38	19.45	17.57	15.12	14.07
16	09.50	08.13	06.34	05.41	03.53	05.33 (6)	02.28	05.01 (5)	03.18	05.29 (2)	05.02	06.37	08.07	08.50	10.15
	15.00	16.47	18.16	20.52	22.32 16	05.49 (6)	00.05 23	05.24 (5)	23.22 29	05.59 (6)	21.35	19.42	17.53	15.09	14.06
17	09.47	08.10	06.30	05.37	03.50	05.32 (6)	02.27	05.01 (5)	03.21	05.29 (2)	05.05	06.40	08.11	08.53	10.16
	15.04	16.50	18.19	20.55	22.36 17	05.49 (6)	00.06 22	05.23 (5)	23.18 30	05.59 (6)	21.31	19.38	17.50	15.06	14.06
18	09.45	08.06	06.27	05.33	03.46	05.31 (6)	02.26	05.01 (5)	03.25	05.30 (2)	05.09	06.43	08.14	08.57	10.17
	15.07	16.53	18.22	20.58	22.39 18	05.49 (6)	00.07 23	05.24 (5)	23.15 29	06.00 (6)	21.27	19.34	17.46	15.03	14.05
19	09.42	08.03	06.23	05.30	03.43	05.31 (6)	02.25	05.01 (5)	03.28	05.30 (2)	05.12	06.46	08.17	09.00	10.19
	15.10	16.57	18.25	21.01	22.43 19	05.50 (6)	00.08 23	05.24 (5)	23.12 29	06.00 (6)	21.24	19.31	17.42	15.00	14.05
20	09.39	07.59	06.19	05.26	03.40	05.31 (6)	02.25	05.02 (5)	03.31	05.31 (2)	05.15	06.49	08.20	09.03	10.19
	15.14	17.00	18.28	21.05	22.46 19	05.50 (6)	00.08 22	05.24 (5)	23.09 29	06.01 (6)	21.20	19.27	17.39	14.57	14.05
21	09.36	07.56	06.16	05.22	03.36	05.24 (2)	02.25	05.02 (5)	03.35	05.31 (2)	05.18	06.52	08.23	09.07	10.20
	15.17	17.03	18.31	21.08	22.50 24	05.51 (6)	00.09 22	05.24 (5)	23.06 28	06.00 (6)	21.17	19.23	17.35	14.54	14.05
22	09.34	07.52	06.12	05.19	03.33	05.22 (2)	02.25	05.03 (5)	03.38	05.33 (2)	05.21	06.55	08.26	09.10	10.21
	15.21	17.06	18.34	21.11	22.53 26	05.50 (6)	00.09 22	05.25 (5)	23.02 25	06.01 (6)	21.13	19.20	17.32	14.51	14.06
23	09.31	07.49	06.08	05.15	03.30	05.21 (2)	02.25	05.02 (5)	03.42	05.41 (6)	05.24	06.58	08.30	09.13	10.21
	15.24	17.10	18.37	21.14	22.57 29	05.51 (6)	00.09 23	05.25 (5)	22.59 19	06.00 (6)	21.09	19.16	17.28	14.49	14.06
24	09.28	07.45	06.05	05.12	03.26	05.21 (2)	02.26	05.02 (5)	03.45	05.42 (6)	05.28	07.01	08.33	09.17	10.22
	15.27	17.13	18.41	21.18	23.00 29	05.51 (6)	00.09 23	05.25 (5)	22.56 19	06.01 (6)	21.06	19.12	17.25	14.46	14.07
25	09.25	07.42	06.01	05.08	03.23	05.20 (2)	02.26	05.03 (5)	03.48	05.41 (6)	05.31	07.04	07.36	09.20	10.22
	15.31	17.16	18.44	21.21	23.04 30	05.50 (6)	00.08 23	05.26 (5)	22.52 19	06.00 (6)	21.02	19.09	16.21	14.43	14.08
26	09.22	07.38	05.57	05.04	03.20	05.20 (2)	02.27	05.04 (5)	03.52	05.42 (6)	05.34	07.07	07.39	09.23	10.22
	15.34	17.19	18.47	21.24	23.07 29	05.50 (6)	00.07 22	05.26 (5)	22.49 18	06.00 (6)	20.58	19.05	16.18	14.41	14.09
27	09.19	07.35	05.54	05.01	03.17	05.20 (2)	02.29	05.04 (5)	03.55	05.43 (6)	05.37	07.10	07.43	09.27	10.22
	15.38	17.23	18.50	21.28	23.10 30	05.50 (6)	00.06 22	05.26 (5)	22.45 17	06.00 (6)	20.55	19.01	16.15	14.38	14.10
28	09.16	07.31	05.50	04.57	03.14	05.20 (2)	02.30	05.04 (5)	03.59	05.43 (6)	05.40	07.13	07.46	09.30	10.21
	15.41	17.26	18.53	21.31	23.14 29	05.50 (6)	00.05 22	05.26 (5)	22.42 16	05.59 (6)	20.51	18.58	16.11	14.35	14.12
29	09.13		06.46	04.53	03.10	05.20 (2)	02.32	05.04 (5)	04.02	05.44 (6)	05.43	07.16	07.49	09.33	10.21
	15.45		19.56	21.34	23.17 27	05.49 (6)	00.04 22	05.26 (5)	22.39 14	05.58 (6)	20.47	18.54	16.08	14.33	14.13
30	09.10		06.43	04.50	03.07	05.21 (2)	02.33	05.04 (5)	04.05	05.45 (6)	05.46	07.19	07.52	09.36	10.20
	15.48		19.59	21.38	23.20 26	05.49 (6)	00.02 22	05.26 (5)	22.35 12	05.57 (6)	20.44	18.51	16.04	14.31	14.15
31	09.06		06.39		03.04	05.09 (5)			04.09	05.46 (6)	05.49		07.56		10.19
	15.52		20.02		23.24 25	05.48 (6)			22.32 9	05.55 (6)	20.40		16.01		14.17
Potential sun hours	163	235	363	454	578	641	620	513	394	302	192	126			
Total, worst case					437	693	716								
Sun reduction					0,50	0,50	0,50								
Oper. time red.					0,80	0,80	0,80								
Wind dir. red.					0,64	0,61	0,63								
Total reduction					0,26	0,25	0,25								
Total, real					112	170	181								

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6 **Shadow receptor:** F - Storeienen

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February		March		April		May	June
1	10.18	09.03		07.28		09.02 (2)	06.35	04.46	03.01
	14.19	15.55		17.29	106	11.53 (3)	20.05	21.41	23.27
2	10.17	09.00		07.24		09.00 (2)	06.32	07.34 (14) 04.43	02.58
	14.21	15.58		17.32	104	11.51 (3)	20.08	6 07.40 (14) 21.44	23.30
3	10.16	08.57		07.21		08.59 (2)	06.28	07.30 (14) 04.39	02.55
	14.23	16.02		17.35	100	11.49 (3)	20.11	13 07.43 (14) 21.48	23.33
4	10.14	08.54		07.17		08.40 (6)	06.24	07.28 (14) 04.35	02.53
	14.26	16.05		17.39	104	11.47 (3)	20.14	16 07.44 (14) 21.51	23.37
5	10.13	08.50	12.15 (1)	07.13		08.37 (6)	06.21	07.27 (14) 04.32	02.50
	14.28	16.09	9 12.24 (1)	17.42	98	11.42 (3)	20.17	18 07.45 (14) 21.55	23.40
6	10.11	08.47	12.14 (1)	07.10		08.35 (6)	06.17	07.25 (14) 04.28	02.47
	14.31	16.12	12 12.26 (1)	17.45	88	10.40 (4)	20.21	20 07.45 (14) 21.58	23.42
7	10.10	08.44	12.13 (1)	07.06		08.14 (7)	06.13	07.25 (14) 04.25	02.45
	14.33	16.16	14 12.27 (1)	17.48	91	10.38 (4)	20.24	21 07.46 (14) 22.01	23.45
8	10.08	08.41	12.12 (1)	07.03		08.12 (7)	06.10	07.24 (14) 04.21	02.42
	14.36	16.19	16 12.28 (1)	17.51	88	10.37 (4)	20.27	21 07.45 (14) 22.05	23.48
9	10.06	08.37	12.12 (1)	06.59		08.11 (7)	06.06	07.24 (14) 04.18	02.40
	14.39	16.23	16 12.28 (1)	17.54	76	10.34 (4)	20.30	21 07.45 (14) 22.08	23.51
10	10.04	08.34	11.37 (3)	06.56		08.10 (7)	06.03	07.23 (14) 04.14	02.38
	14.42	16.26	22 12.28 (1)	17.57	65	10.30 (4)	20.33	22 07.45 (14) 22.12	23.53
11	10.02	08.30	11.32 (3)	06.52		08.09 (7)	05.59	07.24 (14) 04.11	02.36
	14.45	16.30	31 12.28 (1)	18.01	41	08.54 (6)	20.36	20 07.44 (14) 22.15	23.56
12	09.59	08.27	11.31 (3)	06.48		08.09 (7)	05.55	07.24 (14) 04.07	02.34
	14.48	16.33	35 12.29 (1)	18.04	41	08.54 (6)	20.39	19 07.43 (14) 22.19	23.58
13	09.57	08.24	11.29 (3)	06.45		08.08 (7)	05.52	07.25 (14) 04.04	02.32
	14.51	16.36	39 12.29 (1)	18.07	40	08.53 (6)	20.42	17 07.42 (14) 22.22	00.00
14	09.55	08.20	11.27 (3)	06.41		08.08 (7)	05.48	07.26 (14) 04.00	02.30
	14.54	16.40	41 12.28 (1)	18.10	38	08.51 (6)	20.46	14 07.40 (14) 22.26	00.02
15	09.52	08.17	10.20 (4)	06.37		08.08 (7)	05.44	07.28 (14) 03.57	02.29
	14.57	16.43	55 12.26 (1)	18.13	34	08.50 (6)	20.49	10 07.38 (14) 22.29	00.03
16	09.50	08.13	10.17 (4)	06.34		08.10 (7)	05.41	03.53	02.27
	15.00	16.47	57 12.24 (1)	18.16	28	08.48 (6)	20.52	22.33	00.05
17	09.47	08.10	10.15 (4)	06.30		07.40 (8)	05.37	03.50	02.26
	15.04	16.50	56 11.56 (3)	18.19	29	08.45 (6)	20.55	22.36	00.06
18	09.45	08.06	10.13 (4)	06.27		07.38 (8)	05.33	03.46	02.26
	15.07	16.53	62 11.57 (3)	18.22	17	08.18 (7)	20.58	22.40	00.07
19	09.42	08.03	10.12 (4)	06.23		07.37 (8)	05.30	03.43	02.25
	15.10	16.57	64 11.57 (3)	18.25	16	07.53 (8)	21.02	22.43	00.08
20	09.39	08.00	09.41 (5)	06.19		07.36 (8)	05.26	03.39	02.24
	15.14	17.00	73 11.57 (3)	18.28	17	07.53 (8)	21.05	22.46	00.09
21	09.36	07.56	09.37 (5)	06.16		07.35 (8)	05.22	03.36	02.24
	15.17	17.03	84 11.58 (3)	18.31	18	07.53 (8)	21.08	22.50	00.09
22	09.34	07.53	09.35 (5)	06.12		07.35 (8)	05.19	03.33	02.24
	15.20	17.06	90 11.58 (3)	18.34	18	07.53 (8)	21.11	22.53	00.10
23	09.31	07.49	09.33 (5)	06.08		07.35 (8)	05.15	03.29	02.25
	15.24	17.10	93 11.57 (3)	18.37	17	07.52 (8)	21.14	22.57	00.09
24	09.28	07.45	09.31 (5)	06.05		07.34 (8)	05.11	03.26	02.25
	15.27	17.13	97 11.57 (3)	18.41	17	07.51 (8)	21.18	23.00	00.09
25	09.25	07.42	09.30 (5)	06.01		07.36 (8)	05.08	03.23	02.26
	15.31	17.16	98 11.56 (3)	18.44	15	07.51 (8)	21.21	23.04	00.09
26	09.22	07.38	09.29 (5)	05.57		07.36 (8)	05.04	03.20	02.27
	15.34	17.19	100 11.56 (3)	18.47	13	07.49 (8)	21.24	23.07	00.08
27	09.19	07.35	09.29 (5)	05.54		07.38 (8)	05.01	03.16	02.28
	15.38	17.23	101 11.56 (3)	18.50	8	07.46 (8)	21.28	23.11	00.07
28	09.16	07.31	09.06 (2)	05.50			04.57	03.13	02.30
	15.41	17.26	100 11.54 (3)	18.53			21.31	23.14	00.06
29	09.13			06.46			04.53	03.10	02.31
	15.45			19.56			21.34	23.17	00.04
30	09.10			06.43			04.50	03.07	02.33
	15.48			19.59			21.38	23.21	00.03
31	09.07			06.39				03.04	
	15.52			20.02				23.24	
Potential sun hours	163	235		363			454	578	641
Total, worst case			1365		1327		238		
Sun reduction			0,50		0,50		0,50		
Oper. time red.			0,80		0,80		0,80		
Wind dir. red.			0,62		0,68		0,71		
Total reduction			0,25		0,27		0,29		
Total, real			336		359		68		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6 **Shadow receptor:** F - Storeienen

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	July	August			September			October			November			December
1	02.35	04.12			05.52		07.23 (14)	07.22		08.47 (7)	07.59		11.42 (1)	09.39
	00.01	22.28			20.36	20	07.43 (14)	18.47	41	09.32 (6)	15.57	17	11.59 (1)	14.28
2	02.37	04.15			05.55		07.22 (14)	07.25		08.47 (7)	08.02		11.42 (1)	09.42
	23.59	22.25			20.33	21	07.43 (14)	18.43	41	09.32 (6)	15.54	17	11.59 (1)	14.26
3	02.39	04.19			05.58		07.22 (14)	07.28		08.48 (7)	08.06		11.43 (1)	09.45
	23.57	22.21			20.29	22	07.44 (14)	18.40	58	11.07 (4)	15.51	15	11.58 (1)	14.24
4	02.42	04.22			06.01		07.21 (14)	07.31		08.48 (7)	08.09		11.43 (1)	09.48
	23.55	22.18			20.25	21	07.42 (14)	18.36	72	11.10 (4)	15.47	14	11.57 (1)	14.22
5	02.44	04.26			06.04		07.21 (14)	07.34		08.49 (7)	08.13		11.44 (1)	09.51
	23.53	22.14			20.22	21	07.42 (14)	18.32	81	11.13 (4)	15.44	12	11.56 (1)	14.20
6	02.47	04.29			06.07		07.21 (14)	07.37		08.50 (7)	08.16		11.46 (1)	09.54
	23.50	22.11			20.18	20	07.41 (14)	18.29	90	11.14 (4)	15.41	8	11.54 (1)	14.18
7	02.50	04.32			06.10		07.22 (14)	07.40		08.52 (7)	08.19			09.56
	23.48	22.07			20.15	18	07.40 (14)	18.25	92	11.15 (4)	15.37			14.16
8	02.53	04.36			06.13		07.23 (14)	07.43		09.11 (6)	08.23			09.59
	23.45	22.04			20.11	16	07.39 (14)	18.22	87	11.16 (4)	15.34			14.14
9	02.56	04.39			06.16		07.24 (14)	07.46		09.14 (6)	08.26			10.01
	23.42	22.00			20.07	13	07.37 (14)	18.18	100	12.20 (3)	15.31			14.13
10	02.59	04.42			06.19		07.26 (14)	07.49		09.17 (6)	08.29			10.03
	23.40	21.56			20.04	7	07.33 (14)	18.14	101	12.22 (3)	15.28			14.11
11	03.02	04.46			06.22			07.52		09.34 (2)	08.33			10.06
	23.37	21.53			20.00			18.11	102	12.24 (3)	15.24			14.10
12	03.05	04.49			06.25			07.55		09.34 (2)	08.36			10.08
	23.34	21.49			19.56			18.07	105	12.25 (3)	15.21			14.09
13	03.08	04.52			06.28			07.58		09.37 (2)	08.40			10.10
	23.31	21.46			19.53			18.04	104	12.27 (3)	15.18			14.08
14	03.11	04.56			06.31			08.01		10.01 (5)	08.43			10.12
	23.28	21.42			19.49			18.00	98	12.27 (3)	15.15			14.07
15	03.14	04.59			06.34			08.04		10.01 (5)	08.47			10.13
	23.25	21.38			19.45			17.57	98	12.27 (3)	15.12			14.06
16	03.18	05.02			06.37		08.28 (8)	08.07		10.02 (5)	08.50			10.15
	23.22	21.35			19.42	6	08.34 (8)	17.53	99	12.28 (3)	15.09			14.06
17	03.21	05.05			06.40		08.25 (8)	08.11		10.02 (5)	08.53			10.16
	23.19	21.31			19.38	12	08.37 (8)	17.49	99	12.28 (3)	15.06			14.05
18	03.24	05.08			06.43		08.24 (8)	08.14		10.04 (5)	08.57			10.18
	23.16	21.28			19.34	14	08.38 (8)	17.46	95	12.29 (3)	15.03			14.05
19	03.28	05.12			06.46		08.21 (8)	08.17		10.04 (5)	09.00			10.19
	23.12	21.24			19.31	17	08.38 (8)	17.42	92	12.28 (3)	15.00			14.05
20	03.31	05.15			06.49		08.21 (8)	08.20		10.06 (5)	09.04			10.20
	23.09	21.20			19.27	17	08.38 (8)	17.39	88	12.28 (3)	14.57			14.05
21	03.34	05.18			06.52		08.20 (8)	08.23		10.08 (5)	09.07			10.21
	23.06	21.17			19.23	18	08.38 (8)	17.35	82	12.28 (3)	14.54			14.05
22	03.38	05.21			06.55		08.20 (8)	08.26		10.42 (4)	09.10			10.21
	23.02	21.13			19.20	18	08.38 (8)	17.32	66	12.28 (3)	14.51			14.06
23	03.41	05.24			06.58		08.20 (8)	08.30		10.43 (4)	09.14			10.22
	22.59	21.09			19.16	17	08.37 (8)	17.28	63	12.28 (3)	14.48			14.06
24	03.45	05.27			07.01		08.20 (8)	08.33		10.44 (4)	09.17			10.22
	22.56	21.06			19.12	16	08.36 (8)	17.25	59	12.26 (3)	14.46			14.07
25	03.48	05.31			07.04		08.21 (8)	07.36		09.46 (4)	09.20			10.22
	22.52	21.02			19.09	14	08.35 (8)	16.21	55	11.26 (3)	14.43			14.08
26	03.52	05.34			07.07		08.22 (8)	07.39		09.48 (4)	09.23			10.22
	22.49	20.58			19.05	22	09.24 (6)	16.18	57	11.55 (1)	14.40			14.09
27	03.55	05.37			07.10		08.24 (8)	07.43		09.50 (4)	09.27			10.22
	22.46	20.55			19.01	31	09.29 (6)	16.14	53	11.56 (1)	14.38			14.10
28	03.58	05.40		07.28 (14)	07.13		08.50 (7)	07.46		10.57 (3)	09.30			10.21
	22.42	20.51	11	07.39 (14)	18.58	31	09.30 (6)	16.11	39	11.57 (1)	14.35			14.11
29	04.02	05.43		07.26 (14)	07.16		08.49 (7)	07.49		10.58 (3)	09.33			10.21
	22.39	20.47	15	07.41 (14)	18.54	36	09.31 (6)	16.08	39	11.58 (1)	14.33			14.13
30	04.05	05.46		07.25 (14)	07.19		08.48 (7)	07.52		11.00 (3)	09.36			10.20
	22.35	20.44	17	07.42 (14)	18.51	39	09.32 (6)	16.04	35	11.58 (1)	14.30			14.15
31	04.09	05.49		07.24 (14)				07.56		11.03 (3)				10.19
	22.32	20.40	19	07.43 (14)				16.01	31	11.59 (1)				14.16
Potential sun hours	621	513			394			302			192			125
Total, worst case			62			487			2322			83		
Sun reduction			0,50			0,50			0,50			0,50		
Oper. time red.			0,80			0,80			0,80			0,80		
Wind dir. red.			0,71			0,71			0,64			0,58		
Total reduction			0,29			0,28			0,26			0,23		
Total, real			18			138			594			19		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**Shadow receptor:** G - Hamland

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January		February		March		April	May	June
1	10.18		09.03		12.28 (8)		07.28	09.01 (13)	06.35	04.46	03.01
	14.19		15.55	12	12.40 (8)		17.29	47	10.06 (12)	20.05	21.41	23.27
2	10.17		09.00		12.27 (8)		07.24	09.01 (13)	06.32	04.42	02.58
	14.21		15.58	15	12.42 (8)		17.32	46	10.05 (12)	20.08	21.44	23.30
3	10.16		08.57		12.26 (8)		07.21	09.00 (13)	06.28	04.39	02.55
	14.23		16.02	17	12.43 (8)		17.35	45	10.04 (12)	20.11	21.48	23.34
4	10.15		08.54		11.58 (9)		07.17	09.01 (13)	06.24	04.35	02.52
	14.25		16.05	31	13.12 (14)		17.38	43	10.03 (12)	20.14	21.51	23.37
5	10.13		08.50		11.18 (10)		07.13	09.01 (13)	06.21	04.32	02.50
	14.28		16.09	52	13.15 (14)		17.42	39	10.01 (12)	20.17	21.54	23.40
6	10.11		08.47		11.15 (10)		07.10	09.01 (13)	06.17	04.28	02.47
	14.30		16.12	65	13.17 (14)		17.45	34	09.59 (12)	20.20	21.58	23.43
7	10.10		08.44		11.14 (10)		07.06	09.01 (13)	06.13	04.24	02.44
	14.33		16.16	74	13.19 (14)		17.48	19	09.20 (13)	20.24	22.01	23.45
8	10.08		08.40		11.13 (10)		07.03	09.03 (13)	06.10	04.21	02.42
	14.36		16.19	79	13.20 (14)		17.51	16	09.19 (13)	20.27	22.05	23.48
9	10.06		08.37		11.12 (10)		06.59	09.04 (13)	06.06	04.17	02.40
	14.38		16.23	84	13.21 (14)		17.54	13	09.17 (13)	20.30	22.08	23.51
10	10.04		08.34		11.11 (10)		06.55	09.08 (13)	06.02	04.14	02.37
	14.41		16.26	88	13.22 (14)		17.57	4	09.12 (13)	20.33	22.12	23.53
11	10.02		08.30		10.32 (11)		06.52			05.59	04.10	02.35
	14.44		16.29	96	13.22 (14)		18.00			20.36	22.15	23.56
12	09.59		08.27		10.31 (11)		06.48			05.55	04.07	02.33
	14.47		16.33	100	13.23 (14)		18.03			20.39	22.19	23.58
13	09.57		08.24		10.29 (11)		06.45			05.51	04.03	02.31
	14.50		16.36	101	13.24 (14)		18.07			20.42	22.22	00.00
14	09.55		08.20		10.28 (11)		06.41			05.48	04.00	02.30
	14.54		16.40	98	13.24 (14)		18.10			20.45	22.26	00.02
15	09.52		08.17		10.27 (11)		06.37			05.44	03.56	02.28
	14.57		16.43	91	13.23 (14)		18.13			20.49	22.29	00.04
16	09.50		08.13		10.26 (11)		06.34			05.40	03.53	02.27
	15.00		16.46	89	13.23 (14)		18.16			20.52	22.33	00.05
17	09.47		08.10		10.25 (11)		06.30			05.37	03.49	02.26
	15.03		16.50	87	13.23 (14)		18.19			20.55	22.36	00.06
18	09.45		08.06		10.25 (11)		06.26			05.33	03.46	02.25
	15.07		16.53	81	13.22 (14)		18.22			20.58	22.40	00.08
19	09.42		08.03		09.50 (12)		06.23			05.29	03.43	02.24
	15.10		16.56	80	13.21 (14)		18.25			21.01	22.43	00.08
20	09.39		07.59		09.47 (12)		06.19			05.26	03.39	02.24
	15.13		17.00	73	13.20 (14)		18.28			21.05	22.46	00.09
21	09.36		07.56		09.46 (12)		06.15			05.22	03.36	02.24
	15.17		17.03	65	13.19 (14)		18.31			21.08	22.50	00.10
22	09.34		07.52		09.45 (12)		06.12			05.19	03.32	02.24
	15.20		17.06	58	13.17 (14)		18.34			21.11	22.53	00.10
23	09.31		07.49		09.43 (12)		06.08			05.15	03.29	02.24
	15.23		17.09	51	13.13 (14)		18.37			21.14	22.57	00.10
24	09.28		07.45		09.09 (13)		06.05			05.11	03.26	02.25
	15.27		17.13	52	10.45 (11)		18.40			21.18	23.00	00.09
25	09.25		07.42		09.06 (13)		06.01			05.08	03.23	02.25
	15.30		17.16	53	10.43 (11)		18.43			21.21	23.04	00.09
26	09.22		07.38		09.04 (13)		05.57			05.04	03.19	02.26
	15.34		17.19	52	10.40 (11)		18.47			21.24	23.07	00.08
27	09.19		07.35		09.03 (13)		05.54			05.00	03.16	02.28
	15.37		17.22	45	10.07 (12)		18.50			21.28	23.11	00.07
28	09.16		07.31		09.02 (13)		05.50			04.57	03.13	02.29
	15.41		17.26	47	10.07 (12)		18.53			21.31	23.14	00.06
29	09.13						06.46			04.53	03.10	02.31
	15.44						19.56			21.34	23.17	00.04
30	09.10						06.43			04.50	03.07	02.33
	15.48						19.59			21.38	23.21	00.03
31	09.06	12.30 (8)					06.39				03.04	
	15.51	8 12.38 (8)					20.02				23.24	
Potential sun hours	162		235		363		454	578	641
Total, worst case	8		1836		306				
Sun reduction	0,50		0,50		0,50				
Oper. time red.	0,80		0,80		0,80				
Wind dir. red.	0,58		0,60		0,68				
Total reduction	0,23		0,24		0,27				
Total, real	2		442		83				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**Shadow receptor:** G - Hamland

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	July	August	September	October		November		December
1	02.35	04.12	05.52	07.22		07.59	10.42 (10)	09.39
	00.01	22.28	20.36	18.47		15.57	86 12.52 (14)	14.28
2	02.37	04.15	05.55	07.25		08.02	10.42 (10)	09.42
	23.59	22.25	20.33	18.43		15.54	84 12.51 (14)	14.26
3	02.39	04.19	05.58	07.28		08.06	10.43 (10)	09.45
	23.57	22.21	20.29	18.39		15.50	79 12.50 (14)	14.23
4	02.41	04.22	06.01	07.31	09.43 (13)	08.09	10.44 (10)	09.48
	23.55	22.18	20.25	18.36	10 09.53 (13)	15.47	73 12.49 (14)	14.21
5	02.44	04.25	06.04	07.34	09.40 (13)	08.12	10.46 (10)	09.51
	23.53	22.14	20.22	18.32	15 09.55 (13)	15.44	63 12.47 (14)	14.19
6	02.47	04.29	06.07	07.37	09.38 (13)	08.16	10.48 (10)	09.54
	23.50	22.11	20.18	18.29	18 09.56 (13)	15.40	51 12.45 (14)	14.18
7	02.49	04.32	06.10	07.40	09.37 (13)	08.19	11.30 (9)	09.56
	23.48	22.07	20.14	18.25	29 10.33 (12)	15.37	28 12.42 (14)	14.16
8	02.52	04.35	06.13	07.43	09.36 (13)	08.23	11.56 (8)	09.59
	23.45	22.03	20.11	18.21	36 10.35 (12)	15.34	16 12.12 (8)	14.14
9	02.55	04.39	06.16	07.46	09.35 (13)	08.26	11.58 (8)	10.01
	23.43	22.00	20.07	18.18	41 10.37 (12)	15.31	14 12.12 (8)	14.13
10	02.58	04.42	06.19	07.49	09.35 (13)	08.29	11.59 (8)	10.03
	23.40	21.56	20.03	18.14	44 10.38 (12)	15.27	12 12.11 (8)	14.11
11	03.01	04.45	06.22	07.52	09.34 (13)	08.33	12.01 (8)	10.06
	23.37	21.53	20.00	18.11	46 10.39 (12)	15.24	7 12.08 (8)	14.10
12	03.04	04.49	06.25	07.55	09.34 (13)	08.36		10.08
	23.34	21.49	19.56	18.07	47 10.39 (12)	15.21		14.09
13	03.08	04.52	06.28	07.58	09.35 (13)	08.40		10.10
	23.31	21.46	19.52	18.04	47 10.40 (12)	15.18		14.08
14	03.11	04.55	06.31	08.01	09.35 (13)	08.43		10.12
	23.28	21.42	19.49	18.00	46 10.39 (12)	15.15		14.07
15	03.14	04.59	06.34	08.04	09.35 (13)	08.46		10.13
	23.25	21.38	19.45	17.56	45 10.39 (12)	15.12		14.06
16	03.17	05.02	06.37	08.07	09.37 (13)	08.50		10.15
	23.22	21.35	19.41	17.53	53 11.14 (11)	15.09		14.05
17	03.21	05.05	06.40	08.10	09.38 (13)	08.53		10.16
	23.19	21.31	19.38	17.49	53 11.15 (11)	15.06		14.05
18	03.24	05.08	06.43	08.14	09.42 (13)	08.57		10.18
	23.16	21.27	19.34	17.46	48 11.17 (11)	15.03		14.05
19	03.27	05.11	06.46	08.17	10.14 (12)	09.00		10.19
	23.12	21.24	19.30	17.42	55 13.45 (14)	15.00		14.05
20	03.31	05.15	06.49	08.20	10.16 (12)	09.03		10.20
	23.09	21.20	19.27	17.39	58 13.48 (14)	14.57		14.05
21	03.34	05.18	06.52	08.23	10.16 (12)	09.07		10.21
	23.06	21.17	19.23	17.35	70 13.49 (14)	14.54		14.05
22	03.38	05.21	06.55	08.26	10.19 (12)	09.10		10.21
	23.02	21.13	19.19	17.32	74 13.51 (14)	14.51		14.05
23	03.41	05.24	06.58	08.30	10.21 (12)	09.14		10.22
	22.59	21.09	19.16	17.28	81 13.51 (14)	14.48		14.06
24	03.44	05.27	07.01	08.33	10.55 (11)	09.17		10.22
	22.56	21.06	19.12	17.25	83 13.52 (14)	14.45		14.06
25	03.48	05.30	07.04	07.36	09.55 (11)	09.20		10.22
	22.52	21.02	19.09	16.21	87 12.53 (14)	14.43		14.07
26	03.51	05.34	07.07	07.39	09.55 (11)	09.23		10.22
	22.49	20.58	19.05	16.18	89 12.52 (14)	14.40		14.08
27	03.55	05.37	07.10	07.42	09.56 (11)	09.27		10.22
	22.46	20.55	19.01	16.14	91 12.52 (14)	14.37		14.10
28	03.58	05.40	07.13	07.46	09.57 (11)	09.30		10.22
	22.42	20.51	18.58	16.11	100 12.53 (14)	14.35		14.11
29	04.02	05.43	07.16	07.49	09.58 (11)	09.33		10.21
	22.39	20.47	18.54	16.07	103 12.53 (14)	14.32		14.13
30	04.05	05.46	07.19	07.52	10.00 (11)	09.36		10.20
	22.35	20.44	18.50	16.04	100 12.53 (14)	14.30		14.14
31	04.08	05.49		07.56	10.03 (11)			10.20
	22.32	20.40		16.01	94 12.52 (14)			14.16
Potential sun hours	621	513	394	302		192		125
Total, worst case					1663			
Sun reduction					0,50		0,50	
Oper. time red.					0,80		0,80	
Wind dir. red.					0,62		0,58	
Total reduction					0,25		0,23	
Total, real					415		118	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Project:
Hundhammerfjellet Reetablering

NTE Energi AS

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20.12.2018 10.43/3.2.737

SHADOW - Calendar

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**Shadow receptor:** H - Myhrvang

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January		February		March	April	May	June	July	August	September	October		November		December
1	10.18		09.03	12.10 (10)	07.28	06.35	04.46	03.01	02.34	04.12	05.52	07.22		07.59	10.21 (12)	09.39
	14.18		15.55 28	12.55 (9)	17.29	20.05	21.41	23.27	00.01	22.28	20.36	18.47		15.57 105	13.41 (14)	14.28
2	10.17		09.00	11.31 (11)	07.24	06.32	04.42	02.58	02.37	04.15	05.55	07.25		08.02	10.22 (12)	09.42
	14.21		15.58 42	12.57 (9)	17.32	20.08	21.44	23.30	23.59	22.25	20.33	18.43		15.54 104	13.40 (14)	14.26
3	10.16		08.57	11.29 (11)	07.21	06.28	04.39	02.55	02.39	04.19	05.58	07.28		08.06	10.25 (12)	09.45
	14.23		16.02 60	14.04 (14)	17.35	20.11	21.48	23.34	23.57	22.21	20.29	18.39		15.50 98	13.40 (14)	14.23
4	10.15		08.54	11.27 (11)	07.17	06.24	04.35	02.52	02.41	04.22	06.01	07.31		08.09	10.29 (12)	09.48
	14.25		16.05 69	14.05 (14)	17.38	20.14	21.51	23.37	23.55	22.18	20.25	18.36		15.47 88	13.39 (14)	14.21
5	10.13		08.50	11.26 (11)	07.13	06.21	04.32	02.49	02.44	04.25	06.04	07.34		08.12	10.56 (11)	09.51
	14.28		16.09 77	14.07 (14)	17.42	20.17	21.54	23.40	23.53	22.14	20.22	18.32		15.44 80	13.38 (14)	14.19
6	10.11		08.47	11.25 (11)	07.10	06.17	04.28	02.47	02.47	04.29	06.07	07.37		08.16	10.57 (11)	09.54
	14.30		16.12 81	14.08 (14)	17.45	20.20	21.58	23.43	23.50	22.11	20.18	18.29		15.40 73	13.37 (14)	14.17
7	10.10		08.44	10.57 (12)	07.06	06.13	04.24	02.44	02.49	04.32	06.10	07.40		08.19	10.58 (11)	09.56
	14.33		16.16 91	14.09 (14)	17.48	20.23	22.01	23.45	23.48	22.07	20.14	18.25		15.37 68	13.35 (14)	14.16
8	10.08		08.40	10.54 (12)	07.03	06.10	04.21	02.42	02.52	04.35	06.13	07.43		08.23	10.59 (11)	09.59
	14.36		16.19 99	14.10 (14)	17.51	20.27	22.05	23.48	23.45	22.03	20.11	18.21		15.34 58	13.33 (14)	14.14
9	10.06		08.37	10.52 (12)	06.59	06.06	04.17	02.39	02.55	04.39	06.16	07.46		08.26	11.02 (11)	10.01
	14.38		16.23 104	14.10 (14)	17.54	20.30	22.08	23.51	23.43	22.00	20.07	18.18		15.31 40	12.27 (9)	14.12
10	10.04		08.34	10.50 (12)	06.55	06.02	04.14	02.37	02.58	04.42	06.19	07.49		08.29	11.40 (10)	10.03
	14.41		16.26 106	14.10 (14)	17.57	20.33	22.12	23.53	23.40	21.56	20.03	18.14		15.27 28	12.26 (9)	14.11
11	10.02		08.30	10.49 (12)	06.52	05.59	04.10	02.35	03.01	04.45	06.22	07.52		08.33	11.41 (10)	10.06
	14.44		16.29 106	14.10 (14)	18.00	20.36	22.15	23.56	23.37	21.53	20.00	18.11		15.24 21	12.23 (9)	14.10
12	09.59		08.27	10.07 (13)	06.48	05.55	04.07	02.33	03.04	04.49	06.25	07.55		08.36	11.44 (10)	10.08
	14.47		16.33 110	14.10 (14)	18.03	20.39	22.19	23.58	23.34	21.49	19.56	18.07		15.21 11	11.55 (10)	14.09
13	09.57		08.24	10.05 (13)	06.45	05.51	04.03	02.31	03.08	04.52	06.28	07.58		08.40	11.46 (10)	10.10
	14.50		16.36 111	14.11 (14)	18.07	20.42	22.22	00.00	23.31	21.46	19.52	18.03		15.18 5	11.51 (10)	14.08
14	09.55		08.20	10.03 (13)	06.41	05.48	04.00	02.30	03.11	04.55	06.31	08.01	10.36 (13)	08.43		10.12
	14.54		16.40 104	14.11 (14)	18.10	20.45	22.26	00.02	23.28	21.42	19.49	18.00 13	10.49 (13)	15.15		14.07
15	09.52		08.17	10.02 (13)	06.37	05.44	03.56	02.28	03.14	04.59	06.34	08.04	10.34 (13)	08.46		10.13
	14.57		16.43 85	14.10 (14)	18.13	20.49	22.29	00.04	23.25	21.38	19.45	17.56 16	10.50 (13)	15.12		14.06
16	09.50		08.13	10.00 (13)	06.34	05.40	03.53	02.27	03.17	05.02	06.37	08.07	10.33 (13)	08.50		10.15
	15.00		16.46 84	14.09 (14)	18.16	20.52	22.33	00.05	23.22	21.35	19.41	17.53 19	10.52 (13)	15.09		14.05
17	09.47		08.10	10.00 (13)	06.30	05.37	03.49	02.26	03.21	05.05	06.40	08.10	10.31 (13)	08.53		10.16
	15.03		16.50 81	14.08 (14)	18.19	20.55	22.36	00.07	23.19	21.31	19.38	17.49 32	11.36 (12)	15.05		14.05
18	09.45		08.06	09.59 (13)	06.26	05.33	03.46	02.25	03.24	05.08	06.43	08.14	10.31 (13)	08.57		10.18
	15.07		16.53 71	14.06 (14)	18.22	20.58	22.40	00.08	23.16	21.27	19.34	17.46 39	11.40 (12)	15.02		14.05
19	09.42		08.03	09.58 (13)	06.23	05.29	03.43	02.24	03.27	05.11	06.46	08.17	10.30 (13)	09.00		10.19
	15.10		16.56 57	14.03 (14)	18.25	21.01	22.43	00.09	23.12	21.24	19.30	17.42 43	11.41 (12)	15.00		14.04
20	09.39		07.59	09.58 (13)	06.19	05.26	03.39	02.24	03.31	05.15	06.49	08.20	10.29 (13)	09.03		10.20
	15.13		17.00 49	11.12 (12)	18.28	21.05	22.46	00.09	23.09	21.20	19.27	17.39 46	11.42 (12)	14.57		14.05
21	09.36		07.56	09.58 (13)	06.15	05.22	03.36	02.24	03.34	05.18	06.52	08.23	10.29 (13)	09.07		10.21
	15.17		17.03 48	11.11 (12)	18.31	21.08	22.50	00.10	23.06	21.17	19.23	17.35 49	11.43 (12)	14.54		14.05
22	09.34		07.52	09.59 (13)	06.12	05.18	03.32	02.24	03.38	05.21	06.55	08.26	10.29 (13)	09.10		10.21
	15.20		17.06 45	11.11 (12)	18.34	21.11	22.53	00.10	23.02	21.13	19.19	17.32 50	11.44 (12)	14.51		14.05
23	09.31		07.49	09.59 (13)	06.08	05.15	03.29	02.24	03.41	05.24	06.58	08.29	10.28 (13)	09.14		10.22
	15.23		17.09 42	11.09 (12)	18.37	21.14	22.57	00.10	22.59	21.09	19.16	17.28 61	14.34 (14)	14.48		14.06
24	09.28		07.45	09.59 (13)	06.04	05.11	03.26	02.25	03.44	05.27	07.01	08.33	10.29 (13)	09.17		10.22
	15.27		17.13 37	11.07 (12)	18.40	21.18	23.00	00.09	22.56	21.06	19.12	17.25 75	14.36 (14)	14.45		14.06
25	09.25		07.42	10.00 (13)	06.01	05.08	03.23	02.25	03.48	05.30	07.04	07.36	09.30 (13)	09.20		10.22
	15.30		17.16 28	11.03 (12)	18.43	21.21	23.04	00.09	22.52	21.02	19.09	16.21 81	13.38 (14)	14.43		14.07
26	09.22		07.38	10.01 (13)	05.57	05.04	03.19	02.26	03.51	05.34	07.07	07.39	09.30 (13)	09.23		10.22
	15.34		17.19 18	10.19 (13)	18.46	21.24	23.07	00.08	22.49	20.58	19.05	16.18 83	13.38 (14)	14.40		14.08
27	09.19		07.35	10.03 (13)	05.54	05.00	03.16	02.28	03.55	05.37	07.10	07.42	09.31 (13)	09.27		10.22
	15.37		17.22 15	10.18 (13)	18.50	21.28	23.11	00.07	22.46	20.55	19.01	16.14 88	13.39 (14)	14.37		14.10
28	09.16		07.31	10.05 (13)	05.50	04.57	03.13	02.29	03.58	05.40	07.13	07.46	09.32 (13)	09.30		10.22
	15.41		17.26 10	10.15 (13)	18.53	21.31	23.14	00.06	22.42	20.51	18.58	16.11 108	13.40 (14)	14.35		14.11
29	09.13	12.14 (10)			06.46	04.53	03.10	02.31	04.02	05.43	07.16	07.49	09.35 (13)	09.33		10.21
	15.44 6	12.20 (10)			19.56	21.34	23.17	00.04	22.39	20.47	18.54	16.07 111	13.40 (14)	14.32		14.12
30	09.10	12.12 (10)			06.43	04.49	03.07	02.32	04.05	05.46	07.19	07.52	09.39 (13)	09.36		10.20
	15.48 11	12.23 (10)			19.59	21.38	23.21	00.03	22.35	20.44	18.50	16.04 107	13.41 (14)	14.30		14.14
31	09.06	12.10 (10)			06.39		03.04		04.08	05.49		07.56	10.20 (12)			10.20
	15.51 21	12.52 (9)			20.02		23.24		22.32	20.40		16.01 106	13.41 (14)			14.16
Potential sun hours	162		235		363	454	578	641	621	513	394	302		192		125
Total, worst case	38		1858									1127		779		
Sun reduction	0,50		0,50									0,50		0,50		
Oper. time red.	0,80		0,80									0,80		0,80		
Wind dir. red.	0,58		0,60									0,61		0,57		
Total reduction	0,23		0,24									0,24		0,23		
Total, real	9		443									275		179		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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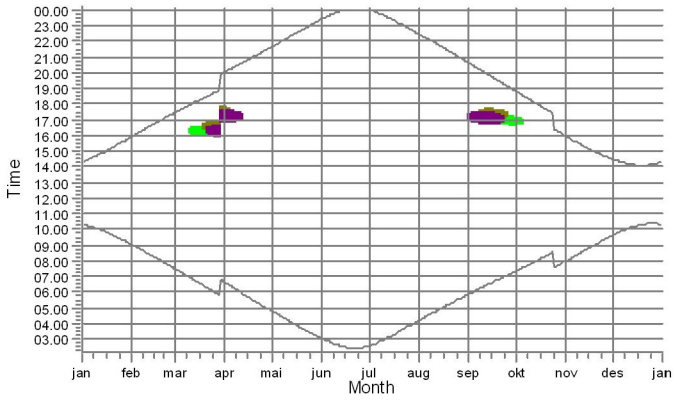
Calculated:
20.12.2018 10.43/3.2.737

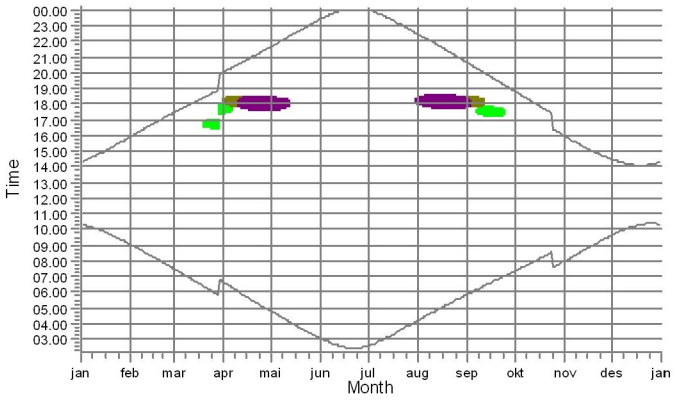
SHADOW - Calendar, graphical

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6

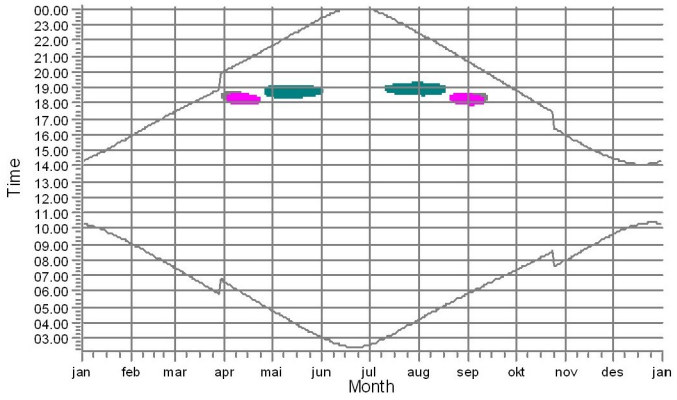
A: Hamlandsvika



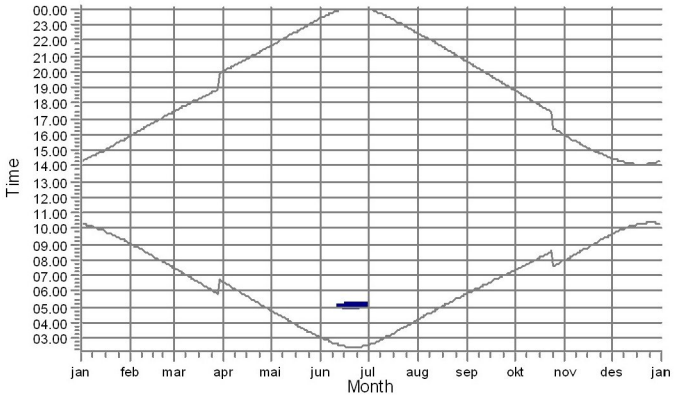
B: Skogmo



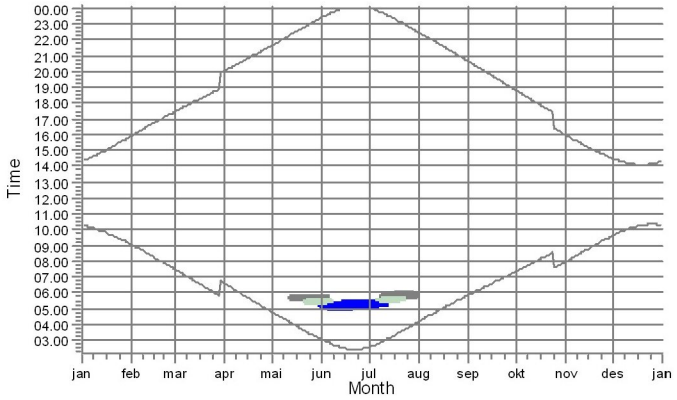
C: Hundhammer



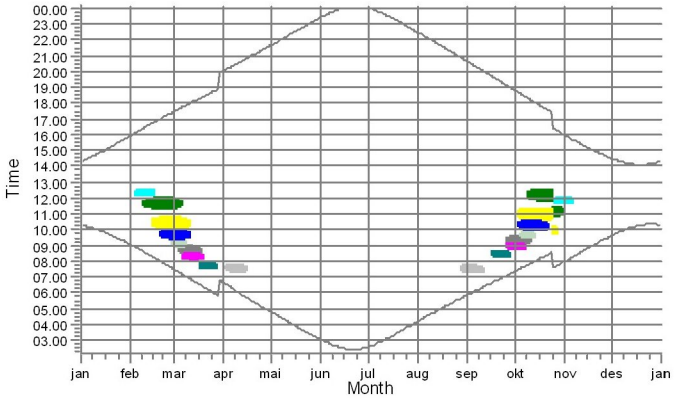
D: Klungset



E: Løvmo



F: Storeienen



WTGs

- 3: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (627)
- 4: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (628)
- 5: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (629)
- 6: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (630)
- 7: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (631)
- 8: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (632)
- 9: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (633)
- 11: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (635)
- 12: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (636)
- 13: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (637)
- 14: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (638)
- 1: M1-E-70 E4 2000 71.0
- 2: M5- E-70 E4 2,3 MW 2300

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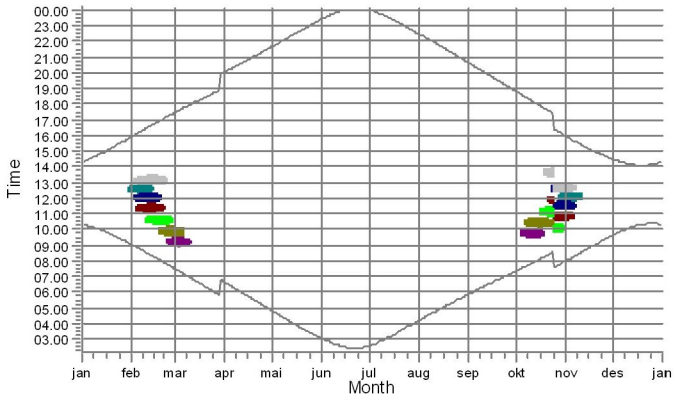
Calculated:
20.12.2018 10.43/3.2.737

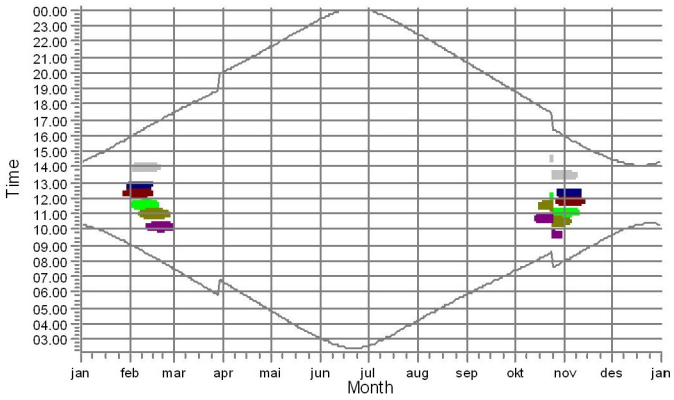
SHADOW - Calendar, graphical

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6

G: Hamland



H: Myhrvang



WTGs

- 8: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (632)
- 9: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (633)
- 10: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (634)
- 11: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (635)
- 12: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (636)
- 13: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (637)
- 14: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (638)

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Helge Dalbu / helge.dalbu@multiconsult.no
Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 3 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (627)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February		March		April	May	June	July	August	September	October		November	December
1	10.18	09.03		07.28	11.24-11.53/29	06.35	04.46	03.01	02.35	04.12	05.52	07.22		07.59	09.39
	14.19	15.55		17.29		20.05	21.41	23.27	00.01	22.28	20.36	18.47		15.57	14.28
2	10.17	09.00		07.24	11.25-11.51/26	06.32	04.43	02.58	02.37	04.16	05.55	07.25		08.02	09.42
	14.21	15.59		17.32		20.08	21.44	23.30	23.59	22.25	20.33	18.43		15.54	14.26
3	10.16	08.57		07.21	11.27-11.49/22	06.28	04.39	02.56	02.40	04.19	05.58	07.28		08.06	09.45
	14.23	16.02		17.35		20.11	21.48	23.33	23.57	22.21	20.29	18.40		15.51	14.24
4	10.14	08.54		07.17	11.30-11.47/17	06.24	04.35	02.53	02.42	04.22	06.01	07.31		08.09	09.48
	14.26	16.06		17.39		20.14	21.51	23.36	23.55	22.18	20.25	18.36		15.47	14.22
5	10.13	08.50		07.13	11.34-11.42/8	06.21	04.32	02.50	02.45	04.26	06.04	07.34		08.12	09.51
	14.28	16.09		17.42		20.17	21.54	23.39	23.52	22.14	20.22	18.32		15.44	14.20
6	10.11	08.47		07.10		06.17	04.28	02.47	02.47	04.29	06.07	07.37		08.16	09.53
	14.31	16.12		17.45		20.20	21.58	23.42	23.50	22.11	20.18	18.29		15.41	14.18
7	10.09	08.44		07.06		06.13	04.25	02.45	02.50	04.32	06.10	07.40		08.19	09.56
	14.33	16.16		17.48		20.24	22.01	23.45	23.47	22.07	20.14	18.25		15.37	14.16
8	10.08	08.40		07.03		06.10	04.21	02.42	02.53	04.36	06.13	07.43		08.23	09.59
	14.36	16.19		17.51		20.27	22.05	23.48	23.45	22.03	20.11	18.22		15.34	14.14
9	10.06	08.37		06.59		06.06	04.18	02.40	02.56	04.39	06.16	07.46	12.07-12.20/13	08.26	10.01
	14.39	16.23		17.54		20.30	22.08	23.50	23.42	22.00	20.07	18.18		15.31	14.13
10	10.04	08.34	11.37-11.43/6	06.55		06.03	04.14	02.38	02.59	04.42	06.19	07.49	12.03-12.22/19	08.29	10.03
	14.42	16.26		17.57		20.33	22.12	23.53	23.39	21.56	20.03	18.14		15.28	14.12
11	10.02	08.30	11.32-11.47/15	06.52		05.59	04.11	02.36	03.02	04.46	06.22	07.52	12.00-12.24/24	08.33	10.06
	14.45	16.30		18.01		20.36	22.15	23.55	23.37	21.53	20.00	18.11		15.24	14.10
12	09.59	08.27	11.31-11.50/19	06.48		05.55	04.07	02.34	03.05	04.49	06.25	07.55	11.58-12.25/27	08.36	10.08
	14.48	16.33		18.04		20.39	22.19	23.58	23.34	21.49	19.56	18.07		15.21	14.09
13	09.57	08.24	11.29-11.52/23	06.45		05.52	04.04	02.32	03.08	04.52	06.28	07.58	11.57-12.27/30	08.40	10.10
	14.51	16.36		18.07		20.42	22.22	00.00	23.31	21.46	19.52	18.04		15.18	14.08
14	09.55	08.20	11.27-11.54/27	06.41		05.48	04.00	02.30	03.11	04.56	06.31	08.01	11.56-12.27/31	08.43	10.11
	14.54	16.40		18.10		20.46	22.25	00.01	23.28	21.42	19.49	18.00		15.15	14.07
15	09.52	08.17	11.26-11.55/29	06.37		05.44	03.57	02.29	03.15	04.59	06.34	08.04	11.55-12.27/32	08.46	10.13
	14.57	16.43		18.13		20.49	22.29	00.03	23.25	21.38	19.45	17.57		15.12	14.06
16	09.50	08.13	11.25-11.55/30	06.34		05.41	03.53	02.28	03.18	05.02	06.37	08.07	11.54-12.28/34	08.50	10.15
	15.00	16.47		18.16		20.52	22.32	00.05	23.22	21.35	19.42	17.53		15.09	14.06
17	09.47	08.10	11.24-11.56/32	06.30		05.37	03.50	02.27	03.21	05.05	06.40	08.11	11.53-12.28/35	08.53	10.16
	15.04	16.50		18.19		20.55	22.36	00.06	23.19	21.31	19.38	17.49		15.06	14.05
18	09.45	08.06	11.23-11.57/34	06.27		05.33	03.46	02.26	03.24	05.08	06.43	08.14	11.54-12.29/35	08.57	10.17
	15.07	16.53		18.22		20.58	22.39	00.07	23.15	21.27	19.34	17.46		15.03	14.05
19	09.42	08.03	11.23-11.57/34	06.23		05.30	03.43	02.25	03.28	05.12	06.46	08.17	11.53-12.28/35	09.00	10.19
	15.10	16.57		18.25		21.01	22.43	00.08	23.12	21.24	19.31	17.42		15.00	14.05
20	09.39	07.59	11.22-11.57/35	06.19		05.26	03.40	02.25	03.31	05.15	06.49	08.20	11.53-12.28/35	09.03	10.20
	15.14	17.00		18.28		21.05	22.46	00.09	23.09	21.20	19.27	17.39		14.57	14.05
21	09.36	07.56	11.23-11.58/35	06.16		05.22	03.36	02.24	03.35	05.18	06.52	08.23	11.52-12.28/36	09.07	10.20
	15.17	17.03		18.31		21.08	22.50	00.09	23.06	21.17	19.23	17.35		14.54	14.05
22	09.34	07.52	11.22-11.58/36	06.12		05.19	03.33	02.25	03.38	05.21	06.55	08.26	11.53-12.28/35	09.10	10.21
	15.20	17.06		18.34		21.11	22.53	00.09	23.02	21.13	19.20	17.32		14.51	14.06
23	09.31	07.49	11.22-11.57/35	06.08		05.15	03.30	02.25	03.41	05.24	06.58	08.30	11.54-12.28/34	09.13	10.21
	15.24	17.10		18.37		21.14	22.57	00.09	22.59	21.09	19.16	17.28		14.48	14.06
24	09.28	07.45	11.22-11.57/35	06.05		05.11	03.26	02.25	03.45	05.28	07.01	08.33	11.53-12.26/33	09.17	10.22
	15.27	17.13		18.41		21.18	23.00	00.09	22.56	21.06	19.12	17.25		14.46	14.07
25	09.25	07.42	11.22-11.56/34	06.01		05.08	03.23	02.26	03.48	05.31	07.04	07.36	10.54-11.26/32	09.20	10.22
	15.31	17.16		18.44		21.21	23.04	00.08	22.52	21.02	19.09	16.21		14.43	14.08
26	09.22	07.38	11.22-11.56/34	05.57		05.04	03.20	02.27	03.52	05.34	07.07	07.39	10.55-11.25/30	09.23	10.22
	15.34	17.19		18.47		21.24	23.07	00.08	22.49	20.58	19.05	16.18		14.40	14.09
27	09.19	07.35	11.23-11.56/33	05.54		05.01	03.17	02.28	03.55	05.37	07.10	07.43	10.55-11.23/28	09.27	10.22
	15.38	17.23		18.50		21.28	23.10	00.07	22.45	20.55	19.01	16.14		14.38	14.10
28	09.16	07.31	11.24-11.54/30	05.50		04.57	03.13	02.30	03.58	05.40	07.13	07.46	10.57-11.22/25	09.30	10.21
	15.41	17.26		18.53		21.31	23.14	00.05	22.42	20.51	18.58	16.11		14.35	14.11
29	09.13			06.46		04.53	03.10	02.31	04.02	05.43	07.16	07.49	10.58-11.21/23	09.33	10.21
	15.45			19.56		21.34	23.17	00.04	22.39	20.47	18.54	16.08		14.33	14.13
30	09.10			06.43		04.50	03.07	02.33	04.05	05.46	07.19	07.52	11.00-11.19/19	09.36	10.20
	15.48			19.59		21.38	23.20	00.02	22.35	20.44	18.50	16.04		14.30	14.15
31	09.06			06.39			03.04		04.09	05.49		07.56	11.03-11.17/14		10.19
	15.52			20.02			23.24		22.32	20.40		16.01			14.16
Potential sun hours	163	235		363		454	578	641	620	513	394	302		192	125
Sum of minutes with flicker	0	556		102		0	0	0	0	0	0	659		0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:
Hundhammerfjellet Reetablering

NTE Energi AS

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 4 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (628)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February		March		April	May	June	July	August	September	October		November	December
1	10.18	09.03		07.28	10.07-10.45/38	06.35	04.46	03.01	02.35	04.12	05.52	07.22		07.59	09.39
	14.19	15.55		17.29		20.05	21.41	23.27	00.01	22.28	20.36	18.47		15.57	14.28
2	10.17	09.00		07.24	10.07-10.44/37	06.32	04.43	02.58	02.37	04.16	05.55	07.25		08.02	09.42
	14.21	15.59		17.32		20.08	21.44	23.30	23.59	22.25	20.33	18.43		15.54	14.26
3	10.16	08.57		07.21	10.07-10.43/36	06.28	04.39	02.55	02.40	04.19	05.58	07.28	10.57-11.07/10	08.06	09.45
	14.23	16.02		17.35		20.11	21.48	23.33	23.57	22.21	20.29	18.40		15.51	14.24
4	10.14	08.54		07.17	10.08-10.43/35	06.24	04.35	02.53	02.42	04.22	06.01	07.31	10.52-11.10/18	08.09	09.48
	14.26	16.05		17.39		20.14	21.51	23.36	23.55	22.18	20.25	18.36		15.47	14.22
5	10.13	08.50		07.13	10.08-10.42/34	06.21	04.32	02.50	02.45	04.26	06.04	07.34	10.49-11.13/24	08.12	09.51
	14.28	16.09		17.42		20.17	21.54	23.39	23.52	22.14	20.22	18.32		15.44	14.20
6	10.11	08.47		07.10	10.09-10.40/31	06.17	04.28	02.47	02.47	04.29	06.07	07.37	10.47-11.14/27	08.16	09.53
	14.31	16.12		17.45		20.20	21.58	23.42	23.50	22.11	20.18	18.29		15.41	14.18
7	10.09	08.44		07.06	10.10-10.38/28	06.13	04.25	02.45	02.50	04.32	06.10	07.40	10.45-11.15/30	08.19	09.56
	14.33	16.16		17.48		20.24	22.01	23.45	23.48	22.07	20.14	18.25		15.37	14.16
8	10.08	08.40		07.03	10.12-10.37/25	06.10	04.21	02.42	02.53	04.36	06.13	07.43	10.44-11.16/32	08.23	09.59
	14.36	16.19		17.51		20.27	22.05	23.48	23.45	22.03	20.11	18.22		15.34	14.14
9	10.06	08.37		06.59	10.13-10.34/21	06.06	04.18	02.40	02.56	04.39	06.16	07.46	10.43-11.17/34	08.26	10.01
	14.39	16.23		17.54		20.30	22.08	23.50	23.42	22.00	20.07	18.18		15.31	14.13
10	10.04	08.34		06.55	10.16-10.30/14	06.02	04.14	02.38	02.59	04.42	06.19	07.49	10.42-11.18/36	08.29	10.03
	14.42	16.26		17.57		20.33	22.12	23.53	23.39	21.56	20.03	18.14		15.28	14.11
11	10.02	08.30		06.52		05.59	04.11	02.36	03.02	04.46	06.22	07.52	10.41-11.18/37	08.33	10.06
	14.45	16.30		18.01		20.36	22.15	23.55	23.37	21.53	20.00	18.11		15.24	14.10
12	09.59	08.27		06.48		05.55	04.07	02.34	03.05	04.49	06.25	07.55	10.40-11.17/37	08.36	10.08
	14.48	16.33		18.04		20.39	22.19	23.58	23.34	21.49	19.56	18.07		15.21	14.09
13	09.57	08.24		06.45		05.52	04.04	02.32	03.08	04.52	06.28	07.58	10.40-11.18/38	08.40	10.10
	14.51	16.36		18.07		20.42	22.22	00.00	23.31	21.46	19.52	18.04		15.18	14.08
14	09.55	08.20		06.41		05.48	04.00	02.30	03.11	04.56	06.31	08.01	10.40-11.18/38	08.43	10.11
	14.54	16.40		18.10		20.46	22.25	00.02	23.28	21.42	19.49	18.00		15.15	14.07
15	09.52	08.17	10.20-10.35/15	06.37		05.44	03.57	02.29	03.14	04.59	06.34	08.04	10.39-11.17/38	08.46	10.13
	14.57	16.43		18.13		20.49	22.29	00.03	23.25	21.38	19.45	17.57		15.12	14.06
16	09.50	08.13	10.17-10.37/20	06.34		05.41	03.53	02.28	03.18	05.02	06.37	08.07	10.39-11.17/38	08.50	10.15
	15.00	16.47		18.16		20.52	22.32	00.05	23.22	21.35	19.42	17.53		15.09	14.06
17	09.47	08.10	10.15-10.39/24	06.30		05.37	03.50	02.27	03.21	05.05	06.40	08.11	10.39-11.17/38	08.53	10.16
	15.04	16.50		18.19		20.55	22.36	00.06	23.19	21.31	19.38	17.49		15.06	14.05
18	09.45	08.06	10.13-10.41/28	06.26		05.33	03.46	02.26	03.24	05.08	06.43	08.14	10.40-11.17/37	08.57	10.17
	15.07	16.53		18.22		20.58	22.39	00.07	23.15	21.27	19.34	17.46		15.03	14.05
19	09.42	08.03	10.12-10.42/30	06.23		05.30	03.43	02.25	03.28	05.12	06.46	08.17	10.39-11.15/36	09.00	10.19
	15.10	16.56		18.25		21.01	22.43	00.08	23.12	21.24	19.31	17.42		15.00	14.05
20	09.39	07.59	10.11-10.43/32	06.19		05.26	03.40	02.25	03.31	05.15	06.49	08.20	10.40-11.15/35	09.03	10.20
	15.14	17.00		18.28		21.05	22.46	00.09	23.09	21.20	19.27	17.39		14.57	14.05
21	09.36	07.56	10.10-10.44/34	06.16		05.22	03.36	02.24	03.35	05.18	06.52	08.23	10.40-11.14/34	09.07	10.20
	15.17	17.03		18.31		21.08	22.50	00.09	23.06	21.17	19.23	17.35		14.54	14.05
22	09.34	07.52	10.09-10.45/36	06.12		05.19	03.33	02.24	03.38	05.21	06.55	08.26	10.42-11.13/31	09.10	10.21
	15.20	17.06		18.34		21.11	22.53	00.09	23.02	21.13	19.20	17.32		14.51	14.06
23	09.31	07.49	10.09-10.45/36	06.08		05.15	03.30	02.25	03.41	05.24	06.58	08.30	10.43-11.12/29	09.13	10.21
	15.24	17.10		18.37		21.14	22.57	00.09	22.59	21.09	19.16	17.28		14.48	14.06
24	09.28	07.45	10.08-10.45/37	06.05		05.11	03.26	02.25	03.45	05.27	07.01	08.33	10.44-11.10/26	09.17	10.22
	15.27	17.13		18.40		21.18	23.00	00.09	22.56	21.06	19.12	17.25		14.46	14.07
25	09.25	07.42	10.07-10.45/38	06.01		05.08	03.23	02.26	03.48	05.31	07.04	07.36	09.46-10.09/23	09.20	10.22
	15.31	17.16		18.44		21.21	23.04	00.08	22.52	21.02	19.09	16.21		14.43	14.08
26	09.22	07.38	10.07-10.45/38	05.57		05.04	03.20	02.27	03.52	05.34	07.07	07.39	09.48-10.07/19	09.23	10.22
	15.34	17.19		18.47		21.24	23.07	00.08	22.49	20.58	19.05	16.18		14.40	14.09
27	09.19	07.35	10.07-10.46/39	05.54		05.01	03.17	02.28	03.55	05.37	07.10	07.43	09.50-10.03/13	09.27	10.22
	15.38	17.23		18.50		21.28	23.10	00.07	22.45	20.55	19.01	16.14		14.38	14.10
28	09.16	07.31	10.07-10.45/38	05.50		04.57	03.13	02.30	03.58	05.40	07.13	07.46		09.30	10.21
	15.41	17.26		18.53		21.31	23.14	00.05	22.42	20.51	18.58	16.11		14.35	14.11
29	09.13			06.46		04.53	03.10	02.31	04.02	05.43	07.16	07.49		09.33	10.21
	15.45			19.56		21.34	23.17	00.04	22.39	20.47	18.54	16.08		14.33	14.13
30	09.10			06.43		04.50	03.07	02.33	04.05	05.46	07.19	07.52		09.36	10.20
	15.48			19.59		21.38	23.20	00.02	22.35	20.44	18.50	16.04		14.30	14.15
31	09.06			06.39			03.04		04.09	05.49		07.56			10.19
	15.52			20.02			23.24		22.32	20.40		16.01			14.16
Potential sun hours	163	235		363		454	578	641	620	513	394	302		192	125
Sum of minutes with flicker	0	445		299		0	0	0	0	0	0	758		0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 5 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (629)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February		March		April	May		June	
1	10.18	09.03		07.28	09.28-09.58/30	06.35	04.46		03.01	05.06-05.13/7
	14.19	15.55		17.29		20.05	21.41		23.27	
2	10.17	09.00		07.24	09.28-09.57/29	06.32	04.43		02.58	05.05-05.16/11
	14.21	15.58		17.32		20.08	21.44		23.30	
3	10.16	08.57		07.21	09.28-09.57/29	06.28	04.39		02.55	05.04-05.17/13
	14.23	16.02		17.35		20.11	21.48		23.33	
4	10.14	08.54		07.17	09.28-09.57/29	06.24	04.35		02.53	05.02-05.17/15
	14.26	16.05		17.39		20.14	21.51		23.36	
5	10.13	08.50		07.13	09.29-09.56/27	06.21	04.32		02.50	05.02-05.18/16
	14.28	16.09		17.42		20.17	21.54		23.39	
6	10.11	08.47		07.10	09.29-09.55/26	06.17	04.28		02.47	05.01-05.19/18
	14.31	16.12		17.45		20.20	21.58		23.42	
7	10.09	08.44		07.06	09.29-09.53/24	06.13	04.25		02.45	05.01-05.19/18
	14.33	16.16		17.48		20.24	22.01		23.45	
8	10.08	08.40		07.03	09.31-09.52/21	06.10	04.21		02.42	05.01-05.20/19
	14.36	16.19		17.51		20.27	22.05		23.48	
9	10.06	08.37		06.59	09.32-09.50/18	06.06	04.18		02.40	05.01-05.21/20
	14.39	16.23		17.54		20.30	22.08		23.50	
10	10.04	08.34		06.55	09.35-09.46/11	06.02	04.14		02.38	05.01-05.21/20
	14.42	16.26		17.57		20.33	22.12		23.53	
11	10.01	08.30		06.52		05.59	04.11		02.36	05.01-05.22/21
	14.45	16.30		18.00		20.36	22.15		23.55	
12	09.59	08.27		06.48		05.55	04.07		02.34	05.01-05.22/21
	14.48	16.33		18.04		20.39	22.19		23.57	
13	09.57	08.24		06.45		05.52	04.04		02.32	05.01-05.22/21
	14.51	16.36		18.07		20.42	22.22		00.00	
14	09.55	08.20		06.41		05.48	04.00		02.30	05.01-05.23/22
	14.54	16.40		18.10		20.45	22.25		00.01	
15	09.52	08.17		06.37		05.44	03.57		02.29	05.01-05.23/22
	14.57	16.43		18.13		20.49	22.29		00.03	
16	09.50	08.13		06.34		05.41	03.53		02.28	05.01-05.24/23
	15.00	16.46		18.16		20.52	22.32		00.05	
17	09.47	08.10		06.30		05.37	03.50		02.27	05.01-05.23/22
	15.04	16.50		18.19		20.55	22.36		00.06	
18	09.45	08.06		06.26		05.33	03.46		02.26	05.01-05.24/23
	15.07	16.53		18.22		20.58	22.39		00.07	
19	09.42	08.03		06.23		05.30	03.43		02.25	05.01-05.24/23
	15.10	16.56		18.25		21.01	22.43		00.08	
20	09.39	07.59	09.41-09.47/6	06.19		05.26	03.40		02.25	05.02-05.24/22
	15.14	17.00		18.28		21.05	22.46		00.09	
21	09.36	07.56	09.37-09.52/15	06.16		05.22	03.36		02.24	05.02-05.24/22
	15.17	17.03		18.31		21.08	22.50		00.09	
22	09.34	07.52	09.35-09.53/18	06.12		05.19	03.33		02.24	05.03-05.25/22
	15.20	17.06		18.34		21.11	22.53		00.09	
23	09.31	07.49	09.33-09.55/22	06.08		05.15	03.29		02.25	05.02-05.25/23
	15.24	17.10		18.37		21.14	22.57		00.09	
24	09.28	07.45	09.31-09.56/25	06.05		05.11	03.26		02.25	05.02-05.25/23
	15.27	17.13		18.40		21.18	23.00		00.09	
25	09.25	07.42	09.30-09.56/26	06.01		05.08	03.23		02.26	05.03-05.26/23
	15.31	17.16		18.44		21.21	23.04		00.08	
26	09.22	07.38	09.29-09.57/28	05.57		05.04	03.20		02.27	05.04-05.26/22
	15.34	17.19		18.47		21.24	23.07		00.07	
27	09.19	07.35	09.29-09.58/29	05.54		05.01	03.17		02.28	05.04-05.26/22
	15.38	17.23		18.50		21.28	23.10		00.07	
28	09.16	07.31	09.29-09.58/29	05.50		04.57	03.13		02.30	05.04-05.26/22
	15.41	17.26		18.53		21.31	23.14		00.05	
29	09.13			06.46		04.53	03.10		02.31	05.04-05.26/22
	15.45			19.56		21.34	23.17		00.04	
30	09.10			06.43		04.50	03.07		02.33	05.04-05.26/22
	15.48			19.59		21.38	23.20		00.02	
31	09.06			06.39			03.04	05.09-05.10/1		
	15.52			20.02			23.24			
Potential sun hours	163	235		363		454	578		641	
Sum of minutes with flicker	0	198		244		0	1		600	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 5 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (629)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	July		August	September	October		November	December
1	02.35	05.05-05.26/21	04.12	05.52	07.22		07.59	09.39
	00.01		22.28	20.36	18.47		15.57	14.28
2	02.37	05.06-05.26/20	04.15	05.55	07.25		08.02	09.42
	23.59		22.25	20.33	18.43		15.54	14.26
3	02.40	05.06-05.26/20	04.19	05.58	07.28	10.15-10.22/7	08.06	09.45
	23.57		22.21	20.29	18.40		15.51	14.24
4	02.42	05.07-05.26/19	04.22	06.01	07.31	10.11-10.26/15	08.09	09.48
	23.55		22.18	20.25	18.36		15.47	14.22
5	02.45	05.07-05.25/18	04.26	06.04	07.34	10.09-10.28/19	08.12	09.51
	23.52		22.14	20.22	18.32		15.44	14.20
6	02.47	05.08-05.25/17	04.29	06.07	07.37	10.07-10.29/22	08.16	09.53
	23.50		22.11	20.18	18.29		15.41	14.18
7	02.50	05.09-05.25/16	04.32	06.10	07.40	10.05-10.30/25	08.19	09.56
	23.47		22.07	20.14	18.25		15.37	14.16
8	02.53	05.09-05.24/15	04.36	06.13	07.43	10.04-10.30/26	08.23	09.59
	23.45		22.03	20.11	18.22		15.34	14.14
9	02.56	05.10-05.24/14	04.39	06.16	07.46	10.04-10.31/27	08.26	10.01
	23.42		22.00	20.07	18.18		15.31	14.13
10	02.59	05.11-05.23/12	04.42	06.19	07.49	10.03-10.31/28	08.29	10.03
	23.39		21.56	20.03	18.14		15.28	14.11
11	03.02	05.13-05.22/9	04.46	06.22	07.52	10.02-10.31/29	08.33	10.06
	23.37		21.53	20.00	18.11		15.24	14.10
12	03.05	05.15-05.20/5	04.49	06.25	07.55	10.01-10.31/30	08.36	10.08
	23.34		21.49	19.56	18.07		15.21	14.09
13	03.08		04.52	06.28	07.58	10.02-10.31/29	08.40	10.10
	23.31		21.45	19.52	18.04		15.18	14.08
14	03.11		04.55	06.31	08.01	10.01-10.30/29	08.43	10.11
	23.28		21.42	19.49	18.00		15.15	14.07
15	03.14		04.59	06.34	08.04	10.01-10.29/28	08.46	10.13
	23.25		21.38	19.45	17.57		15.12	14.06
16	03.18		05.02	06.37	08.07	10.02-10.29/27	08.50	10.15
	23.22		21.35	19.41	17.53		15.09	14.06
17	03.21		05.05	06.40	08.10	10.02-10.28/26	08.53	10.16
	23.19		21.31	19.38	17.49		15.06	14.05
18	03.24		05.08	06.43	08.14	10.04-10.27/23	08.57	10.17
	23.15		21.27	19.34	17.46		15.03	14.05
19	03.28		05.12	06.46	08.17	10.04-10.25/21	09.00	10.19
	23.12		21.24	19.31	17.42		15.00	14.05
20	03.31		05.15	06.49	08.20	10.06-10.24/18	09.03	10.20
	23.09		21.20	19.27	17.39		14.57	14.05
21	03.35		05.18	06.52	08.23	10.08-10.20/12	09.07	10.20
	23.06		21.17	19.23	17.35		14.54	14.05
22	03.38		05.21	06.55	08.26		09.10	10.21
	23.02		21.13	19.20	17.32		14.51	14.06
23	03.41		05.24	06.58	08.30		09.13	10.21
	22.59		21.09	19.16	17.28		14.48	14.06
24	03.45		05.27	07.01	08.33		09.17	10.22
	22.56		21.06	19.12	17.25		14.46	14.07
25	03.48		05.31	07.04	07.36		09.20	10.22
	22.52		21.02	19.09	16.21		14.43	14.08
26	03.52		05.34	07.07	07.39		09.23	10.22
	22.49		20.58	19.05	16.18		14.40	14.09
27	03.55		05.37	07.10	07.42		09.27	10.22
	22.45		20.55	19.01	16.14		14.38	14.10
28	03.58		05.40	07.13	07.46		09.30	10.21
	22.42		20.51	18.58	16.11		14.35	14.11
29	04.02		05.43	07.16	07.49		09.33	10.21
	22.39		20.47	18.54	16.08		14.33	14.13
30	04.05		05.46	07.19	07.52		09.36	10.20
	22.35		20.44	18.50	16.04		14.30	14.15
31	04.09		05.49		07.56			10.19
	22.32		20.40		16.01			14.16
Potential sun hours	620		513	394	302		192	125
Sum of minutes with flicker		186	0	0		441	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 6 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (630)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February	March		April		May		June	
1	10.18	09.03	07.28		06.35	18.20-18.35/15	04.46		03.01	05.35-05.48/13
	14.19	15.55	17.29		20.05		21.41		23.27	
2	10.17	09.00	07.24		06.32	18.18-18.36/18	04.43		02.58	05.37-05.48/11
	14.21	15.58	17.32		20.08		21.44		23.30	
3	10.16	08.57	07.21		06.28	18.17-18.37/20	04.39		02.55	05.38-05.46/8
	14.23	16.02	17.35		20.11		21.48		23.33	
4	10.14	08.54	07.17	08.40-08.50/10	06.24	18.15-18.37/22	04.35		02.53	05.39-05.45/6
	14.26	16.05	17.39		20.14		21.51		23.36	
5	10.13	08.50	07.13	08.37-08.52/15	06.21	18.15-18.38/23	04.32		02.50	
	14.28	16.09	17.42		20.17		21.54		23.39	
6	10.11	08.47	07.10	08.35-08.53/18	06.17	18.14-18.38/24	04.28		02.47	
	14.31	16.12	17.45		20.20		21.58		23.42	
7	10.09	08.44	07.06	08.34-08.53/19	06.13	18.14-18.38/24	04.25		02.45	
	14.33	16.16	17.48		20.23		22.01		23.45	
8	10.08	08.40	07.03	08.34-08.54/20	06.10	18.14-18.37/23	04.21		02.42	
	14.36	16.19	17.51		20.27		22.05		23.48	
9	10.06	08.37	06.59	08.33-08.54/21	06.06	18.14-18.37/23	04.18		02.40	
	14.39	16.23	17.54		20.30		22.08		23.50	
10	10.04	08.34	06.55	08.32-08.54/22	06.02	18.14-18.36/22	04.14		02.38	
	14.42	16.26	17.57		20.33		22.12		23.53	
11	10.01	08.30	06.52	08.31-08.54/23	05.59	18.14-18.34/20	04.11		02.36	
	14.45	16.30	18.00		20.36		22.15		23.55	
12	09.59	08.27	06.48	08.32-08.54/22	05.55	18.16-18.33/17	04.07	05.38-05.44/6	02.34	
	14.48	16.33	18.04		20.39		22.18		23.57	
13	09.57	08.24	06.45	08.32-08.53/21	05.51	18.17-18.32/15	04.04	05.36-05.46/10	02.32	
	14.51	16.36	18.07		20.42		22.22		00.00	
14	09.55	08.20	06.41	08.32-08.51/19	05.48	18.19-18.29/10	04.00	05.34-05.47/13	02.30	
	14.54	16.40	18.10		20.45		22.25		00.01	
15	09.52	08.17	06.37	08.33-08.50/17	05.44		03.57	05.33-05.48/15	02.29	
	14.57	16.43	18.13		20.49		22.29		00.03	
16	09.50	08.13	06.34	08.35-08.48/13	05.41		03.53	05.33-05.49/16	02.28	
	15.00	16.46	18.16		20.52		22.32		00.05	
17	09.47	08.10	06.30	08.37-08.45/8	05.37		03.50	05.32-05.49/17	02.27	
	15.04	16.50	18.19		20.55		22.36		00.06	
18	09.44	08.06	06.26		05.33		03.46	05.31-05.49/18	02.26	
	15.07	16.53	18.22		20.58		22.39		00.07	
19	09.42	08.03	06.23		05.30		03.43	05.31-05.50/19	02.25	
	15.10	16.56	18.25		21.01		22.43		00.08	
20	09.39	07.59	06.19		05.26		03.39	05.31-05.50/19	02.25	
	15.14	17.00	18.28		21.05		22.46		00.09	
21	09.36	07.56	06.16		05.22		03.36	05.31-05.51/20	02.24	
	15.17	17.03	18.31		21.08		22.50		00.09	
22	09.33	07.52	06.12		05.19		03.33	05.31-05.50/19	02.24	
	15.20	17.06	18.34		21.11		22.53		00.09	
23	09.31	07.49	06.08		05.15		03.29	05.31-05.51/20	02.25	
	15.24	17.10	18.37		21.14		22.57		00.09	
24	09.28	07.45	06.05		05.11		03.26	05.32-05.51/19	02.25	
	15.27	17.13	18.40		21.18		23.00		00.09	
25	09.25	07.42	06.01		05.08		03.23	05.31-05.50/19	02.26	
	15.31	17.16	18.43		21.21		23.04		00.08	
26	09.22	07.38	05.57		05.04		03.20	05.32-05.50/18	02.27	
	15.34	17.19	18.47		21.24		23.07		00.07	
27	09.19	07.35	05.54		05.01		03.16	05.32-05.50/18	02.28	
	15.38	17.23	18.50		21.27		23.10		00.06	
28	09.16	07.31	05.50		04.57		03.13	05.33-05.50/17	02.30	
	15.41	17.26	18.53		21.31		23.14		00.05	
29	09.13		06.46		04.53		03.10	05.34-05.49/15	02.31	
	15.45		19.56		21.34		23.17		00.04	
30	09.10		06.43		04.50		03.07	05.34-05.49/15	02.33	
	15.48		19.59		21.37		23.20		00.02	
31	09.06		06.39	18.23-18.33/10			03.04	05.35-05.48/13		
	15.51		20.02				23.24			
Potential sun hours	163	235	363		454		578		641	
Sum of minutes with flicker	0	0	258		276		326		38	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 6 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (630)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	July		August		September		October		November	December
1	02.35		04.12		05.52	18.14-18.34/20	07.22	09.11-09.32/21	07.59	09.39
	00.01		22.28		20.36		18.47		15.57	14.28
2	02.37		04.15		05.55	18.12-18.34/22	07.25	09.10-09.32/22	08.02	09.42
	23.59		22.25		20.33		18.43		15.54	14.26
3	02.39		04.19		05.58	18.11-18.34/23	07.28	09.10-09.33/23	08.06	09.45
	23.57		22.21		20.29		18.40		15.51	14.24
4	02.42		04.22		06.01	18.11-18.34/23	07.31	09.10-09.32/22	08.09	09.48
	23.55		22.18		20.25		18.36		15.47	14.22
5	02.44		04.26		06.04	18.10-18.34/24	07.34	09.10-09.31/21	08.12	09.51
	23.52		22.14		20.22		18.32		15.44	14.20
6	02.47		04.29		06.07	18.10-18.34/24	07.37	09.10-09.30/20	08.16	09.53
	23.50		22.10		20.18		18.29		15.41	14.18
7	02.50		04.32		06.10	18.10-18.33/23	07.40	09.11-09.29/18	08.19	09.56
	23.47		22.07		20.14		18.25		15.37	14.16
8	02.53	05.46-05.51/5	04.36		06.13	18.11-18.33/22	07.43	09.11-09.27/16	08.23	09.58
	23.45		22.03		20.11		18.22		15.34	14.14
9	02.56	05.45-05.53/8	04.39		06.16	18.10-18.31/21	07.46	09.14-09.26/12	08.26	10.01
	23.42		22.00		20.07		18.18		15.31	14.13
10	02.59	05.44-05.54/10	04.42		06.19	18.11-18.30/19	07.49	09.17-09.22/5	08.29	10.03
	23.39		21.56		20.03		18.14		15.28	14.11
11	03.02	05.44-05.55/11	04.46		06.22	18.12-18.28/16	07.52		08.33	10.05
	23.37		21.53		20.00		18.11		15.24	14.10
12	03.05	05.43-05.56/13	04.49		06.25	18.14-18.25/11	07.55		08.36	10.08
	23.34		21.49		19.56		18.07		15.21	14.09
13	03.08	05.42-05.57/15	04.52		06.28		07.58		08.40	10.10
	23.31		21.45		19.52		18.04		15.18	14.08
14	03.11	05.43-05.58/15	04.55		06.31		08.01		08.43	10.11
	23.28		21.42		19.49		18.00		15.15	14.07
15	03.14	05.42-05.59/17	04.59		06.34		08.04		08.46	10.13
	23.25		21.38		19.45		17.56		15.12	14.06
16	03.18	05.42-05.59/17	05.02		06.37		08.07		08.50	10.15
	23.22		21.35		19.41		17.53		15.09	14.06
17	03.21	05.41-05.59/18	05.05		06.40		08.10		08.53	10.16
	23.18		21.31		19.38		17.49		15.06	14.05
18	03.24	05.42-06.00/18	05.08		06.43		08.14		08.57	10.17
	23.15		21.27		19.34		17.46		15.03	14.05
19	03.28	05.41-06.00/19	05.12		06.46		08.17		09.00	10.19
	23.12		21.24		19.30		17.42		15.00	14.05
20	03.31	05.42-06.01/19	05.15		06.49		08.20		09.03	10.19
	23.09		21.20		19.27		17.39		14.57	14.05
21	03.34	05.41-06.00/19	05.18		06.52		08.23		09.07	10.20
	23.06		21.16		19.23		17.35		14.54	14.05
22	03.38	05.42-06.01/19	05.21		06.55		08.26		09.10	10.21
	23.02		21.13		19.20		17.32		14.51	14.06
23	03.41	05.41-06.00/19	05.24		06.58		08.29		09.13	10.21
	22.59		21.09		19.16		17.28		14.48	14.06
24	03.45	05.42-06.01/19	05.27		07.01		08.33		09.17	10.22
	22.56		21.06		19.12		17.25		14.46	14.07
25	03.48	05.41-06.00/19	05.31		07.04		07.36		09.20	10.22
	22.52		21.02		19.09		16.21		14.43	14.08
26	03.52	05.42-06.00/18	05.34		07.07	09.22-09.24/2	07.39		09.23	10.22
	22.49		20.58		19.05		16.18		14.40	14.09
27	03.55	05.43-06.00/17	05.37		07.10	09.17-09.29/12	07.42		09.27	10.22
	22.45		20.55		19.01		16.14		14.38	14.10
28	03.58	05.43-05.59/16	05.40		07.13	09.15-09.30/15	07.46		09.30	10.21
	22.42		20.51		18.58		16.11		14.35	14.11
29	04.02	05.44-05.58/14	05.43	18.20-18.30/10	07.16	09.13-09.31/18	07.49		09.33	10.21
	22.39		20.47		18.54		16.08		14.33	14.13
30	04.05	05.45-05.57/12	05.46	18.17-18.32/15	07.19	09.12-09.32/20	07.52		09.36	10.20
	22.35		20.44		18.50		16.04		14.30	14.15
31	04.09	05.46-05.55/9	05.49	18.15-18.33/18			07.56			10.19
	22.32		20.40				16.01			14.16
Potential sun hours	620		513		394		302		192	125
Sum of minutes with flicker		366		43		315		180	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 7 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (631)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February	March	April	May	June	July	August	September	October	November	December
1	10.18	09.03	07.28	06.35	04.46	03.01	02.35	04.12	05.52 18.00-18.30/30	07.22 08.47-09.07/20	07.59	09.39
	14.19	15.55	17.29	20.05	21.41	23.27	00.01	22.28	20.36	18.47	15.57	14.28
2	10.17	09.00	07.24	06.32	04.42	02.58	02.37	04.15	05.55 17.59-18.29/30	07.25 08.47-09.06/19	08.02	09.42
	14.21	15.58	17.32	20.08	21.44	23.30	23.59	22.25	20.33	18.43	15.54	14.26
3	10.16	08.57	07.21	06.28 18.12-18.24/12	04.39	02.55	02.39	04.19	05.58 17.59-18.28/29	07.28 08.48-09.06/18	08.06	09.45
	14.23	16.02	17.35	20.11	21.48	23.33	23.57	22.21	20.29	18.40	15.51	14.24
4	10.14	08.54	07.17	06.24 18.09-18.26/17	04.35	02.53	02.42	04.22	06.01 18.00-18.27/27	07.31 08.48-09.05/17	08.09	09.48
	14.26	16.05	17.38	20.14	21.51	23.36	23.55	22.18	20.25	18.36	15.47	14.22
5	10.13	08.50	07.13	06.21 18.07-18.28/21	04.32	02.50	02.44	04.26	06.04 18.00-18.26/26	07.34 08.49-09.04/15	08.12	09.51
	14.28	16.09	17.42	20.17	21.54	23.39	23.52	22.14	20.22	18.32	15.44	14.20
6	10.11	08.47	07.10	06.17 18.05-18.29/24	04.28	02.47	02.47	04.29	06.07 18.01-18.25/24	07.37 08.50-09.02/12	08.16	09.53
	14.31	16.12	17.45	20.20	21.58	23.42	23.50	22.10	20.18	18.29	15.41	14.18
7	10.09	08.44	07.06 08.14-08.24/10	06.13 18.04-18.30/26	04.25	02.45	02.50	04.32	06.10 18.02-18.23/21	07.40 08.52-08.59/7	08.19	09.56
	14.33	16.16	17.48	20.23	22.01	23.45	23.47	22.07	20.14	18.25	15.37	14.16
8	10.08	08.40	07.03 08.12-08.27/15	06.10 18.03-18.30/27	04.21	02.42	02.53	04.36	06.13 18.04-18.21/17	07.43	08.22	09.58
	14.36	16.19	17.51	20.27	22.05	23.48	23.45	22.03	20.11	18.21	15.34	14.14
9	10.06	08.37	06.59 08.11-08.27/16	06.06 18.02-18.31/29	04.18	02.40	02.56	04.39	06.16 18.05-18.17/12	07.46	08.26	10.01
	14.39	16.23	17.54	20.30	22.08	23.50	23.42	22.00	20.07	18.18	15.31	14.13
10	10.04	08.34	06.55 08.10-08.28/18	06.02 18.01-18.31/30	04.14	02.38	02.59	04.42	06.19	07.49	08.29	10.03
	14.42	16.26	17.57	20.33	22.12	23.53	23.39	21.56	20.03	18.14	15.28	14.11
11	10.01	08.30	06.52 08.09-08.27/18	05.59 18.00-18.30/30	04.10	02.36	03.02	04.46	06.22	07.52	08.33	10.05
	14.45	16.30	18.00	20.36	22.15	23.55	23.37	21.53	20.00	18.11	15.24	14.10
12	09.59	08.27	06.48 08.09-08.28/19	05.55 18.00-18.30/30	04.07	02.34	03.05	04.49	06.25	07.55	08.36	10.08
	14.48	16.33	18.04	20.39	22.18	23.57	23.34	21.49	19.56	18.07	15.21	14.09
13	09.57	08.24	06.45 08.08-08.27/19	05.51 18.01-18.31/30	04.03	02.32	03.08	04.52	06.28	07.58	08.40	10.10
	14.51	16.36	18.07	20.42	22.22	00.00	23.31	21.45	19.52	18.04	15.18	14.08
14	09.55	08.20	06.41 08.08-08.27/19	05.48 18.00-18.30/30	04.00	02.30	03.11	04.55	06.31	08.01	08.43	10.11
	14.54	16.40	18.10	20.45	22.25	00.01	23.28	21.42	19.49	18.00	15.15	14.07
15	09.52	08.17	06.37 08.08-08.25/17	05.44 18.01-18.29/28	03.57	02.29	03.14	04.59	06.34	08.04	08.46	10.13
	14.57	16.43	18.13	20.49	22.29	00.03	23.25	21.38	19.45	17.56	15.12	14.06
16	09.50	08.13	06.34 08.10-08.25/15	05.40 18.01-18.28/27	03.53	02.28	03.18	05.02	06.37	08.07	08.50	10.15
	15.00	16.46	18.16	20.52	22.32	00.05	23.22	21.35	19.41	17.53	15.09	14.06
17	09.47	08.10	06.30 08.11-08.22/11	05.37 18.01-18.28/27	03.50	02.26	03.21	05.05	06.40	08.10	08.53	10.16
	15.03	16.50	18.19	20.55	22.36	00.06	23.18	21.31	19.38	17.49	15.06	14.05
18	09.44	08.06	06.26 08.14-08.18/4	05.33 18.02-18.26/24	03.46	02.26	03.24	05.08	06.43	08.14	08.57	10.17
	15.07	16.53	18.22	20.58	22.39	00.07	23.15	21.27	19.34	17.46	15.03	14.05
19	09.42	08.03	06.23	05.30 18.03-18.25/22	03.43	02.25	03.28	05.12	06.46	08.17	09.00	10.19
	15.10	16.56	18.25	21.01	22.43	00.08	23.12	21.24	19.30	17.42	15.00	14.05
20	09.39	07.59	06.19	05.26 18.05-18.24/19	03.39	02.25	03.31	05.15	06.49	08.20	09.03	10.19
	15.13	17.00	18.28	21.05	22.46	00.09	23.09	21.20	19.27	17.39	14.57	14.05
21	09.36	07.56	06.15	05.22 18.06-18.21/15	03.36	02.24	03.34	05.18 18.14-18.23/9	06.52	08.23	09.07	10.20
	15.17	17.03	18.31	21.08	22.50	00.09	23.06	21.16	19.23	17.35	14.54	14.05
22	09.33	07.52	06.12	05.19 18.10-18.17/7	03.33	02.24	03.38	05.21 18.10-18.26/16	06.55	08.26	09.10	10.21
	15.20	17.06	18.34	21.11	22.53	00.09	23.02	21.13	19.19	17.32	14.51	14.06
23	09.31	07.49	06.08	05.15	03.29	02.25	03.41	05.24 18.08-18.27/19	06.58	08.29	09.13	10.21
	15.24	17.10	18.37	21.14	22.57	00.09	22.59	21.09	19.16	17.28	14.48	14.06
24	09.28	07.45	06.05	05.11	03.26	02.25	03.45	05.27 18.07-18.29/22	07.01	08.33	09.17	10.22
	15.27	17.13	18.40	21.18	23.00	00.09	22.56	21.06	19.12	17.25	14.46	14.07
25	09.25	07.42	06.01	05.08	03.23	02.26	03.48	05.31 18.05-18.30/25	07.04	07.36	09.20	10.22
	15.31	17.16	18.43	21.21	23.04	00.08	22.52	21.02	19.09	16.21	14.43	14.08
26	09.22	07.38	05.57	05.04	03.20	02.27	03.52	05.34 18.04-18.30/26	07.07 08.54-09.03/9	07.39	09.23	10.22
	15.34	17.19	18.47	21.24	23.07	00.07	22.49	20.58	19.05	16.18	14.40	14.09
27	09.19	07.35	05.54	05.01	03.16	02.28	03.55	05.37 18.02-18.30/28	07.10 08.52-09.05/13	07.42	09.26	10.22
	15.38	17.23	18.50	21.27	23.10	00.06	22.45	20.55	19.01	16.14	14.38	14.10
28	09.16	07.31	05.50	04.57	03.13	02.30	03.58	05.40 18.01-18.30/29	07.13 08.50-09.06/16	07.46	09.30	10.21
	15.41	17.26	18.53	21.31	23.14	00.05	22.42	20.51	18.58	16.11	14.35	14.11
29	09.13		06.46	04.53	03.10	02.31	04.02	05.43 18.01-18.30/29	07.16 08.49-09.07/18	07.49	09.33	10.21
	15.44		19.56	21.34	23.17	00.04	22.39	20.47	18.54	16.07	14.33	14.13
30	09.09		06.43	04.50	03.07	02.33	04.05	05.46 18.01-18.30/29	07.19 08.48-09.07/19	07.52	09.36	10.20
	15.48		19.59	21.37	23.20	00.02	22.35	20.44	18.50	16.04	14.30	14.15
31	09.06		06.39		03.04		04.09	05.49 18.00-18.30/30		07.56		10.19
	15.51		20.02		23.24		22.32	20.40		16.01		14.16
Potential sun hours	163	235	363	454	578	641	620	513	394	302	192	125
Sum of minutes with flicker	0	0	181	475	0	0	0	262	291	108	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 8 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (632)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February	March	April	May	June
1	10.18	09.03 12.28-12.40/12	07.28	06.35	04.46 18.31-18.59/28	03.01 18.45-18.49/4
	14.19	15.55	17.29	20.05	21.41	23.27
2	10.17	09.00 12.27-12.42/15	07.24	06.32	04.42 18.29-18.59/30	02.58
	14.21	15.58	17.32	20.08	21.44	23.30
3	10.16	08.57 12.26-12.43/17	07.20	06.28	04.39 18.28-19.00/32	02.55
	14.23	16.02	17.35	20.11	21.48	23.33
4	10.14	08.54 12.25-12.43/18	07.17	06.24	04.35 18.28-19.01/33	02.53
	14.25	16.05	17.38	20.14	21.51	23.36
5	10.13	08.50 12.25-12.43/18	07.13	06.21	04.32 18.27-19.01/34	02.50
	14.28	16.09	17.42	20.17	21.54	23.39
6	10.11	08.47 12.24-12.44/20	07.10	06.17	04.28 18.26-19.02/36	02.47
	14.30	16.12	17.45	20.20	21.58	23.42
7	10.09	08.44 12.24-12.44/20	07.06	06.13	04.25 18.26-19.02/36	02.45
	14.33	16.16	17.48	20.23	22.01	23.45
8	10.08	08.40 12.25-12.44/19	07.03	06.10	04.21 18.26-19.02/36	02.42
	14.36	16.19	17.51	20.27	22.05	23.48
9	10.06	08.37 12.25-12.44/19	06.59	06.06	04.18 18.26-19.02/36	02.40
	14.39	16.23	17.54	20.30	22.08	23.50
10	10.04	08.34 12.25-12.44/19	06.55	06.02	04.14 18.25-19.03/38	02.38
	14.42	16.26	17.57	20.33	22.12	23.53
11	10.01	08.30 12.26-12.43/17	06.52	05.59	04.10 18.25-19.02/37	02.36
	14.45	16.29	18.00	20.36	22.15	23.55
12	09.59	08.27 12.28-12.43/15	06.48	05.55	04.07 18.25-19.02/37	02.34
	14.48	16.33	18.04	20.39	22.18	23.57
13	09.57	08.24 12.30-12.41/11	06.45	05.51	04.03 18.26-19.03/37	02.32
	14.51	16.36	18.07	20.42	22.22	00.00
14	09.55	08.20 12.32-12.38/6	06.41	05.48	04.00 18.26-19.03/37	02.30
	14.54	16.40	18.10	20.45	22.25	00.01
15	09.52	08.17	06.37	05.44	03.56 18.26-19.02/36	02.29
	14.57	16.43	18.13	20.49	22.29	00.03
16	09.50	08.13	06.34	05.40	03.53 18.26-19.02/36	02.27
	15.00	16.46	18.16	20.52	22.32	00.05
17	09.47	08.10	06.30 07.40-07.50/10	05.37	03.50 18.27-19.02/35	02.26
	15.03	16.50	18.19	20.55	22.36	00.06
18	09.44	08.06	06.26 07.38-07.51/13	05.33	03.46 18.27-19.01/34	02.26
	15.07	16.53	18.22	20.58	22.39	00.07
19	09.42	08.03	06.23 07.37-07.53/16	05.30	03.43 18.27-19.01/34	02.25
	15.10	16.56	18.25	21.01	22.43	00.08
20	09.39	07.59	06.19 07.36-07.53/17	05.26	03.39 18.29-19.01/32	02.24
	15.13	17.00	18.28	21.05	22.46	00.09
21	09.36	07.56	06.15 07.35-07.53/18	05.22	03.36 18.29-19.00/31	02.24
	15.17	17.03	18.31	21.08	22.50	00.09
22	09.33	07.52	06.12 07.35-07.53/18	05.19	03.33 18.30-19.00/30	02.24
	15.20	17.06	18.34	21.11	22.53	00.09
23	09.31	07.49	06.08 07.35-07.52/17	05.15	03.29 18.31-19.00/29	02.25
	15.24	17.10	18.37	21.14	22.57	00.09
24	09.28	07.45	06.05 07.34-07.51/17	05.11	03.26 18.31-18.58/27	02.25
	15.27	17.13	18.40	21.18	23.00	00.09
25	09.25	07.42	06.01 07.36-07.51/15	05.08	03.23 18.33-18.58/25	02.26
	15.31	17.16	18.43	21.21	23.04	00.08
26	09.22	07.38	05.57 07.36-07.49/13	05.04	03.20 18.34-18.58/24	02.27
	15.34	17.19	18.47	21.24	23.07	00.07
27	09.19	07.35	05.54 07.38-07.46/8	05.00 18.38-18.51/13	03.16 18.35-18.57/22	02.28
	15.37	17.23	18.50	21.27	23.10	00.07
28	09.16	07.31	05.50	04.57 18.35-18.54/19	03.13 18.37-18.56/19	02.30
	15.41	17.26	18.53	21.31	23.14	00.05
29	09.13		06.46	04.53 18.33-18.56/23	03.10 18.38-18.55/17	02.31
	15.44		19.56	21.34	23.17	00.04
30	09.09		06.43	04.50 18.32-18.58/26	03.07 18.40-18.54/14	02.33
	15.48		19.59	21.37	23.20	00.02
31	09.06 12.30-12.38/8		06.39		03.04 18.42-18.52/10	
	15.51		20.02		23.24	
Potential sun hours	163	235	363	454	578	641
Sum of minutes with flicker	8	226	162	81	942	4

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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20.12.2018 10.43/3.2.737

SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 8 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (632)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	July		August		September		October		November		December
1	02.35		04.12	18.36-19.13/37	05.52		07.22		07.59	11.56-12.14/18	09.39
	00.01		22.28		20.36		18.47		15.57		14.28
2	02.37		04.15	18.36-19.13/37	05.55		07.25		08.02	11.55-12.14/19	09.42
	23.59		22.25		20.33		18.43		15.54		14.26
3	02.39		04.19	18.35-19.12/37	05.58		07.28		08.06	11.55-12.15/20	09.45
	23.57		22.21		20.29		18.40		15.51		14.24
4	02.42		04.22	18.36-19.12/36	06.01		07.31		08.09	11.55-12.15/20	09.48
	23.55		22.18		20.25		18.36		15.47		14.22
5	02.44		04.26	18.36-19.12/36	06.04		07.34		08.12	11.55-12.14/19	09.51
	23.52		22.14		20.22		18.32		15.44		14.20
6	02.47		04.29	18.36-19.12/36	06.07		07.37		08.16	11.55-12.14/19	09.53
	23.50		22.10		20.18		18.29		15.41		14.18
7	02.50		04.32	18.37-19.12/35	06.10		07.40		08.19	11.55-12.13/18	09.56
	23.47		22.07		20.14		18.25		15.37		14.16
8	02.53		04.36	18.36-19.10/34	06.13		07.43		08.22	11.56-12.12/16	09.58
	23.45		22.03		20.11		18.21		15.34		14.14
9	02.56		04.39	18.37-19.10/33	06.16		07.46		08.26	11.58-12.12/14	10.01
	23.42		22.00		20.07		18.18		15.31		14.13
10	02.59		04.42	18.37-19.09/32	06.19		07.49		08.29	11.59-12.11/12	10.03
	23.39		21.56		20.03		18.14		15.28		14.11
11	03.02		04.46	18.38-19.08/30	06.22		07.52		08.33	12.01-12.08/7	10.05
	23.37		21.53		20.00		18.11		15.24		14.10
12	03.05	18.51-18.59/8	04.49	18.39-19.07/28	06.25		07.55		08.36		10.08
	23.34		21.49		19.56		18.07		15.21		14.09
13	03.08	18.49-19.01/12	04.52	18.41-19.06/25	06.28		07.58		08.40		10.10
	23.31		21.45		19.52		18.04		15.18		14.08
14	03.11	18.47-19.02/15	04.55	18.41-19.03/22	06.31		08.01		08.43		10.11
	23.28		21.42		19.49		18.00		15.15		14.07
15	03.14	18.45-19.04/19	04.59	18.43-19.01/18	06.34		08.04		08.46		10.13
	23.25		21.38		19.45		17.56		15.12		14.06
16	03.18	18.45-19.06/21	05.02	18.46-18.58/12	06.37	08.28-08.34/6	08.07		08.50		10.15
	23.22		21.35		19.41		17.53		15.09		14.06
17	03.21	18.44-19.06/22	05.05		06.40	08.25-08.37/12	08.10		08.53		10.16
	23.18		21.31		19.38		17.49		15.06		14.05
18	03.24	18.42-19.07/25	05.08		06.43	08.24-08.38/14	08.14		08.57		10.17
	23.15		21.27		19.34		17.46		15.03		14.05
19	03.28	18.42-19.08/26	05.12		06.46	08.21-08.38/17	08.17		09.00		10.19
	23.12		21.24		19.30		17.42		15.00		14.05
20	03.31	18.41-19.09/28	05.15		06.49	08.21-08.38/17	08.20		09.03		10.19
	23.09		21.20		19.27		17.39		14.57		14.05
21	03.34	18.41-19.10/29	05.18		06.52	08.20-08.38/18	08.23		09.07		10.20
	23.06		21.16		19.23		17.35		14.54		14.05
22	03.38	18.39-19.10/31	05.21		06.55	08.20-08.38/18	08.26		09.10		10.21
	23.02		21.13		19.19		17.32		14.51		14.06
23	03.41	18.39-19.11/32	05.24		06.58	08.20-08.37/17	08.29		09.13		10.21
	22.59		21.09		19.16		17.28		14.48		14.06
24	03.45	18.38-19.11/33	05.27		07.01	08.20-08.36/16	08.33		09.17		10.22
	22.56		21.06		19.12		17.25		14.46		14.07
25	03.48	18.38-19.12/34	05.31		07.04	08.21-08.35/14	07.36		09.20		10.22
	22.52		21.02		19.09		16.21		14.43		14.08
26	03.51	18.38-19.12/34	05.34		07.07	08.22-08.33/11	07.39		09.23		10.22
	22.49		20.58		19.05		16.18		14.40		14.09
27	03.55	18.37-19.12/35	05.37		07.10	08.24-08.30/6	07.42		09.26		10.22
	22.45		20.55		19.01		16.14		14.38		14.10
28	03.58	18.37-19.13/36	05.40		07.13		07.46	12.00-12.08/8	09.30		10.21
	22.42		20.51		18.58		16.11		14.35		14.11
29	04.02	18.37-19.13/36	05.43		07.16		07.49	11.58-12.11/13	09.33		10.21
	22.39		20.47		18.54		16.07		14.33		14.13
30	04.05	18.36-19.13/37	05.46		07.19		07.52	11.57-12.12/15	09.36		10.20
	22.35		20.44		18.50		16.04		14.30		14.14
31	04.09	18.36-19.13/37	05.49				07.56	11.56-12.13/17			10.19
	22.32		20.40				16.01				14.16
Potential sun hours	620		513		394		302		192		125
Sum of minutes with flicker		550		488		166		53		182	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 9 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (633)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February	March	April	May	June	July	August	September	October	November	December
1	10.18	09.03 12.44-12.55/11	07.28	06.35	04.46	03.01	02.35	04.12	05.52	07.22	07.59 12.11-12.30/19	09.39
	14.19	15.55	17.29	20.05	21.41	23.27	00.01	22.28	20.36	18.47	15.57 11.21-11.42/21	14.28
2	10.17	09.00 12.43-12.57/14	07.24	06.32	04.42	02.58	02.37	04.15	05.55	07.25	08.02 12.10-12.30/20	09.42
	14.21	15.58	17.32	20.08	21.44	23.30	23.59	22.25	20.33	18.43	15.54 11.22-11.42/20	14.26
3	10.16	08.57 12.42-12.58/16	07.20	06.28	04.39	02.55	02.39	04.19	05.58	07.28	08.06 12.10-12.30/20	09.45
	14.23	16.02	17.35	20.11	21.48	23.33	23.57	22.21	20.29	18.39	15.50 11.23-11.41/18	14.24
4	10.14	08.54 12.41-12.58/17	07.17	06.24	04.35	02.53	02.42	04.22	06.01	07.31	08.09 12.10-12.30/20	09.48
	14.25	16.05 11.58-12.03/5	17.38	20.14	21.51	23.36	23.55	22.18	20.25	18.36	15.47 11.23-11.40/17	14.22
5	10.13	08.50 12.40-12.59/19	07.13	06.21	04.32	02.50	02.44	04.26	06.04	07.34	08.12 12.10-12.30/20	09.51
	14.28	16.09 11.55-12.07/12	17.42	20.17	21.54	23.39	23.52	22.14	20.22	18.32	15.44 11.25-11.39/14	14.20
6	10.11	08.47 12.40-12.59/19	07.10	06.17	04.28	02.47	02.47	04.29	06.07	07.37	08.16 12.11-12.29/18	09.53
	14.30	16.12 11.54-12.09/15	17.45	20.20	21.58	23.42	23.50	22.10	20.18	18.29	15.41 11.26-11.37/11	14.18
7	10.09	08.44 12.40-13.00/20	07.06	06.13	04.25	02.45	02.50	04.32	06.10	07.40	08.19 12.11-12.29/18	09.56
	14.33	16.16 11.53-12.10/17	17.48	20.23	22.01	23.45	23.47	22.07	20.14	18.25	15.37 11.30-11.33/3	14.16
8	10.08	08.40 12.40-13.00/20	07.03	06.10	04.21	02.42	02.53	04.36	06.13	07.43	08.22 12.12-12.28/16	09.58
	14.36	16.19 11.52-12.11/19	17.51	20.27	22.05	23.48	23.45	22.03	20.11	18.21	15.34	14.14
9	10.06	08.37 12.40-13.00/20	06.59	06.06	04.17	02.40	02.55	04.39	06.16	07.46	08.26 12.14-12.27/13	10.01
	14.39	16.23 11.51-12.12/21	17.54	20.30	22.08	23.50	23.42	22.00	20.07	18.18	15.31	14.13
10	10.04	08.34 12.41-12.59/18	06.55	06.02	04.14	02.38	02.58	04.42	06.19	07.49	08.29 12.15-12.26/11	10.03
	14.42	16.26 11.51-12.12/21	17.57	20.33	22.12	23.53	23.39	21.56	20.03	18.14	15.27	14.11
11	10.01	08.30 12.41-12.59/18	06.52	05.59	04.10	02.36	03.02	04.46	06.22	07.52	08.33 12.17-12.23/6	10.05
	14.44	16.29 11.51-12.12/21	18.00	20.36	22.15	23.55	23.37	21.53	20.00	18.11	15.24	14.10
12	09.59	08.27 12.42-12.58/16	06.48	05.55	04.07	02.34 05.04-05.05/1	03.05	04.49	06.25	07.55	08.36	10.08
	14.48	16.33 11.52-12.13/21	18.03	20.39	22.18	23.58	23.34	21.49	19.56	18.07	15.21	14.09
13	09.57	08.23 12.44-12.57/13	06.45	05.51	04.03	02.32 05.02-05.06/4	03.08	04.52	06.28	07.58	08.40	10.10
	14.51	16.36 11.52-12.13/21	18.07	20.42	22.22	00.00	23.31	21.45	19.52	18.04	15.18	14.08
14	09.55	08.20 12.47-12.55/8	06.41	05.48	04.00	02.30 05.02-05.08/6	03.11	04.55	06.31	08.01	08.43	10.11
	14.54	16.40 11.52-12.13/21	18.10	20.45	22.25	00.01	23.28	21.42	19.49	18.00	15.15	14.07
15	09.52	08.17 11.52-12.12/20	06.37	05.44	03.56	02.29 05.01-05.08/7	03.14	04.59	06.34	08.04	08.46	10.13
	14.57	16.43	18.13	20.49	22.29	00.03	23.25	21.38	19.45	17.56	15.12	14.06
16	09.50	08.13 11.53-12.11/18	06.34	05.40	03.53	02.27 05.01-05.09/8	03.18	05.02	06.37	08.07	08.50	10.15
	15.00	16.46	18.16	20.52	22.32	00.05	23.22	21.35	19.41	17.53	15.09	14.06
17	09.47	08.10 11.54-12.10/16	06.30	05.37	03.50	02.26 05.00-05.09/9	03.21	05.05	06.40	08.10	08.53	10.16
	15.03	16.50	18.19	20.55	22.36	00.06	23.18	21.31	19.38	17.49	15.06	14.05
18	09.44	08.06 11.55-12.08/13	06.26	05.33	03.46	02.25 05.00-05.10/10	03.24	05.08	06.43	08.14	08.57	10.17
	15.07	16.53	18.22	20.58	22.39	00.07	23.15	21.27	19.34	17.46	15.03	14.05
19	09.42	08.03 11.58-12.05/7	06.23	05.29	03.43	02.25 05.01-05.10/9	03.28	05.12	06.46	08.17	09.00	10.19
	15.10	16.56	18.25	21.01	22.43	00.08	23.12	21.24	19.30	17.42	15.00	14.05
20	09.39	07.59	06.19	05.26	03.39	02.24 05.01-05.10/9	03.31	05.15	06.49	08.20	09.03	10.19
	15.13	17.00	18.28	21.05	22.46	00.09	23.09	21.20	19.27	17.39	14.57	14.05
21	09.36	07.56	06.15	05.22	03.36	02.24 05.01-05.11/10	03.34	05.18	06.52	08.23	09.07	10.20
	15.17	17.03	18.31	21.08	22.50	00.09	23.06	21.16	19.23	17.35	14.54	14.05
22	09.33	07.52	06.12	05.19	03.33	02.24 05.02-05.12/10	03.38	05.21	06.55	08.26	09.10	10.21
	15.20	17.06	18.34	21.11	22.53	00.09	23.02	21.13	19.19	17.32	14.51	14.05
23	09.31	07.49	06.08	05.15	03.29	02.25 05.02-05.11/9	03.41	05.24	06.58	08.29 12.27-12.36/9	09.13	10.21
	15.24	17.10	18.37	21.14	22.57	00.09	22.59	21.09	19.16	17.28	14.48	14.06
24	09.28	07.45	06.05	05.11	03.26	02.25 05.01-05.11/10	03.45	05.27	07.01	08.33 12.25-12.39/14	09.17	10.22
	15.27	17.13	18.40	21.18	23.00	00.09	22.56	21.06	19.12	17.25	14.46	14.07
25	09.25	07.42	06.01	05.08	03.23	02.26 05.02-05.11/9	03.48	05.30	07.04	07.36 11.24-11.40/16	09.20	10.22
	15.31	17.16	18.43	21.21	23.04	00.08	22.52	21.02	19.09	16.21	14.43	14.08
26	09.22	07.38	05.57	05.04	03.20	02.27 05.03-05.12/9	03.51	05.34	07.07	07.39 11.22-11.40/18	09.23	10.22
	15.34	17.19	18.46	21.24	23.07	00.08	22.49	20.58	19.05	16.18	14.40	14.09
27	09.19	07.35	05.54	05.00	03.16	02.28 05.03-05.11/8	03.55	05.37	07.10	07.42 11.21-11.41/20	09.26	10.22
	15.37	17.22	18.50	21.27	23.10	00.07	22.45	20.55	19.01	16.14	14.38	14.10
28	09.16	07.31	05.50	04.57	03.13	02.29 05.04-05.11/7	03.58	05.40	07.13	07.46 12.15-12.25/10	09.30	10.21
	15.41	17.26	18.53	21.31	23.14	00.05	22.42	20.51	18.58	16.11 11.21-11.42/21	14.35	14.11
29	09.13		06.46	04.53	03.10	02.31 05.05-05.10/5	04.02	05.43	07.16	07.49 12.13-12.27/14	09.33	10.21
	15.44		19.56	21.34	23.17	00.04	22.39	20.47	18.54	16.07 11.21-11.42/21	14.33	14.13
30	09.09		06.43	04.50	03.07	02.33 05.06-05.09/3	04.05	05.46	07.19	07.52 12.12-12.28/16	09.36	10.20
	15.48		19.59	21.37	23.20	00.02	22.35	20.44	18.50	16.04 11.21-11.42/21	14.30	14.14
31	09.06 12.46-12.52/6		06.39		03.04		04.09	05.49		07.56 12.11-12.29/18		10.19
	15.51		20.02		23.24		22.32	20.40		16.01 11.21-11.42/21		14.16
Potential sun hours	163	235	363	454	578	641	620	513	394	302	192	125
Sum of minutes with flicker	6	497	0	0	0	143	0	0	0	219	285	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 10 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (634)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February	March	April	May	June	July	August	September	October	November	December
1	10.18	09.03 12.10-12.27/17	07.28	06.35	04.46	03.01	02.35	04.12	05.52	07.22	07.59 11.38-11.59/21	09.39
	14.19	15.55	17.29	20.05	21.41	23.27	00.01	22.28	20.36	18.47	15.57 10.42-11.03/21	14.28
2	10.17	09.00 12.09-12.28/19	07.24	06.32	04.42	02.58	02.37	04.15	05.55	07.25	08.02 11.38-12.00/22	09.42
	14.21	15.58	17.32	20.08	21.44	23.30	23.59	22.25	20.33	18.43	15.54 10.42-11.03/21	14.26
3	10.16	08.57 12.09-12.29/20	07.20	06.28	04.39	02.55	02.39	04.19	05.58	07.28	08.06 11.38-12.00/22	09.45
	14.23	16.02	17.35	20.11	21.48	23.33	23.57	22.21	20.29	18.39	15.50 10.43-11.02/19	14.24
4	10.14	08.54 12.07-12.28/21	07.17	06.24	04.35	02.52	02.42	04.22	06.01	07.31	08.09 11.38-12.00/22	09.48
	14.25	16.05	17.38	20.14	21.51	23.36	23.55	22.18	20.25	18.36	15.47 10.44-11.00/16	14.22
5	10.13	08.50 12.07-12.29/22	07.13	06.21	04.32	02.50	02.44	04.25	06.04	07.34	08.12 11.38-12.00/22	09.51
	14.28	16.09 11.18-11.26/8	17.42	20.17	21.54	23.39	23.52	22.14	20.22	18.32	15.44 10.46-10.59/13	14.20
6	10.11	08.47 12.07-12.29/22	07.10	06.17	04.28	02.47	02.47	04.29	06.07	07.37	08.16 11.38-11.59/21	09.53
	14.30	16.12 11.15-11.28/13	17.45	20.20	21.58	23.42	23.50	22.10	20.18	18.29	15.40 10.48-10.56/8	14.18
7	10.09	08.44 12.07-12.29/22	07.06	06.13	04.25	02.45	02.50	04.32	06.10	07.40	08.19 11.38-11.59/21	09.56
	14.33	16.16 11.14-11.30/16	17.48	20.23	22.01	23.45	23.47	22.07	20.14	18.25	15.37	14.16
8	10.08	08.40 12.07-12.29/22	07.03	06.10	04.21	02.42	02.53	04.36	06.13	07.43	08.22 11.38-11.58/20	09.58
	14.36	16.19 11.13-11.31/18	17.51	20.27	22.05	23.48	23.45	22.03	20.11	18.21	15.34	14.14
9	10.06	08.37 12.08-12.29/21	06.59	06.06	04.17	02.40	02.55	04.39	06.16	07.46	08.26 11.40-11.58/18	10.01
	14.39	16.23 11.12-11.32/20	17.54	20.30	22.08	23.50	23.42	22.00	20.07	18.18	15.31	14.13
10	10.04	08.34 12.08-12.29/21	06.55	06.02	04.14	02.38	02.58	04.42	06.19	07.49	08.29 11.40-11.57/17	10.03
	14.41	16.26 11.11-11.33/22	17.57	20.33	22.12	23.53	23.39	21.56	20.03	18.14	15.27	14.11
11	10.01	08.30 12.09-12.28/19	06.52	05.59	04.10	02.35	03.02	04.46	06.22	07.52	08.33 11.41-11.56/15	10.05
	14.44	16.29 11.11-11.33/22	18.00	20.36	22.15	23.55	23.37	21.53	20.00	18.11	15.24	14.10
12	09.59	08.27 12.10-12.27/17	06.48	05.55	04.07	02.34	03.05	04.49	06.25	07.55	08.36 11.44-11.55/11	10.08
	14.47	16.33 11.11-11.35/24	18.03	20.39	22.18	23.58	23.34	21.49	19.56	18.07	15.21	14.09
13	09.57	08.23 12.12-12.27/15	06.44	05.51	04.03	02.32	03.08	04.52	06.28	07.58	08.40 11.46-11.51/5	10.10
	14.51	16.36 11.11-11.35/24	18.07	20.42	22.22	00.00	23.31	21.45	19.52	18.04	15.18	14.08
14	09.55	08.20 12.14-12.24/10	06.41	05.48	04.00	02.30	03.11	04.55	06.31	08.01	08.43	10.11
	14.54	16.40 11.11-11.35/24	18.10	20.45	22.25	00.02	23.28	21.42	19.49	18.00	15.15	14.07
15	09.52	08.17 11.11-11.34/23	06.37	05.44	03.56	02.29	03.14	04.59	06.34	08.04	08.46	10.13
	14.57	16.43	18.13	20.49	22.29	00.03	23.25	21.38	19.45	17.56	15.12	14.06
16	09.50	08.13 11.12-11.34/22	06.34	05.40	03.53	02.27	03.18	05.02	06.37	08.07	08.50	10.15
	15.00	16.46	18.16	20.52	22.32	00.05	23.22	21.35	19.41	17.53	15.09	14.06
17	09.47	08.10 11.12-11.33/21	06.30	05.37	03.50	02.26	03.21	05.05	06.40	08.10	08.53	10.16
	15.03	16.50	18.19	20.55	22.36	00.06	23.19	21.31	19.38	17.49	15.06	14.05
18	09.44	08.06 11.13-11.32/19	06.26	05.33	03.46	02.25	03.24	05.08	06.43	08.14	08.57	10.17
	15.07	16.53	18.22	20.58	22.39	00.07	23.15	21.27	19.34	17.46	15.03	14.05
19	09.42	08.03 11.14-11.30/16	06.23	05.29	03.43	02.25	03.28	05.11	06.46	08.17	09.00	10.19
	15.10	16.56	18.25	21.01	22.43	00.08	23.12	21.24	19.30	17.42	15.00	14.05
20	09.39	07.59 11.15-11.28/13	06.19	05.26	03.39	02.24	03.31	05.15	06.49	08.20	09.03	10.20
	15.13	17.00	18.28	21.05	22.46	00.09	23.09	21.20	19.27	17.39	14.57	14.05
21	09.36	07.56 11.20-11.25/5	06.15	05.22	03.36	02.24	03.34	05.18	06.52	08.23 11.48-11.57/9	09.07	10.20
	15.17	17.03	18.31	21.08	22.50	00.09	23.06	21.16	19.23	17.35	14.54	14.05
22	09.33	07.52	06.12	05.19	03.33	02.24	03.38	05.21	06.55	08.26 11.46-12.00/14	09.10	10.21
	15.20	17.06	18.34	21.11	22.53	00.09	23.02	21.13	19.19	17.32	14.51	14.05
23	09.31	07.49	06.08	05.15	03.29	02.24	03.41	05.24	06.58	08.29 11.43-12.01/18	09.13	10.21
	15.24	17.09	18.37	21.14	22.57	00.09	22.59	21.09	19.16	17.28	14.48	14.06
24	09.28	07.45	06.04	05.11	03.26	02.25	03.45	05.27	07.01	08.33 11.42-12.02/20	09.17	10.22
	15.27	17.13	18.40	21.18	23.00	00.09	22.56	21.06	19.12	17.25	14.45	14.07
25	09.25	07.42	06.01	05.08	03.23	02.26	03.48	05.30	07.04	07.36 10.42-11.03/21	09.20	10.22
	15.30	17.16	18.43	21.21	23.04	00.08	22.52	21.02	19.09	16.21	14.43	14.08
26	09.22	07.38	05.57	05.04	03.20	02.27	03.51	05.34	07.07	07.39 10.41-11.03/22	09.23	10.22
	15.34	17.19	18.46	21.24	23.07	00.08	22.49	20.58	19.05	16.18	14.40	14.09
27	09.19	07.35	05.54	05.00	03.16	02.28	03.55	05.37	07.10	07.42 11.47-11.49/2	09.26	10.22
	15.37	17.22	18.50	21.27	23.10	00.07	22.45	20.55	19.01	16.14 10.40-11.03/23	14.38	14.10
28	09.16	07.31	05.50	04.57	03.13	02.29	03.58	05.40	07.13	07.46 11.43-11.54/11	09.30	10.21
	15.41	17.26	18.53	21.31	23.14	00.05	22.42	20.51	18.58	16.11 10.40-11.04/24	14.35	14.11
29	09.13 12.14-12.20/6		06.46	04.53	03.10	02.31	04.02	05.43	07.16	07.49 11.41-11.56/15	09.33	10.21
	15.44		19.56	21.34	23.17	00.04	22.39	20.47	18.54	16.07 10.40-11.04/24	14.33	14.13
30	09.09 12.12-12.23/11		06.43	04.50	03.07	02.33	04.05	05.46	07.19	07.52 11.40-11.57/17	09.36	10.20
	15.48		19.59	21.37	23.20	00.02	22.35	20.44	18.50	16.04 10.41-11.04/23	14.30	14.14
31	09.06 12.10-12.25/15		06.39		03.04		04.09	05.49		07.56 11.39-11.58/19		10.19
	15.51		20.02		23.24		22.32	20.40		16.01 10.41-11.04/23		14.16
Potential sun hours	163	235	363	454	578	641	620	513	394	302	192	125
Sum of minutes with flicker	32	578	0	0	0	0	0	0	0	285	335	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 11 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (635)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February		March		April		May	June
1	10.18	09.03		07.28		06.35	17.30-17.53/23	04.46	03.01
	14.19	15.55		17.29		20.05		21.41	23.27
2	10.17	09.00	11.31-11.40/9	07.24		06.32	17.31-17.51/20	04.42	02.58
	14.21	15.58		17.32		20.08		21.44	23.30
3	10.16	08.57	11.29-11.43/14	07.20		06.28	17.33-17.50/17	04.39	02.55
	14.23	16.02		17.35		20.11		21.48	23.33
4	10.14	08.53	11.27-11.44/17	07.17		06.24	17.34-17.47/13	04.35	02.52
	14.25	16.05		17.38		20.14		21.51	23.36
5	10.13	08.50	11.26-11.45/19	07.13		06.21	17.39-17.43/4	04.32	02.50
	14.28	16.09		17.42		20.17		21.54	23.39
6	10.11	08.47	11.25-11.46/21	07.10		06.17		04.28	02.47
	14.30	16.12		17.45		20.20		21.58	23.42
7	10.09	08.44	11.25-11.47/22	07.06		06.13		04.24	02.45
	14.33	16.16		17.48		20.23		22.01	23.45
8	10.08	08.40	11.25-11.47/22	07.03		06.10		04.21	02.42
	14.36	16.19		17.51		20.27		22.05	23.48
9	10.06	08.37	11.24-11.47/23	06.59		06.06		04.17	02.40
	14.39	16.23		17.54		20.30		22.08	23.50
10	10.04	08.34	11.24-11.48/24	06.55	16.13-16.23/10	06.02		04.14	02.38
	14.41	16.26		17.57		20.33		22.12	23.53
11	10.01	08.30	11.24-11.48/24	06.52	16.10-16.25/15	05.59		04.10	02.35
	14.44	16.29	10.32-10.41/9	18.00		20.36		22.15	23.55
12	09.59	08.27	11.24-11.47/23	06.48	16.08-16.26/18	05.55		04.07	02.33
	14.47	16.33	10.31-10.44/13	18.03		20.39		22.18	23.58
13	09.57	08.23	11.26-11.48/22	06.44	16.07-16.27/20	05.51		04.03	02.32
	14.51	16.36	10.29-10.46/17	18.07		20.42		22.22	00.00
14	09.55	08.20	11.26-11.47/21	06.41	16.06-16.28/22	05.48		04.00	02.30
	14.54	16.40	10.28-10.47/19	18.10		20.45		22.25	00.02
15	09.52	08.17	11.27-11.46/19	06.37	16.05-16.27/22	05.44		03.56	02.29
	14.57	16.43	10.27-10.48/21	18.13		20.49		22.29	00.03
16	09.50	08.13	11.28-11.45/17	06.34	16.04-16.27/23	05.40		03.53	02.27
	15.00	16.46	10.26-10.48/22	18.16		20.52		22.32	00.05
17	09.47	08.10	11.29-11.43/14	06.30	16.04-16.28/24	05.37		03.49	02.26
	15.03	16.50	10.25-10.48/23	18.19		20.55		22.36	00.06
18	09.44	08.06	11.32-11.40/8	06.26	16.04-16.27/23	05.33		03.46	02.25
	15.07	16.53	10.25-10.48/23	18.22		20.58		22.39	00.07
19	09.42	08.03	10.25-10.48/23	06.23	16.04-16.26/22	05.29		03.43	02.25
	15.10	16.56		18.25		21.01		22.43	00.08
20	09.39	07.59	10.25-10.48/23	06.19	16.39-16.51/12	05.26		03.39	02.24
	15.13	17.00		18.28	16.05-16.25/20	21.05		22.46	00.09
21	09.36	07.56	10.26-10.48/22	06.15	16.36-16.53/17	05.22		03.36	02.24
	15.17	17.03		18.31	16.06-16.24/18	21.08		22.50	00.09
22	09.33	07.52	10.26-10.48/22	06.12	16.34-16.54/20	05.19		03.33	02.24
	15.20	17.06		18.34	16.07-16.21/14	21.11		22.53	00.09
23	09.31	07.49	10.27-10.47/20	06.08	16.33-16.56/23	05.15		03.29	02.24
	15.24	17.09		18.37	16.10-16.19/9	21.14		22.57	00.09
24	09.28	07.45	10.27-10.45/18	06.04	16.32-16.56/24	05.11		03.26	02.25
	15.27	17.13		18.40		21.18		23.00	00.09
25	09.25	07.42	10.29-10.43/14	06.01	16.30-16.56/26	05.08		03.23	02.26
	15.30	17.16		18.43		21.21		23.04	00.08
26	09.22	07.38	10.31-10.40/9	05.57	16.30-16.57/27	05.04		03.19	02.27
	15.34	17.19		18.46		21.24		23.07	00.08
27	09.19	07.35		05.54	16.29-16.56/27	05.00		03.16	02.28
	15.37	17.22		18.50		21.27		23.10	00.07
28	09.16	07.31		05.50	16.29-16.56/27	04.57		03.13	02.29
	15.41	17.26		18.53		21.31		23.14	00.05
29	09.13			06.46	17.29-17.56/27	04.53		03.10	02.31
	15.44			19.56		21.34		23.17	00.04
30	09.09			06.43	17.29-17.55/26	04.50		03.07	02.33
	15.48			19.59		21.37		23.20	00.02
31	09.06			06.39	17.30-17.55/25			03.04	
	15.51			20.02				23.24	
Potential sun hours	163	235		363		454		578	641
Sum of minutes with flicker	0	617		541		77		0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 11 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (635)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	July	August	September		October		November		December
1	02.35	04.12	05.52		07.22	16.47-17.06/19	07.59	10.55-11.18/23	09.39
	00.01	22.28	20.36		18.47		15.57		14.28
2	02.37	04.15	05.55		07.25	16.47-17.04/17	08.02	10.55-11.18/23	09.42
	23.59	22.25	20.33		18.43		15.54		14.26
3	02.39	04.19	05.58		07.28	16.49-17.02/13	08.06	10.55-11.17/22	09.45
	23.57	22.21	20.29		18.39		15.50		14.24
4	02.42	04.22	06.01		07.31	16.52-16.58/6	08.09	10.55-11.17/22	09.48
	23.55	22.18	20.25		18.36		15.47		14.21
5	02.44	04.25	06.04		07.34		08.12	10.56-11.16/20	09.51
	23.52	22.14	20.22		18.32		15.44		14.19
6	02.47	04.29	06.07		07.37		08.16	10.57-11.15/18	09.53
	23.50	22.10	20.18		18.29		15.40		14.18
7	02.50	04.32	06.10	17.35-17.37/2	07.40		08.19	10.58-11.14/16	09.56
	23.47	22.07	20.14		18.25		15.37		14.16
8	02.52	04.36	06.13	17.29-17.41/12	07.43		08.22	10.59-11.12/13	09.58
	23.45	22.03	20.11		18.21		15.34		14.14
9	02.55	04.39	06.16	17.26-17.43/17	07.46		08.26	11.02-11.11/9	10.01
	23.42	22.00	20.07		18.18		15.31		14.13
10	02.58	04.42	06.19	17.24-17.45/21	07.49		08.29		10.03
	23.39	21.56	20.03		18.14		15.27		14.11
11	03.01	04.45	06.22	17.23-17.45/22	07.52		08.33		10.05
	23.37	21.53	20.00		18.11		15.24		14.10
12	03.05	04.49	06.25	17.22-17.46/24	07.55		08.36		10.08
	23.34	21.49	19.56		18.07		15.21		14.09
13	03.08	04.52	06.28	17.21-17.46/25	07.58		08.39		10.10
	23.31	21.45	19.52		18.03		15.18		14.08
14	03.11	04.55	06.31	17.20-17.46/26	08.01		08.43		10.11
	23.28	21.42	19.49		18.00		15.15		14.07
15	03.14	04.59	06.34	17.19-17.46/27	08.04		08.46		10.13
	23.25	21.38	19.45		17.56		15.12		14.06
16	03.18	05.02	06.37	17.18-17.45/27	08.07	11.02-11.14/12	08.50		10.15
	23.22	21.35	19.41		17.53		15.09		14.06
17	03.21	05.05	06.40	17.18-17.45/27	08.10	11.00-11.15/15	08.53		10.16
	23.19	21.31	19.38		17.49		15.06		14.05
18	03.24	05.08	06.43	17.18-17.44/26	08.14	10.59-11.17/18	08.57		10.17
	23.15	21.27	19.34		17.46		15.03		14.05
19	03.28	05.11	06.46	17.18-17.43/25	08.17	10.57-11.18/21	09.00		10.19
	23.12	21.24	19.30		17.42		15.00		14.05
20	03.31	05.15	06.49	17.19-17.42/23	08.20	10.57-11.19/22	09.03		10.20
	23.09	21.20	19.27	16.57-17.04/7	17.39		14.57		14.05
21	03.34	05.18	06.52	17.20-17.41/21	08.23	10.55-11.18/23	09.07		10.20
	23.06	21.16	19.23	16.53-17.07/14	17.35		14.54		14.05
22	03.38	05.21	06.55	17.21-17.39/18	08.26	10.55-11.19/24	09.10		10.21
	23.02	21.13	19.19	16.51-17.08/17	17.32		14.51		14.05
23	03.41	05.24	06.58	17.22-17.36/14	08.29	10.55-11.18/23	09.13		10.21
	22.59	21.09	19.16	16.50-17.09/19	17.28		14.48		14.06
24	03.45	05.27	07.01	17.26-17.32/6	08.33	12.01-12.11/10	09.17		10.22
	22.56	21.06	19.12	16.48-17.09/21	17.25	10.55-11.18/23	14.45		14.07
25	03.48	05.30	07.04	16.47-17.10/23	07.36	10.59-11.14/15	09.20		10.22
	22.52	21.02	19.08		16.21	09.55-10.18/23	14.43		14.08
26	03.51	05.34	07.07	16.47-17.10/23	07.39	10.57-11.14/17	09.23		10.22
	22.49	20.58	19.05		16.18	09.55-10.17/22	14.40		14.09
27	03.55	05.37	07.10	16.46-17.09/23	07.42	10.56-11.16/20	09.26		10.22
	22.45	20.55	19.01		16.14	09.56-10.17/21	14.38		14.10
28	03.58	05.40	07.13	16.46-17.09/23	07.46	10.55-11.17/22	09.30		10.21
	22.42	20.51	18.58		16.11	09.57-10.16/19	14.35		14.11
29	04.02	05.43	07.16	16.46-17.08/22	07.49	10.55-11.17/22	09.33		10.21
	22.39	20.47	18.54		16.07	09.58-10.15/17	14.33		14.13
30	04.05	05.46	07.19	16.46-17.07/21	07.52	10.55-11.18/23	09.36		10.20
	22.35	20.44	18.50		16.04	10.00-10.13/13	14.30		14.14
31	04.08	05.49			07.56	10.54-11.18/24			10.19
	22.32	20.40			16.01	10.03-10.10/7			14.16
Potential sun hours	620	513	394		302		192		125
Sum of minutes with flicker	0	0	576		511		166		0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 12 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (636)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February		March		April		May	June
1	10.18	09.03		07.28	09.41-10.06/25	06.35	18.14-18.16/2	04.46	03.01
	14.19	15.55		17.29		20.05	17.23-17.45/22	21.41	23.27
2	10.17	09.00		07.24	09.41-10.05/24	06.32	18.07-18.21/14	04.42	02.58
	14.21	15.58		17.32		20.08	17.24-17.43/19	21.44	23.30
3	10.16	08.57		07.20	09.42-10.04/22	06.28	18.05-18.24/19	04.39	02.55
	14.23	16.02		17.35		20.11	17.26-17.41/15	21.48	23.33
4	10.14	08.53		07.17	09.43-10.03/20	06.24	18.02-18.25/23	04.35	02.52
	14.25	16.05		17.38		20.14	17.29-17.37/8	21.51	23.36
5	10.13	08.50		07.13	09.44-10.01/17	06.21	18.01-18.27/26	04.32	02.50
	14.28	16.09		17.42		20.17		21.54	23.39
6	10.11	08.47		07.10	09.46-09.59/13	06.17	17.59-18.27/28	04.28	02.47
	14.30	16.12		17.45		20.20		21.58	23.42
7	10.09	08.44	10.57-11.03/6	07.06		06.13	17.58-18.27/29	04.24	02.44
	14.33	16.16		17.48		20.23		22.01	23.45
8	10.08	08.40	10.54-11.07/13	07.03		06.10	17.57-18.28/31	04.21	02.42
	14.36	16.19		17.51		20.27		22.05	23.48
9	10.06	08.37	10.52-11.09/17	06.59		06.06	17.56-18.28/32	04.17	02.40
	14.39	16.23		17.54		20.30		22.08	23.50
10	10.04	08.34	10.50-11.10/20	06.55		06.02	17.56-18.28/32	04.14	02.37
	14.41	16.26		17.57		20.33		22.12	23.53
11	10.01	08.30	10.49-11.11/22	06.52		05.59	17.55-18.28/33	04.10	02.35
	14.44	16.29		18.00		20.36		22.15	23.55
12	09.59	08.27	10.48-11.12/24	06.48		05.55	17.55-18.28/33	04.07	02.33
	14.47	16.33		18.03		20.39		22.18	23.58
13	09.57	08.23	10.49-11.14/25	06.44		05.51	17.55-18.27/32	04.03	02.32
	14.50	16.36		18.07		20.42		22.22	00.00
14	09.55	08.20	10.48-11.14/26	06.41		05.48	17.55-18.27/32	04.00	02.30
	14.54	16.40		18.10		20.45		22.25	00.02
15	09.52	08.17	10.48-11.14/26	06.37		05.44	17.55-18.26/31	03.56	02.28
	14.57	16.43		18.13		20.49		22.29	00.03
16	09.50	08.13	10.48-11.14/26	06.34		05.40	17.56-18.26/30	03.53	02.27
	15.00	16.46		18.16		20.52		22.32	00.05
17	09.47	08.10	10.47-11.14/27	06.30		05.37	17.57-18.25/28	03.49	02.26
	15.03	16.50		18.19		20.55		22.36	00.06
18	09.44	08.06	10.48-11.14/26	06.26		05.33	17.57-18.23/26	03.46	02.25
	15.07	16.53		18.22		20.58		22.39	00.07
19	09.42	08.03	10.48-11.13/25	06.23	16.31-16.43/12	05.29	17.58-18.22/24	03.43	02.25
	15.10	16.56	09.50-10.00/10	18.25		21.01		22.43	00.08
20	09.39	07.59	10.48-11.12/24	06.19	16.29-16.46/17	05.26	17.59-18.20/21	03.39	02.24
	15.13	17.00	09.47-10.02/15	18.28		21.05		22.46	00.09
21	09.36	07.56	10.48-11.11/23	06.15	16.27-16.47/20	05.22	18.01-18.18/17	03.36	02.24
	15.17	17.03	09.46-10.05/19	18.31		21.08		22.50	00.09
22	09.33	07.52	10.50-11.11/21	06.12	16.25-16.48/23	05.19	18.05-18.16/11	03.33	02.24
	15.20	17.06	09.45-10.06/21	18.34		21.11		22.53	00.09
23	09.31	07.49	10.51-11.09/18	06.08	16.24-16.49/25	05.15		03.29	02.24
	15.24	17.09	09.43-10.06/23	18.37		21.14		22.57	00.09
24	09.28	07.45	10.53-11.07/14	06.04	16.23-16.49/26	05.11		03.26	02.25
	15.27	17.13	09.42-10.07/25	18.40		21.18		23.00	00.09
25	09.25	07.42	10.56-11.03/7	06.01	16.22-16.49/27	05.08		03.23	02.26
	15.30	17.16	09.42-10.07/25	18.43		21.21		23.04	00.08
26	09.22	07.38	09.41-10.07/26	05.57	16.22-16.49/27	05.04		03.19	02.27
	15.34	17.19		18.46		21.24		23.07	00.08
27	09.19	07.35	09.42-10.07/25	05.54	16.21-16.49/28	05.00		03.16	02.28
	15.37	17.22		18.50		21.27		23.10	00.07
28	09.16	07.31	09.41-10.07/26	05.50	16.21-16.48/27	04.57		03.13	02.29
	15.41	17.26		18.53		21.31		23.14	00.05
29	09.13			06.46	17.21-17.48/27	04.53		03.10	02.31
	15.44			19.56		21.34		23.17	00.04
30	09.09			06.43	17.21-17.47/26	04.50		03.07	02.33
	15.48			19.59		21.37		23.20	00.03
31	09.06			06.39	17.22-17.46/24			03.04	
	15.51			20.02				23.24	
Potential sun hours	163	235		363		454		578	641
Sum of minutes with flicker	0	605		430		618		0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 12 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (636)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	July	August		September		October		November		December
1	02.35	04.12		05.52	17.55-18.28/33	07.21		07.59	10.21-10.40/19	09.39
	00.01	22.28		20.36		18.47		15.57		14.28
2	02.37	04.15		05.55	17.54-18.26/32	07.24		08.02	10.22-10.39/17	09.42
	23.59	22.25		20.33		18.43		15.54		14.26
3	02.39	04.19		05.58	17.54-18.26/32	07.27		08.06	10.25-10.37/12	09.45
	23.57	22.21		20.29		18.39		15.50		14.23
4	02.42	04.22		06.01	17.54-18.25/31	07.30		08.09	10.29-10.33/4	09.48
	23.55	22.18		20.25		18.36		15.47		14.21
5	02.44	04.25		06.04	17.55-18.24/29	07.34		08.12		09.51
	23.52	22.14		20.22		18.32		15.44		14.19
6	02.47	04.29		06.07	17.55-18.23/28	07.37		08.16		09.53
	23.50	22.10		20.18		18.29		15.40		14.18
7	02.50	04.32		06.10	17.56-18.22/26	07.40	10.24-10.33/9	08.19		09.56
	23.48	22.07		20.14		18.25		15.37		14.16
8	02.52	04.35		06.13	17.56-18.20/24	07.43	10.20-10.35/15	08.22		09.59
	23.45	22.03		20.11	17.23-17.31/8	18.21		15.34		14.14
9	02.55	04.39		06.16	17.58-18.17/19	07.46	10.18-10.37/19	08.26		10.01
	23.42	22.00		20.07	17.19-17.34/15	18.18		15.31		14.13
10	02.58	04.42		06.19	18.00-18.15/15	07.49	10.17-10.38/21	08.29		10.03
	23.39	21.56		20.03	17.17-17.36/19	18.14		15.27		14.11
11	03.01	04.45		06.22	18.05-18.10/5	07.52	10.16-10.39/23	08.33		10.06
	23.37	21.53		20.00	17.15-17.37/22	18.11		15.24		14.10
12	03.05	04.49		06.25	17.14-17.38/24	07.55	10.15-10.39/24	08.36		10.08
	23.34	21.49		19.56		18.07		15.21		14.09
13	03.08	04.52		06.28	17.13-17.38/25	07.58	10.15-10.40/25	08.40		10.10
	23.31	21.45		19.52		18.03		15.18		14.08
14	03.11	04.55		06.31	17.12-17.39/27	08.01	10.14-10.39/25	08.43		10.11
	23.28	21.42		19.49		18.00		15.15		14.07
15	03.14	04.59		06.34	17.11-17.39/28	08.04	10.13-10.39/26	08.46		10.13
	23.25	21.38		19.45		17.56		15.12		14.06
16	03.17	05.02		06.37	17.10-17.37/27	08.07	10.14-10.39/25	08.50		10.15
	23.22	21.35		19.41		17.53		15.09		14.05
17	03.21	05.05		06.40	17.10-17.37/27	08.10	11.26-11.36/10	08.53		10.16
	23.19	21.31		19.38		17.49	10.13-10.38/25	15.06		14.05
18	03.24	05.08		06.43	17.09-17.37/28	08.14	11.24-11.40/16	08.57		10.17
	23.15	21.27		19.34		17.46	10.14-10.38/24	15.03		14.05
19	03.27	05.11		06.46	17.10-17.36/26	08.17	11.22-11.41/19	09.00		10.19
	23.12	21.24		19.30		17.42	10.14-10.37/23	15.00		14.05
20	03.31	05.15		06.49	17.10-17.35/25	08.20	11.21-11.42/21	09.03		10.20
	23.09	21.20		19.27		17.39	10.16-10.36/20	14.57		14.05
21	03.34	05.18	18.09-18.21/12	06.52	17.10-17.34/24	08.23	11.19-11.43/24	09.07		10.20
	23.06	21.16		19.23		17.35	10.16-10.34/18	14.54		14.05
22	03.38	05.21	18.06-18.23/17	06.55	17.11-17.32/21	08.26	11.19-11.44/25	09.10		10.21
	23.02	21.13		19.19		17.32	10.19-10.32/13	14.51		14.05
23	03.41	05.24	18.03-18.25/22	06.58	17.12-17.31/19	08.29	11.17-11.43/26	09.13		10.21
	22.59	21.09		19.16		17.28	10.21-10.28/7	14.48		14.06
24	03.44	05.27	18.02-18.26/24	07.01	17.14-17.28/14	08.33	11.17-11.44/27	09.17		10.22
	22.56	21.06		19.12		17.25		14.45		14.07
25	03.48	05.30	18.00-18.27/27	07.04	17.18-17.24/6	07.36	10.17-10.44/27	09.20		10.22
	22.52	21.02		19.08		16.21		14.43		14.07
26	03.51	05.34	17.58-18.27/29	07.07		07.39	10.17-10.43/26	09.23		10.22
	22.49	20.58		19.05		16.18		14.40		14.09
27	03.55	05.37	17.57-18.27/30	07.10		07.42	10.17-10.43/26	09.27		10.22
	22.45	20.55		19.01		16.14		14.38		14.10
28	03.58	05.40	17.57-18.28/31	07.13		07.46	10.17-10.43/26	09.30		10.21
	22.42	20.51		18.58		16.11		14.35		14.11
29	04.02	05.43	17.56-18.28/32	07.16		07.49	10.18-10.43/25	09.33		10.21
	22.39	20.47		18.54		16.07		14.33		14.13
30	04.05	05.46	17.56-18.28/32	07.19		07.52	10.19-10.42/23	09.36		10.20
	22.35	20.44		18.50		16.04		14.30		14.14
31	04.08	05.49	17.55-18.28/33			07.56	10.20-10.41/21			10.19
	22.32	20.40				16.01				14.16
Potential sun hours	621	513		394		302		192		125
Sum of minutes with flicker	0	289		659		684		52		0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 13 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (637)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February		March		April		May		June
1	10.18	09.03		07.28	09.01-09.23/22	06.35	16.58-17.34/36	04.46	17.41-18.23/42	03.01
	14.19	15.55		17.29		20.05		21.41		23.27
2	10.17	09.00		07.24	09.01-09.23/22	06.32	16.58-17.33/35	04.42	17.42-18.22/40	02.58
	14.21	15.58		17.32		20.08		21.44		23.30
3	10.16	08.57		07.20	09.00-09.23/23	06.28	16.58-17.33/35	04.39	17.43-18.22/39	02.55
	14.23	16.02		17.35		20.11		21.48		23.33
4	10.14	08.53		07.17	09.01-09.24/23	06.24	16.58-17.32/34	04.35	17.43-18.21/38	02.52
	14.25	16.05		17.38		20.14		21.51		23.36
5	10.13	08.50		07.13	09.01-09.23/22	06.21	16.59-17.32/33	04.32	17.44-18.20/36	02.50
	14.28	16.09		17.42		20.17		21.54		23.39
6	10.11	08.47		07.10	09.01-09.22/21	06.17	16.59-17.30/31	04.28	17.46-18.20/34	02.47
	14.30	16.12		17.45		20.20		21.58		23.42
7	10.09	08.44		07.06	09.01-09.20/19	06.13	17.00-17.29/29	04.24	17.47-18.18/31	02.44
	14.33	16.16		17.48		20.23		22.01		23.45
8	10.08	08.40		07.02	09.03-09.19/16	06.10	17.01-17.28/27	04.21	17.48-18.17/29	02.42
	14.36	16.19		17.51		20.27		22.05		23.48
9	10.06	08.37		06.59	09.04-09.17/13	06.06	17.02-17.26/24	04.17	17.50-18.16/26	02.40
	14.38	16.23		17.54		20.30		22.08		23.50
10	10.04	08.34		06.55	09.08-09.12/4	06.02	17.59-18.13/14	04.14	17.52-18.14/22	02.37
	14.41	16.26		17.57		20.33	17.05-17.24/19	22.12		23.53
11	10.01	08.30		06.52		05.59	17.55-18.16/21	04.10	17.54-18.12/18	02.35
	14.44	16.29		18.00		20.36	17.08-17.20/12	22.15		23.55
12	09.59	08.27	10.07-10.14/7	06.48		05.55	17.52-18.19/27	04.07	17.57-18.08/11	02.33
	14.47	16.33		18.03		20.39		22.18		23.58
13	09.57	08.23	10.05-10.18/13	06.44		05.51	17.50-18.20/30	04.03		02.32
	14.50	16.36		18.07		20.42		22.22		00.00
14	09.55	08.20	10.03-10.20/17	06.41		05.48	17.48-18.22/34	04.00		02.30
	14.54	16.40		18.10		20.45		22.25		00.02
15	09.52	08.17	10.02-10.21/19	06.37		05.44	17.46-18.22/36	03.56		02.28
	14.57	16.43		18.13		20.49		22.29		00.03
16	09.50	08.13	10.00-10.22/22	06.34		05.40	17.46-18.24/38	03.53		02.27
	15.00	16.46		18.16		20.52		22.32		00.05
17	09.47	08.10	10.00-10.23/23	06.30		05.37	17.45-18.25/40	03.49		02.26
	15.03	16.50		18.19		20.55		22.36		00.06
18	09.44	08.06	09.59-10.23/24	06.26		05.33	17.43-18.25/42	03.46		02.25
	15.07	16.53		18.22		20.58		22.39		00.07
19	09.42	08.03	09.58-10.23/25	06.23		05.29	17.43-18.25/42	03.43		02.25
	15.10	16.56		18.25		21.01		22.43		00.08
20	09.39	07.59	09.58-10.23/25	06.19		05.26	17.42-18.25/43	03.39		02.24
	15.13	17.00		18.28		21.05		22.46		00.09
21	09.36	07.56	09.58-10.23/25	06.15	16.12-16.26/14	05.22	17.41-18.26/45	03.36		02.24
	15.17	17.03		18.31		21.08		22.50		00.09
22	09.33	07.52	09.59-10.23/24	06.12	16.09-16.29/20	05.18	17.41-18.26/45	03.33		02.24
	15.20	17.06		18.34		21.11		22.53		00.09
23	09.31	07.49	09.59-10.23/24	06.08	16.07-16.31/24	05.15	17.40-18.25/45	03.29		02.24
	15.23	17.09		18.37		21.14		22.57		00.09
24	09.28	07.45	09.59-10.22/23	06.04	16.05-16.32/27	05.11	17.40-18.26/46	03.26		02.25
	15.27	17.13	09.09-09.18/9	18.40		21.18		23.00		00.09
25	09.25	07.42	10.00-10.21/21	06.01	16.03-16.33/30	05.08	17.40-18.26/46	03.23		02.26
	15.30	17.16	09.06-09.20/14	18.43		21.21		23.04		00.08
26	09.22	07.38	10.01-10.19/18	05.57	16.02-16.34/32	05.04	17.40-18.25/45	03.19		02.27
	15.34	17.19	09.04-09.21/17	18.46		21.24		23.07		00.08
27	09.19	07.35	10.03-10.18/15	05.53	16.01-16.34/33	05.00	17.40-18.25/45	03.16		02.28
	15.37	17.22	09.03-09.23/20	18.49		21.27		23.10		00.07
28	09.16	07.31	10.05-10.15/10	05.50	16.00-16.34/34	04.57	17.40-18.25/45	03.13		02.29
	15.41	17.26	09.02-09.23/21	18.53		21.31		23.14		00.05
29	09.13			06.46	17.00-17.35/35	04.53	17.41-18.25/44	03.10		02.31
	15.44			19.56		21.34		23.17		00.04
30	09.09			06.43	16.59-17.34/35	04.50	17.41-18.24/43	03.07		02.33
	15.48			19.59		21.37		23.20		00.03
31	09.06			06.39	16.59-17.35/36			03.04		
	15.51			20.02				23.24		
Potential sun hours	163	235		363		454		578		641
Sum of minutes with flicker	0	416		505		1131		366		0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 13 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (637)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	July		August		September		October		November	December
1	02.35		04.12	18.06-18.21/15	05.52	17.55-18.16/21	07.21		07.59	09.39
	00.01		22.28		20.36	17.07-17.20/13	18.47		15.57	14.28
2	02.37		04.15	18.03-18.22/19	05.55	17.57-18.11/14	07.24		08.02	09.42
	23.59		22.25		20.33	17.03-17.22/19	18.43		15.54	14.26
3	02.39		04.19	18.01-18.25/24	05.58	17.00-17.24/24	07.27		08.06	09.45
	23.57		22.21		20.29		18.39		15.50	14.23
4	02.42		04.22	17.59-18.26/27	06.01	16.59-17.25/26	07.30	09.43-09.53/10	08.09	09.48
	23.55		22.18		20.25		18.36		15.47	14.21
5	02.44		04.25	17.58-18.28/30	06.04	16.57-17.26/29	07.33	09.40-09.55/15	08.12	09.51
	23.52		22.14		20.22		18.32		15.44	14.19
6	02.47		04.29	17.56-18.29/33	06.07	16.56-17.27/31	07.37	09.38-09.56/18	08.16	09.53
	23.50		22.10		20.18		18.29		15.40	14.18
7	02.50		04.32	17.54-18.29/35	06.10	16.54-17.27/33	07.40	09.37-09.57/20	08.19	09.56
	23.48		22.07		20.14		18.25		15.37	14.16
8	02.52		04.35	17.53-18.30/37	06.13	16.53-17.26/33	07.43	09.36-09.57/21	08.22	09.58
	23.45		22.03		20.11		18.21		15.34	14.14
9	02.55		04.39	17.52-18.31/39	06.16	16.52-17.27/35	07.46	09.35-09.57/22	08.26	10.01
	23.42		22.00		20.07		18.18		15.31	14.13
10	02.58		04.42	17.51-18.31/40	06.19	16.51-17.27/36	07.49	09.35-09.58/23	08.29	10.03
	23.39		21.56		20.03		18.14		15.27	14.11
11	03.01		04.45	17.51-18.32/41	06.22	16.51-17.27/36	07.52	09.34-09.57/23	08.33	10.05
	23.37		21.53		20.00		18.11		15.24	14.10
12	03.04		04.49	17.50-18.32/42	06.25	16.50-17.26/36	07.55	09.34-09.57/23	08.36	10.08
	23.34		21.49		19.56		18.07		15.21	14.09
13	03.08		04.52	17.48-18.32/44	06.28	16.50-17.26/36	07.58	09.35-09.57/22	08.39	10.10
	23.31		21.45		19.52		18.03		15.18	14.08
14	03.11		04.55	17.48-18.32/44	06.31	16.50-17.25/35	08.01	10.36-10.49/13	08.43	10.11
	23.28		21.42		19.49		18.00	09.35-09.56/21	15.15	14.07
15	03.14		04.59	17.48-18.32/44	06.34	16.50-17.25/35	08.04	10.34-10.50/16	08.46	10.13
	23.25		21.38		19.45		17.56	09.35-09.54/19	15.12	14.06
16	03.17		05.02	17.47-18.32/45	06.37	16.50-17.23/33	08.07	10.33-10.52/19	08.50	10.15
	23.22		21.35		19.41		17.53	09.37-09.53/16	15.09	14.05
17	03.21		05.05	17.47-18.32/45	06.40	16.50-17.22/32	08.10	10.31-10.53/22	08.53	10.16
	23.19		21.31		19.38		17.49	09.38-09.51/13	15.06	14.05
18	03.24		05.08	17.47-18.32/45	06.43	16.51-17.21/30	08.13	10.31-10.54/23	08.57	10.17
	23.15		21.27		19.34		17.46	09.42-09.48/6	15.03	14.05
19	03.27		05.11	17.47-18.32/45	06.46	16.51-17.19/28	08.17	10.30-10.54/24	09.00	10.19
	23.12		21.24		19.30		17.42		15.00	14.05
20	03.31		05.15	17.46-18.31/45	06.49	16.53-17.17/24	08.20	10.29-10.54/25	09.03	10.20
	23.09		21.20		19.27		17.39		14.57	14.05
21	03.34		05.18	17.46-18.31/45	06.52	16.54-17.15/21	08.23	10.29-10.54/25	09.07	10.20
	23.06		21.16		19.23		17.35		14.54	14.05
22	03.38		05.21	17.46-18.30/44	06.55	16.56-17.12/16	08.26	10.29-10.54/25	09.10	10.21
	23.02		21.13		19.19		17.32		14.51	14.05
23	03.41		05.24	17.46-18.30/44	06.58	17.01-17.07/6	08.29	10.28-10.53/25	09.13	10.21
	22.59		21.09		19.16		17.28		14.48	14.06
24	03.44		05.27	17.47-18.29/42	07.01		08.33	10.29-10.53/24	09.17	10.22
	22.56		21.05		19.12		17.25		14.45	14.07
25	03.48		05.30	17.47-18.28/41	07.04		07.36	09.30-09.52/22	09.20	10.22
	22.52		21.02		19.08		16.21		14.43	14.07
26	03.51		05.33	17.47-18.26/39	07.07		07.39	09.30-09.51/21	09.23	10.22
	22.49		20.58		19.05		16.18		14.40	14.09
27	03.55		05.37	17.47-18.25/38	07.10		07.42	09.31-09.50/19	09.26	10.22
	22.45		20.55		19.01		16.14		14.37	14.10
28	03.58		05.40	17.48-18.24/36	07.13		07.46	09.32-09.49/17	09.30	10.21
	22.42		20.51		18.58		16.11		14.35	14.11
29	04.02		05.43	17.49-18.22/33	07.16		07.49	09.35-09.47/12	09.33	10.21
	22.39		20.47		18.54		16.07		14.33	14.13
30	04.05		05.46	17.51-18.21/30	07.18		07.52	09.39-09.43/4	09.36	10.20
	22.35		20.44		18.50		16.04		14.30	14.14
31	04.08	18.12-18.15/3	05.49	17.52-18.19/27			07.56			10.19
	22.32		20.40				16.01			14.16
Potential sun hours	621		513		394		302		192	125
Sum of minutes with flicker	3		1158		682		608		0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 14 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (638)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February		March	April		May	June
1	10.18	09.03		07.28	06.35		04.46	03.01
	14.19	15.55		17.29	20.05		21.41	23.27
2	10.17	09.00		07.24	06.32	07.34-07.40/6	04.42	02.58
	14.21	15.58		17.32	20.08		21.44	23.30
3	10.16	08.57	13.54-14.04/10	07.21	06.28	07.30-07.43/13	04.39	02.55
	14.23	16.02		17.35	20.11		21.48	23.33
4	10.14	08.54	13.51-14.05/14	07.17	06.24	07.28-07.44/16	04.35	02.52
	14.25	16.05	13.04-13.12/8	17.38	20.14		21.51	23.36
5	10.13	08.50	13.50-14.07/17	07.13	06.21	07.27-07.45/18	04.32	02.50
	14.28	16.09	13.01-13.15/14	17.42	20.17		21.54	23.39
6	10.11	08.47	13.49-14.08/19	07.10	06.17	07.25-07.45/20	04.28	02.47
	14.30	16.12	13.00-13.17/17	17.45	20.20		21.58	23.42
7	10.09	08.44	13.48-14.09/21	07.06	06.13	07.25-07.46/21	04.25	02.45
	14.33	16.16	12.58-13.19/21	17.48	20.23		22.01	23.45
8	10.08	08.40	13.48-14.10/22	07.03	06.10	07.24-07.45/21	04.21	02.42
	14.36	16.19	12.57-13.20/23	17.51	20.27		22.05	23.48
9	10.06	08.37	13.47-14.10/23	06.59	06.06	07.24-07.45/21	04.17	02.40
	14.39	16.23	12.57-13.21/24	17.54	20.30		22.08	23.51
10	10.04	08.34	13.47-14.10/23	06.55	06.02	07.23-07.45/22	04.14	02.38
	14.42	16.26	12.56-13.22/26	17.57	20.33		22.12	23.53
11	10.02	08.30	13.47-14.10/23	06.52	05.59	07.24-07.44/20	04.10	02.35
	14.44	16.29	12.55-13.22/27	18.00	20.36		22.15	23.55
12	09.59	08.27	13.47-14.10/23	06.48	05.55	07.24-07.43/19	04.07	02.34
	14.48	16.33	12.56-13.23/27	18.04	20.39		22.19	23.58
13	09.57	08.24	13.48-14.11/23	06.45	05.51	07.25-07.42/17	04.03	02.32
	14.51	16.36	12.56-13.24/28	18.07	20.42		22.22	00.00
14	09.55	08.20	13.49-14.11/22	06.41	05.48	07.26-07.40/14	04.00	02.30
	14.54	16.40	12.56-13.24/28	18.10	20.45		22.25	00.02
15	09.52	08.17	13.49-14.10/21	06.37	05.44	07.28-07.38/10	03.56	02.29
	14.57	16.43	12.56-13.23/27	18.13	20.49		22.29	00.03
16	09.50	08.13	13.50-14.09/19	06.34	05.40		03.53	02.27
	15.00	16.46	12.56-13.23/27	18.16	20.52		22.32	00.05
17	09.47	08.10	13.51-14.08/17	06.30	05.37		03.50	02.26
	15.03	16.50	12.56-13.23/27	18.19	20.55		22.36	00.06
18	09.45	08.06	13.53-14.06/13	06.26	05.33		03.46	02.25
	15.07	16.53	12.56-13.22/26	18.22	20.58		22.39	00.07
19	09.42	08.03	13.56-14.03/7	06.23	05.30		03.43	02.25
	15.10	16.56	12.57-13.21/24	18.25	21.01		22.43	00.08
20	09.39	07.59	12.58-13.20/22	06.19	05.26		03.39	02.24
	15.13	17.00		18.28	21.05		22.46	00.09
21	09.36	07.56	13.00-13.19/19	06.15	05.22		03.36	02.24
	15.17	17.03		18.31	21.08		22.50	00.09
22	09.34	07.52	13.02-13.17/15	06.12	05.19		03.33	02.24
	15.20	17.06		18.34	21.11		22.53	00.09
23	09.31	07.49	13.05-13.13/8	06.08	05.15		03.29	02.24
	15.24	17.10		18.37	21.14		22.57	00.09
24	09.28	07.45		06.05	05.11		03.26	02.25
	15.27	17.13		18.40	21.18		23.00	00.09
25	09.25	07.42		06.01	05.08		03.23	02.26
	15.31	17.16		18.43	21.21		23.04	00.08
26	09.22	07.38		05.57	05.04		03.20	02.27
	15.34	17.19		18.47	21.24		23.07	00.08
27	09.19	07.35		05.54	05.00		03.16	02.28
	15.37	17.22		18.50	21.28		23.10	00.07
28	09.16	07.31		05.50	04.57		03.13	02.29
	15.41	17.26		18.53	21.31		23.14	00.05
29	09.13			06.46	04.53		03.10	02.31
	15.44			19.56	21.34		23.17	00.04
30	09.10			06.43	04.50		03.07	02.33
	15.48			19.59	21.38		23.20	00.03
31	09.06			06.39			03.04	
	15.51			20.02			23.24	
Potential sun hours	163	235		363	454		578	641
Sum of minutes with flicker	0	755		0	238		0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 14 - VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (638)

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	July	August		September		October		November		December
1	02.35	04.12		05.52	07.23-07.43/20	07.22		07.59	13.18-13.41/23	09.39
	00.01	22.28		20.36		18.47		15.57	12.26-12.52/26	14.28
2	02.37	04.15		05.55	07.22-07.43/21	07.25		08.02	13.18-13.40/22	09.42
	23.59	22.25		20.33		18.43		15.54	12.27-12.51/24	14.26
3	02.39	04.19		05.58	07.22-07.44/22	07.28		08.06	13.18-13.40/22	09.45
	23.57	22.21		20.29		18.40		15.51	12.28-12.50/22	14.24
4	02.42	04.22		06.01	07.21-07.42/21	07.31		08.09	13.19-13.39/20	09.48
	23.55	22.18		20.25		18.36		15.47	12.29-12.49/20	14.22
5	02.44	04.26		06.04	07.21-07.42/21	07.34		08.12	13.20-13.38/18	09.51
	23.52	22.14		20.22		18.32		15.44	12.30-12.47/17	14.20
6	02.47	04.29		06.07	07.21-07.41/20	07.37		08.16	13.21-13.37/16	09.53
	23.50	22.11		20.18		18.29		15.41	12.32-12.45/13	14.18
7	02.50	04.32		06.10	07.22-07.40/18	07.40		08.19	13.22-13.35/13	09.56
	23.48	22.07		20.14		18.25		15.37	12.35-12.42/7	14.16
8	02.53	04.36		06.13	07.23-07.39/16	07.43		08.23	13.24-13.33/9	09.59
	23.45	22.03		20.11		18.21		15.34		14.14
9	02.55	04.39		06.16	07.24-07.37/13	07.46		08.26		10.01
	23.42	22.00		20.07		18.18		15.31		14.13
10	02.58	04.42		06.19	07.26-07.33/7	07.49		08.29		10.03
	23.40	21.56		20.03		18.14		15.27		14.11
11	03.02	04.46		06.22		07.52		08.33		10.06
	23.37	21.53		20.00		18.11		15.24		14.10
12	03.05	04.49		06.25		07.55		08.36		10.08
	23.34	21.49		19.56		18.07		15.21		14.09
13	03.08	04.52		06.28		07.58		08.40		10.10
	23.31	21.45		19.52		18.04		15.18		14.08
14	03.11	04.55		06.31		08.01		08.43		10.12
	23.28	21.42		19.49		18.00		15.15		14.07
15	03.14	04.59		06.34		08.04		08.46		10.13
	23.25	21.38		19.45		17.56		15.12		14.06
16	03.18	05.02		06.37		08.07		08.50		10.15
	23.22	21.35		19.41		17.53		15.09		14.06
17	03.21	05.05		06.40		08.10		08.53		10.16
	23.19	21.31		19.38		17.49		15.06		14.05
18	03.24	05.08		06.43		08.14		08.57		10.18
	23.15	21.27		19.34		17.46		15.03		14.05
19	03.28	05.12		06.46		08.17	13.34-13.45/11	09.00		10.19
	23.12	21.24		19.30		17.42		15.00		14.05
20	03.31	05.15		06.49		08.20	13.32-13.48/16	09.03		10.20
	23.09	21.20		19.27		17.39		14.57		14.05
21	03.34	05.18		06.52		08.23	13.29-13.49/20	09.07		10.20
	23.06	21.17		19.23		17.35		14.54		14.05
22	03.38	05.21		06.55		08.26	13.28-13.51/23	09.10		10.21
	23.02	21.13		19.19		17.32		14.51		14.05
23	03.41	05.24		06.58		08.29	14.24-14.34/10	09.13		10.21
	22.59	21.09		19.16		17.28	13.27-13.51/24	14.48		14.06
24	03.45	05.27		07.01		08.33	14.22-14.36/14	09.17		10.22
	22.56	21.06		19.12		17.25	13.26-13.52/26	14.46		14.07
25	03.48	05.30		07.04		07.36	13.21-13.38/17	09.20		10.22
	22.52	21.02		19.09		16.21	12.26-12.53/27	14.43		14.08
26	03.51	05.34		07.07		07.39	13.19-13.38/19	09.23		10.22
	22.49	20.58		19.05		16.18	12.25-12.52/27	14.40		14.09
27	03.55	05.37		07.10		07.42	13.18-13.39/21	09.27		10.22
	22.45	20.55		19.01		16.14	12.25-12.52/27	14.38		14.10
28	03.58	05.40	07.28-07.39/11	07.13		07.46	13.18-13.40/22	09.30		10.21
	22.42	20.51		18.58		16.11	12.25-12.53/28	14.35		14.11
29	04.02	05.43	07.26-07.41/15	07.16		07.49	13.17-13.40/23	09.33		10.21
	22.39	20.47		18.54		16.07	12.25-12.53/28	14.33		14.13
30	04.05	05.46	07.25-07.42/17	07.19		07.52	13.17-13.41/24	09.36		10.20
	22.35	20.44		18.50		16.04	12.25-12.53/28	14.30		14.14
31	04.09	05.49	07.24-07.43/19			07.56	13.17-13.41/24			10.19
	22.32	20.40				16.01	12.26-12.52/26			14.16
Potential sun hours	620	513		394		302		192		125
Sum of minutes with flicker	0	62		179		485		272		0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
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SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 1 - M1-E-70 E4 2000 71.0

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February		March	April	May	June	July	August	September	October		November		December
1	10.18	09.03		07.28	06.35	04.46	03.01	02.35	04.12	05.52	07.22		07.59	11.42-11.59/17	09.39
	14.19	15.55		17.29	20.05	21.41	23.27	00.01	22.28	20.36	18.47		15.57		14.28
2	10.17	09.00		07.24	06.32	04.43	02.58	02.37	04.16	05.55	07.25		08.02	11.42-11.59/17	09.42
	14.21	15.59		17.32	20.08	21.44	23.30	23.59	22.25	20.33	18.43		15.54		14.26
3	10.16	08.57		07.21	06.28	04.39	02.56	02.40	04.19	05.58	07.28		08.06	11.43-11.58/15	09.45
	14.23	16.02		17.35	20.11	21.48	23.33	23.57	22.21	20.29	18.40		15.51		14.24
4	10.14	08.54		07.17	06.24	04.35	02.53	02.42	04.22	06.01	07.31		08.09	11.43-11.57/14	09.48
	14.26	16.06		17.39	20.14	21.51	23.36	23.55	22.18	20.25	18.36		15.47		14.22
5	10.13	08.50	12.15-12.24/9	07.13	06.21	04.32	02.50	02.45	04.26	06.04	07.34		08.12	11.44-11.56/12	09.51
	14.28	16.09		17.42	20.17	21.54	23.39	23.52	22.14	20.22	18.32		15.44		14.20
6	10.11	08.47	12.14-12.26/12	07.10	06.17	04.28	02.47	02.47	04.29	06.07	07.37		08.16	11.46-11.54/8	09.53
	14.31	16.12		17.45	20.20	21.58	23.42	23.50	22.11	20.18	18.29		15.41		14.18
7	10.09	08.44	12.13-12.27/14	07.06	06.14	04.25	02.45	02.50	04.32	06.10	07.40		08.19		09.56
	14.33	16.16		17.48	20.24	22.01	23.45	23.47	22.07	20.14	18.25		15.37		14.16
8	10.08	08.40	12.12-12.28/16	07.03	06.10	04.21	02.42	02.53	04.36	06.13	07.43		08.23		09.59
	14.36	16.19		17.51	20.27	22.05	23.48	23.45	22.03	20.11	18.22		15.34		14.15
9	10.06	08.37	12.12-12.28/16	06.59	06.06	04.18	02.40	02.56	04.39	06.16	07.46		08.26		10.01
	14.39	16.23		17.54	20.30	22.08	23.50	23.42	22.00	20.07	18.18		15.31		14.13
10	10.04	08.34	12.12-12.28/16	06.55	06.03	04.14	02.38	02.59	04.42	06.19	07.49		08.29		10.03
	14.42	16.26		17.57	20.33	22.12	23.53	23.39	21.56	20.03	18.14		15.28		14.12
11	10.02	08.30	12.12-12.28/16	06.52	05.59	04.11	02.36	03.02	04.46	06.22	07.52		08.33		10.06
	14.45	16.30		18.01	20.36	22.15	23.55	23.37	21.53	20.00	18.11		15.24		14.10
12	09.59	08.27	12.13-12.29/16	06.48	05.55	04.07	02.34	03.05	04.49	06.25	07.55		08.36		10.08
	14.48	16.33		18.04	20.39	22.19	23.57	23.34	21.49	19.56	18.07		15.21		14.09
13	09.57	08.24	12.13-12.29/16	06.45	05.52	04.04	02.32	03.08	04.52	06.28	07.58		08.40		10.10
	14.51	16.36		18.07	20.42	22.22	00.00	23.31	21.46	19.53	18.04		15.18		14.08
14	09.55	08.20	12.14-12.28/14	06.41	05.48	04.00	02.30	03.11	04.56	06.31	08.01		08.43		10.11
	14.54	16.40		18.10	20.46	22.25	00.01	23.28	21.42	19.49	18.00		15.15		14.07
15	09.52	08.17	12.15-12.26/11	06.37	05.44	03.57	02.29	03.15	04.59	06.34	08.04		08.46		10.13
	14.57	16.43		18.13	20.49	22.29	00.03	23.25	21.38	19.45	17.57		15.12		14.06
16	09.50	08.13	12.17-12.24/7	06.34	05.41	03.53	02.28	03.18	05.02	06.37	08.07		08.50		10.15
	15.00	16.47		18.16	20.52	22.32	00.05	23.22	21.35	19.42	17.53		15.09		14.06
17	09.47	08.10		06.30	05.37	03.50	02.27	03.21	05.05	06.40	08.11		08.53		10.16
	15.04	16.50		18.19	20.55	22.36	00.06	23.19	21.31	19.38	17.49		15.06		14.05
18	09.45	08.06		06.27	05.33	03.46	02.26	03.24	05.09	06.43	08.14		08.57		10.17
	15.07	16.53		18.22	20.58	22.39	00.07	23.15	21.27	19.34	17.46		15.03		14.05
19	09.42	08.03		06.23	05.30	03.43	02.25	03.28	05.12	06.46	08.17		09.00		10.19
	15.10	16.57		18.25	21.01	22.43	00.08	23.12	21.24	19.31	17.42		15.00		14.05
20	09.39	07.59		06.19	05.26	03.40	02.25	03.31	05.15	06.49	08.20		09.03		10.20
	15.14	17.00		18.28	21.05	22.46	00.09	23.09	21.20	19.27	17.39		14.57		14.05
21	09.36	07.56		06.16	05.22	03.36	02.25	03.35	05.18	06.52	08.23		09.07		10.20
	15.17	17.03		18.31	21.08	22.50	00.09	23.06	21.17	19.23	17.35		14.54		14.05
22	09.34	07.52		06.12	05.19	03.33	02.25	03.38	05.21	06.55	08.26		09.10		10.21
	15.20	17.06		18.34	21.11	22.53	00.09	23.02	21.13	19.20	17.32		14.51		14.06
23	09.31	07.49		06.08	05.15	03.30	02.25	03.41	05.24	06.58	08.30		09.13		10.21
	15.24	17.10		18.37	21.14	22.57	00.09	22.59	21.09	19.16	17.28		14.48		14.06
24	09.28	07.45		06.05	05.12	03.26	02.25	03.45	05.28	07.01	08.33		09.17		10.22
	15.27	17.13		18.41	21.18	23.00	00.09	22.56	21.06	19.12	17.25		14.46		14.07
25	09.25	07.42		06.01	05.08	03.23	02.26	03.48	05.31	07.04	07.36		09.20		10.22
	15.31	17.16		18.44	21.21	23.04	00.08	22.52	21.02	19.09	16.21		14.43		14.08
26	09.22	07.38		05.57	05.04	03.20	02.27	03.52	05.34	07.07	07.39	11.47-11.55/8	09.23		10.22
	15.34	17.19		18.47	21.24	23.07	00.07	22.49	20.58	19.05	16.18		14.40		14.09
27	09.19	07.35		05.54	05.01	03.17	02.28	03.55	05.37	07.10	07.43	11.44-11.56/12	09.27		10.22
	15.38	17.23		18.50	21.28	23.10	00.07	22.45	20.55	19.01	16.14		14.38		14.10
28	09.16	07.31		05.50	04.57	03.13	02.30	03.59	05.40	07.13	07.46	11.43-11.57/14	09.30		10.21
	15.41	17.26		18.53	21.31	23.14	00.05	22.42	20.51	18.58	16.11		14.35		14.12
29	09.13			06.46	04.53	03.10	02.31	04.02	05.43	07.16	07.49	11.42-11.58/16	09.33		10.21
	15.45			19.56	21.34	23.17	00.04	22.39	20.47	18.54	16.08		14.33		14.13
30	09.10			06.43	04.50	03.07	02.33	04.05	05.46	07.19	07.52	11.42-11.58/16	09.36		10.20
	15.48			19.59	21.38	23.20	00.02	22.35	20.44	18.51	16.04		14.31		14.15
31	09.06			06.39		03.04		04.09	05.49		07.56	11.42-11.59/17			10.19
	15.52			20.02		23.24		22.32	20.40		16.01				14.17
Potential sun hours	163	235		363	454	578	641	620	513	394	302		192		125
Sum of minutes with flicker	0	163		0	0	0	0	0	0	0	83		83		0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6**WTG:** 2 - M5- E-70 E4 2,3 MW 2300

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	January	February		March		April	May		June	
1	10.18	09.03		07.28	09.02-09.11/9	06.35	04.46		03.01	05.21-05.32/11
	14.19	15.55		17.29		20.05	21.41		23.27	
2	10.17	09.00		07.24	09.00-09.12/12	06.32	04.43		02.58	05.22-05.32/10
	14.21	15.58		17.32		20.08	21.44		23.30	
3	10.16	08.57		07.21	08.59-09.12/13	06.28	04.39		02.55	05.22-05.32/10
	14.23	16.02		17.35		20.11	21.48		23.33	
4	10.14	08.54		07.17	09.00-09.13/13	06.24	04.35		02.53	05.23-05.31/8
	14.26	16.05		17.39		20.14	21.51		23.36	
5	10.13	08.50		07.13	08.59-09.13/14	06.21	04.32		02.50	05.24-05.31/7
	14.28	16.09		17.42		20.17	21.54		23.39	
6	10.11	08.47		07.10	08.59-09.12/13	06.17	04.28		02.47	05.24-05.30/6
	14.31	16.12		17.45		20.20	21.58		23.42	
7	10.09	08.44		07.06	09.00-09.10/10	06.13	04.25		02.45	05.26-05.29/3
	14.33	16.16		17.48		20.24	22.01		23.45	
8	10.08	08.40		07.03	09.02-09.09/7	06.10	04.21		02.42	
	14.36	16.19		17.51		20.27	22.05		23.48	
9	10.06	08.37		06.59		06.06	04.18		02.40	
	14.39	16.23		17.54		20.30	22.08		23.50	
10	10.04	08.34		06.55		06.02	04.14		02.38	
	14.42	16.26		17.57		20.33	22.12		23.53	
11	10.01	08.30		06.52		05.59	04.11		02.36	
	14.45	16.30		18.00		20.36	22.15		23.55	
12	09.59	08.27		06.48		05.55	04.07		02.34	
	14.48	16.33		18.04		20.39	22.18		23.57	
13	09.57	08.24		06.45		05.51	04.04		02.32	
	14.51	16.36		18.07		20.42	22.22		00.00	
14	09.55	08.20		06.41		05.48	04.00		02.30	
	14.54	16.40		18.10		20.45	22.25		00.01	
15	09.52	08.17		06.37		05.44	03.57		02.29	
	14.57	16.43		18.13		20.49	22.29		00.03	
16	09.50	08.13		06.34		05.41	03.53		02.28	
	15.00	16.46		18.16		20.52	22.32		00.05	
17	09.47	08.10		06.30		05.37	03.50		02.27	
	15.04	16.50		18.19		20.55	22.36		00.06	
18	09.45	08.06		06.26		05.33	03.46		02.26	
	15.07	16.53		18.22		20.58	22.39		00.07	
19	09.42	08.03		06.23		05.30	03.43		02.25	
	15.10	16.56		18.25		21.01	22.43		00.08	
20	09.39	07.59		06.19		05.26	03.39		02.25	
	15.14	17.00		18.28		21.05	22.46		00.09	
21	09.36	07.56		06.16		05.22	03.36	05.24-05.28/4	02.24	
	15.17	17.03		18.31		21.08	22.50		00.09	
22	09.34	07.52		06.12		05.19	03.33	05.22-05.29/7	02.24	
	15.20	17.06		18.34		21.11	22.53		00.09	
23	09.31	07.49		06.08		05.15	03.29	05.21-05.30/9	02.25	
	15.24	17.10		18.37		21.14	22.57		00.09	
24	09.28	07.45		06.05		05.11	03.26	05.21-05.31/10	02.25	
	15.27	17.13		18.40		21.18	23.00		00.09	
25	09.25	07.42		06.01		05.08	03.23	05.20-05.31/11	02.26	
	15.31	17.16		18.44		21.21	23.04		00.08	
26	09.22	07.38		05.57		05.04	03.20	05.20-05.31/11	02.27	
	15.34	17.19		18.47		21.24	23.07		00.07	
27	09.19	07.35		05.54		05.01	03.17	05.20-05.32/12	02.28	
	15.38	17.23		18.50		21.28	23.10		00.07	
28	09.16	07.31	09.06-09.09/3	05.50		04.57	03.13	05.20-05.32/12	02.30	
	15.41	17.26		18.53		21.31	23.14		00.05	
29	09.13			06.46		04.53	03.10	05.20-05.32/12	02.31	
	15.45			19.56		21.34	23.17		00.04	
30	09.10			06.43		04.50	03.07	05.21-05.32/11	02.33	
	15.48			19.59		21.38	23.20		00.02	
31	09.06			06.39			03.04	05.21-05.32/11		
	15.52			20.02			23.24			
Potential sun hours	163	235		363		454	578		641	
Sum of minutes with flicker	0	3		91		0	110		55	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Calendar per WTG

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6 **WTG:** 2 - M5- E-70 E4 2,3 MW 2300

Assumptions for shadow calculations

Sunshine probability S/S0 (Sun hours/Possible sun hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
336	290	258	618	1 095	913	457	524	726	653	632	498	7 000

	July		August	September	October		November	December
1	02.35		04.12	05.52	07.22		07.59	09.39
	00.01		22.28	20.36	18.47		15.57	14.28
2	02.37		04.15	05.55	07.25		08.02	09.42
	23.59		22.25	20.33	18.43		15.54	14.26
3	02.40		04.19	05.58	07.28		08.06	09.45
	23.57		22.21	20.29	18.40		15.51	14.24
4	02.42		04.22	06.01	07.31		08.09	09.48
	23.55		22.18	20.25	18.36		15.47	14.22
5	02.44	05.32-05.34/2	04.26	06.04	07.34	09.41-09.43/2	08.12	09.51
	23.52		22.14	20.22	18.32		15.44	14.20
6	02.47	05.31-05.36/5	04.29	06.07	07.37	09.37-09.46/9	08.16	09.53
	23.50		22.11	20.18	18.29		15.41	14.18
7	02.50	05.31-05.37/6	04.32	06.10	07.40	09.35-09.47/12	08.19	09.56
	23.47		22.07	20.14	18.25		15.37	14.16
8	02.53	05.30-05.37/7	04.36	06.13	07.43	09.34-09.47/13	08.23	09.58
	23.45		22.03	20.11	18.22		15.34	14.14
9	02.56	05.29-05.38/9	04.39	06.16	07.46	09.34-09.48/14	08.26	10.01
	23.42		22.00	20.07	18.18		15.31	14.13
10	02.59	05.29-05.39/10	04.42	06.19	07.49	09.34-09.47/13	08.29	10.03
	23.39		21.56	20.03	18.14		15.28	14.11
11	03.02	05.29-05.39/10	04.46	06.22	07.52	09.34-09.46/12	08.33	10.05
	23.37		21.53	20.00	18.11		15.24	14.10
12	03.05	05.29-05.40/11	04.49	06.25	07.55	09.34-09.45/11	08.36	10.08
	23.34		21.49	19.56	18.07		15.21	14.09
13	03.08	05.29-05.40/11	04.52	06.28	07.58	09.37-09.44/7	08.40	10.10
	23.31		21.45	19.52	18.04		15.18	14.08
14	03.11	05.30-05.41/11	04.55	06.31	08.01		08.43	10.11
	23.28		21.42	19.49	18.00		15.15	14.07
15	03.14	05.29-05.41/12	04.59	06.34	08.04		08.46	10.13
	23.25		21.38	19.45	17.56		15.12	14.06
16	03.18	05.29-05.41/12	05.02	06.37	08.07		08.50	10.15
	23.22		21.35	19.41	17.53		15.09	14.06
17	03.21	05.29-05.41/12	05.05	06.40	08.10		08.53	10.16
	23.19		21.31	19.38	17.49		15.06	14.05
18	03.24	05.30-05.41/11	05.08	06.43	08.14		08.57	10.17
	23.15		21.27	19.34	17.46		15.03	14.05
19	03.28	05.30-05.40/10	05.12	06.46	08.17		09.00	10.19
	23.12		21.24	19.30	17.42		15.00	14.05
20	03.31	05.31-05.41/10	05.15	06.49	08.20		09.03	10.19
	23.09		21.20	19.27	17.39		14.57	14.05
21	03.34	05.31-05.40/9	05.18	06.52	08.23		09.07	10.20
	23.06		21.17	19.23	17.35		14.54	14.05
22	03.38	05.33-05.39/6	05.21	06.55	08.26		09.10	10.21
	23.02		21.13	19.20	17.32		14.51	14.06
23	03.41		05.24	06.58	08.30		09.13	10.21
	22.59		21.09	19.16	17.28		14.48	14.06
24	03.45		05.27	07.01	08.33		09.17	10.22
	22.56		21.06	19.12	17.25		14.46	14.07
25	03.48		05.31	07.04	07.36		09.20	10.22
	22.52		21.02	19.09	16.21		14.43	14.08
26	03.52		05.34	07.07	07.39		09.23	10.22
	22.49		20.58	19.05	16.18		14.40	14.09
27	03.55		05.37	07.10	07.42		09.27	10.22
	22.45		20.55	19.01	16.14		14.38	14.10
28	03.58		05.40	07.13	07.46		09.30	10.21
	22.42		20.51	18.58	16.11		14.35	14.11
29	04.02		05.43	07.16	07.49		09.33	10.21
	22.39		20.47	18.54	16.08		14.33	14.13
30	04.05		05.46	07.19	07.52		09.36	10.20
	22.35		20.44	18.50	16.04		14.30	14.15
31	04.09		05.49		07.56			10.19
	22.32		20.40		16.01			14.16
Potential sun hours	620		513	394	302		192	125
Sum of minutes with flicker		164		0	0	93	0	0

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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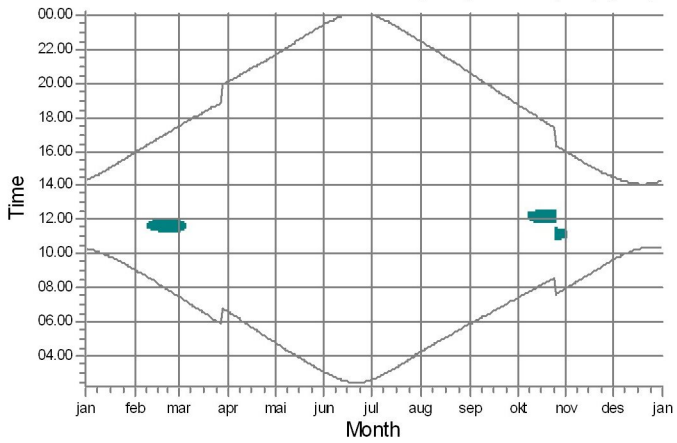
Calculated:
20.12.2018 10.43/3.2.737

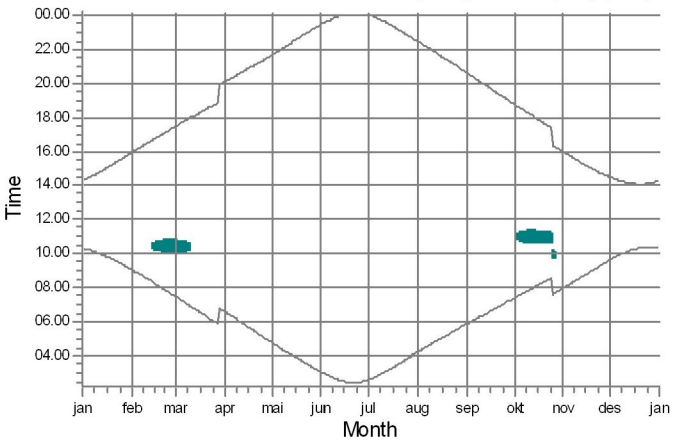
SHADOW - Calendar per WTG, graphical

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6

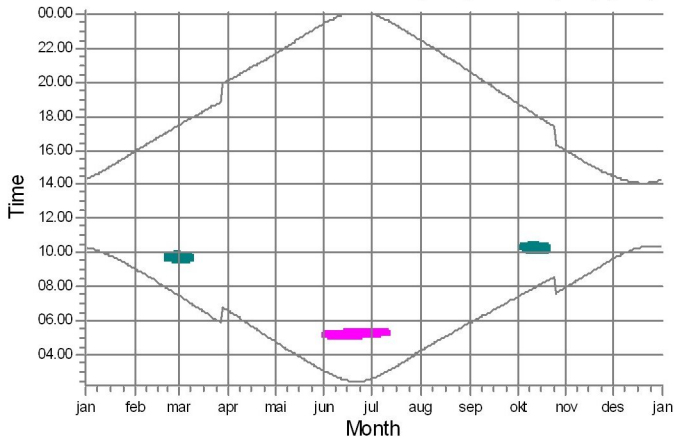
3: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (627)



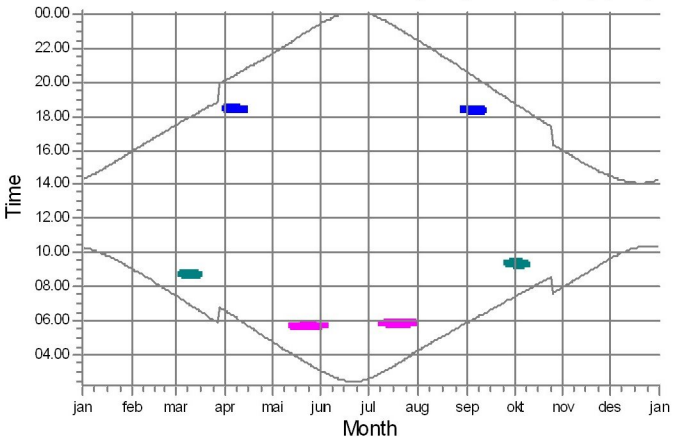
4: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (628)



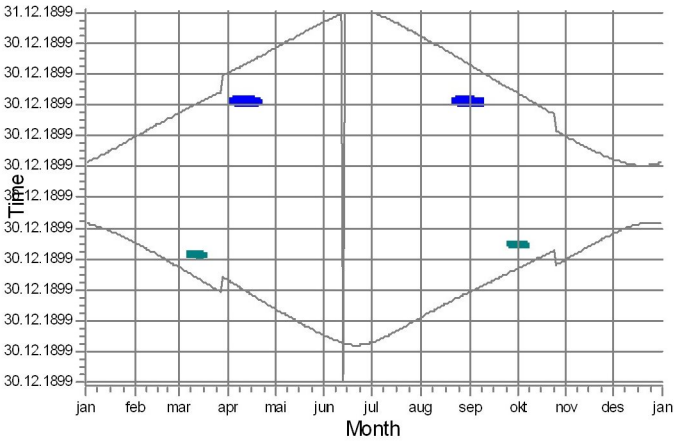
5: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (629)



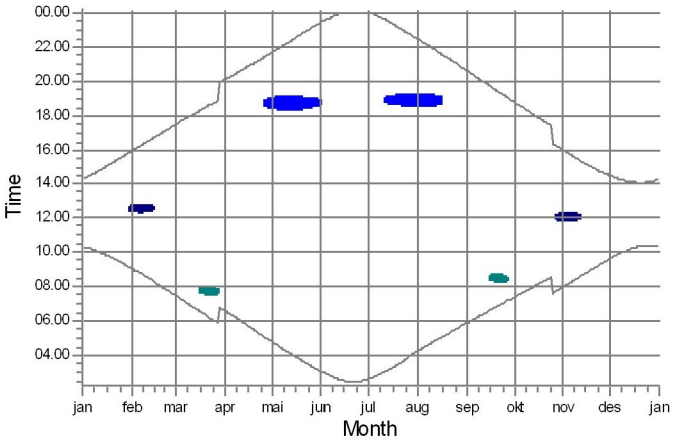
6: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (630)



7: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (631)



8: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (632)



Shadow receptors

C: Hundhammer E: Løvmo F: Storeienen G: Hamland

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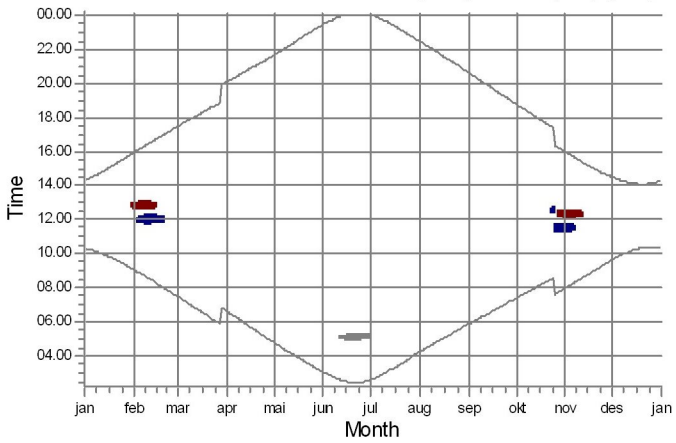
Calculated:
20.12.2018 10.43/3.2.737

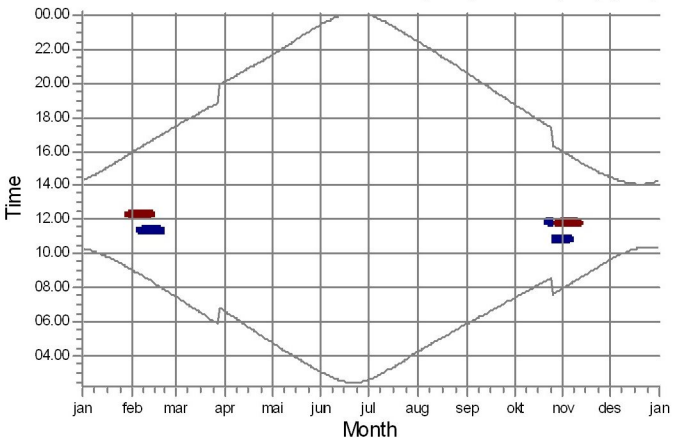
SHADOW - Calendar per WTG, graphical

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6

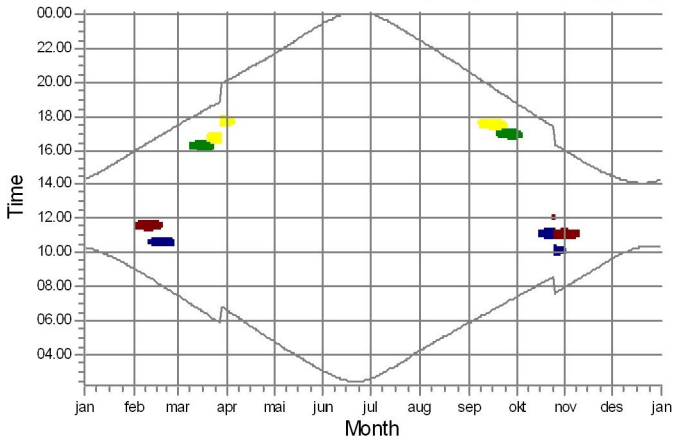
9: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (633)



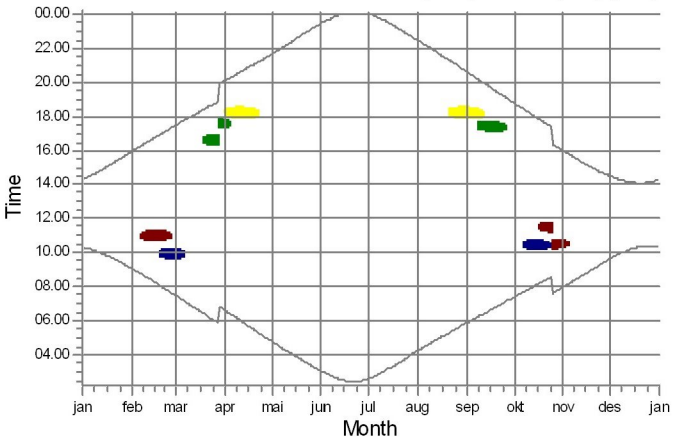
10: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (634)



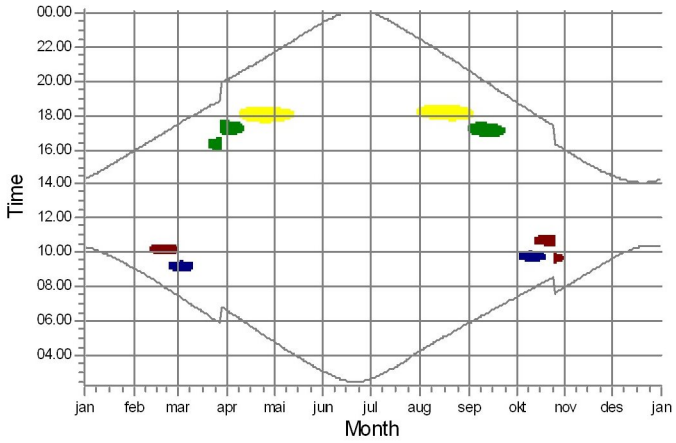
11: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (635)



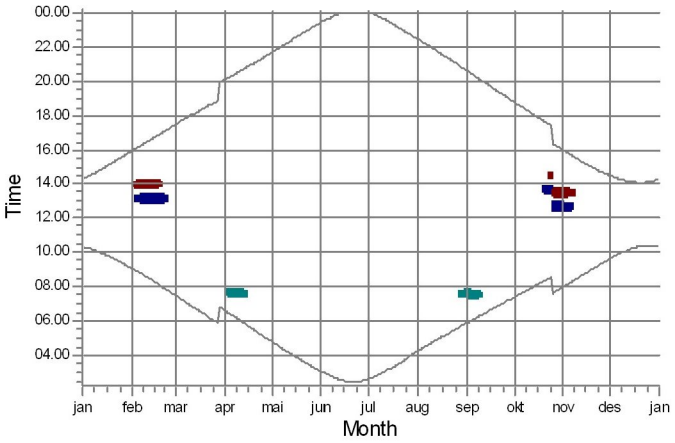
12: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (636)



13: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (637)



14: VESTAS V136-4.2 4200 136.0 !O! hub: 90,0 m (TOT: 158,0 m) (638)



Shadow receptors

	A: Hamlandsvika		D: Klungset		G: Hamland
	B: Skogmo		F: Storeienen		H: Myhrvang

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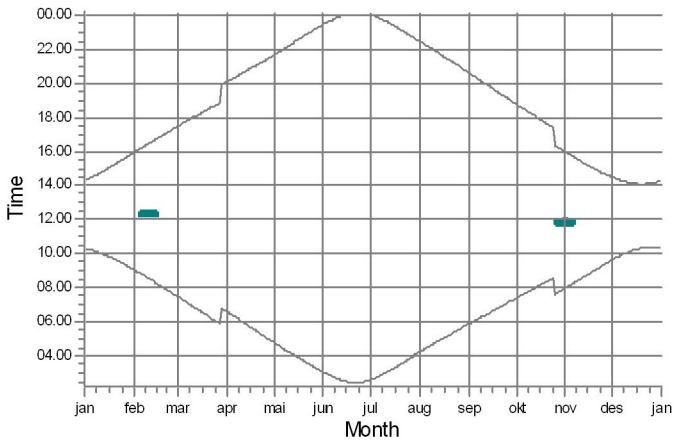
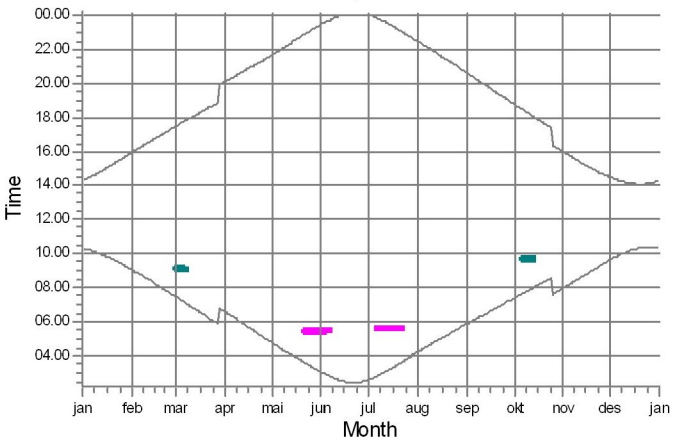
SHADOW - Calendar per WTG, graphical

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6

1: M1-E-70 E4 2000 71.0



2: M5- E-70 E4 2,3 MW 2300



Shadow receptors

E: Løvmo

F: Storeienen

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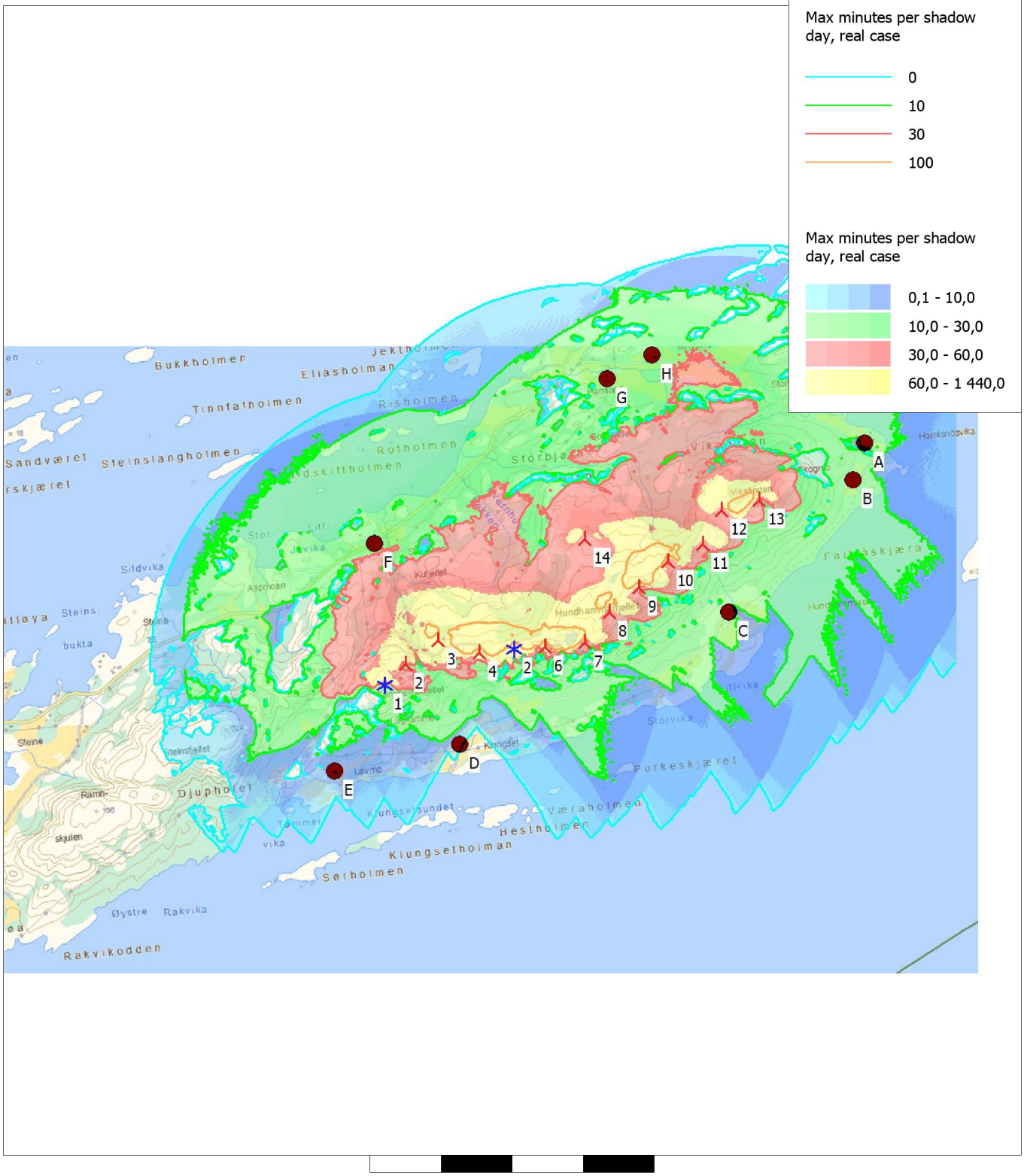
Calculated:
20.12.2018 10.43/3.2.737

SHADOW - Map

Calculation: Sannsynlig (real case) med solskinnssannsynlighet på 0,5 12 x V136 + 2 x E70 timer/år layout v6



Map: HHF , Print scale 1:40 000, Map center ETRS 89 Zone: 32 East: 612 510 North: 7 183 590

New WTG Existing WTG Shadow receptor

Flicker map level: Height Contours 2013